PROJECT FINAL REPORT

ESA Section 6, Habitat Conservation Planning Grants

State: New Mexico **Project Number:** E-59-HP-1

Project Title: Development of a Multi-species HCP for the Malpai Borderlands Region

Contract Period: 1 October 2003 **To:** 30 June 2006

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I. Grant Narrative Objective

To provide guidance for a regional, multi-species Habitat Conservation Plan for the Malpai Borderlands ecosystem that will create the greatest possible benefit for native habitats and species, and provide guidance on specific activities to minimize possible adverse effects of activities to listed, candidate, and other sensitive species.

II. Timeline of Project

The project deadline was extended in 2005 by grant amendment #1 from 30 September 2005 to 30 June 2006. The amendment became necessary due to delays in implementing the work caused by contract negotiations between New Mexico Department of Game and Fish (NMDGF) and Arizona Game and Fish Department (AGFD). The contract issues were resolved and work on this project proceeded through 2005 and early 2006. The involvement of NMDGF was completed as of 30 June 2006 although minor revision work and coordination with AGFD and U.S. Fish and Wildlife Service (USFWS) will be conducted by the contractor through 30 September 2006.

III. Need

The work proposed was the final step in plan development for a long-range program being undertaken by the Malpai Borderlands Group and the state wildlife agencies of Arizona and New Mexico, working in an 800,000 acre area along the U.S./Mexico border, to protect the area from development and to improve the condition of natural habitats. The goal of the proposed project was to create a multi-species Habitat Conservation Plan (HCP) that will provide a framework for cooperation among participating organizations, agencies, and landowners to guide restoration and management activities for listed and sensitive species in grassland, oak woodland and riparian habitats of the Malpai Borderlands region of southeastern Arizona and southwestern New Mexico. This area includes one of the few large intact landscapes that covers the entire range of

ecological gradients from valley bottom grasslands to forest and woodlands on the mountain tops with no significant landscape fragmentation. Many listed and sensitive species associated with these habitats are continuing to experience population declines as the Basin and Range landscape of the Southwest is fragmented by development. Over 50 state or federally listed or sensitive species occur within the project area. The Malpai Borderlands Group (MBG) is working to protect this region from habitat loss due to development and landscape fragmentation, by promoting a cooperative approach to management and restoration of natural habitats. The completed plan will benefit numerous listed species and sensitive species that occupy these habitats by improving watershed conditions, restoring more natural fire conditions, improving livestock management practices and creating opportunities for recovery of listed species.

IV. Expected Results and Benefits

The purpose of this project was to prepare a HCP for the entire Malpai Borderlands ecosystem. Within this area the MBG is working to protect the integrity of the landscape through use of conservation easements to prevent subdivision, as well as working to promote ecologically sustainable land management. There are two general program areas that will result in benefit to wildlife. The first is the protection of private land from subdivision and development through use of conservation easements. The MBG has already protected over 25,000 acres with conservation easements and is working on more. The second area is improved management and restoration of grassland and woodland habitat through cooperative projects with neighboring landowners.

The HCP addresses the management activities for which the MBG intends to pursue opportunities for cooperation among landowners, ranchers and agencies in the area. The plan provides guidance for each of these activities to minimize possible adverse effects to listed, candidate, and other sensitive species, and to create the greatest possible benefit for native habitats and species. The activities considered in the plan include grassland improvement through fire management (e.g., prescribed burns), erosion control, and mechanical brush control; and ranch management such as livestock placement and movement, waterline and fence construction, and stocktank maintenance and use.

This project was conducted in two phases. The first phase (phase one; completed) was to prepare a background document that discusses: 1) the population status and trends of state and federally listed, candidate, and other sensitive species that occur in the area, 2) the habitat needs and management concerns of the species being considered, and 3) the recommendations for management activities that would likely be included in a HCP. The background document was completed and reviewed by the MBG and other cooperators. The second phase of the project was to prepare a HCP which will be evaluated by the USFWS for implementation. The HCP provides detailed recommendations for the activities that are considered, and it will result in agreements for habitat management and permitting for the affected listed and candidate species, including species such as Rio Yaqui fishes, Chiricahua and lowland leopard frogs, Mexican garter snake, Huachuca water umbel, aplomado falcon, New Mexico ridgenose rattlesnake, Mexican spotted owl, yellow-billed cuckoo, western red bat, white-sided jackrabbit, burrowing

owl, and black-tailed prairie dog. The draft HCP will be reviewed by the MBG and the other cooperators to determine the feasibility of implementing the agreement.

V. Approach

1. *The work already completed was a background review that will serve as the foundation for a HCP. The background review (phase one) was completed in March 2003. The work proposed (creation of a HCP; phase two) is to be completed by June 2006. This document will be produced by reviewing the pertinent literature for the region and consulting with the recognized experts for the species of concern.*

   Accomplishments on Item #1:

   Major topics of discussion at meetings of the HCP Technical Working Group and that are addressed in the HCP (Appendix 1) include the following:

   - Composition, ownership, history, and ecological conditions of lands in the study area (HCP section 2.0).
   - Structure of the HCP and scope of land-management activities, including fire management, erosion and brush control, livestock management, and stock tank maintenance, to be conducted by the Malpai Borderlands Group (MBG) that are covered by the plan (HCP section 3.0).
   - A final list of Federally listed and candidate species to be included in the HCP, their habitat requirements and distribution in the MBG study area, and their natural history as it relates to human activities in the area (HCP section 4.0).
   - Measures for take minimization and mitigation, monitoring activities, adaptive management, and participation by stakeholders in the conservation program described in the HCP (HCP section 5.0).
   - Funding requirements and available and potential sources to support activities discussed in the HCP (HCP section 6.0).
   - Definition and possible effects of take on covered species by covered activities (HCP section 7.0).
   - Changed and unforeseen circumstances, including "no surprises" provisions (HCP section 8.0).
   - Permit provisions including amendments, permit termination, and participation responsibilities (HCP section 9.0).

- Alternatives that were considered in respect to the actions discussed in the HCP, including the possible inclusion of livestock grazing (herbivory) as a covered activity (HCP section 10.0).

- Incorporation of species listed under the New Mexico Wildlife Conservation Act into the HCP to ensure compliance with the Act for all covered land management activities (HCP Appendix A).

These topics were addressed through extensive review of the available literature, discussion at HCP meetings, and contacts with experts affiliated with participating entities and at other institutions such as New Mexico State University and the University of New Mexico.

2. *The primary coordination for this project will be done by the Malpai Borderlands Group, with Peter Warren serving a lead role. Bill Lehman served as the main technical analyst and writer for the completed background review and will continue in this role for the HCP. The New Mexico Department of Game and Fish will take the lead in developing background information for a subset of the listed and sensitive species in the New Mexico part of the study area, particularly those protected under the state's Wildlife Conservation Act, and will develop a comprehensive set of conservation and recovery recommendations for these species.*

Accomplishments on Item #2:

Bill Lehman and Peter Warren have served as the primary organizers for meetings, document review, and setting deadlines for developing HCP components. Mr. Warren has served as the primary liaison between the HCP Working Group and the MBG and has briefed the latter organization on the progress of the HCP at regular meetings of the MBG. The NMDGF, represented by Jim Stuart, has provided background information on the New Mexico Wildlife Conservation Act and its place in the HCP and has been actively involved in regular meetings of the HCP Working Group by providing and reviewing wildlife information relevant to the New Mexico portion of the HCP study area. The NMDGF Endangered Species Program developed and refined an analysis of species that are listed or may be listed under the Wildlife Conservation Act and that are known or likely to occur in the New Mexico portion of the study area. The NMDGF developed conservation recommendations for these species, based on the planned HCP scope and activities identified by the Technical Working Group. See Appendix 1, page 158 ("Appendix A" of the HCP) for the NMDGF's discussion of species listed under the Wildlife Conservation Act and other species of concern.

3. *As was done during development of the background review, the project will be guided by*

a steering committee (the HCP Technical Working Group) composed of representatives from each of the cooperating organizations. We plan to organize periodic meetings (approximately bimonthly) of this committee during the course of the project. Purposes of these meetings will be to decide upon the species to be included and the structure of the plan, to discuss progress, and to review drafts of the plan. Meetings will generally be located in southern Arizona, with at least some in New Mexico (Albuquerque or Santa Fe). Knowledgeable experts for the species of concern will also be invited to these meetings, and their input will be individually solicited as well. Preliminary habitat management guidelines will be presented for each species with specific reference to cooperative land protection and management activities proposed by the Malpai Borderlands Group.

Accomplishments on Item #3:

Meetings of the HCP Technical Working Group during the contract period were held in 2004 (18 June, 6 August, 20-21 October [site visit to SE Arizona and SW New Mexico], and 14 December), 2005 (18 January, 2 March, 25 May, 6 July, 8 August, September 30), and the first half of 2006 (18 May). Most meetings were held in Arizona, and New Mexico group members participated by teleconference in those meetings. Participants at these meetings in addition to the agency and organization representatives have included HCP specialists from the USFWS, endangered species experts from NMDGF, and members of the Malpai Borderlands Group.

4. *Cooperators in this project will include at least the Malpai Borderlands Group, Arizona Game and Fish Department, New Mexico Department of Game and Fish, Arizona Ecological Services Field Office, New Mexico Ecological Services Field Office, Natural Resources Conservation Service, Animas Foundation, Border Ecology Institute, U.S. Forest Service, the University of Arizona and the Nature Conservancy.*

Accomplishments on Item #4:

Most of the above-mentioned agencies and organizations have been represented at regular meetings. NMDGF, AGFD, and USFWS were regular participants in meetings either in person or via teleconference. Meeting notes and materials and topics of discussion were regularly distributed by the contractor and other parties to representatives of all these entities via e-mail.

VI. Summary of Accomplishments and Significant Deviations

The appended HCP covers all items discussed above in the Approach section. The final product will be provided to the MBG and USFWS for consideration, possible approval and use in future management in the study area for the covered species. The HCP allows for amendments and addenda as needed based on changing information or circumstances.

No significant deviations from the outlined goals of the project were made. The inclusion of livestock grazing (herbivory) was originally considered a covered activity; this was altered to livestock management based on the assumption that grazing itself does not constitute an activity that poses a risk of take to any of the covered species whereas how grazing is conducted (managed) does. An explanation for this decision to exclude livestock grazing per se is provided in sections 3.6 and 10.3 of the HCP (Appendix 1). The covered species list was altered somewhat as better information was obtained on what activities would be covered and what geographic areas were being considered for prescription fire use, the primary concern in terms of potential adverse effects to listed species. A discussion of the rationale for which species were included (covered) in the HCP is provided in HCP section 3.3 in Appendix 1.

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APPENDIX 1

Draft Malpai Borderlands
Habitat Conservation Plan

April 2006

1.0 Introduction and Background

1.1 Purpose and Need

This Habitat Conservation Plan (HCP), also referred to as the Malpai Borderlands Habitat Conservation Plan (MBHCP), has been prepared to address the requirements of the Endangered Species Act of 1973 (as amended) (ESA or Act), which arise in connection with activities and programs proposed by the Malpai Borderlands Group (MBG) and its cooperators in the Malpai Borderlands of southern Arizona and New Mexico. MBG is a non-profit coalition of conservation-minded ranchers who, collectively (i.e., as MBG), function as a grass-roots conservation organization and, individually, own or operate working livestock ranches in the Malpai Borderlands. The issue triggering the HCP is that some of the conservation activities undertaken by MBG, and some of the ranching activities undertaken by individual Malpai-area ranchers, have the potential to result in "take" (defined, in part, as killing, harming, or harassment) of endangered and threatened species inhabiting the borderlands area. This possibility, in turn, triggers the need for MBG to obtain an Incidental Take Permit (I.T.P.) authorizing such take pursuant to Section 10(a)(1)(B) of the ESA, and, in support of the application for that permit, to prepare a "conservation plan" (or HCP) which describes how the effects of the take are to be addressed. This is the fundamental statutory basis and purpose for the plan.

The HCP has other purposes as well, which are reflected in the organizational objectives of MBG and the operational needs of it member-ranchers. These, to some extent, have been constrained by unresolved ESA issues (i.e., the possibility of take) and the fact that some activities that would otherwise be undertaken to meet these needs have had to be deferred. Thus, the essence of the plan is to establish the measures and means required to meet the conservation needs of endangered and threatened species in the Malpai Borderlands, and at the same time to preserve MBG's ability to pursue its organizational objectives, to effectively carry out its activities and programs, and to assist its member-ranchers in carrying out theirs. In a sense, the HCP also has a third purpose, which is reflected in the nature of MBG and its programs. As noted above, MBG is essentially a conservation organization seeking to conserve the natural character of the Malpai Borderlands, the quality of its rangelands, and the role of livestock ranching within it. In this sense, the MBHCP serves the conservation purposes of MBG, as distinct from the purposes of the ESA, but in most respects compatible with and complementary to them. In this sense, too, MBG and the HCP play "dual" roles in the Malpai Borderlands—on one hand proposing to undertake activities that result in take of protected species, but which, on the other hand, also confer long-term ecological benefits to the area (and to its constituent fish and wildlife populations, however indirectly).

The MBHCP can therefore be said to serve three needs—a biological need, an organizational need, and a regulatory need. It can also be said to have three purposes corresponding to these needs, which are:

(1) To establish a program that protects and conserves Federally listed species inhabiting the Malpai Borderlands in the course of activities and programs carried out by MBG, Malpai-area ranchers, and other MBG partners and cooperators;

(2) At the same time, to allow for the carrying out of those activities and programs effectively, efficiently, and over the long term; and,

(3) To ensure those activities and programs are also carried out in regulatory compliance with the Endangered Species Act, through issuance to MBG of an I.T.P. pursuant to section 10(a)(1)(B) of the ESA and through such other regulatory protections and assurances as may be appropriate.

The MBHCP seeks to achieve these purposes in a number of ways. It addresses all ESA issues connected with 19 species of fish, wildlife and plants inhabiting the Malpai Borderlands and six sets of activities, three of which are typically undertaken by MBG (referred to as "range improvement" activities) and three by Malpai-area ranchers (referred to as "ranch management" activities). It also establishes measures to minimize take of these species in the course of carrying out the activities; provides for monitoring and Adaptive Management procedures that allow the terms of the plan to adjust through time to pertinent new information, as necessary; establishes a Technical Advisory Committee to help guide implementation of the plan; and provides for assurances to MBG and its member-ranchers that their responsibilities under the plan are clearly defined, are consistent with their economic and operational needs, and will remain predictable over the life of the plan. The MBHCP thus seeks to balance the species-based conservation goals deriving from the requirements of the ESA with the broader, land-based conservation goals reflected by MBG programs and activities.

1.2 Description of the Applicant

(A) Introduction.

The Malpai Borderlands Group is a private, non-profit organization established in 1994 by a coalition of ranchers who live in the Malpai Borderlands, which today consists of about two dozen of the 35 or so ranchers currently present in the area. Early in the development of the group, they created a mission statement through consensus of the board that has been the basis of all decisions and action since that time. The mission statement is:

> *Our goal is to restore and maintain the natural processes that create and protect a healthy, unfragmented landscape to support a diverse, flourishing community of human, plant, and animal life in our Borderlands Region. Together, we will accomplish this by working to encourage profitable ranching and other traditional livelihoods, which will sustain the open-space nature of our land for generations to come.*

It is important to note that the mission has two distinct components, the first is an ecological goal to maintain the integrity and health of the land, and the second is a socio-economic goal to encourage ranching and other livelihoods that are dependant on the land, all of which will be achieved through a collaborative program.

MBG is governed by Board of Directors of between 9 and 13 individuals (currently including local ranchers, a scientist, a Vice-President of The Nature Conservancy (TNC), and a retired U.S. Forest Service range conservationist) and is funded through grants from private foundations, tax-deductible contributions, and, in some cases (e.g., with respect to specific projects) grants from state and Federal agencies. This HCP, for example, was developed with the support of Federal funding appropriated through section 6 of the ESA and administered through the Arizona Game and Fish Department (AGFD) and New Mexico Department of Game and Fish (NMDGF) as a grant.

In the years since its formation, MBG has initiated, completed, cooperated in, or undertakes on an ongoing basis a wide array of activities and programs, all of which are directed at the accomplishment of its fundamental mission.

Consistent with this mission, MBG has identified three major objectives for its programs: (1) restoration of periodic fire as a functional component of the ecology of the Malpai Borderlands; (2) improvement of

ecological conditions in and the overall ecological health of the Malpai Borderlands through science-driven management; and (3) preservation of the economic and cultural traditions of livestock ranching in the borderlands and of the natural, open-space character of the area that make ranching possible.

(B) History/Organizational Principles.

(1) History. MBG's mission statement, and the description of its objectives tell much about the organization. To begin with is the sheer reach of its vision—which encompasses not less than the permanent preservation of the Malpai Borderlands as an intact, unspoiled landscape; restoration and permanent maintenance of its internal ecological integrity; preservation of its characteristic flora and fauna; the return of fire as an ecologically important part of the landscape; and permanent maintenance of livestock ranching in the Malpai Borderlands, not just compatibly with, but in mutually-supporting relationship to, all of the preceding.

This vision has been shaped, in part, by its origins. As an organization, MBG was conceived and arose over the course of several years (1991 to 1994), out of a complex set of circumstances then besetting the Malpai Borderlands and the ranchers who lived there. These consisted, in part, of an array of threats to the future of the area, and to ranching, that had been growing for years. The newest threat concerned the fate of the 320,000-acre and nearly pristine Diamond A Ranch (previously known as the Gray Ranch), which makes up the entire eastern half of the borderlands, and at the time had been put up for sale by its owners, a prospect that raised the possibility of development of the ranch. The others included a decades-long pattern of brush expansion into the area's historic grasslands; the virtual disappearance of ecologically beneficial fire from the area and numerous regulatory constraints on the employment of managed fire; the generally negative view that the public, and many public-lands policy makers, seemed to have about livestock ranching; related uncertainties about the future of public-lands grazing (which most Malpai ranchers depended upon); and the threat to the Malpai Borderlands generally represented by increasing amounts of urban development, which had begun to occur around the edges of the area.

While little of this was new, it was getting worse, and in 1991 a few Malpai ranchers began getting together periodically to discuss their options. Also in 1991, TNC arrived onto the scene as a prospective buyer of Diamond A Ranch. These two developments were seminal and what happened over the next few years determined much about the future of the Malpai Borderlands, resulted in the establishment of MBG, and in many ways set management of the area on a new path. What MBG represented, furthermore, was something entirely new at the time—a conservation organization made up of livestock ranchers.

Briefly, TNC eventually purchased Diamond A Ranch from its owners and established a conservation easement across its holdings that removed, permanently, the threat of development of the ranch (and the threat such development represented to the Malpai Borderlands generally). In 1994, TNC sold the ranch, less the cost of the easement, to the Animas Foundation, a non-profit organization whose goals are to manage the ranch as Diamond Aa working cattle ranch, with conservation and scientific research as additional goals. All this had happened through an unlikely alliance between the livestock ranchers of the Malpai Borderlands and TNC. This event led to a continuing relationship between Malpai ranchers and TNC, and eventually, to the establishment and incorporation by its founding members (with TNC's assistance) of the Malpai Borderlands Group.

(2) Organizational Principles. The establishment of MBG thus represented the culmination of years of growing threats to ranching interests in the Malpai Borderlands, and in effect was the response of those interests to those threats. Because, moreover, those threats were myriad and profound, the organization that resulted encompassed a broad vision (described above) and adopted organizational principles that, in many ways, departed from the traditional approaches and views of ranching and ranchers.

Collaboration and Partnership. MBG recognizedthat because of a number of factors—e.g., the mixed land ownership in the area, the cost and complexity of the programs it wished to undertake (e.g., better fire management), and the array of statutes and regulations affecting those programs (including those of the ESA)—collaboration between the Malpai ranching community and the state and Federal agencies, conservation organizations, and academic institutions of the region (all of which they, like most ranchers, had traditionally distrusted) would be essential to the success of their efforts. Collaborative conservation thus became an MBG hallmark.

Science. MBG recognized early on that the practice and application of good science would be essential to pursuing their goals. This is important because only science can ultimately resolve many uncertainties about resource management issues in the Malpai Borderlands. Accordingly, MBG wanted rigorous science as a foundation for its programs—not science designed merely to validate its own views. Malpai rancher Bill McDonald put the matter succinctly: "[We] wanted the best and most credible scientists in the U.S. working with us...If the information and research is honest and unbiased, we'll let the chips fall where they may" (Cook 2001 in Wolf 2001).

Fire management. . Fire management is a major component of MBG's objectives and programs; with respect to the Malpai Borderlands. Fire has the potential to significantly benefit ecological conditions in the area (e.g., in combating brush encroachment) and, with respect to the MBHCP, also has potential to adversely affect endangered and threatened species inhabiting the area (over the short term, at least; see Section 7.1). To complicate matters, however, fire management can also (over the long term; see Section 7.3) beneficially affect endangered and threatened species populations. With respect to all three, fire management will be by far the most complex MBG and MBHCP program to coordinate and carry out; is a multi-faceted issue; and will be treated often and in different ways throughout MBG's proposed fire management program generally and the MBHCP specifically.

(3) Summary. Since 1994, the ranchers of the Malpai Borderlands, as the collective Malpai Borderlands Group, have built a respected organization and amassed an impressive record of achievement (see following subsection). Carrying its principles and programs forward, furthermore, MBG continues to seek—in part, through the means of the MBHCP—to balance sustainable ranching with sound land stewardship in the Malpai Borderlands; to earn respect for the role it believes ranching plays in the long-term protection of natural values in the area; to maintain and improve the ecological health of the area (including its biotic health, and the members of that biota that are threatened and endangered); and to promote strategic alliances among the ranching, conservation, regulatory, land management, and scientific communities that are necessary to achieve all this.

(C) Past/Current Activities/Programs.

Since 1994, MBG has initiated, completed, or carried out on an ongoing basis a wide range of activities and programs in pursuit of its purposes and mission. This section provides a summary of these programs which, while not comprehensive, is representative of the kinds of work MBG has undertaken to date and, in part under the authorities of the MBHCP, proposes to continue to undertake in the future.

(1) Collaboration/Partnership. As discussed in the previous subsection, a hallmark of MBG's organizational approach is the principle, adopted at the time of its formation, of collaboration with its member-ranchers and with partners and cooperators from across the land management spectrum—an approach often referred to as "collaborative resource management." MBG also adopted the principle at that time that collaborative conservation efforts in the Malpai Borderlands are best initiated by the private sector, especially where private lands are involved—an approach sometimes referred to as "community-

based conservation." These decisions, in part, were a reflection of the role in the Malpai Boderlands MBG had been established to play (i.e., to represent the private sector in the area) and its organizational make-up (which consisted of private individuals in the area whose ranches, and collective interests, encompass the majority of the Borderlands landscape). Thus, from the time of its establishment MBG has been in an excellent position to function based on these approaches; using this position, furthermore, MBG has played a central role in many programs and initiatives in the Borderlands involving multiple landowners, multiple agencies, or both (see following subsections), has itself collaborated with many partners over the years, and has helped broker partnerships as well.

Among MBG's many partners and cooperators in the Malpai Borderlands are the U.S. Fish and Wildlife Service (Ecological Services Division; USFWS and San Bernardino National Wildlife Refuge; NWR or Refuge), U.S. Forest Service (Coronado National Forest; USFS), U.S. Forest Service (Rocky Mountain Forest and Range Experiment Station; RMFRS), U.S. Bureau of Land Management (Safford and Las Cruces Districts; BLM), Natural Resource Conservation Service; NRCS, Arizona Game and Fish Department, New Mexico Department of Game and Fish, Arizona State Land Department; ASLD), New Mexico State Lands Office; NMSLO); Hidalgo Soil and Water Conservation District, Arizona State University, University of New Mexico, and The Nature Conservancy.

(2) Science/Monitoring/Research. Another key to MBG's organizational approach is the extent to which it has embraced good science in both its principles and programs. This is seen in MBG's Scientific Advisory Committee, which the group established early on to oversee its science program and which meets annually; and in the many monitoring and research efforts currently occurring in the Malpai Borderlands. A key to the latter is the work being done by the RMFRS, the USFS's research arm, under a National Ecosystem Management grant. This has resulted in initiation in the borderlands of numerous studies pertinent to a variety of range management issues (with MBG ranchers providing research sites), and in the development of research partnerships between MBG and RMFRS, as well as other, scientists.

Among the studies completed or underway in the Malpai Borderlands as a result of the RMFRS program are the following: (a) a study on the effects of the 1997 Maverick prescribed burn on New Mexico ridge-nosed rattlesnakes (Holycross et al. 1999); (b) a study of historical fire frequencies in the Malpai Borderlands (Kaib et al. 1999); (c) a long-term experimental study of the ecological interactions between fire and grazing at McKinney Flats on Diamond A Ranch (Brown 1999, Curtin 1999); (d) a set of studies examining how fire both alone and in combination with grazing affects plants and animals in shrub-invaded grasslands (Valone 1999); and (e) studies to determine how fire can be managed in woodland/savanna ecosystems to improve watershed function (Gottfried et al. 1999). In addition, as a result of these and other studies and efforts, MBG, MBG-member ranchers, and other MBG cooperators (e.g., agency and university personnel) have established and currently operate approximately 250 individual monitoring sites in the Malpai Borderlands; these are checked annually, at a minimum, provide information on long-term trends in vegetation composition and health, and examine a variety of other wildlife, plant, and range management questions and issues.

(3) Fire Management. One of MBG's primary organizational objectives is restoration of a more natural fire regime to the Malpai Borderlands. Several important steps toward of this goal have been taken, including: (a) in 1993, development of a Memorandum of Understanding (MOU) among MBG and nine Federal, state, and county agencies establishing new fire management policies that allowed for prescribed natural fire; (b) development by MBG of the Malpai Borderlands Regional Fire Management Map (the most recent dated 2002), which identifies the preferences of Malpai-area landowners with respect to three options (consult with owner, contain and control, or suppress immediately) in the event a wildland fire is considered for management as a prescribed natural fire; (c) in 2003, development and

approval of the Bootheel Fire Management Plan (Smith 2003), which provides guidance for managing fire in the Malpai Borderlands within New Mexico; (d) development by the USFS (with MBG cooperation) of the Peloncillo Programmatic FireManagement Plan, which establishes fire management policies and goals for the Peloncillo Mountains (USFS 2005); and (e) three prescribed burns undertaken cooperatively by the USFS, MBG, and others on a combination of public and private lands in the Peloncillo Mountains (the 1995 Baker burn, 1997 Maverick burn, and 2003 Baker II). (See Section 2.2.3).

(4) Safe Harbor Agreement. Beginning in 2000, MBG began development of a Safe Harbor Agreement (SHA) for the Chiricahua leopard frog, a species listed as threatened under the ESA (see Section 4.1.2). Safe Harbor Agreements are a mechanism established by the U.S. Fish and Wildlife Service under the ESA which provide for voluntary endangered species conservation actions to be undertaken on non-Federal lands, in return for which landowners implementing such measures can obtain regulatory assurances protecting their land-use interests should their conservation efforts increase endangered species populations on their lands. MBG's SHA (Lehman 2004), approved in April 2004, provides for landowners to voluntarily introduce leopard frogs into stock watering facilities (i.e., stocktanks) on private and state-trust lands in the Malpai Borderlands, but also guarantees that stocktanks into which leopard frogs have been introduced under the terms of the SHA may be maintained and used in a relatively unrestricted fashion. After a specified conservation term has been satisfied, the SHA also provides for return of an affected stocktank to "baseline conditions" (i.e., to conditions existing prior to the introduction) at the election of any landowner participating in the agreement.

(5) Conservation Easement Program. Also a principal MBG objective is protection of the Malpai Borderlands against the threat of development. Accordingly, MBG has administered and funded a conservation easement program in the borderlands since 1995. Under this program, Malpai-area ranchers who do not want their private ranchlands developed have the option to sell a conservation easement for those lands to MBG which prohibits subdivision and development of the lands. In these transactions the commodity being sold is the development rights to the lands; the seller of those rights (and grantor of the associated conservation easement) is the rancher and owner of the lands; and the purchaser of those rights (and grantee, or holder, of the associated easement) is MBG. The cost of the purchase is computed as the approximate monetary value of the development rights (i.e., the difference in the fair market value of the land with those rights versus that value without the rights). In its role as holder of these easements, MBG has the ongoing responsibility of monitoring and enforcing the easement terms. Funding for the easement program has been obtained from grants and donations.

Participation in the program has been considerable. To date, a minimum of twelve Malpai-area ranchers have sold or (under the grassbanking program; see below) exchanged conservation easements to MBG on lands totaling approximately **75,000 acres** in the Malpai Borderlands—thus ensuring long-term protection of the rural character of those lands and demonstrating the landowners' commitment to the future of ranching in the borderlands. In addition, TNC placed a conservation easement prohibiting development on approximately **227,000 acres** of Diamond A Ranch during its ownership of the ranch from 1991 to 1994, which stayed with the land when TNC sold the ranch to the Animas Foundation in 1994 (see Section 2.1.1.1). Together with the easements purchased by MBG, approximately **328,000 acres** of the Malpai Borderlands are now under protection of long-term conservation easements; this represents almost half (40%) of the area overall, and almost three-quarters (71%) of privately-owned lands in the area.

(6) Grassbanking Program. The grassbanking program, administered jointly by MBG and the Animas Foundation, is a creative approach to addressing not one, but two MBG objectives, protecting the Malpai Borderlands from development and improving conditions in its grasslands. The program depends

upon and is made possible by Diamond A Ranch—by virtue of its great size, its large and abundant grass supply, and its management as a foundation—and works as follows.

If Malpai-area ranchers wish to rest their lands from grazing they may make a request to MBG and the Animas Foundation to pasture their herds on Diamond A Ranch for a specified time period. Under a grassbanking agreement, the rancher agrees to grant a conservation easement to MBG in exchange for equivalent value of the grass consumed by the rancher's cattle during their pasturage on Diamond A Ranch. The grassbank arrangement is thus an exchange of equal value of the conservation easement, as determined by an appraisal, for the equivalent value of forage based on current pasture lease rates. MBG acts as a liaison in the transaction and becomes the holder of the conservation easement.

1.3 Planning History

MBG has been exploring since approximately 1996 whether an HCP of some type could be helpful in the carrying out of some of its programs. This became evident in the course of planning the 1997 Maverick burn in the Peloncillo Mountains (see Section 1.3), when significant difficulties in addressing the effects of the proposed burn on the New Mexico ridge-nosed rattlesnake (*Crotalus willardi obscurus*) were encountered. These were eventually resolved through an ESA section 7 consultation between the USFWS and USFS (see Section 1.4). However, endangered species issues in the Malpai Borderlands have had to be addressed on an inefficient, project-by project basis, and, as a result, MBG has been considering more comprehensive alternatives to this approach for some time.

Planning for the MBHCP began in earnest in early 2002, when MBG commissioned a study to determine the scope of the endangered species issue in the Malpai Borderlands in relation to its activities and those of its rancher-members. This resulted in March 2003 in completion of a report entitled, "Problem Assessment: Endangered Species Act Compliance Issues and Needs in the Malpai Borderlands of Southern Arizona and New Mexico" (Lehman 2003). The report concluded, among other things, that MBG's proposed fire management program carries with it the clearest, most unambiguous likelihood of potentially taking federally listed species, and recommended development of a "Focused HCP" to address take in the course of fire management and a few other activities; and that take in the course of other activities could largely be avoided through suitable take avoidance measures (see Section 10.2). A multi-species/multi-activities HCP was also considered in the course of this assessment, but was felt to be justified only if MBG had other, non-regulatory purposes in mind in developing the plan.

Actual development of the MBHCP began in May 2004. To assist in this, a Technical Workgroup was convened which met numerous times during the planning process and consisted of representatives from the USFWS, San Bernardino NWR, AGFD, NMDGF, NRCS, TNC (as an MBG representative), and an MBG consultant serving as primary author of the plan.

1.4 Regulatory Background

The purposes of the ESA, among other things, are to provide for the conservation of fish, wildlife, and plants that are threatened with extinction; with respect to species listed as endangered or threatened under the statute, to provide a means whereby the ecosystems upon which such species depend may be conserved; and to ensure that Federal departments and agencies conserve endangered and threatened species and utilize their authorities in furtherance of the ESA's purposes. The ESA is administered, with respect to terrestrial and freshwater fish, by the USFWS, and, with respect to marine species and anadromous fish, by the National Marine Fisheries Service (NMFS).

The following sections briefly summarize ESA provisions that are pertinent to the MBHCP.

(1) The "Take" Prohibition. The ESA and Federal regulation (50 CFR 17.31 and 17.32) prohibit the "take" of endangered and threatened species of fish and wildlife. Section 3 of the ESA defines "take" to mean "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or to attempt to engage in any such conduct." Federal regulation (50 CFR 17.3) further defines the term "harm" in the take definition to include "significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, and sheltering." The term "harass" in the definition of take means "an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding or sheltering." Thus, take as defined by the ESA with respect to fish and wildlife can include direct killing or injury, indirect killing or injury as a result of habitat modification (under the "harm" definition), and significant disruption of essential behavioral patterns (under the "harass" definition).

(2) Section 10(a)/HCPs. During the 1983 ESA reauthorization process, Congress amended section 10(a) of the statute to provide for the issuance of "incidental take" permits with respect to projects on non-Federal lands that result in take of listed species. Section 10(a)(1)(B) of the Act defines incidental take as take that "is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity." Under section 10(a)(2)(A), any application for an incidental take permit must include a "conservation plan" that details, among other things, the impacts of the taking on affected species and how those impacts will be minimized and mitigated. Such plans have come to be known as "Habitat Conservation Plans" or "HCPs," and thus represent the supporting document (and biological basis) for an incidental take permit. Under section 10(a)(2)(B) of the Act, the taking under an HCP must be incidental and the HCP must be found to minimize and mitigate the impacts of the taking of affected species to the maximum extent practicable, to provide for adequate funding, and to ensure that the taking will not appreciably reduce the likelihood of the survival and recovery of affected species in the wild.

(3) Critical Habitat. Section 4(a)(3) of the Act provides for the designation of "critical habitat" for endangered and threatened species at the time such species are listed, and, as seen above, section 7(a)(2) requires Federal agencies to ensure that their actions are not likely to adversely modify or destroy critical habitat. Federal regulation (50 CFR 402.02) defines the term "destruction or adverse modification" of critical habitat to mean "a direct or indirect alteration that appreciably diminishes the value of critical habitat for both the survival and recovery of a listed species." This language is similar to the "jeopardy" standard and in effect constitutes protection for a species' habitat similar to that provided by section 7(a)(2) for the species itself. However, critical habitat comes into play under the ESA only in the context of section 7 consultations; thus, critical habitat affects private lands only to the extent that the owners of lands designated as critical habitat undertake actions requiring Federal funding or a Federal permit.

(4) Other ESA provisions. In addition to incidental take permits under section 10(a)(1)(B), and incidental take statements under section 7, take of Federally listed species can also be authorized under the ESA through "enhancement of survival" permits under section 10(a)(1)(A) and special regulations under section 4(d). Enhancement of survival permits authorize take of listed species for the purpose of scientific studies, captive breeding programs, and recovery activities; it is also the mechanism employed to authorize incidental take under Safe Harbor Agreements and Candidate Conservation Agreements.

Section 4(d) of the Act permits the USFWS to issue protective regulations where deemed necessary to protect threatened species. This is the mechanism under which the USFWS in 1975 prohibited take of threatened species generally (since the ESA itself prohibits take only of endangered species). Section 4(d) has also been used to authorize incidental take that occurs within the context of activities which

otherwise confer a conservation benefit to affected species. It was under a section 4(d) rule, for example, promulgated concurrently with the listing of the Chicicahua leopard frog in 2002, that the USFWS authorized take of the species in the course of stocktank maintenance and use on private and state lands (see Section 5.2.2.3).

2.0 Overview of the Planning Area

2.1 Description of the Area

The Malpai Borderlands consists of approximately 828,000 acreas (1,290 square miles) of desert landscape which straddles the southeastern corner of Arizona (in Cochise County) and the southwestern corner of New Mexico (in Hidalgo County).[1] Topographically the Malpai Borderlands is characteristic of the Basin-and-Range geologic region, with rugged, forested north-south trending mountain ranges and broad intervening valleys. The term "Malpai," coined by the ranchers who live there, is an anglicization of the Spanish "*Mal país*," meaning "badlands," while the term "borderlands" refers to the fact that the area abuts the international border between U.S. and Mexico. Visually, the area resembles an upright triangle with the U.S./Mexican border forming its southern boundary, Arizona Highway 80 forming its diagonal western boundary, and the Arizona/New Mexico border bisecting it south-to-north (see Map 2-1). The Malpai Borderlands encompasses two distinct geomorphic regions: (1) the San Bernardino Valley/southern Peloncillo Mountains on the west side of the area (in Arizona and New Mexico); and (2) the Animas Valley/Animas Mountains on the east side (in New Mexico only).

Outside, but adjacent to or near the borderlands, principal features consist of: (1) the City of Douglas, Arizona (approximately five miles due west of the southwest corner of the area); (2) the Chiricahua Mountains (the southern end of which lies alongside the area's western boundary); (3) Portal, Arizona (a town at the foot of the east side of the Chiricahuas); (4) Rodeo, New Mexico (a town lying along the area's northwest border); (5) Animas, New Mexico (a town lying just outside the area's northern tip); and (6) Playas Valley and Playas Lake (immediately to the east of the borderlands).

2.1.1 Land Ownership/Management

Landownership in the Malpai Borderlands is a mosaic of privately-owned lands and State Trust Land, and Federally-administered public lands. On the San Bernardino Valley/Peloncillo Mountains side of the area, principal public land management agencies are the ASLD, USFS (Coronado National Forest), and BLM. Ranchers in this area operate their grazing programs on their own private lands, and on state and Federal lands through grazing leases (see Section 2.2.1.2). Another important land manager on this side is San Bernardino NWR, which is administered by the USFWS and is situated at the extreme southwestern corner of the borderlands and the southern end of San Bernardino Valley.

The Animas Valley/Animas Mountains side of the borderlands is comprised of the 321,700-acre Diamond A Ranch and five smaller ranches. The Diamond A Ranch was purchased by TNC in 1991, which in 1994 sold the property to the Animas Foundation, a non-profit organization established expressly to purchase, manage and administer the ranch. Diamond A Ranch is subject to a conservation easement established by TNC during the period of its ownership, which, among other things, prevents subdivision or sale of the ranch for development. Today, it is operated both as a working cattle ranch and for conservation and scientific purposes. Of the ranch's total acreage, the Animas Foundation owns 226,900 acres outright and leases 72,400 acres on its east side from the Phelps-Dodge mining company which purchased that portion of the ranch in 1970 (Wolf 2001).

[1] The area may be variously referred to in the MBHCP as the "Malpai Borderlands, the "borderlands," or the "covered area" or "planning area," all of which have essentially the same meaning, referring to area to which the MBHCP applies (see Section 3.4).

Counting the Diamond A Ranch, private lands constitute approximately 55 percent of the Malpai Borderlands, state lands 24 percent, and Federal lands 21 percent (see Table 1-1).

Table 2-1:
Land Ownership in the Malpai Borderlands[1]

Ownership Type	Landowner	Total Acres	% of Total
Private	Private owners	460,000	55%
State	AZ State Lands Dept	xxx	xxx
	NM State Lands Dept	xxx	xxx
	State subtotal	197,000	24.0%
Federal	USFS[2]	88,000	11.0%
	BLM	81,000	10.0%
	USFWS[3]	2,300	0.3%
	Federal subtotal	171,300	21.0%
Totals		828,300	100%

[1] Source: Wolf (2001); figures are approximate.
[2] Coronado National Forest, Douglas Ranger District.
[3] San Bernardino NWR.

2.1.1.1 Privately-owned Lands

Privately-owned lands are scattered throughout the Malpai Borderlands and are typically intermixed with other ownerships. Diamond A Most private lands in the Malpai borderlands are open rangeland operated as livestock ranches.

Approximately 35 separate ranches currently exist in the borderlands, of which 24 (including Diamond A Ranch) are currently involved in MBG programs. A "ranch" is typically comprised of a base of privately-owned lands together with state trust and Federal lands used for grazing under ASLD, NMSLO, USFS, or BLM grazing leases. Most of these ranches engage in livestock grazing for their primary livelihood, although some also engage in non-ranching (but ranching compatible) activities such as guiding mountain lion hunts. Malpai ranchers vary in size from approximately 15,000 acres to 40,000 acres. Most developed ranch facilities (e.g., houses, barns, etc., with the exception of holding corrals, fences, and watering sources) occur within the private portions of the ranches. However, livestock pastures do not generally observe the boundaries between public, state trust, and private lands, but follow natural features (e.g., ridgelines) or manmade features (e.g., stocktanks). The result is that private lands, state-trust lands, and Federal lands are often co-mingled within individual pastures and are effectively indistinguishable from each other, at least for purposes of livestock management.

A second, potentially significant use of private lands in the borderlands area has begun to emerge in recent years—rural residential development. To date this is confined to the periphery of the area, especially near the towns of Animas, Rodeo, Portal, and Douglas, where subdivision of rangeland into 20- and 40-acre parcels (or "ranchettes") appears to be on the increase. Although data is limited, many such lots are available and sales appear to be brisk, with many buyers from outside the region (Sayre 2003). How many of these parcels have been built on or may be built on in the future is unclear; however, the potential for fragmentation and loss of the Malpai Borderland's rangelands represented by such development (or future development) is a primary MBG concern.

2.1.1.2 State-trust Lands

(1) In Arizona. State lands on the Arizona side of the Malpai Borderlands were established in 1912 under the Arizona Enabling Act. Under this Act the State of Arizona was granted ownership to four sections of land per township; however, because the land in many townships was already claimed, the state was authorized to claim *in lieu* sections elsewhere, including the Malpai Borderlands. As a result,

[This page reserved for Map 2-1.]

WHEN DO WE GET THIS MAP!
And who is producing this?

state lands are scattered throughout much of the borderlands and in some areas (e.g., the San Bernardino Valley) are concentrated into relatively large blocks. These lands—called state-trust lands—are owned and administered by ASLD and are managed primarily to produce revenue for the Arizona State-trust, which supports 14 beneficiaries, including the state's school system, hospitals, and penitentiaries. In the Malpai Borderlands, state-trust lands are managed primarily for livestock grazing.

(2) In New Mexico. State-trust lands on the New Mexico side were initially established in 1850 under the Organic Act, which created the Territory of New Mexico and set aside sections 16 and 36 of every township to support the schools of the territory. This was followed in 1898 by legislation that expanded the beneficiaries of these territorial lands to include universities, hospitals, charitable organizations, and penitentiaries; and in 1910 by the New Mexico Enabling Act, which established New Mexico statehood and added sections 2 and 32 of every township as state-trust lands. New Mexico state-trust lands are owned and administered by NMSLO, which today manages roughly 9 million acres of surface land and 13 million acres of subsurface mineral rights on behalf of 21 beneficiaries; the proceeds of each acre of these lands is designated to a specific institution, with the majority held in trust for public schools. New Mexico state-trust lands are managed for a wide variety of uses including livestock grazing; development of oil, gas, mineral, and geothermal resources; water exploration and development; recreational development; and recreational and educational activities.

2.1.1.3 Federal Lands

Federal lands in the Malpai Borderlands principally occur in three areas. The most prominent of these geographically are the Peloncillo Mountains, a north-south trending range the southern end of which straddles the Arizona-New Mexico border near the center of the borderlands. This area comprises approximately 85,000 acres and is managed by the USFS, Coronado National Forest (CNF) as part of the Douglas Ranger District. The Peloncillos represent one of 12 so-called "sky islands" (high-elevation mountain ranges that rise from the desert floor and support diverse floral and faunal arrays) occurring in the CNF. The Peloncillos themselves extend to 6,625 feet in elevation.

Much smaller in size, but of major ecological importance, is the 2,309-acre San Bernardino NWR managed by the USFWS. San Bernardino NWR lies at the southern end of the San Bernardino Valley on the Arizona-Mexico Border within an elevation range of 3,700 to 3,900 feet. The importance of this refuge lies in the fact that it encompasses the lower reach of one of the few significant riparian corridors in the Malpai Borderlands (Black Draw); also contains scattered riparian, marshland, and aquatic habitats that are the result of artesian wells and seeps; and supports populations of Federally listed fish that occur no where else in the borderlands and in few locations elsewhere (see Section 4.1). Protecting these habitats and fish represents the primary mission of the San Bernardino NWR and was the principal reason for its establishment in 1982.

In addition to the above, portions of the Malpai Borderlands are owned and administered by BLM. BLM lands in the borderlands occur primarily as scattered parcels in and to the east of the northern end of the area but also Diamond Ainclude a few sections south and southwest of the Peloncillo Mountains.

2.1.2 Environmental Setting

The Malpai Borderlands is part of the "basin and range" geologic region, which encompasses much of the American west and is characterized by linear mountain ranges separated by broad, flat basins. The borderlands consists of three basins (the San Bernardino, Upper San Simon, and Animas valleys)

separated by two ranges (the Peloncillo and Animas mountains). In addition, the Continental Divide (with a maximum elevation of just over 9,000 feet) runs along the crest of the Animas Mountains.

The Malpai Borderlands are an area of exceptional biological diversity. This is a function of both elevational range (valley to mountain top) and the fact that the area lies at the convergence of several major topographic regions and plant and animal biotic communities. Here, the southern end of the Rocky Mountain biotic region (with a temperate climate) terminates and the northern end of the Mexican Highlands biotic region (with a subtropical climate) begins; the borderlands and surrounding area thus represent the northern tip of the ranges of a number of subtropical species (Brown, 1995). Illustrating the former is the periodic occurrence of jaguars in the borderlands, one of which was photographed in the Peloncillo Mountains by MBG rancher Warner Glenn in 1995 (Glenn 1996). The Malpai Borderlands also lie at the juncture of the Sonoran and Chihuahuan deserts and the edge of the American high plains and support at least ten vegetation associations. As a result of this range of elevation, topography, and habitat, the borderlands region supports approximately 400 species of vertebrates, including 264 birds (137 of which breed in the area), 55 reptiles and amphibians, and 80 mammals, as well as a long list of invertebrates (Wolf 2001).

The climate of the borderlands is semi-arid with relatively low precipitation, low humidity, and high summer temperatures. Precipitation averages 12 to 24 inches per year depending on elevation and falls primarily during two rainy periods—summer rainfall, which usually occurs in local torrential convection showers; and winter rainfall, which is usually slow and can occur over several days duration. (CITATION)

2.2 Land Use History/Management

The Malpai Borderlands has had a long and colorful history. Jesuit priests were the first in the area, in the late 1700's. In 1822 the San Bernardino Land Grant (which included present-day San Bernardino NWR) resulted in what was probably the first large-scale cattle operation in the area; it lasted for only 10 years, however, before the Apaches Indians drove the ranchers out. In 1848, most of what is now Arizona and New Mexico became part of the U.S through the Treaty of Guadalupe Hidalgo, which ended the war with Mexico, while the present-day Malpai Borderlands and all lands south of the Gila River were part of the Gadsden Purchase five years later. This area, which came to be known as "The Bootheel," for some years after was a haven for outlaws, smugglers, and cattle rustlers. More permanent ranching began to come to both sides of the borderlands area in the late 1800's, when, in 1880, John Gray started a cattle ranch on what is now Diamond A Ranch (and gave it his name), and, in 1887, John Slaughter purchased what had been the San Bernardino Land Grant. In 1881, Mexican border raiders killed Gray's son and he abandoned the ranch, in 1883 selling to George Hearst, a mining magnate; since then, cattle ranching (and some mining) has occurred more-or-less continuously on Diamond A Ranch to the present day. On the San Bernardino side, ranching has also been more-or-less permanent since the time of the Slaughter Ranch. (Hadley, 2005)

2.2.1 Livestock Grazing in the Malpai Borderlands

2.2.1.1 Livestock Grazing History

Unless otherwise indicated, the information in this section is adapted from Sayre (2000).

(1) 1880 to 1905. As seen above, relatively large-scale, commercial cattle ranching in the Malpai Borderlands began in the 1880's. One factor responsible for this was the introduction about the same time of the steam-powered water pump, which made possible the drilling of wells and pumping of water that could support large herds (prior to that time, livestock grazing had been limited primarily by the availability of surface water). The wells were initially powered by burning wood, which was obtained by cutting mesquite, until the gas-powered pump was introduced in the early 1900's.

Two droughts occurred in the area during this period—one from 1891 to 1893, and a second from 1898 to 1904. The first of these evidently prompted ranchers to develop more water sources, which, in turn, allowed grazing across a greater portion of the borderlands. By the second drought, livestock had been introduced onto the range in large numbers, but there was little infrastructure or equipment either to transport large numbers of cattle out or large quantities of cattle feed in. The result was heavy grazing pressure combined with poor forage production and a six-year period of significant over-grazing. The second drought ended with heavy rains from December 1904 to March 1905, which undoubtedly triggered much erosion, the effects of which may be evident in the borderlands to this day.

Prior to the early 1900's, the grazing system on public rangelands across the west was open range, meaning they could not be fenced and were open to all grazers. This meant that grazing was essentially uncontrolled, and that ranchers had an incentive to use as much forage as possible (lest it be used by others). As a consequence, stocking rates in the Malpai Borderlands between about 1886 and 1920 were extremely high; one estimate, for example, has the Diamond A (the name of Diamond A Ranch in the early part of the century) running cattle at more than twice the number that would be normal today (Hilliard 1996 in Wolf 2001).

(2) 1905 to 1970. Between 1905 and 1934, this open range system was gradually replaced by a system of leases which gave individual ranchers exclusive access to discrete areas of public grazing lands called allotments. Three types of public lands were leased in this fashion: (1) USFS lands; (2) state-trust lands; and (3) lands administered by the General Land Office's Grazing Service (now BLM). This leasing system required perimeter fencing to distinguish between allotments, and each allotment had to have at least one water source.

This system made management of the range possible for the first time, and livestock management began to take into account range carrying capacity. The central goal of this concept was to limit stocking rates to the amount of livestock that would ensure a sustainable supply of forage from year to year. Nevertheless, livestock numbers in the borderlands region continued to climb through the early part of the 1900's, boosted in part by high cattle prices during World War I. After the war, cattle prices dropped and in 1920 another drought occurred, with the result that cattle numbers appear to have peaked that year (1920) and thereafter began to decline. The ASLD, however, did not begin setting carrying capacities (i.e., stocking rates) in its leases until the mid 1950's; the reason for beginning this practice was likely the occurrence of another drought in the mid 1950s—estimated to have been the most severe in 350 years (Sayre 2000). In any case, stocking rates in the region evidently declined again following this drought, and finally stabilized in the 1970's and 1980's at the levels practiced today.

World War I seems to have had another effect—that is, funds saved during that period of high cattle prices apparently were often invested in improvements on the range, such as fences and water sources. Water improvements included construction of small reservoirs, cement dams in mountain canyons, and wells, pipelines, storage tanks, and troughs (Sayre 2002). In addition, during the 1950's and 1960's the practices of mesquite control and reseeding of grasses began. Such improvements helped stabilize range

conditions and livestock numbers in the region during this period; however, individual ranches were still almost always grazed year round.

(3) 1970 to Present. Beginning in the 1970's, ranchers in the Malpai Borderlands began shifting from year-round grazing to rotational grazing systems. This was, in part, the result of promotion of these systems by the Soil Conservation Service (now the NRCS) based on evolving principles of range management science. Such systems involve periodic exclusion of grazing from individual pastures—i.e., "resting" the pastures—during some growing seasons and giving the forage a chance to recover. Today, most Malpai-area ranchers practice some form of rotational grazing, typically maintaining their cattle in higher, mountain pastures during the winter and rotating them through a number of lowland pastures during the summer growing season. However, rotational grazing involved the need to develop new interior fencing (to establish individual pastures) and new water sources (since each pasture had to be supplied with water); consequently, many miles of fenceline and waterline have been constructed on Malpai ranches since the 1970's, and this, to some extent, will likely continue.

2.2.1.2 Livestock Grazing Management

(1) On State-trust Lands. Livestock grazing on state-trust lands is governed by grazing leases issued to individual ranchers by ASLD in Arizona and NMSLO in New Mexico. The principal components of ASLD and NMSLO grazing leases are: (a) the term of the lease (usually 10 years); (b) the permissible stocking rates (typically expressed as animal-units, or AUs); and (c) a requirement for the lessee to obtain range improvement and land treatment permits for the construction of ranch facilities (e.g., fencelines) or to undertake certain management efforts (e.g., mesquite control or prescribed burns) on state-trust lands. ASLD and NMSLO leases are typically renewable upon the expiration of the lease at the request of the lessee, provided there were no major lease defaults during the previous lease term.

ASLD, with respect to its role in administering leases, has entered into two agreements with other Arizona state agencies—a Memorandum of Understanding (MOU) with the Arizona Game and Fish Commission (AGFC), and a programmatic agreement with the Arizona State Parks Board's State Historic Preservation Office (SHPO). The February 1987 MOU with AGFC concerns the enhancement of wildlife and other resource values on state-trust lands and commits ASLD, among other things, to: (a) notify the AGFD of all proposed projects or actions that may affect wildlife habitat on state-trust lands (including grazing management plans and alteration of vegetation by fire, chemical, or mechanical means); (b) to consult with and obtain recommendations from AGFD prior to initiation or authorization of such projects or actions; and (c) to allow the AGFD to conduct wildlife census and habitat evaluations on state-trust lands. In accordance with this MOU, ASLD routinely forwards to AGFD range improvement and land treatment permit applications it receives for review. ASLD generally incorporates the AGFD recommendations into the **range improvement and** land treatment permits it issues.

The August 2000 programmatic agreement with SHPO concerns the protection of sites that may qualify for inclusion on the Arizona Register of Historic Places. Among other things, the agreement commits ASLD to establishment of a program that ensures that archeological and historic sites on state-trust lands are not inadvertently harmed or sold as a result of ASLD actions, including issuance of range improvement and land treatment permits. In practice, this means that locations subject to ground disturbing activities are routinely surveyed prior to commencement of the activities being considered to determine whether archeological or historical sites are present, and any such sites found are avoided or otherwise protected.

(2) On Federal and Private Lands. Livestock grazing on Federal lands—as on state lands—is governed by leases issued by the applicable agency (USFS or BLM) to individual ranchers utilizing its

lands for grazing purposes. With respect to ESA issues, grazing on Federal lands is addressed under the section 7(a)(2) consultation process, not the section 10 HCP process (as with grazing on private and state-trust lands); thus, no aspect of grazing on Federal lands is addressed by the MBHCP, nor are Federal lands considered to be part of the HCP's covered area (see Section 3.4).

Grazing on private lands, is not governed or regulated by any government authority. However, because private and state-trust lands are often co-mingled and indistinguishable within individual livestock pastures (see Section 2.1.1.1), in practice grazing management on private lands in the Malpai Borderlands is usually equivalent to that which occurs on associated state-trust lands. If no state lands are involved, private-land grazing can be practiced however the landowner wishes.

(3) With respect to the HCP. Over the course of HCP development, the issue of whether to address livestock grazing under the plan—and, if so, how—was the topic of much discussion. The discussion centered on the question of whether livestock grazing, as practiced in the Malpai Borderlands, is likely to result in take of Federally listed species. Eventually, however, it was understood with respect to this question that grazing had to be considered in its component parts—i.e., as herbivory (or the actual consumption of vegetation by livestock); and as livestock management (or the presence or placement of cattle within particular areas). Considered thus, the answer to the question of whether take might occur in the course of these activities became "no" in the case of herbivory (see Sections 3.6 and 10.3), and "yes" in the case of livestock management (see Sections 3.5.2.1 and 7.1). The outcome of these conclusions, furthermore, is that grazing defined as herbivory is not addressed by the HCP or included within its coverage, while grazing considered as livestock management is so addressed and covered.

(4) NRCS Role. The NRCS (formerly the Soil Conservation Service) is neither a regulatory nor a land management agency and its role in grazing and range management issues in the Malpai Borderlands is largely advisory and at the invitation of individual ranchers. Nevertheless, for two reasons the NRCS plays an important and crucial role in these issues—first, it has the resources to provide significant technical, scientific, and funding assistance to Malpai-area ranchers; and, second, over the years it has established trusted relationships with those ranchers. Consequently, the NRCS has been a working partner in the borderlands for many years.

There are two mechanisms through which the NRCS is able to advise Malpai Borderlands ranchers on the wise use of rangeland resources, both on private and state-trust lands—Cooperator Agreements and Coordinated Resource Management Plans. In addition, by joining the applicable NRCS Conservation District (which, in the Malpai Borderlands, is the Whitewater Draw Natural Resource Conservation District in Arizona and the Hidalgo Soil and Water Conservation District in New Mexico), the rancher creates a legal pathway through which the NRCS can assist in inventory and planning on non-Federal lands via these mechanismsCooperator Agreements are general in nature and do not by themselves commit a rancher to any specific conservation-related action or plan. To date, cooperative plans have been completed and signed for nine Malpai-area ranches, and the area subject to these plans totals approximately 80,000 acres (D. Decker, NRCS, pers. comm.).

2.2.2 Current Ecological Problems/Conditions

A number of ecological problems currently afflict the Malpai Borderlands. Generally, this is the result of over-grazing in combination with drought at the turn of the last century (see preceding section); and a century of fire suppression policies. The combination of weather and these other factors have left the area with a number of unfavorable and self-perpetuating conditions. Among these are de-vegetation and

resulting erosion, encroachment of woody brush into the area's historic grasslands, and a reduction in the role of wildfire in the area's ecosystems that affects each of the preceding conditions.

To combat these problems and improve ecological function in the borderlands, MBG and its cooperators for some time have applied and experimented with a number of techniques to increase the incidence of beneficial fire in the area, to restore and increase vegetative productivity, to control erosion, and to suppress brush encroachment. Among these are managed fire (including prescribed burns), various types of erosion control structures, and various types of brush control measures. Taken together, these three sets of activities—fire management, erosion control, and mechanical brush control—comprise MBG's overall "grassland improvement" program, which it proposes under the MBHCP to continue, in some cases to expand, and which is also explicitly included in and covered by the plan (see Section 3.5.1).

2.2.2.1 Lack of Ecologically Appropriate Fire Management

(1) Historical Perspective. Fire almost certainly played an important role in the ecology of the Malpai Borderlands prior to Euro-American settlement. Bahre (1985) concluded that fires were "fairly frequent" in southern Arizona grasslands prior to 1882, and Kaib (1998) suggests that desert grasslands in this area likely burned approximately once every 8-12 years. In addition, evidence suggests that both native Americans and early settlers in the region used fire as a management tool (Sayre 2000). These fire regimes likely played a crucial role in maintaining the area's grasslands by suppressing woody species and encouraging new growth. However, fire incidence in the Malpai Borderlands has decreased dramatically during most of the 20th century. This is the result of several factors, including discontinuation of managed range fires with the introduction of wood fencing in the 1910's and 1920's; in some periods (e.g., the early 1900's) the lack of sufficient herbaceous cover to sustain fires; and since then, increasingly effective and thorough fire suppression policies which remained in place until the 1990's. The result, in recent decades, has been the near elimination of natural fire from its historical role in the Malpai Borderlands, and the loss of its clear ecological benefits.

Concurrent with this has been a steady encroachment of woody shrub species into the historical grasslands of the Malpai Borderlands (see Section 2.2.2.3), a phenomenon that has triggered interest in restoring fire to the area—both in its managed form (management ignited prescribed fire, or "prescribed burns") and its managed natural form (prescribed natural fire) (see Section 5.2.1.1, Subsection A.3 for fire-related definitions). Thus, as discussed in Section 1.2, lack of fire in the Malpai Borderlands and improving and correcting this situation was a primary motivating factor in the formation of MBG in 1994.

At that time, three factors more-or-less constrained effective fire management of the type MBG wished to undertake—the 80-year-old fire suppression policies of state and Federal agencies (in place still in the early 1990's), ineffective coordination between those agencies and the landowners affected by their policies, and the constraints of the Endangered Species Act. The former of these to a large extent have been resolved—e.g., through a 1993 MOU between the agencies and Malpai landowners that set new fire policies for the borderlands, development of regional fire management maps for the area (the most recent dated 2002) specifying fire management policies with respect to particular ranches, and development and approval of the Bootheel Fire Management Plan, which provides comprehensive guidance for managing fire in the New Mexico portion of the Malpai Borderlands

(2) Current Circumstances/Benefits of Fire. The constraints of the ESA on fire management in the Malpai Borderlands largely remain, however. These primarily affect private and state trust lands and occur principally as a result of three factors—the ESA's prohibition against "take" of Federally listed endangered and threatened species (see Section 1.4), the fact that a minimum of nine such species inhabit

the Malpai Borderlands (and the risk that they may be taken in the course of managed fire events), and lack of an efficient mechanism under the ESA for approval of fire management activities on a project-by-project basis. As a result of these factors, prescribed burns in the Malpai Borderlands to date have occurred only where Federal lands were involved, in which case related ESA issues have been addressed under Federal authorities These consist of the 6,000-acre Baker burn in 1995; the 12,000-acre Maverick burn in 1997; and the 46,000-acre Baker II burn in 2003. Plans to let natural fires burn on private and state-trust lands (under the Bootheel Fire Management Plan) cannot be carried out without significant ESA-related uncertainties; and the real objective of MBG's fire management proposals—restoration of fire across the Malpai Borderlands—has yet to be fully realized.

The potential benefits of such a program are likely considerable. It has been found, for example, that mesquite control efforts often fail unless applied in combination with fire (see Section 2.2.2.3); and, in studies undertaken in the Altar Valley watershed (approximately 80 miles west of the borderlands) Meyer (2000) noted: (1) that numerous grassland areas within that watershed that had recently been burned showed vegetative components similar to pre-settlement conditions; (2) that burning appeared to be effective on small mesquite trees and reduced the vigor of mid-sized trees; and (3) that live basal areas, grasses, and forage production were significantly greater, and bare ground and shrubs significantly less, in burned as compared to unburned areas within certain sites within that watershed.

2.2.2.2 Erosion

(1) Types/Sources of Erosion. The primary types of erosion occurring in the Malpai Borderlands are sheet erosion, channel and gully erosion, and floodplain downcutting and headcutting. Sheet erosion (which occurs across broad areas of poorly-vegetated ground surface) likely accounts for a majority of erosion in the area in terms of sediment produced. However, gully erosion (which moves downward from steeper slopes as runoff cuts through inadequately-vegetated uplands and washes), floodplain downcutting (a form of gully erosion), and headcutting (also a form of gully erosion, which moves up ephemeral stream channels from their mouths) are often more visible and severe, in part because they are more localized. As a result of the latter types of erosion, many small to medium-sized arroyos have formed within ephemeral stream channels and across floodplains in the borderlands over the years, creating a network of incised arroyos and washes in many areas. Stream channel erosion (a relatively large-scale form of gully erosion, typically occurring in perennial streambeds) has also occurred in the area, most conspicuously in Black Draw in San Bernardino NWR. All of these types of erosion produce significant quantities of sediment, much of which finds its way into downstream perennial streams where it can significantly degrade aquatic habitats.

(2) Control Measures. MBG and Malpai-area ranchers have undertaken a variety of efforts to control erosion over the years. Grasses have been restored in some areas, which eliminates or helps slow sheet erosion, while many measures to combat gully and stream channel erosion have also been implemented, including: (1) gabions (rock-filled wire-mesh containers set into a stream channel or gully); (2) contour plowing (to slow runoff and increase infiltration); (3) construction of earthen reservoirs equipped with spillways and sandtraps (to prevent washouts and capture sediment); (4) construction of dikes and drop structures (to prevent headcutting); and (5) installation of spillways, culverts, and water bars around stocktanks and roadways.

More recently, however, MBG and its cooperators have been moving toward a group of relatively simple erosion control structures that are, nevertheless, very effective (Peter Warren, TNC, pers. comm.). These include "one-rock dams" (consisting of one-thick layers of rock placed within shallowly-eroded areas such as ephemeral drainages); "loose rock-rubble" check dams (dams or plugs of heavy rock placed

within gullies to slow water velocities); splash basins (pads of rock placed where airborne or high-velocity water strikes the ground surface); channel deflectors (also constructed of rock, which deflect water flows from vulnerable cutbanks), and others. Such structures are the key component of MBG's current erosion control plans because they are simple, can be constructed using little more than rock, and work ingeniously by allowing natural processes that in the past have been destructive to reverse themselves and become corrective. This is accomplished, for example, by installing one-rock dams, point bars, and check dams in combinations and size configurations appropriate to a given area and then "letting nature take over." The structures begin by armoring the treated sites and arresting continuing erosion; this then slows runoff rates leading to sediment deposition and build-up; naturally transported seed then deposits on these developing substrates and vegetative cover begins taking hold. Then, just as they did in their destructive phases but in reverse, these processes extend, expand, and accelerate—with excellent results.

2.2.2.3 Brush Encroachment

(1) History/Effects. The encroachment of woody brush, including mesquite, from the lowlands of the Malpai Borderlands into its upland grasslands appears to have begun at the turn of the last century and to have been associated with the droughts and overgrazing that occurred in conjunction at that time (see Section 2.2.1.1). Brush species, with their relatively deep root structure, are more capable of withstanding drought than grasses and forbs, and so would have been significantly favored during this period. In the years following, brush encroachment seems to have occurred at gradually increasing rates, and to have been significantly accelerated by another drought in the mid-1950's, estimated to have been the most severe in 350 years (Sayre 2000). Today, mesquite and other brush species occur in unwanted areas and/or at excessively high densities across much of the Malpai Borderlands and represents a potentially permanent shift in vegetation from grassland to shrubland.

The effects of brush encroachment are significant. It has been found, for example, that when mesquite canopy cover exceeds about 16 percent, herbaceous cover is greatly reduced (Kincaid et al. 1959) which, in turn, significantly increases erosion rates, since the amount of bare ground and soil movement increases as vegetative cover decreases

(2) Control Measures. There are two methods currently or potentially available to control mesquite and other invasive brush species in rangelands: (1) fire management (addressed in Section 2.2.2.1); and (2) mechanical control (e.g., chaining and grubbing; see Section 3.5.1.3). Each of these measures has been used at one time or another in the Malpai Borderlands, often in combination with each other and with the seeding of grasses. Mechanical control, however, is relatively costly on a per-acre basis, which tends to limit its use, and rising fuel costs in recent years have further limited its use. Prior to completion of the HCP, for example, mechanical brush control activities in the Malpai Borderlands likely totaled no more than about 100 acres per year, and cumulatively, areas treated in this fashion to date likely do not total more than about 1,000 acres (P. Warren, TNC, pers. comm.). In addition, while the short term results of mechanical brush control are fairly good, over the long term (10-20 years) brush species re-colonize treated areas unless fire is used in combination with other control methods (Sayre 2000). Nevertheless, MBG and Malpai-area ranchers wish to have mechanical brush control as an available option and its use on a limited basis will likely continue; it could even increase if results from current brush control treatment studies in the Malpai Borderlands were to identify a particularly effective form of mechanical treatment.

3.0 Overview of the MBHCP

As seen in Section 1.1, the MBHCP has been prepared for the purpose of integrating three sets of issues and needs: (1) the activities and programs of MBG and of individual Malpai-area ranchers who collectively make up MBG; (2) the conservation interests of endangered and threatened species inhabiting the Malpai Borderlands; and (3) the regulatory requirements of the Endangered Species Act arising in connection with the effects of these activities on these species. The specific issue triggering the plan is the fact that some of the activities proposed by MBG and Malpai-area ranchers have the potential to result in "take" of Federally listed species inhabiting or potentially inhabiting the Malpai Borderlands; this, in turn, results in the need for an Incidental Take Permit (ITP) authorizing such take.

Thus, functionally, the MBHCP derives from three distinct purposes (which, can be characterized as organizational, biological, and regulatory, respectively) and is driven and defined by a very specific set of components, participating interests, and regulatory issues, and by the relationships and interactions between them. The latter are fundamental to every aspect of the plan and consist, specifically, of the following: (1) a set of "covered" activities (i.e., activities specifically addressed by the plan) in two categories (referred to as "grassland improvement" activities and "ranch management" activities); (2) the specific entities proposing or planning to undertake those activities (i.e., MBG and individual Malpai-area ranch owners); (3) a set of "covered" species (which, because of the potential effects of the covered activities on the species, are also addressed by the plan); (4) a set of "conservation" activities (i.e., activities proposed to address those effects and to protect the species); (5) a set of entities and organizations who, in addition to MBG and Malpai-area ranchers, play substantial roles in the plan as MBG partners and cooperators; and (6) the issue of "take" and the functioning of the ITP (the former being the specific potential effect of the covered activities on the covered species at issue in the plan: the latter being the specific legal authority that both permits such take, and, with respect to any ITP holder or beneficiary, causes implementation of the MBHCP (or applicable parts or measures of the MBHCP) to be an enforceable legal requirement.

In light of its importance, this section describes the regulatory and organizational structure of the MBHCP in detail, particularly with respect to the above six components (with the exception that the bulk of the conservation program is described in Sections 5.0, 6.0, and 8.0 of the plan, and with the addition of a few related topics); where relevant, it also explains the associations and relationships between particular plan components or interests and the effects of those relationships, if any. Table 3-1 in the section can be consulted for a convenient overview of the plan.

3.1 Plan Structure/Organization

(A) Required Content/Elements.

The MBHCP is organized and structured with respect to four sets of criteria or standards: (1) the statutory requirements of section 10(a) of the ESA and its implementing Federal regulations; (2) USFWS policy guidance (as applicable); (3) generally accepted HCP format and practices; and (4) requirements and needs (structurally or functionally) stemming from its own particular contexts. The first three of these result in a statutorily complete HCP, the elements of which are shown in the following list of components making up the MBHCP.[3] Characteristics of the plan resulting from the fourth criterion are also shown in the following list and are described in Subsection (B) of this section.

[3] Also shown in the list, in the italicized section numbers within or following each such component, is the location in the plan where the component is discussed or described.

The essential components of the MBHCP (i.e., those required by statute, regulation, and other accepted standards that make it statutorily and functionally complete) consist of the following.

(1) The permittee (holder of the plan's associated I.T.P.): This is (a) MBG *(Section 3.2.1)*; in addition (b) Malpai-area ranchers may voluntarily become parties to the plan *(Section 3.2.2)* through Voluntary Conservation Agreements and Certificates of Inclusion *(Section 5.6)*.

(2) Three factors for which the MBHCP provides regulatory coverage under MBG's permit:

(a) The "covered species": Consisting of 19 species of fish, wildlife, and plants in four species assemblages (11 aquatic species, 4 grassland species, 2 riparian species, and 2 montane species). *(Sections 3.3 and 4.0)*

(b) The "covered area": Consisting of all private and state-trust lands within the Malpai Borderlands. *(Section 3.4)*.

(c) The "covered activities": Consisting of two categories with three sets of activities each—(i) grassland improvement activities (including fire management, erosion control, and mechanical brush control); and (ii) ranch management activities (including livestock management, linear project construction, and stocktank maintenance and use). *(Sections 3.5.1 and 3.5.2, respectively)*.

(3) The permit term: 30 years. *(Section 3.8.)*

(4) A conservation program consisting of: (a) objectives and goals *(Section 5.1)*; (b) take minimization measures *(Section 5.2)*; (c) mitigation measures *(Section 5.3)*; (d) a monitoring program consisting of compliance monitoring measures and biological effectiveness monitoring measures *(Section 5.4)*; (e) an Adaptive Management program *(Section 5.5)*; (f) procedures allowing willing Malpai-area ranchers to enroll and participate in the HCP *(Section 5.6*; (g) a Technical Advisory Committee to help implement the plan *(Section 5.7)*; and (h) an annual report *(Section 5.8)*.

(5) A description of: Funding responsibilities and sources. *(Section 6.0.)*

(6) A description of: (a) The anticipated effects of the HCP on the covered species; and (b) take limits allowed by the plan with respect to each covered species. *(Section 7.0.)*

(7) A description of: (a) How "changed circumstances" will be addressed if they occur; and (b) "No Surprises" assurances provided by the plan with respect to "unforeseen circumstances." *(Sections 8.1 and 8.2, respectively.)*

(8) Procedures for: (a) Amending the HCP and permit; (b) voluntary termination of the permit; and (c) early termination of Voluntary Conservation Agreements. *(Sections 9.1 and 9.2.)*

(9) A description of: Alternatives to the proposed taking considered but not adopted and consisting of: (a) a No Action Alternative; (b) a Reduced HCP Coverage Alternative; and (c) Inclusion of Herbivory *(Sections 10.1, 10.2,and 10.3 respectively)*

(10) An Implementing Agreement: (a) Formalizing responsibilities under the plan of non-permittee signatory parties; and (b) addressing a range of legal HCP issues.

[This page reserved for Table 3-1.]

(B) Other Characteristics.

MBHCP features that derive from its contextual circumstances and/or result in circumstances that in some way characterize the plan, limit or extend its authorities, and/or require special attention in its implementation are as follows.

(1) Plan Scope. First, the MBHCP's scope (i.e., the regulatory coverage it puts into place) encompasses the entire 800,000-acre Malpai Borderlands area and all reasonably-determinable and foreseeable ESA issues and needs currently connected with, or likely in the future to be connected with, activities planned or being undertaken by MBG and Malpai-area ranchers; this has resulted in regulatory coverage under the plan of 19 species of fish, wildlife and plants (ten of which are not currently ESA-listed), and six sets of covered activities. Because of the plan scope, implementing the plan will present many challenges—in terms of planning and carrying out the covered activities; coordinating the many activities and HCP parties and cooperators involved in the plan; in some cases coordinating multiple layers of authority (especially with respect to fire management); and integrating the covered activities with the endangered species conservation program.

(2) The MBHCP's Conservation Orientation. Second, the MBHCP is unusual in the important sense that it is conservation-oriented in its own right. That is, the activities covered by the plan do not represent actions expected to modify, degrade, or destroy natural ecosystems or habitats, as in many HCPs, but, to the contrary (and especially in the case of the grassland improvement activities), represent conservation programs designed to improve long-term ecological conditions in the Malpai Borderlands. To the extent these activities conflict with endangered and threatened species, this will primarily consist of temporary, short-term effects (e.g., occasional mortality, injury, or harassment to individuals of such species), but will not typically involve the more serious, long-term effects of habitat loss. Under these circumstances the overall net effect of the MBHCP on endangered and threatened speciesis expected to be beneficial.

(3) Plan Context. A related issue involves the context within which the MBHCP occurs and the role the plan plays within that context. This can be seen in that fact that the MBHCP's covered grassland improvement activities (as well as its covered ranch management activities) will be undertaken in concert with MBG conservation activities that are not covered by the plan (for the reason that these activities are not expected to result in take). An example of the latter is MBG's conservation easement program, which is designed to preserve the natural conditions of the Malpai Borderlands and thus complements the covered grassland improvement activitiesIn the context of the MBHCP there are two distinct sets of MBG activities—those that are covered by the plan and those that are not coveredThe distinction between the two is therefore determined by the regulatory considerations of the ESA, not by any inherent MBG purpose. Taken together the MBHCP-covered MBG activities and non-MBHCP-covered MBG activities form a comprehensive, land-based conservation strategy designed to protect, preserve, and improve the entirety of the Malpai Borderlands landscape.

There is a second issue to consider within this issue of context—the MBHCP's species conservation program. These activities, in the context of the MBHCP, serve the relatively straight-forward purpose of protecting endangered and threatened species in the course of carrying out the covered activities. With respect to MBG programs overall, the MBHCP's species conservation activities are essentially a subset of MBG conservation purposes (described above), and within that land-based strategy represent a more limited, species-based strategy designed to meet the specific requirements of the ESA.

(4) Applicability to MBG/Malpai-area Ranchers. A final point involves the relationship between MBG and its member-ranchers. Malpai-area ranches for the most part function independently of MBG.

While MBG is subject to the MBHCP's conservation requirements or recipients of its regulatory coverage, the Malpai-area ranchersare not *per se* subject to the MBHCP's conservation requirements or recipients of its regulatory coverage. The MBHCP, however, includes provisions underwhich Malpai area ranchers may voluntarily enroll and implement MBHCP's conservation requirements or recipients of its regulatory coverage. A detailed description of the roles, rights, and responsibilities are found in Section 5.6 of this plan.

3.2 Roles and Responsibilities

3.2.1 Plan Activities/Parties/Cooperators

Implementing the MBHCP will involve the carrying out of activities of several different types, and participation by numerous individuals, organizations, and agencies who will be acting in several capacities and roles. This section therefore describes: (1) the types or categories of activities that will be undertaken or carried out under the MBHCP; (2) the particular entity or entities that will undertake each such activity; and (3) the type of participation in, or role in relation to, the MBHCP each such entity will play in the carrying out of each such activity.

(1) Types of Activities. Generally, two types of activities are addressed by and will be implemented under the MBHCP. These are:

(a) *Covered Activities*. The covered activities consist of activities planned or proposed by MBG and/or Malpai-area ranchers which have the potential to result in take of federally-listed species and are therefore included in the MBHCP's regulatory coverage. Two categories of activities are covered by the plan: (i) those planned or proposed to improve ecological conditions in the Malpai Borderlands (and referred to as grassland improvement activities; see Section 3.5.1); and (ii) those planned or proposed in the course of managing and operating individual Malpai-area ranches (referred to as ranch management activities; see Section 3.5.2).

(b) *Conservation Program Activities*. The conservation activities, on the other hand, consist of activities and measures established by the MBHCP pursuant to the ESA for the purpose of protecting federally listed species (and other covered species; see Section 3.3) in the course of carrying out the covered activities described above. The conservation activities include take minimization measures, a monitoring program, various program implementation measures and procedures, and other measures; described in Section 5.0 of the plan.

(2) Types of Participation. Implementing the MBHCP will also involve participation by a wide range of individuals, organizations, and entities, each of whom will belong to one or another (or, in some cases, both) of two categories of such participation: (a) HCP participants; or (b) HCP cooperators. For purposes of the plan, these are defined as follows:

(a) *HCP Participant*. An HCP participant consists of any individual or entity who has accepted specified responsibilities under the MBHCP, which are formalized and made binding as a result of: (i) holding the plan's associated I.T.P.; (ii) being signatory to the plan's associated Implementing Agreement (IA) (see Section 3.7); or (iii) being signatory to a Voluntary Conservation Agreement (VCA) and a recipient of an associated Certificate of Inclusion (COI) (see Section 5.6.2).

(b) *HCP cooperator*. An HCP cooperator, on the other hand, consists of an entity who has no formal responsibilities under the MBHCP (as determined by the I.T.P, the IA, or a VCA), but who participates indirectly or in effect as a result of other arrangements, agreements, or responsibilities.

Examples of HCP cooperators include research personnel (e.g., from the RMFRS; see Section 1.2, Subsection C) who carry out range management-related studies in the Malpai Borderlands. and fire officials and crews who assist in managing prescribed fire in the borderlands. Examples of non-HCP-related agreements or responsibilities that would result in participation in the MBHCP by plan cooperators include research agreements between the RMFRS (or colleges. universities, conservation organizations, etc.) and MBG; the statutory responsibilities of government land management agencies in the area (under which, for example, the USFS might assist in managing prescribed burns), and mutual-aid agreements between fire departments and/or fire agencies in the area (under which such a department or agency might assist another in managing fire in the Malpai Borderlands).

(3) Entities Undertaking the Activities. Remaining is the question how the activities described in Subsection (1) are divided among the HCP participants and cooperators described in Subsection (2). Generally, with two exceptions, covered activities under the MBHCP will be carried out by HCP cooperators; while both covered activities and conservation program activities will be carried out by HCP participants. The two exceptions are MBG and Malpai ranchers—who alone among HCP participants will play substantial roles in carrying out the covered activities. A further division occurs in the roles MBG and Malpai ranchers will respectively play in carrying out these activities. That is, the covered grassland improvement activities will be typically (although not always) be carried out either by, with the assistance of, or in cooperation with MBG; while the covered ranch management activities in most cases will be carried out by Malpai-area ranchers (although, at times, with MBG assistance). With respect to both situations, furthermore, MBG will play the central role (relative to all participants and cooperators) in promoting, coordinating, and carrying out the grassland improvement activities.

Thus, the roles HCP participants and cooperators will play in the plan, with respect to the activities included in it, are as follows.

(a) *HCP Participants Undertaking Conservation Program Activities*: A total of eight entities are (or likely will be) HCP participants under the MBHCP, which, by definition, means that they have been assigned (through the I.T.P), have voluntarily accepted (under the IA), or will likely voluntarily accept (under the VCA process) specified activities and responsibilities in implementing the plan's conservation program, which responsibilities are also (or also will likely be) formalized and made binding either through the I.T.P., the IA, or VCAs. These entities (together with the specific mechanism tying each to the plan) are:

The Malpai Borderlands Group (I.T.P)	U.S. Fish & Wildlife Service (E.S. Div.) (I.T.P & IA)
Individual Malpai-area ranchers (VCAs)	U.S. Fish & Wildlife Service (S. Bernardino NWR) (IA)
Arizona Game & Fish Department (IA)	New Mexico Department of Game & Fish (IA)
Arizona State Land Department (IA)	New Mexico State Lands Office (IA)
Natural Resources Cons. Service (IA)	

(b) *HCP Participants Undertaking Covered Activities*: In addition to its role in implementing the conservation program, MBG will also be the primary party coordinating and overseeing the covered grassland improvement activities, and will help carry out those activities. In addition, to the extent they become HCP participants in accordance with the plan (see Sections 3.2.2.2 and 5.6), Malpai-area ranchers will be the primary parties carrying out the covered ranch management activities, and, in some cases, will help carry out the grassland improvement activities.

(c) *HCP Cooperators Undertaking Covered Activities*: Over the life of the plan there are likely to be many HCP cooperators, including but not limited to:

U.S. Forest Service (fire personnel)	Arizona State Land Department (the State Forester)
U.S. Forest Service (RMFRS)	U.S. Bureau of Land Management (fire personnel)
The Nature Conservancy	NMNRD, Forestry & Resources Conservation Division
Arizona State University	University of New Mexico
Hidalgo Soil and Water Cons. District	Whitewater Draw Natural Resource Cons. District

3.2.2 The "Programmatic" Approach

The MBHCP is a "programmatic" plan, meaning: (1) that its regulatory scope encompasses the land-use interests of not one, but potentially many individuals and entities; and (2) that its associated I.T.P. is held by one entity on behalf of itself and other entities. The advantages of the approach are twofold—it allows an entire group of entities (and activities) to fall under the coverage of a single HCP and permit (as opposed to multiple, duplicative HCPs needing to be prepared individually); and, once the HCP and permit are in place, allows their coverage to be implemented on an as-needed basis.

There are also three essential requirements to the approach. First, activities included in a programmatic HCP must be described as clearly as circumstances allow (since what is covered in such plans is often not actual or particular activities, but generic classes or types of activities). Second, because the authorities of a programmatic permit by definition are vested in the permitee, and because the entities on behalf of whom the permit is held by definition are not the permittee, a specific mechanism or process is necessary for conveying the permit's authorities—as well as its responsibilities—to those on behalf of whom the permit is held. And third, because, notwithstanding the first requirement, the actual activities involved in individual projects may not be fully reflected in the generic description in the HCP, a mechanism is also necessary for documenting the specifics in individual cases in which a landowner seeks coverage under a programmatic HCP and permit.

3.2.2.1 Role of MBG (as Permittee)

(1) Permittee. In the case of the MBHCP, the party proposing to hold the plan's associated I.T.P. is the Malpai Borderlands Group. MBG will hold the permit on behalf of itself, with respect to carrying out the plan's grassland improvement activities; (see Sections 3.2.1 and 3.5.1) and on behalf of individual Malpai-area ranchers, with respect to carrying out the ranch management activities (see Section 3.5.2). The conveyance of the authorities of MBG's permit to individual Malpai ranchers, and documentation of the activities covered by the MBHCP and its I.T.P. in individual cases, is accomplished under the plan via "Voluntary Conservation Agreements" (VCAs) jointly executed by MBG and individual ranchers. Furthermore, each VCA includes an attached "Certificate of Inclusion" (COI) issued by MBG to each rancher entering into a VCA. Pre-approved "template" VCAs and COIs for use in preparing these documents under the MBHCP are provided in Appendix D.

The responsibilities of MBG as the MBHCP's permittee are described throughout the plan, but broadly consist of implementation (i.e., helping carry out specific covered activities and conservation program activities); coordination (of the many individuals, agencies, organizations, and activities involved in plan implementation); and administration and oversight (e.g., preparing annual reports, securing plan funding, chairing the plan's Technical Advisory Committee, and effecting participation in the plan by willing Malpai ranchers). MBG is also responsible for ensuring legal compliance with the MBHCP by any entity (including itself) subject to the authorities of its I.T.P.

(2) Authorized Designee. MBG may, however, transfer certain of its responsibilities under the MBHCP to a suitable designee. To do this it must: (a) inform the USFWS in writing of its intention to transfer such responsibilities to a designee, identify the designee, explain the relationship of the designee to MBG and the designee's qualifications to carry out the MBHCP's responsibilities on behalf of MBG, and detail the specific actions and measures the designee will carry out (or, alternately, will not carry out); and (b) obtain from the USFWS concurrence with the transfer in writing. Notwithstanding any such designation, MBG understands that it is responsible for any and all actions undertaken by the authorized designee and remains solely responsible for ensuring that the responsibilities assigned to it under the MBHCP are fully met and carried out.

3.2.2.2 Participation by Ranchers

(1) Summary. As noted above, because the authorities of an HCP derive from its associated I.T.P., and because MBG is the only permittee under the plan, individual Malpai-area ranchers are not obligated by (i.e., subject to) the MBHCP or its requirements, nor are they included within its regulatory authorities or benefits. They may, however, at their own discretion, elect to enroll in and participate in the plan. If a rancher elects to participate, they: (a) agree to implement conservation measures specified by the plan that are applicable to the covered activity or activities he or she wishes to enroll in under the plan; and (b) in return, obtains the regulatory authorizations and protections vested in MBG's I.T.P. with respect to those activities. These results are effected, respectively, through the VCA (and attached COI) described above (see Section 5.6). In addition, for purposes of the plan, any rancher electing to enroll in and participate in the HCP is said, upon execution of the VCA, to be an HCP participant (as defined in Section 3.2.1) or a "participating rancher" and in effect becomes a sub-permittee under MBG's I.T.P.

As previously noted, such participation is voluntary, and may be elected or declined within any rancher's sole discretion. However, in making this decision, it is critical that Malpai-area ranchers understand the relative benefits, responsibilities, and liabilities of participating in the HCP versus not participating.

(2) Benefits/Responsibilities of Participation. As seen above, participation in the MBHCP carries with it the responsibility to implement the conservation measures required by the plan with respect to the activities in question; in any given case, these would consist primarily of applicable take minimization, monitoring, and reporting measures described in Sections 5.2, 5.4.3.1, and 5.8, respectively. Participation also carries with it the plan's regulatory protections, consisting of legal coverage should take of federally listed species occur in the course of carrying out the enrolled activities; and the plan's "No Surprises" assurances, which provide long-term regulatory certainty (see Section 8.1).

Non-participation, on the other hand, means that a rancher is under no obligation as a result of the HCP and need not implement its measures, but also that its regulatory benefits are not obtained. If a landowner wants Malpai assistance for a covered activity, then they must enroll as a participant.

In light of these considerations, Malpai-area ranchers should individually assess whether the benefits (e.g., I.T.P. coverage) and responsibilities (implementing the plan's requirements) of participation in the MBHCP outweigh the risks (unauthorized taking of listed species) of non-participation. As previously noted, this is the rancher's decision. However, once a rancher elects to participate in the plan and a VCA has been prepared and executed, all applicable conservation measures then become binding for the term specified by the VCA. However, the MBHCP does provide for early termination procedures for VCAs (see Section 9.2).

3.3 Proposed Covered Species

(1) Definition. The term "covered species" refers to those species for which the MBHCP provides specific conservation measures and to which the coverage of the plan's associated I.T.P applies. Thus, take of a covered species that occurs in the course of carrying out one or more of the plan's covered activities is expressly authorized by the permit.

(2) Discussion. Eighteen fish and wildlife species and one plant are covered by the MBHCP. These are shown in Table 3-2, together with their listing status under the ESA, under the New Mexico Wildlife Conservation Act, and under applicable Arizona state designations. Also shown in Table 3-2 is the species assemblage to which each of the covered species belongs (see Section 4.0).

Treatment of Unlisted Species. As also seen in Table 3-2, 10 of the 19 covered species are not currently listed under the ESA. They are nevertheless covered under the MBHCP as a result of two considerations—first, the possibility that, over the life of the plan's 30-year term, any one or more of them could become listed (in which case the requirements of the ESA would then apply); and, second, the fact that any one or more of them could be killed, injured, harmed, or harassed (i.e., "taken") in the course of carrying out the plan's covered activities. Given the latter, if any currently unlisted species inhabiting the Malpai Borderlands was to become listed at some future date, coverage of the species within the MBHCP (or another HCP) would be needed. The advantage of considering such species in the plan now is that, in the event such a listing should occur, coverage under the plan would already have been accomplished and no (or relatively few) further actions to satisfy the ESA's requirements with respect to such species would be needed.

In that event, however, coverage under the MBHCP's I.T.P would also be needed. Consequently, the plan's 10 currently-unlisted covered species are already named on its associated I.T.P.—with, however, the caveat that the permit will not become effective with respect to such species until the time of an actual

Table 3-2:
Species Covered by the Malpai Borderlands HCP

Species Assemblage	Species	ESA Status[1,2]	WCA Status[1]	AZ Status[3]
Aquatic Species	Yaqui chub	E		WSC
	Yaqui topminnow	E		WSC
	Yaqui catfish	T		WSC
	Yaqui sucker			WSC
	Longfin Dace			
	Mexican stoneroller			
	Beautiful shiner	T		WSC
	Chiricahua leopard frog	T		WSC
	Lowland leopard frog	SC	E	WSC
	Northern Mexican garter snake	SC	E	WSC
	Huachuca water umbel	E		HS
Grassland Species	Black-tailed prairie dog	RC/A		WSC
	Western burrowing owl	SC		
	Northern aplomado falcon	E	E	WSC
	White-sided jackrabbit	SC	T	
Riparian Species	Western yellow-billed cuckoo	CS/WBC		WSC
	Western red bat	SC		WSC
Montane Species	N.M. ridge-nosed rattlesnake	T	E	
	Mexican spotted owl	T		WSC

[1] E = Endangered; T = Threatened.
[2] SC = Species of concern, which is not a formal classification but means that the USFWS is concerned about these species and that further biological study is needed to resolve their conservation status (USFWS 1996); generally includes former category 2 candidate species. RC = Species the USFWS has removed from the candidate list because currently available information does not support a proposed listing. A = Species that are more abundant or widespread than previously believed and that are not subject to the degree of threats sufficient to warrant continuing candidate status or issuance of a proposed or final listing. CS/WBC = Candidate Species with a Warranted but Precluded finding; this classification refers to species for which the USFWS has found that sufficient data exist to support ESA listing but for which listing is precluded by other higher-priority actions (USFWS 1996).
[3] HS = Highly Safeguarded (meaning that collection is prohibited); WSC = Wildlife of Special Concern.

future listing. For present purposes, however, these species are treated under the plan as if they are already listed, meaning that any conservation measures specified by the MBHCP and applicable to them must be implemented from the outset of the plan, notwithstanding the fact that, technically, a legal taking of such species cannot by definition occur until the time of actual listing. The rational of this strategy is that through proactive conservation, a future need to list these species may not occur.

Selection of the Covered Species/Covered Activities. Selection of the MBHCP's covered species and covered activities; (see Section 3.5) involved what is essentially a risk-benefit analysis. Where the issue under consideration is the possibility that particular species might be taken in the course of implementing particular activities. . Factors also pertinent to this analysis include the magnitude of the possibility of take; the extent to which take could be avoided through take minimization measures; the costs of meeting

the ESA's conservation requirements with respect to species covered by the plan; and the extent to which areas affected by plan activities are inhabited by listed species.

A total of 19 species and six sets of activities were selected for coverage under the plan. In actuality, however, neither can be considered in isolation, since the taking of a particular species at a particular time (or the potential for such a taking) necessarily involves the interaction between a species and an activity—that is, a species and activity in combination with each other. The MBHCP encompasses a total of 114 such species/activity combinations (or 19 covered species x 6 sets of covered activities). However, coverage under the plan is not needed (and has not been provided) for all such combinations since in many cases there is little to no likelihood of interaction between particular species and activities (i.e., little to no overlap in the areas in which each occurs); only the leopard frogs and gartersnakes, for example, occur in stocktanks and are likely to be affected by stocktank maintenance. All this is depicted in convenient summary form in Table 3-3, which shows all potential covered species/covered activity combinations under the MBHCP and all such combinations actually covered by the plan (these are shown in red).

Coverage of Grazing. Note that Table 3-3 depicts "Grazing" as a species/activity combination in two ways—one defining it as "herbivory," the other as "livestock management." As also seen, livestock management is covered by the plan with respect to ten species, while herbivory is not covered at all. The reasons for this, and for categorizing grazing in this fashion, are explained in Sections 3.5.2.1 and 3.6.

3.4 Proposed Covered Area

The term "covered area" refers to the geographic area to which the MBHCP and its associated I.T.P. apply. Generally, the covered area consists of the triangular-shaped Malpai Borderlands area as it is typically depicted on maps (e.g., see Figure 1, Section 2.1), which straddles the southern end of the state border between Arizona (in Cochise County) and New Mexico (in Hidalgo County). It includes, specifically, all private and state-trust lands within the following defined boundaries: (1) on the south—the U.S./Mexico border; (2) along the west-side diagonal—Hwy 80 (to its junction with Hwy 9); (3) along the northern tip—Hwy 9; and (4) along the east-side diagonal—the Continental Divide (to where it enters Diamond A Ranch) and thence the boundary of the Diamond A Ranch to its junction with the U.S./Mexico border.

The area covered by the MBHCP does not include Federal (e.g., USFWS, USFS, or BLM) lands within the above-described area; Federal lands are addressed by the ESA under different provisions than non-Federal lands. This means that regulatory coverage under the ESA is not provided by the MBHCP with respect to those portions of Malpai Borderlands ranches that occur on Federal lands and are grazed under Federal permits. ESA issues on those lands, if any, are addressed by the USFWS and the Federal agency involved under the consultation requirements of section 7 of the ESA.

[This page reserved for Table 3-3.]

3.5 Proposed Covered Activities

(1) Definition. For purposes of the plan, the term "covered activities" refers to activities planned or proposed in the Malpai Borderlands by MBG, individual Malpai-area ranchers, or both, to which the coverage of the plan's associated I.T.P apply. A covered activity, in other words, is one which is legally covered by the permit should take of the covered species occur while it is being conducted or carried out, and one for which the assumption has been made that such take is a potential result of the activity.

As previously seen, covered activities under the MBHCP consist of two general types, referred to as grassland improvement activities and ranch management activities; and each of these is comprised of three distinct subsets of activities—fire management, erosion control, and mechanical brush control under the range improvement activities; and livestock management, linear facility construction, and stocktank maintenance and use under the ranch management activities. Covered activities under the MBHCP therefore consist of six sets or subsets of activities within two broad categories.

(2) Discussion/Distinctions. The two sets of covered activities are distinguished from each other in several ways. The most obvious is function and scope—the grassland improvement activities representing relatively large-scale endeavors serving landscape-level conservation purposes, while ranch management activities are more narrowly focused on ranch-level concerns. As seen in Section 3.2.1, they are also carried out by different HCP participants—the grassland improvement activities, typically, by MBG, and the ranch management activities by Malpai-area ranchers. This distinction, furthermore, accounts for the primary difference between the two in terms of plan function.

Applicability of the HCP to MBG/Malpai Ranchers. One of the most important features of the MBHCP is the difference in how activities carried out by MBG versus activities carried out by Malpai-area ranchers are treated with respect to the plan's regulatory structure. That is, when covered activities are carried out by MBG or under the control or supervision or with the cooperation of MBG, they fall automatically within the plan's regulatory coverage (meaning that any take that occurs as a result of the activities is covered by the plan). Similarly, MBG activities are automatically subject to the HCP's requirements (meaning that all conservation measures specified by the plan and applicable to a given activity must be implemented). However, activities undertaken by Malpai ranchers independently of MBG (i.e., without MBG involvement or assistance) are not subject to the plan's requirements or included in its regulatory coverage. The reason for this is that, legally, compliance with the HCP is mandated by its associated I.T.P., and MBG alone, as the permit holder (see Section 3.2.2.1), is specifically subject to its authorities. However, as a programmatic plan (see Section 3.2.2.2), the MBHCP establishes procedures allowing individual ranchers to voluntarily enroll in and become HCP participants where this is desired.

Rancher Participation in the HCP. Section 5.6.2 describes procedures for rancher enrollment and participation in the MBHCP in detail. The main points are that:

(a) Enrollment in the MBHCP by Malpai-area ranchers can be effected with respect to the entire plan (i.e., to all activities applicable to ranchers) or with respect to any single activity or combination of activities;

(b) By participating in the plan, a rancher in effect becomes a sub-permittee to MBG's I.T.P., and, for the duration of the period of enrollment, obtains its regulatory protections and authorities but is also subject to all plan requirements applicable to the enrolled activities;

(c) Unlike MBG's role, which is mandatory, enrollment and participation in the MBHCP by individual Malpai ranchers is voluntary unless a rancher seeks or requests MBG assistance in

carrying out a particular activity, in which case receipt of the assistance is conditioned upon the rancher's agreement to enroll in the plan with respect to the activity for which the assistance is requested; and,

(d) Rancher enrollment in the MBHCP involves MBG and the interested rancher only and employs two simple documentary mechanisms: (i) a VCA (which formalizes the rancher's commitment to implement applicable requirements of the plan, and (ii) an attached COI (which extends the plan's regulatory coverage to the rancher and to the activity or activities enrolled).

3.5.1 Grassland Improvement Activities

For the purposes of the HCP, range improvement activities are defined as those expressly designed and carried out to correct, ameliorate, or improve a specific adverse grassland condition (e.g., lack of beneficial range fire, gully or stream channel erosion, etc.) and to meet the long-term interests of ecosystem health, watershed function, and grassland stability and productivity. They are not intended to address day-to-day ranch operation or management—except to the extent that, over the long term, they help maintain the landscape-level conditions that make ranching possible (see Section 1.2,). The MBHCP covers or addresses three categories of range improvement activities: (1) fire management; (2) erosion control; and (3) mechanical brush control.

3.5.1.1 Fire Management

(1) Discussion/Methods. A number of factors have reduced fire to a relatively rare event in the Malpai Borderlands, yet the benefits of fire to southwestern grassland ecosystems are well-documented (McPherson, 1997). Among other things, fire significantly to reduces the density of woody brush, slows its spread, and increases grass and forb production—all of which are among MBG's grassland improvement objectives. MBG has not developed specific fire frequencies or goals for the program except as stated in its objectives ("Restoration of periodic fire as a functional component of the ecology of the Malpai Borderlands."). Based on likely historical fire frequencies in the Malpai Borderlands, fire management goals under the program would provide for fire return intervals similar to or approximating the historic rate of once ever 8 to 12 years (Kaib 1998).

Prescribed (i.e., management-ignited) burns are usually started with hand-held drip torches or helicopter drops of the ignition agent, while prescribed natural fires are started naturally (e.g., by lightening). In both cases, a variety of firefighting equipment (fire engines, water tankers, pick-up trucks, etc.) and personnel are maintained on site to manage and control the fire. Often, but not always, these are confined to established roads. Prior to or during a fire, firelines (to mineral soil) are often constructed by handcrews to control and confine the fire and these may be constructed anywhere in or adjacent to the burn area. On large or severe wildfires, firelines may be constructed utilizing heavy equipment.

(2) Covered Activities. Consist of all activities and programs necessary to implementation of MBG's fire management objectives, including:

(a) Managed fire designed to restore more natural fire regimes to the Malpai Borderlands and consisting of a combination of: (i) prescribed fire conducted under appropriate supervision by professional fire managers and the guidance of written burn or fire management plans, as applicable; and (ii) wildland fire managed under appropriate supervision by professional fire managers, in accordance with the 2002 (or similar) Malpai Borderlands Regional Fire Management Map (see

Section 1.2, Subsection C), and fire management plans as applicable and appropriate (e.g., the Bootheel Fire Management Plan), and,

(b) All on-the-ground fire management, control, and monitoring activities and practices normally and customarily associated with conducting prescribed fire and managing wildland fire.

3.5.1.2 Erosion Control

(1) Discussion/Methods. The primary types of erosion occurring in the Malpai Borderlands are sheet erosion, channel and gully erosion, floodplain downcutting, and headcutting. Erosion control measures planned or already underway to combat erosion include: (a) construction or placement of simple, rock-based erosion control structures (e.g., one-rock dams and loose-rock-rubble check dams) within ephemeral stream channels, floodplain downcuts, etc.; (b) on-ground surveys and evaluations to identify areas most needing improvement and determine optimal placement of these structures; and (c) in some cases, re-vegetation and planting of native grasses.

These structures work by allowing natural processes that in the past have been destructive to reverse themselves and become corrective (see Section 2.2.2.2). Most are surprisingly low in impact to construct or install and few require use of heavy equipment (or the ground surface disturbances typically associated with its use). In most cases, preparation of a given project site can be accomplished with hand tools, and materials for erosion control structures can be obtained within walking distance of a site. Materials will typically consist of hand-sized to 50-lb or 100 lb rocks, most of which can be collected or dug up from the areas immediately surrounding the site, transported by wheelbarrow, and placed by hand into the various configurations needed; at times, posts (obtained either commercially or locally in the form of mesquite trunks) and/or commercially-obtained rock may also be used to supplement local supplies.

(2) Covered Activities. Include all activities necessary to address two categories of erosion in the Malpai Borderlands:

(a) Small-scale, acute, and semi-acute erosion (e.g., gullies, headcuts, and small arroyos); and,

(b) Sheet erosion.

Activities covered under the plan to prevent, minimize, or repair these categories of erosion include, respectively:

(a) Within stream channels, headcuts, downcuts, and similar areas, hand construction of erosion control structures (e.g., one-rock dams, loose rock-rubble check dams, small wire-basket gabions, and similar structures) utilizing local or supplemental materials (e.g., rock, posts, and local vegetation); and,

(b) Within grasslands generally, planting of native grasses and forbs (including site-preparation, seeding, and related activities), the purpose of which is to increase ground cover, reduce erosion, restore grasslands generally, and restore native grasses and forbs specifically.

Also covered are all vehicle and equipment uses associated with the above activities.

3.5.1.3 Mechanical Brush Control

(1) Discussion/Methods. Mechanical brush control is another method for controlling encroachment of woody brush species into grassland vegetation associations and helping restore native grasslands. It is costly on a per-acre basis, which tends to limit its use to relatively small areas (e.g., in the tens of acres, typically) and/or particular situations (e.g., heavy brush accumulations in relatively discrete areas). Prior to the completion of the MBHCP, mechanical brush control activities in the Malpai Borderlands likely have not exceeded 100 acres per year and, cumulatively, no more than 1,000 acres (P. Warren, TNC, pers. comm.). Though no specific estimates have been provided, mechanical brush control in the future is likely to continue at roughly similar levels, although an increase or decrease in these levels could occur. In any case, cost considerations will likely always prevent mechanical brush control activities in the Malpai Borderlands on a large-scale basis.

A number of mechanical brush control methods may be employed in the course of this activity, including use of "roller-choppers," and grubbing. A "roller-chopper" cuts and breaks brush it into small pieces. This method cut brush at the base of the stem, but generally leave the roots intact; grubbing, on the other hand, involves inserting a steel blade beneath the ground at individual brush plants to break the tree below its root crown. Mechanical brush control activities all employ relatively heavy equipment, including bulldozers, backhoes, and "roller-choppers," usually resulting in significant ground impacts and noise.

(2) Covered Activities. Include all mechanical, non-fire related activities in the Malpai Borderlands designed to control or remove mesquite and other undesirable brush species, including, but not necessarily limited to, bulldozing, chaining, roller-chopping, and grubbing.

3.5.2 Ranch Management Activities

Livestock ranching involves a wide range of activities. Among those of interest to the MBHCP are the placement and movement of livestock in and between pastures and locations in accordance with season, forage availability, water availability, etc.; construction of perimeter fencing, cross-fencing, and corrals; construction of livestock watering facilities (e.g., stocktanks, stockponds, troughs, drill wells, and waterlines); and maintenance and use of stocktanks. All this is relatively routine on a ranch, and much of this infrastructure is already in place in the Malpai Borderlands. Nevertheless, new structures and facilities occasionally will be needed (primarily for the purpose of better managing livestock herds) and some existing facilities require periodic maintenance. The MBHCP therefore covers or addresses three categories of ranch management activities: (1) livestock management; (2) linear facilities construction, and (3) stocktank maintenance and use.

3.5.2.1 Livestock Management

(1) Discussion/Methods. For purposes of the MBHCP, the term "livestock grazing" is defined as two separate and distinct sets of activities: (1) herbivory (or the consumption of vegetation or forage by livestock); and (2) livestock management (or the placement or movement of livestock into, through, or within particular areas within the Malpai Borderlands). The purpose of this distinction is to segregate this rather broad activity into categories useful to the plan. The two categories are useful, furthermore, because they differentiate between livestock-related activities having the potential for take of the covered species (which therefore require regulatory coverage under the plan) and activities not likely to result in take (which therefore do not require such coverage). MBG does not believe livestock grazing defined as herbivory is a likely source of take in the Malpai Borderlands and has therefore declined to cover it in the plan. However, certain aspects of livestock management might result in take in some circumstances and therefore are covered by the plan.

In the Malpai Borderlands, the most likely circumstances in which such take might occur would result from the presence or placement of livestock within riparian corridors and/or streambeds to water (in which case take of fish or leopard frogs might occur), and within pastures that might contain an Aplomado falcon nest (in which case damage to falcon nest trees might occur (see Section 7.1).

(2) Definition/Covered Activities. For purposes of this section, activities referred to by the term "livestock management" and covered by the plan include the presence or movement of livestock into, through, or within suitable habitats of the plan's covered aquatic, grassland, or riparian species, as applicable, in the Malpai Borderlands. In addition, the actions of Malpai-area ranchers resulting in such livestock presence and movement enjoy the regulatory protections of the plan provided that they have enrolled in and become participants in the plan in accordance with procedures described in Section 5.6.

3.5.2.2 Linear Facility Construction/Maintenance

(1) Discussion/Methods. A number of linear-type facilities will occasionally need to be constructed and maintained in the course of ranching in the Malpai Borderlands, including fences, waterlines, utility lines, and roads; of these, the former two will be most common while the latter two will be relatively rare. The purposes of fencing are to delineate the boundaries of a ranch or grazing allotment (referred to as perimeter fencing), to divide the ranch into individual pastures (referred to as cross-fencing) and other areas (e.g., corrals), and to manage the location and movement of livestock. Fencing is important to good range stewardship because it allows for rotational grazing and livestock exclusion from particular areas when necessary (e.g., sensitive habitats); it is also a component of at least two of the MBHCP's take minimization measures. Waterlines convey water from its sources on a ranch (e.g., springs or wells) to livestock watering locations (i.e., stocktanks; see following section). Utility lines constructed by Malpai ranchers would normally consist of those needed to convey electricity to ranch houses, barns, water wells, and the like; they might be placed above or below ground, and in individual cases would not normally exceed 1- to 2-mile lengths. Road construction, similarly, would be limited to relatively short road segments needed to connect ranch facilities or to connect ranch facilities to existing county roads; they would involve road lengths similar to utility-line lengths and would invariably consist of dirt roads.

Fence construction is a relatively low-impact activity,; post holes are dug, fence posts set in place and barbed wire strung. Waterlines are usually placed below ground; construction involves ripping a trench, often with a small commercial trencher, and burying the line 6 to 12 inches deep (the line itself consisting, typically, of PVC pipe 2" or less in diameter). For convenience of routing and construction, water lines are often installed beneath dirt road beds (a practice that significantly limits short-term impacts otherwise associated with waterline projects). Both processes would also include the use of vehicles, typically pick-up trucks operated both on road and off-road. Activities involved in utility line construction would depend on where the line is placed, and, if below ground, would be similar to those of waterline construction; if above ground, would be similar to those of fence construction. Road construction would normally involve heavy equipment use (typically bulldozers) and the grading and leveling of road surfaces and shoulders 20 to 30 feet in width. Maintenance of these facilities would consist of periodic structural repairs, clearing of vegetation and brush from facility corridors, and grading of roads, and might involve, hand-clearing of vegetation, mowing (with powered riding mowers or mowing attachments), and grading (e.g., with bulldozers).

(2) Covered Activities. Include all activities normally and customarily associated with fence, waterline, utility line, and road construction and maintenance, including:

(a) For fencelines, corridor grading and preparation,;

(b) For fencelines, waterlines, and utility lines, ground surface disturbances required for trench construction and digging of post-holes and utility-poles; and,

(c) All associated vehicle uses in the immediate vicinity of the fence or water line; other associated or incidental activities necessary to these tasks; and all vegetation-clearing, mowing, grading, and similar activities associated with maintenance of these facilities.

3.5.2.3 Stocktank Maintenance/Use

Stocktanks (i.e., artificial watering stations) typically occur in two forms—above ground tanks with troughs fed from specific point water sources (e.g., springs or wells); and earthen tanks (referred to as "stockponds") fed by ground surface runoff. Both by definition are used and frequented by livestock, and, in the Malpai Borderlands, may also be inhabited by two of the HCP's covered species (Chiricahua leopard frogs and lowland leopard frogs). Stocktanks must also be periodically maintained and repaired, particularly in the case of stockponds as these must be dredged every 5 to 10 years and occasionally repaired (e.g., in the case of flood damage). Stockpond maintenance consists of clearing of accumulated sediment with a bulldozer to prevent eventual filling of the tank, periodic maintenance of banks and spillways, and installation of water bars to prevent erosion, typically involving from 4 to 10 acres of occasional ground disturbance per tank. Stockpond repair could involve similar activities depending on the extent of the problem or damage being repaired.

The regulatory situation with respect to stocktank maintenance and use in the Malpai Borderlands is complicated by the occurrence of two existing regulatory authorities—MBG's existing Safe Harbor Agreement for Chiricahua leopard and the USFWS's existing 4(d) rule for this species. Thus, stocktank-related activities are covered under the MBHCP with respect to lowland leopard frogs only, unless the regulatory coverage provided by the USFWS 4(d) rule should lapse, in which case they would be covered with respect to Chiricahua leopard frogs as well.

(2) Covered Activities. In light of the above, covered activities involving stocktank maintenance and use include:

(a) With respect to lowland leopard frogs, all normal and customary activities associated with: (i) livestock use of stocktanks (including cattle assembling around and standing in such tanks); (ii) periodic maintenance and repair of such tanks; and (iii) all vehicle and heavy equipment use associated with such maintenance and repair; and,

(b) With respect to Chiricahua leopard frogs, all activities described in (a)(i)-(iii) above, provided: (i) that existing regulatory coverage for this species under the USFWS's 4(d) rule has terminated or lapsed; and (ii) that regulatory coverage for stocktank maintenance and use with respect to this species has reverted to the MBHCP in accordance with Section 5.2.2.3, Subsection (2)(a)(ii) of the plan.

3.6 Role of Livestock Grazing under the HCP

As discussed in Section 3.5.2.1, the term "livestock grazing" in the MBHCP is defined as two separate sets of activities: (1) herbivory (or the consumption of vegetation or forage by livestock); and (2) livestock management (or the placement or movement of livestock into, through, or within particular areas). As seen in Section 5.2.2.1, the latter activity is included in the plan as a covered ranch management activity. During development of the MBHCP, MBG, its consultants, and the HCP Technical

Workgroup (considered whether or not to also include livestock grazing defined as herbivory within the HCP's coverage and weighed a number of factors pertinent to that decision. These included possible legal obligations (i.e., the extent to which herbivory is likely to result in take of the plan's covered species); and the costs or risks that coverage or non-coverage, respectively, might introduce into the plan or into the grazing programs of Malpai-area ranchers. In the end, MBG elected not to include herbivory within the HCP's coverage. The reasons for this are explained below.

First, MBG does not believe that herbivory (as distinct from livestock management; see above) is likely to result in take (i.e., killing, harming, or harassment) of any of the HCP's 19 covered species. This is reason enough for its exclusion from the plan's coverage. MBG notes, in addition, that, while livestock grazing (defined as herbivory and livestock management) is obviously central to virtually all ranching operations in the Malpai Borderlands, neither it nor the covered ranch management activities are a central focus of the MBHCP. That focus, in fact, consists of the grassland improvement activities (especially fire management), which are most likely to result in take of the covered species and were the factors primarily triggering the decision to develop the MBHCP.

Second, MBG recognizes that over-grazing in the past has resulted in significant ecological problems in the Malpai Borderlands, and that poorly-managed grazing can result in serious adverse effects on rangeland conditions and, in some cases, on threatened and endangered species. However, MBG member-ranches strive to manage their grazing programs responsibly and to maintain rangeland health in the borderlands to the highest degree possible. Such goals are clearly evidenced by MBG's (and its memebership's) objectives and programs and by the MBHCP in, for example: (1) MBG's mission statement and its belief that livestock ranching is essential to preservation of the Malpai Borderlands itself ; (2) the grassland improvement measures proposed in the MBHCP; and (3) the fact that many MBG member-ranches are parties to NRCS Cooperator Agreements and Coordinated Resource Management Plans.

Thus, while livestock grazing is not central to the MBHCP's purposes, nor (to the extent defined as herbivory) is included within its coverage, it is an integral component of ranch and range management in the Malpai Borderlands. It is also regarded as an essential part of MBG's and MBG member-ranchers' livelihoods and culture—as essential, even, to the Malpai Borderlands itself—and one that must be managed responsibly if all these are to be sustained over the long term.

3.7 Implementing Agreement.

In addition to the MBHCP itself, MBG has prepared an Implementing Agreement (IA), which is associated with the plan and in effect extends the authorities of its associated I.T.P. An IA is essentially a contract which, among other things, and with respect to its signatories: (1) imparts to those signatories the status of HCP participant (see Section 3.2.1, Subsection 2); (2) provides a mechanism through which commitments under the plan voluntarily accepted by those participants are formalized and made binding; (3) summarizes the responsibilities of HCP participants (except for Malpai-area ranchers, with respect to whom all tasks otherwise served by the IA are served by the VCA process; see Section 5.6); (4) provides for a variety of legal understandings and remedies pertinent to the plan; and (5) provides for dispute resolution procedures.

The Implementing Agreement for the MBHCP is attached to the plan as Appendix B and has eight signatories: (1) the Malpai Borderlands Group; (2) U.S. Fish and Wildlife Service (Ecological Services Division); (3) U.S. Fish and Wildlife Service (San Bernardino NWR); (4) Arizona Game and Fish Department; (5) New Mexico Department of Game and Fish; (6) Natural Resources Conservation Service; (7) Arizona State Land Department; and (8) New Mexico State Lands Office.

3.8 Permit Term

The term of the MBHCP and its associated I.T.P. is thirty (30) years.

4.0 Biology of the Covered Species

This section presents relevant biological and life history information for each of the 19 species covered by the MBHCP (see Table 3-2). For the purposes of the plan, the covered species are categorized into four groups or assemblages based on the habitat types they typically inhabit: (1) aquatic species; (2) grassland species; (3) riparian species; and (4) montane species. These have been adopted in part for convenience but also for two practical purposes within the plan's structure. First, they allow the plan's take minimization measures (see Section 5.2) to be organized by species assemblages rather than individual species (since, in most cases, the measures are the same for the species within an assemblage and with respect to a particular activity). Second, in the evaluation of the effects of the plan on the covered species (see Section 7.3) they allow those effects to be generally associated with a particular habitat type (and all species within it) rather than with individual species.

Aquatic species habitats in the Malpai Borderlands consist of creeks, cienegas, ponds (located primarily on the San Bernardino NWF), and stocktanks. Montane species habitat types are found in the Animas and Peloncillo mountains and, based on designations described in Brown (1982), consist of Madrean evergreen woodland and Petran montane coniferous forest vegetation associations. Grassland species habitats in the borderlands consist of both Southern Arizona semidesert grassland and Upper Sonoran desert shrub associations (Brown 1982). Riparian species habitats in the area are limited to vegetation bordering a few springs and perennial streams, including Black Draw (in San Bernardino NWR), Guadalupe Canyon (on the Hadley Ranch), Astin Spring (on the Malpai Ranch), Cottonwood Creek (on the McDonald Ranch), Baker Canyon (a tributary to Guadalupe Canyon), and the cienega at Diamond A Ranch headquarters.

4.1 Aquatic Species

4.1.1 Río Yaqui Fish

Seven species of fish are covered by the MBHCP: (1) Yaqui chub (*Gila purpurea*), federally listed as endangered with critical habitat on August 31, 1984 (49 *Federal Register* 34490); (2) Yaqui topminnow (*Poeciliopsis occidentalis sonoriensis*), Federally listed as endangered on March 11, 1967 (32 *Federal Register* 4001); (3) Yaqui catfish (*Ictalurus pricei*), Federally listed as threatened with critical habitat on August 31, 1984 (49 *Federal Register* 34490); (4) beautiful shiner (*Cyprinella formosa*), Federally listed as threatened with critical habitat on August 31, 1984 (49 *Federal Register* 34490); (5) longfin dace (*Agosia chrysogaster*), which is not currently ESA-listed but might, as a result of recent taxonomic findings (see below), become a candidate for future listing; (6) Yaqui sucker (*Catostomus bernardini*), which is not ESA-listed or a candidate for listing; and (7) Mexican stoneroller (*Campostoma ornatum*), which is also not ESA-listed or a candidate for listing.

All these fish are confined in range to the Río Yaqui Basin, a 73,000-acre watershed in southeastern Arizona and northwestern Mexico, and, in the U.S., currently occur in one or more of only five known locations: (a) Black Draw (Río San Bernardino) and associated ponds on San Bernardino NWR, (b) Leslie Creek (part of the San Bernardino/Leslie Creek NWR Complex); (c) House Pond on the privately-owned Slaughter Ranch/Johnson Historical Museum of the Southwest (a Río San Bernardino tributary); (d) Astin Spring on the privately-owned Malpai Ranch immediately adjacent to the NWR; and (e) West Turkey Creek in the Chiricahua Mountains, lying partially within the El Coronado Ranch (ECR) and partially within Coronado National Forest. Within the Malpai Borderlands, San Bernardino NWR is the primary habitat area for these fish, and is managed specifically for their benefit. In addition, ECR, although privately-owned, in 1998 prepared an HCP for three of these fish (the Yaqui chub, Yaqui topminnow, and

longfin dace), under which it agreed to introduce these fish into stockwatering facilities on the ranch and to undertake measures to protect them. In addition, Astin Spring on the Malpai Ranch has been fenced to protect the suitable fish habitat or potential habitat there (a project carried out jointly by the ranch owners and MBG). The conservation potential for all seven species in the Malpai Borderlands (in terms of protective management) is therefore currently excellent.

Yaqui chub, Yaqui topminnow, longfin dace, and others within this fish community also occur in Cajon Bonito and on Rancho San Bernardino, Sonora, Mexico just south of the Malpai Borderlands in what is probably the best remaining habitat for these species throughout their known range. These habitats are owned and managed by ranchers who are MBG cooperators, and, on Rancho San Bernardino, wetlands restoration programs are underway which will significantly improve habitat conditions for these species in this area (P. Warren, TNC, and B. Radke, SBNWR, pers. comm., respectively). None of the seven fish are currently known to occur on the west (Animas Valley/Animas Mountains) side of the borderlands.

Unless otherwise indicated, the following life history information for these species is adopted from the Río Yaqui Fish Recovery Plan (USFWS 1995); distribution information is from the sources indicated.

(1) *Yaqui Chub*. Yaqui chub live in deep pools in creeks, cienegas, and other stream-associated quiet waters. Habitat preferences vary by life stage, with young fish preferring marginal habitats and lower ends of riffles and adults preferring deep, permanent pools, undercut banks next to large boulders, debris piles, and roots of large trees (USFWS 2002a). Growth to maturity is rapid, often within the first summer of life; reproductive potential is therefore high and large populations can develop quickly from a few adults. Spawning is protracted throughout the warmer months with the greatest activity in spring. The Yaqui chub was near extinction in the U.S. in the late 1960s but has survived due to considerable hatchery production, habitat acquisition, and reintroduction efforts. Critical habitat for the Yaqui chub consists of all aquatic habitats on the San Bernardino NWR (except Leslie Creek, which did not support chub at the time of the critical habitat designation); the constituent elements of critical habitat include clean, permanent water with deep pools and intermediate areas with riffles in the Río Yaqui drainage, areas of detritus or heavily overgrown cut banks, and the absence of introduced exotic fishes (USFWS 1984). In addition to their ESA status, Yaqui chub are considered WSC in Arizona (see Table 3-2).

In the past, the Yaqui chub was found throughout the Río Yaqui basin and in a few smaller adjacent drainages. Currently, chub occur in Leslie Creek and every perennial wetland on San Bernardino NWR (B. Radke, Refuge Manager, pers. comm.), and (as of surveys conducted in 2001), in Pond H on ECR and in two USFS sites on West Turkey Creek (Coleman 2002). They are also found in most wetlands just south of San Bernardino NWR in Mexico and can pioneer upstream during flood events. Yaqui chub have not been documented in Astin Spring for several years but could re-occupy the site during flood conditions. In West Turkey Creek, chub were considerably more abundant in 2000 than in 2001 (291 versus 119 adults, respectively), a consequence, evidently, of chemical and electroshock treatments undertaken in the intervening year to remove non-native fish.

(2) *Yaqui Topminnow*. Yaqui topminnow typically live in shallow, warm, quiet waters (e.g., cienegas and marshes) but can disperse through any flowing water during the warm summer months. Preferred habitats consist of dense mats of algae and debris along stream margins or in eddies below riffles. Topminnows become most abundant in marshes, especially those fed by thermal springs or artesian outflows. Females may have 20 or more young per brood and can breed at intervals of just 20 days. Reproduction occurs year round where winter temperatures are moderated by spring inflows, but under conditions of fluctuating temperature begins in early April and ends in October. Threats to the species include competition with western mosquitofish (*Gambusia affinis*), a widely introduced exotic,

and plant succession (i.e., to cattail marshes) within their limited aquatic habitats. Yaqui topminnow are considered WSC in Arizona.
Yaqui topminnow are found in every wetland on San Bernardino NWR, Hay Hollow Tank on the east side of the refuge, and in Astin Spring (B. Radke, Refuge Manager, pers. comm.). They also disperse readily during flood flows; for this reason, they can be found anywhere in Black Draw and its tributaries during flood seasons and can disappear from particular wetland sites only to reappear in later years.

(3) *Yaqui Catfish*. Juvenile Yaqui catfish are profusely speckled, while adults are fairly unicolored, dark gray to black dorsally, white to grayish beneath. The species is usually found in large streams in areas of medium to slow current over gravel and sand substrates. Besides this information on basic habitat preference, however, little is known about the life history and ecology of this fish, although it is thought to be similar to that of the channel catfish (USFWS 1984). Critical habitat for the Yaqui catfish consists of all aquatic habitats on the San Bernardino NWR (except Leslie Creek), the constituent elements of which include clean, unpolluted permanent water in streams with medium current and clear pools in the Río Yaqui drainage that are free of introduced exotic fishes (USFWS 1984). Threats to the species include habitat modification and actual and potential hybridization with introduced, non-native catfishes (e.g., channel catfish and blue catfish). Yaqui catfish are considered WSC in Arizona.

The historical range of the Yaqui catfish most likely included the northernmost part of the Río Yaqui basin in Arizona and the Río Yaqui and Río Casas Grandes basins in Sonora and Chihuahua, Mexico. However, with the exception of a population of Yaqui catfish stocked in the upper Santa Cruz River in Arizona in 1899 (which persisted until the 1950's), no specimens documenting its presence in the U.S. are known. In the late 1990s, Yaqui catfish were established on San Bernardino NWR and ECR, and today catfish exist in Twin Pond on San Bernardino NWR, in House Pond on Slaughter Ranch, and on ECR. Additionally, a captive population of catfish obtained under permit from the ríos Aros and Sirupa in Mexico in 1987 and 1990 is being held at Dexter National Fish Hatchery (NFH) in New Mexico in anticipation of future releases of the species.

(4) *Beautiful Shiner*. The beautiful shiner is bluish in color when breeding, often masked with a wash of orange, pink, or yellow; non-breeding coloration is tan to olivaceous dorsally, metallic sliver laterally. The species is found in a variety of habitats but the largest populations appear to occur in the riffles of small streams (USFWS 1984). In Mexico, it has been reported in intermittent pools or creeks which have high percentages of riffle habitat when flowing in wet periods. It is also a mid-water-column species, remaining near but rarely within the beds of plants or other cover along pond margins. Like the Yaqui catfish, however, little else is known about the life history and ecology of this fish, although it is thought to be similar to that of the red shiner (USFWS 1984). Critical habitat for the beautiful shiner consists of all aquatic habitats on the San Bernardino NWR (except Leslie Creek), the constituent elements of which include small permanent streams with riffles or intermittent creeks with pools and riffles in the Río Yaqui drainage with clean unpolluted water that is free of introduced exotic fishes (USFWS 1984). Beautiful shiner are considered WSC in Arizona.

The beautiful shiner historically occurred in the U.S. only in San Bernardino Valley in Arizona (now designated as the Yaqui form) and the Mimbres River in New Mexico (now designated as the Guzman form). In Mexico, its range includes the Río Yaqui system, Guzman basin, and Bavicora and Sauz basins. The Guzman form was extirpated in the U.S. by about 1951 and the Yaqui form by 1970; the latter, however, was re-established in San Bernardino NWR in 1990, where it has adapted well to off-channel ponds established as refugia for this and other fish species.

(5) *Longfin Dace*. Longfin dace are one of the most abundant, widely distributed native fish in the Southwest and may occur within particular habitats in very high densities. They appear to be well

adapted to streams that experience periodic, high-intensity flooding and are capable of migrating upstream during floods to occupy isolated perennial stream reaches (P. Warren, TNC, pers. comm.). The longfin dace of the Río Yaqui drainage is of particular interest because it is considered to be an as yet undescribed variety that has a more highly restricted range than the species as a whole (D. Hendrickson, pers. comm. to P. Warren, TNC). Should this be confirmed and accepted by taxonomists, the taxon could be determined to be suitable for listing under the ESA at a future time.

Longfin dace currently occur in every wetland on San Bernardino NWR and in Leslie Creek on Leslie Creek NWR. Stronghold habitats consist of perennial portions of Black Draw on the refuge and Silver Creek just south of the refuge in Mexico (B. Radke, Refuge Manager, pers. comm.). Longfin dace also occur (as of surveys conducted in 2001) in Pond H and Pond ECR-1 (on ECR) and two USFS sites on West Turkey Creek (Coleman 2002).

(6) *Yaqui Sucker*. The Yaqui sucker is typically found in small mountain and desert creeks, deep pools, and runs and rapids of medium-sized rivers. In Arizona, the species historically inhabited the deeply incised creek and headwater springs of San Bernardino Creek up to an elevation of about 7,800 feet. Relatively little is known about the life history and ecology of the Yaqui sucker, although spawning is apparently prolonged, lasting from May to mid-August. Its historical range included the Río Yaqui basin in Sonora and Chihuahua, Mexico, where it remains fairly common, and southeastern Arizona. Reported to be abundant in Astin Spring (just outside San Bernardino NWR) in 1967, the species apparently disappeared by 1969 or 1970 when the entire San Bernardino system dried up as a result of groundwater pumping. Today, a captive population of Yaqui suckers is maintained at Dexter NFH in New Mexico in anticipation of eventual reintroduction of the species into San Bernardino NWR. Yaqui sucker are considered WSC in Arizona.

(7) *Mexican Stoneroller*. The Mexican stoneroller, a member of the minnow family, typically inhabits clear, fast riffles, chutes, and pools in moderate to high-gradient creeks and headwaters with gravel or sandy bottoms. Its range is divided into two disjunct areas—the Río Grande system of the Big Bend region in southern Texas, and the Río Yaqui system of northern Mexico and extreme southeastern Arizona. In Arizona, the Mexican stoneroller originally occurred throughout the Río Yaqui basin and was originally described in the 1880's from Rucker Canyon in the Chiricahua Mountains, where it occurred naturally. Today, the species persists in Arizona, but in small numbers and in only two locations—Rucker Canyon and San Bernardino Creek in San Bernardino NWR (AGFD 1996). Current threats to the species include aquifer pumping, reduction in stream flows, water diversion, drought, and predation by non-native green sunfish. In Arizona, the Mexican stoneroller is considered a WSC, in Texas it is considered threatened, and in Mexico, endangered.

4.1.2 Chiricahua Leopard Frog

The Chiricahua leopard frog (*Rana chiricahuensis*) was federally listed as threatened on June 13, 2002 (67 *Federal Register* 40790), at which time a section 4(d) rule was also promulgated addressing take of leopard frogs at stocktanks on non-Federal lands (see Section 5.2.2.3). Primary factors cited as the basis for listing include significant population declines as a result of destruction, alteration, and fragmentation of the species' aquatic habitats; disease; and predation by introduced aquatic predators (especially bullfrogs and predatory fish) (USFWS 2002b). Chiricahua leopard frogs are considered WSC in Arizona.

Unless otherwise indicated, the following information for this species is adopted from USFWS (2002b).

Description/Habitat. Chiricahua leopard frogs are stout-bodied, medium-sized frogs, generally green in color. The breeding season varies with elevation, occurring between late May and October at

higher elevations (above 5,900 feet) and between mid February and June at lower, warmer elevations (below 5,900 feet). Chiricahua leopard frogs are generally nocturnal but are sometimes active in waterside vegetation during the day. They are capable of surprising migrations—distances of up to 4.3 miles have been recorded—which allows them to move from one water source to another in response to changing habitat conditions. Migrations occur along drainages with permanent or semi-permanent water, along intermittent streams during wet weather, and even overland during wet weather.

Chiricahua leopard frogs inhabit a variety of aquatic habitats including cienegas, ponds, lakes, streams, and stocktanks. Stocktanks are an important, even critical, habitat resource for leopard frogs, accounting for 38 percent of occupied aquatic sites rangewide in surveys conducted between 1994 and 2001, and, in Arizona, for fully 63 percent of occupied sites; it is for this reason that USFWS established the section 4(d) rule noted above.

Distribution/Range. The historical range of the Chiricahua leopard frog roughly encompassed central and southeastern Arizona, west-central and southwestern New Mexico, and portions of northern Mexico. Today, it occurs in two distinct areas in the U.S.: (a) a southern group of populations (the majority of the species' range) located in mountains and valleys south of the Gila River in southeastern Arizona, extreme southwestern New Mexico, and Mexico; and (b) northern montane populations in west central New Mexico and along the Mogollon Rim in central and eastern Arizona. In the Malpai Borderlands, known populations of Chiricahua leopard frogs currently occur only in the San Bernardino NWR, at the Rosewood Tank on the Magoffin Ranch, in two stock tanks on the Diamond A Ranch, and in a pond on the Cañocito Ranch (P. Warren, TNC, pers. comm.; J. Stuart, NMDGF, pers. comm.).

4.1.3 Lowland Leopard Frog

The lowland leopard frog (*Rana yavapaiensis*) is not currently listed under the ESA nor is a "candidate species" but is considered by the USFWS to be a "species of concern." This designation consists, generally, of species that the USFWS termed "category 2" candidate species prior to 1996, at which time it revised the candidate classification system and dropped category 2 candidates. Today, only what were previously termed category 1 candidates in most cases remain designated as candidate species (USFWS 1996). The lowland leopard frog is listed as endangered by the State of New Mexico and is considered WSC in Arizona.

Description/Habitat. The lowland leopard frog is a medium-sized frog, tan or brown to tan-brown in color, sometimes with greenish highlights. It is distinguished from the Chiricahua leopard frog by its lack of the "salt and pepper" thigh pattern. Lowland leopard frogs breed from February through April and occasionally (during relatively wet years) into autumn; eggs are laid in late winter and early spring and tadpoles usually transform into frogs from June to August. Like the Chiricahua leopard frog, lowland leopard frogs are known to migrate fairly long distances from one water body to another; dispersals up to three miles have been recorded (RECON 2002).

Lowland leopard frogs are found primarily in small to medium-sized streams but also occur in small springs, stocktanks, and occasionally larger rivers; they have also been propagated in backyard pools and school ground projects (RECON 2002). Lowland leopard frogs on average are found at lower elevations than Chiricahua leopard frogs, generally occurring below 5,500 feet and usually below 3,000 feet.

Distribution/Range. The historical range of the lowland leopard frog included the lower Colorado River and its tributaries in Nevada, California, Arizona, and New Mexico, and northern Sonora and extreme northeastern Baja California, Mexico. Today, it is extirpated from California and possibly

Nevada, likely as a result of similar factors affecting Chiricahua leopard frogs. In Arizona, lowland leopard frogs occur in the central, southwestern, southeastern, and extreme northwestern parts of the state. In the Malpai Borderlands, on the Arizona side, they have been documented on San Bernardino NWR, adjacent private lands, and Rancho San Bernardino (just south of the refuge in Sonora, Mexico); and, on the New Mexico side, in Guadalupe Canyon—all within the past two years (B. Radke, Refuge Manager, pers. comm. and Jim Stuart, NMDGF, pers. comm., respectively).

4.1.4 Northern Mexican Gartersnake

The northern Mexican gartersnake (*Thamnophis eques megalops*) is not currently listed under the ESA but is considered by the USFWS to be a species of concern and has been petitioned for listing under the ESA. It is listed as endangered by the State of New Mexico and is considered WSC in Arizona. Threats to the species include loss and degradation of its aquatic habitats as a result of dewatering, channel modification, agriculture, over-grazing, and other activities; introduction of non-native aquatic predators (especially bullfrogs) into those habitats; and over-collection (NMDGF website).

Description/Distribution. The northern Mexican gartersnake, like most garter snakes, is aquatic and has a viviparous or ovoviviparous reproductive strategy (i.e., bears its young alive). It is primarily a Mexican species, with only the extreme northern end of its range occurring in the United States. Its historical range extended from central Arizona and southwestern New Mexico south along western Mexico to Oaxaca in southern Mexico. In recent decades, however, northern Mexican gartersnakes appear to have become increasingly rare and patchily distributed within the U.S. portion of their range. For example, since the late 1980s, northern Mexican gartersnakes have been definitely known from only three localities in New Mexico (two in Grant County and one in Hidalgo County) and one locality in Arizona (San Bernardino NWR, Cochise County); however, surveys conducted at the three New Mexico locations in the last few years have yielded no records of the snake (NMDGF 2002), while only a single adult female has been observed on San Bernardino NWR in recent years (in 2005) (B. Radke, SBNWR Refuge Manager, pers. comm.). Precisely what this means is not clear, however. Small numbers of northern Mexican gartersnakes may still occur in any of these locations or in other, unreported locations; however, their apparent disappearance from three previously-occupied habitat areas might also signal a general continuing decline of the species within the U.S. portion of its range.

Habitat. Northern Mexican gartersnakes are associated with a variety of vegetation associations (including pine and oak woodlands, grasslands, and shrublands) and use terrestrial, underground dens as winter hibernation sites; however, they are essentially aquatic animals, occurring throughout most of the year in and immediately adjacent to relatively permanent surface waters and associated riparian vegetation. Aquatic habitats typically inhabited consist of wetlands, marshes, and streams characterized by standing or slow-moving shallow water and vegetated banks. Northern Mexican gartersnakes are typically found between about 3,400 and 5,400 feet in elevation.

4.1.5 Huachuca Water Umbel

The Huachuca water umbel (*Lilaeopsis schaffneriana* ssp. *recurva*) was federally listed as endangered on January 6, 1997 (62 *Federal Register* 665). Critical habitat for the species was designated on July 12, 1999 (64 *Federal Register* 37441), but does not include any area within the Malpai Borderlands. Factors cited for listing were collecting, disease, predation, competition with non-native species, and degradation and destruction of habitat resulting from livestock overgrazing, water diversions, dredging, and groundwater pumping (USFWS 1997). The umbel has the status of HS in Arizona (see Table 3-2).

Unless otherwise indicated, the following information for this species is adopted from USFWS (1997a).

Description/Habitat. The Huachuca water umbel is an herbaceous, semi-aquatic, perennial plant with slender leaves that grow from creeping rhizomes. Three to ten very small flowers are borne in an umbel that is always shorter than the leaves. The species reproduces sexually through flowering and asexually from rhizomes, with the latter probably being the primary reproductive form. As a result, while the extent of occupied *Lilaeopsis* habitat can be ascertained, the number of individual plants in a population is nearly impossible to determine because of the intermeshing nature of the rhizomes; thus, a *Lilaeopsis* population can be composed of one or many individuals. The Huachuca water umbel was first described in 1881 based on the type specimen collected near Tucson, Arizona.

The Huachuca water umbel occurs in cienegas (mid-elevation wetland communities usually surrounded by relatively arid environments) and along streams and rivers at mid elevations from 3,500 to 6,500 feet. These aquatic environments are extremely rare in the desert southwest and much reduced from their historical abundance (about 10% remaining), and the Huachuca water umbel is correspondingly rare. The species has an opportunistic strategy, however, generally occurring in upper watersheds that do not experience scouring floods and in micro-sites where interspecific plant competition is low; at these sites *Lilaeopsis* grows on wetted soils along the periphery of the channel or in small openings in the understory. In stream and river habitats the species can occur in backwaters, side channels, and nearby springs, and, if the stream channel is flooded, can rapidly expand its population and occupy disturbed habitat until interspecific competition exceeds its tolerance. The expansion and contraction of *Lilaeopsis* populations appears to depend on the presence of refugia where the species can escape the effects of scouring floods, a watershed that has an unaltered hydrograph, and a healthy riparian community that stabilizes the channel, while the density of *Lilaeopsis* plants and size of *Lilaeopsis* populations fluctuate in response to both flood cycles and site characteristics. Thus, some sites have only a few sparsely distributed plants while others exhibit dense mats of the species.

Distribution: As of its listing in 1997, the Huachuca water umbel had been documented in 22 sites in Santa Cruz, Cochise, and Pima counties, Arizona, and in adjacent Sonora, Mexico west of the continental divide. The plant had been extirpated from six of those sites, however, and the remaining sites occur in four major watersheds—the San Pedro River (nine sites), Santa Cruz River (four sites), Río Yaqui basin (two sites), and Río Sonora basin (one site). One of the two Río Yaqui basin populations occurs in the San Bernardino/Leslie Creek NWR Complex, where the species occurs naturally in Leslie Creek. Patches of the plant were recently transplanted from Leslie Creek into Black Draw on San Bernardino NWR, the outlet of Twin-II Pond, and the upstream end of Twin-II Pond in an effort to ensure the persistence of Huachuca water umbel on the Refuge. The patches in Twin-II Pond were outcompeted and essentially eliminated by other native wetland species, but the Black Draw patches are still viable (W. Radke, USFWS, pers. comm.). The species also naturally colonized one pond on the refuge, although this population decreased as plant competition around the pond increased.

4.2 Grassland Species

4.2.1 Aplomado Falcon

The northern aplomado falcon (*Falco femoralis septentrionalis*) was Federally listed as endangered on March 27, 1986 (51 *Federal Register* 6686). Critical habitat for the species has not been designated. Factors cited for listing were habitat degradation (i.e., brush encroachment into open rangeland habitats) and contamination with organochlorine pesticides (USFWS 1986). The aplomado falcon is also listed as endangered by the State of New Mexico and is considered WSC in Arizona.

Unless otherwise indicated, the following information for this species is adopted from USFWS (1986).

Description/Habitat. The northern aplomado falcon is a colorful bird of prey intermediate in size between the kestrel and peregrine falcon. The species appears to be non-migratory throughout its range. Nesting chronology appears to be variable, with egg-laying recorded from January to September, although eggs are usually laid in April or May. Aplomados do not build their own nests but use nest sites constructed by corvids (e.g., Chihuahuan ravens) and other raptors; nest sites used include multi-stemmed yuccas, large mesquite trees, as well as other trees. Aplomados feed on a variety of prey including birds, insects, rodents, small snakes, and lizards; birds appear to be preferred, however, comprising 90 percent or more of prey biomass. In one study, 82 bird species were accounted for in prey remains; of these, the most common were meadowlarks, common nighthawks, northern mockingbirds, western kingbirds, brown-headed cowbirds, Scott's oriole, mourning doves, cactus wrens, and pyrrhuloxia, suggesting a preference for medium-sized songbirds (meadowlarks in particular appear to be preferred) (USFWS 2002a). Based on several studies, the USFWS (2002a) estimates aplomado falcon home range size to be about 8,400 acres; for management purposes this can be described by a circle with a radius of two miles around a particular habitat feature (e.g., a nest site).

Aplomado falcon habitat is variable throughout its range and includes palm and oak savannahs, various desert grassland associations, and open pine woodlands. Within these variations, the essential habitat elements appear to be open terrain with scattered trees, relatively low ground cover, an abundance of small to medium-sized birds, and a supply of nest sites. Grass cover is probably also important to support the aplomado's preferred bird prey species.

Distribution. Historically, the northern aplomado falcon occurred in southern New Mexico, southeastern Arizona, southern Texas, much of Mexico, and the western coast of Guatemala but was extirpated from the U.S. as a breeding species by the 1950s. Since 1992, however, when a breeding population of aplomados was confirmed in Chihuahua in western Mexico, aplomado falcon sightings have been reported in west Texas, southern New Mexico, and southeastern Arizona, suggesting that range re-expansion back into the U.S. southwest may be underway. In addition, a resident pair of aplomados in Luna County, New Mexico from 2000 to 2002 bred successfully in 2002, fledging three young, and another pair was present at this site in 2004 but did not breed (Meyer and Williams 2005). However, the 2002 nest represented the first such nesting by naturally occurring aplomado falcons in the U.S. in 50 years. Meyers and Williams (2005) also observed at least eight individual falcons, including another pair, in Luna County between 2000 and 2004. In addition, multiple aplomado sightings have recently been reported in the Animas Mountains (J. Stuart, NMDGF, pers. comm.), all of which suggests that the aplomado falcon could re-colonize, and even be found nesting in, the Malpai Borderlands in the near future. Map 5-1 in Section 5.2.3.1 depicts what is considered to be suitable or potential aplomado falcon habitat in the borderlands.

4.2.2 Black-tailed Prairie Dog

The black-tailed prairie dog (*Cynomys ludovicianus*), formerly designated by the USFWS as a candidate species, was removed from the candidate list (i.e., was given an RC/A designation; see Table 3-2) in 2005 because it has been found to be more abundant or widespread than previously believed and is not subject to the degree of threat sufficient to warrant continuing candidate status or issuance of a proposed or final listing (USFWS 2005). The black-tailed prairie dog is considered WSC in Arizona.

Description/Life History. The black-tailed prairie dog is one of five prairie dog species occurring in North America, two of which are already ESA listed. Prairie dogs are fossorial and highly social, living in aggregations called colonies or towns (groups of colonies are called complexes) and excavating

extensive systems of underground burrows. Historically, black-tailed prairie dog colonies numbered in the many thousands and covered hundreds of thousands of acres. In a sense, prairie dog towns are an ecosystem unto themselves and many other species are often associated with and benefit from them, including black-footed ferrets, ferruginous hawks, and burrowing owls. Black-tailed prairie dogs are diurnal, spending most of their day above ground; and, unlike white-tailed, Gunnison's, and Utah prairie dogs, they do not hibernate but are active year round. Black-tailed prairie dogs crop the vegetation in and around their colonies very close to the ground and often girdle and kill brush, a consequence both of feeding and as a defense mechanism against predators (making them easier to detect). The results, generally, are low-growing vegetation, a high percentage of bare ground, and an absence of brush in and around prairie dog colonies.

Distribution. The historical range of the black-tailed prairie dog included portions of 11 states, Canada, and Mexico and may have encompassed as much as 600,000 square miles and 100 million acres of occupied habitat (USFWS 2000). Today, the species remains in 10 states (Colorado, Wyoming, Montana, North Dakota, South Dakota, Kansas, Nebraska, Oklahoma, Texas, and New Mexico); however, significant contractions have occurred around the eastern and southwestern periphery of the historical range, and prairie dog complexes within the remaining range are small and widely scattered. This is primarily the result of three factors: (1) conversion of rangelands to agriculture (about 1880-1920); (2) large-scale control and eradication efforts (about 1918-1972); and (3) the arrival of sylvatic plague within the species' range (beginning in the 1940s). As a result of these factors, the black-tailed prairie dog's overall historical range has contracted by about 20 percent, occupied habitat has declined by about 99 percent (from approximately 100 million acres to less than one million), and only seven black-tailed prairie dog complexes larger than 10,000 acres in size remain rangewide (USFWS 2000).

In Arizona, black-tailed prairie dogs historically occurred in the southeast corner of the state south of the Gila River and east of the Santa Cruz River, but were extirpated from the state by the 1930s (USFWS 2000). The species still occurs in New Mexico but only in scattered remnant populations and primarily east of the Pecos River (USFWS 2000). In the Malpai Borderlands, large numbers of black-tailed prairie dogs were historically reported in the Animas and Playas valleys (NMGFD 2002); here too, however, they have been gone for many years. However, in 2000, the Animas Foundation initiated an experimental reintroduction of black-tailed prairie dogs onto Diamond A Ranch; specifically, a total of 100 individuals were introduced onto four sites at McKinney Flats on the southeast corner of the ranch. Three of these introduced colonies have survived for five years and are reproducing (P. Warren, TNC, pers. comm.).

4.2.3 Western Burrowing Owl

The western burrowing owl (*Athene cunicularia hypugaea*) is not currently listed under the ESA but is considered by the USFWS to be a species of concern (see Table 3-2).

Description/Habitat. The burrowing owl is a small to medium-sized owl with long legs and prominent spotting and barring. It is a semi-fossorial species that lives and nests in the abandoned burrows of prairie dogs, ground squirrels, foxes, badgers, and other burrowing mammals, which it enlarges or modifies by digging with its feet. Although nocturnal, burrowing owls often perch conspicuously during daylight hours at the entrance to their burrows or on low nearby posts. Burrowing owls nest singly or in pairs, and often in small colonies. Burrowing owl flight is low, undulating, and often hovering like that of the kestrel.

Burrowing owls typically inhabit grasslands, prairies, and open shrublands dominated by mesquite, yucca, and cactus at low (2,800 to 5,500 feet) to middle (5,000 to 7,500 feet) elevations. They are often associated with prairie dog communities, apparently because of the abundance of burrows in such areas,

and also occur in open areas near human activities and habitations such as golf courses, airports, agricultural areas, and undeveloped lands in or near urban areas.

Distribution. Generally, burrowing owls breed in North America but winter south of the U.S./Mexican border from Mexico south to Guatemala and El Salvador. The historical range of the species includes Arizona, California, Colorado, Idaho, Iowa, Kansas, Louisiana, Minnesota, Montana, North Dakota, Nebraska, New Mexico, Nevada, Oklahoma, Oregon, South Dakota, Texas, Washington, Wyoming, Canada, and Mexico. In Arizona and New Mexico they are generally considered local and uncommon. During a 2001-2002 survey conducted by the AGFD, burrowing owls were observed at 19 percent of 150 previously-known sites checked (Brown and Mannon 2002). Most of these were observed along the lower Colorado River near Yuma, Arizona, where they were often associated with burrows along concrete-lined irrigation canals. According to this survey, microhabitats used by owls in order of decreasing occurrence were irrigation canal, prairie dog town, creosote flat, canal/levee, pasture, grassland, and fallow field.

In the Malpai Borderlands area, burrowing owls are permanent residents and breed in the Animas Valley and in the McKinney Flats prairie dog reintroduction area on Diamond A Ranch. They have also been recorded or occur in San Bernardino Valley and on San Bernardino NWR, the Malpai Ranch, and the Snure Ranch, and are reported to be often associated with banner-tail kangaroo rat dens or mounds (D. Decker, NRCS, pers. comm.). Map 5-2 in Section 5.2.3.1 shows a generalized depiction of burrowing owl habitat in the Malpai Borderlands.

4.2.4 White-sided Jackrabbit

The white-sided jackrabbit (*Lepus callotis gaillardi*) is not currently listed under the ESA but is considered by the USFWS to be a species of concern. It was listed as threatened by the state of New Mexico, however, on January 24, 1975.

Description. The white-sided jackrabbit is one of four species of hares (Family Leporidae) occurring in New Mexico, which include the black-tailed jackrabbit (*L. californicus*), white-tailed jackrabbit (*L. townsendii*), and the snowshoe hare (*L. americanus*). Only the black-tailed jackrabbit occurs in sympatry with the white-sided taxon, however. The two species can be distinguished by the patterning of black and white on the ears (*L. callotis* has conspicuously white-tipped dorsal ear surfaces with the anterior ear surface conspicuously dark, while the opposite is true in *L. californicus*). Both species are able to expose varying amounts of white fur on their sides and flanks, but in the white-sided jackrabbit this pelage is more extensive and striking.

In New Mexico, white-sided jackrabbits are observed almost unvaryingly in pairs and of three known pairs of the species collected in the state, all consisted of a male and a female (Bednarz 1977), suggesting that mated animals remain together on a long-term basis. Pair bonds may serve to ensure the sexes stay together all year, because densities of the species are generally low (Dunn et al. 1982). Daytime observations of white-sided jackrabbits are uncommon as the species clearly seems to be most active at night (NMDGF files). Dunn, et al. (1982) reported the minimum breeding season for white-sided jackrabbits to be 18 weeks (mid-April to mid-August). Several litters are probably produced each year, with litter size appearing to average 2.2 young (Bednarz 1977). White-sided jackrabbits apparently spend the daylight hours concealed in depressions or scrapes scratched out from the bases of grass clumps (observations of the species at that time are typically of animals flushed from cover). In New Mexico, white-sided jackrabbits feed primarily on sedge nutgrass, a sedge species, and various shortgrass species including buffalo-grass (Bednarz 1977). Sedge nutgrass is the only non-grass item found in significant

amounts in the animal's diet, although two recently salvaged specimens on the Diamond A Ranch also had finely chewed green plant material in their stomachs (NMDGF files).

Habitat/Distribution and Status. In the U.S. portion of the species' range, white-sided jackrabbits appear to be a virtual obligate of grasslands (Conley and Brown 1977, Bednarz 1977); in the Animas and Playa Valleys, plants common in areas inhabited by the species include blue grama, black grama, tobosa, buffalo grass, wolftail, flatsedge, snakeweed, soap-tree yucca, and honey mesquite. More than 97 percent of all observations of the species recorded have been in pure grasslands, and less than 3 percent in grasslands with varying amounts of forbs and shrubs (Bednarz and Cook, 1984). Although, as seen above, the white-sided jackrabbit shares its range with the black-tailed jackrabbit, the two generally occupy different habitats (Conway 1976, NMDGF files), with white-sided jackrabbits being found in areas of pure grassland to the virtual exclusion of its congener. In areas where grassland is invaded by shrubs and forbs, *L. californicus* outnumbers *L. callotis* proportional to the extent of invasion.

White-sided jackrabbits range from extreme southwestern New Mexico southward across the Mexican Plateau to Oxaca, including approximately 18 Mexican states. The subspecies occurring in New Mexico (*L. c. gaillardi*) (Hall 1981) also occurs southward through the Mexican Plateau in Chihuahua (Anderson 1972), Durango (Baker and Greer 1962), and probably Sonora (Carie 1997). The other subspecies (*L. c. callotis*) is confined to Mexico and occurs south of *L. callotis gaillardi*. In New Mexico, white-sided jackrabbits are found only in the Animas Valley on Diamond A Ranch and in limited parts of the southern Playas Valley east of Diamond A Ranch in southern Hidalgo County (Bednarz 1977). New Mexico is the only place in the U.S. where the species occurs.

White-sided jackrabbits are highly elusive and were reported only a few times after the species' was discovered in 1892 along the U.S./Mexican border (Mearns 1895). Two were later collected in the Playas Valley in 1931 (Anderson and Gaunt 1962). During investigations conducted between May and August 1976, Bednarz (1977) speculated that the number of white-sided jackrabbits in the Animas Valley was 250 to 300 individuals. Five years later, surveys revealed that sightings of black-tailed jackrabbits had increased 2½ times and sightings of desert cottontails (*Sylvilagus audubonii*) by about four times, while white-sided jackrabbit sightings had decreased to approximately half of the mean reported by Bendarz (1977). Bednarz and Cook (1984) postulated that numbers of *L. callotis* had decreased as the density and vigor of grasses declined, while *L. californicus* and *S. auduboni* numbers increased in response to an increase in forb and shrub cover. Overall, the status of the species is unclear, however, in New Mexico as well as its far broader Mexican range. In New Mexico, loss or degradation of grassland habitat within its restricted range (which encourages expansion into its habitat of other Lepidae species) is the primary threat to white-sided jackrabbits.

4.3 Riparian Species

4.3.1 Western Yellow-billed Cuckoo

The western yellow-billed cuckoo (*Cynomys ludovicianus*) is not currently listed under the ESA; however, in 2001, in response to a petition to list the species, the USFWS determined two things: (1) that the yellow-billed cuckoo in western U.S. met the Service's criteria as a Distinct Population Segment (DPS); and (2) that the petitioned listing with respect to the DPS was warranted but precluded by higher priority listing actions (USFWS 2001). The western yellow-billed cuckoo DPS is therefore currently designated by the USFWS as a candidate species and is considered WSC in Arizona.

Unless otherwise indicated, the following information for this species is adopted from USFWS (2001).

Description/Habitat. The western yellow-billed cuckoo (*Coccyzus americanus*) is a medium-sized bird with a slender, long-tailed profile and a fairly stout and down-curved bill. It is a member of the family Cuculidae, all of which share the common feature of a zygodactyl foot in which two toes point forward and two point backward.

Nesting in western yellow-billed cuckoos occurs almost exclusively near water and typically in relatively large blocks of riparian habitat with cottonwoods and willows. Dense understory foliage appears to be an important factor in nest site selection, while cottonwoods appear to provide important foraging habitat. Cuckoos feed on katydids, caterpillars, and other large insect prey. Although they usually raise their own young, yellow-billed cuckoos are facultative brood parasites, occasionally laying their eggs in the nests of other bird species or other yellow-billed cuckoos. Development of the young is very rapid, with a breeding cycle of just 17 days from egg-laying to fledging of young. Yellow-billed cuckoo nesting peaks later than in most co-occurring bird species (mid-June through August) and nesting densities are relatively high, ranging from 1 to 15 pairs per 40 hectares (99 acres) in a New Mexico study and from 8.2 to 26.5 pairs per 40 hectares in an Arizona study. Western yellow-billed cuckoos are typically inconspicuous during breeding, except when calling to attract or communicate with mates.

Distribution/Status. The western yellow-billed cuckoo historically bred throughout western North America from southern British Columbia to Mexico, and was widespread and locally common in California and Arizona, locally common in a few river reaches in New Mexico, locally common in Oregon and Washington, and locally uncommon in scattered drainages in the arid and semi-arid portions of western Colorado, western Wyoming, Idaho, Nevada, and Utah. However, the species has declined substantially in the west over the past fifty years in both range and population numbers. Today, the northern limit of breeding in the coastal states is in the Sacramento Valley, California and in the western interior states is southern Idaho. The species overwinters from Columbia and Venezuela south to northern Argentina.

Among states west of the Rocky Mountains, Arizona probably contains the largest remaining western yellow-billed cuckoo population; in a 1999 statewide survey, for example, 168 cuckoo pairs and 80 single birds were recorded. This, however, is substantially below previous estimates for the state, including a 1976 estimate of 846 pairs for the lower Colorado River and five major tributaries. This is likely attributable to widespread losses of the species' riparian woodland habitats in the state (currently estimated at only about 10 percent of their historical abundance). In New Mexico, western yellow-billed cuckoos remained fairly common in the mid-1980s along the Río Grande River between Albuquerque and Elephant Butte Reservoir and along the Pecos River in southeastern New Mexico. However, a recent status review concluded that continuing declines of the species in the state are likely due, as in Arizona, to loss of riparian woodland habitats.

In the Malpai Borderlands, western yellow-billed cuckoos were recorded in 1999 and 2000 at San Bernardino NWR southeast of Crider Hill; San Bernardino NWR south of Cottonwood Draw; San Bernardino Valley west of Guadalupe Canyon; and near the Malpai area in the town of Portal in the Chiricahua Mountains. Map 5-3 in Section 5.2.3.1 shows the location of riparian areas in the borderlands where yellow-billed cuckoos either have occurred or where the habitat is considered suitable for the species.

4.3.2 Western Red Bat

The western red bat (*Lasiurus blosseveillii*) is not currently listed under the ESA but is considered by the USFWS to be a species of concern. In Arizona, it is considered WSC and is protected through Order 14 of the Arizona Game and Fish Commission (as are all bats) and cannot be taken, alive or dead, nor

imported, exported, or otherwise possessed without a special permit. The primary threat to the species is probably past and present loss of riparian habitats throughout its range, where an estimated 70-90 percent of this habitat type has been lost.

Unless otherwise indicated, the following information on this species is from USFWS (2002d) and the Arizona Game and Fish Department website (http://www.azgfd.gov).

Description/Life History. The western red bat is a medium-sized bat with short, round ears and dense shaggy fur. The pelage ranges from yellow-brown to bright orange with white-tipped hairs and a white bib beneath the neck; the wing membranes are jet black and the wingspan averages about 12 inches. As a result of recent genetics studies, the western red bat is now considered to be a separate species from the eastern red bat (*Lasiurus borealis*).

Unlike other bat families, many members of the Vespertilionidae Family, including the western red bat, roost in trees and migrate south for winter. Roosts are typically 5 to 35 feet from the ground and are shaded from above and are open below, allowing the bats to drop into flight. Red bats emerge from their roosts one to two hours after dark and forage on moths, beetles, and other flying insects and usually remain within approximately 1,000 yards of the roost. They usually forage solitarily, although females and offspring occasionally forage in groups. Western red bats mate between August and October; however, like most North American bats, the female stores sperm until spring, when fertilization occurs. Gestation lasts approximately 65 days and young are born between mid-May and June. Litters range from 1 to 5 pups (averaging 2), which begin flying when 3 to 4 weeks old. In late fall, red bats are thought to migrate to the southern part of their range, where most hibernate.

Habitat/Distribution. The habitat of western red bats is mid-elevation broad-leafed woodlands, particularly riparian areas with mature deciduous trees such as sycamores and cottonwoods, which are important roost areas. The species has an extensive, but patchy distribution and has been documented in New Mexico, Arizona, Texas, Utah, Nevada, and California (with the exception of California, however, actual records of red bats are very limited). During the winter, the species also occurs in the lower latitudes of Central and South America. In Arizona and New Mexico, red bats are known to occupy areas from approximately 2,400 to 7,200 feet in elevation. In the Malpai Borderlands, a single population of western red bats occurs in Double Adobe Creek on Diamond A Ranch, which is apparently the only known population in New Mexico (L. Lewis, USFWS, pers. comm.).

4.4 Montane Species

4.4.1 New Mexico Ridge-nosed Rattlesnake

The New Mexico ridge-nosed rattlesnake (*Crotalus willardi obscurus*) was Federally listed as threatened on August 4, 1978 (43 *Federal Register* 34479). Critical habitat was designated concurrently with listing and consists of Bear, Spring, and Indian canyons in the Animas Mountains between 6,048 and 8,320 feet in elevation. Primary factors cited as the basis for listing include habitat loss and modification within the species' range (including the possibility of catastrophic, stand-replacing fires), and collection. Collecting in the Animas Mountains between 1961 and 1974 may have totaled as many as 130 individual snakes and may have significantly affected that population (USFWS 2002a). The New Mexico ridge-nosed rattlesnake is listed as endangered by the State of New Mexico.

Description/Habitat. The New Mexico ridge-nosed rattlesnake is a small, montane species, one of five ridgenose rattlesnake subspecies known from the U.S southwest and western Mexico. Adult females

bear their young alive probably in late June to August; mean litter size is five (USFWS 2002a). Ridgenose rattlesnakes appear to move less frequently, move relatively short distances, and show high fidelity to specific dens or shelters compared to other rattlesnakes (USFWS 1997b). They are most likely dormant during the winter months.

New Mexico ridge-nosed rattlesnakes are found in steep, rocky canyons with intermittent streams and on talus slopes at elevations ranging from approximately 5,000 to 8,500 feet. Access to rock shelters with moderate interstitial spaces is probably a key habitat component. At lower elevations, ridge-nosed rattlesnakes probably occur primarily in the bottoms of steep, heavily-wooded canyons while at higher elevations they may be found in woodlands, open woodlands, and chaparral on exposed slopes and plateaus (USFWS 2002a). In both cases mature woodlands appear to be an essential habitat element.

Distribution. New Mexico ridge-nosed rattlesnakes currently occur in only three known populations—the Animas and Peloncillo mountains in southwestern New Mexico and southeastern Arizona, and the Sierra San Luis in Sonora and Chihuahua, Mexico. In the U.S., the largest known population occurs in the Animas Mountains. The species was not discovered in the Peloncillo Mountains until 1987; since then, 27 individual snakes have been documented within 13 general areas running from upper Miller Canyon at the southern end of the range to South Skeleton Canyon at the northern end. Generally, ridge-nosed rattlesnakes in the Animas Mountains are more abundant, occur at higher elevations, and are easier to find than in the Peloncillos, which are drier and lower. Encounter rates in the Animas Mountains have been reported at one snake per 4.4 person-days of search time (Holycross 1995) while in the Peloncillos are reported at one snake per 33 person-days (Holycross in USFWS 2002a). Also, ridge-nosed rattlesnakes in the Animas Mountains are often found on talus slopes, while talus is apparently absent from the Peloncillos. In the Peloncillos, ridge-nosed rattlesnakes have not been found above about 6,200 feet in elevation; in the Animas they occur up to 8,500 feet.

4.4.1 Mexican Spotted Owl

The Mexican spotted owl (*Strix occidentalis lucida*) was Federally listed as threatened on March 16, 1993 (58 *Federal Register* 14248). The primary factors cited for listing were habitat alteration as a result of timber management practices (specifically, even-aged management) and the danger of catastrophic wildfire (USFWS 1993). It is considered WCS in Arizona. Critical habitat for the species was designated on February 1, 2001 (66 *Federal Register* 8530); however, the designation does not include USFS lands in Arizona and New Mexico (a result of certain forest management commitments made by the agency in those states) or other lands within the Malpai Borderlands.

Description. The Mexican spotted owl is distinguished from the northern and California subspecies of this taxa by geographic distribution (see below) and plumage, the Mexican subspecies having larger and more numerous spots, which give it a lighter appearance. Mexican spotted owl breeding chronology varies somewhat across its range. In Arizona courtship begins in March, eggs are laid in late March or early April, hatch in early May, and nestlings fledge 4 to 5 weeks after hatching, dispersing in mid-September (USFWS 2002a). Seasonal movement patterns are also variable, with some individuals remaining in their territories year round, others remaining in the same general area but exhibiting shifts in habitat-use patterns, and still others migrating considerable distances (up to 30 miles) from higher-elevation summer nesting habitat to lower-elevation, more open habitats in the winter (USFWS 2002a). Mexican spotted owl nesting typically occurs between 4,000 feet and 9,000 feet in elevation.

Distribution/Habitat. The Mexican spotted owl's range is the largest of the three subspecies, encompassing much of southwestern U.S. and northwestern Mexico. Distribution within the range is scattered and local, generally corresponding to isolated, high- and mid-elevation mountain ecosystems

within an otherwise arid landscape. Habitat use varies both within the species' range and with respect to owl activity. In the northern part of the range (Utah, southern Colorado, and northern Arizona and New Mexico), owls occur primarily in steep-walled, rocky canyons (USFWS 2002a); farther south habitat use is less restricted, occurring in mixed-conifer, ponderosa pine-Gambel oak, Madrean pine-oak, and Arizona cypress forests, rocky canyons, and encinal oak and associated riparian woodlands. Nesting habitat typically consists of rocky canyons or areas with relatively complex forest structures (e.g., uneven-aged, multi-storied mature, or old-growth stands with high canopy closure), with nests apparently occurring most often in Ponderosa pine (USFWS 2002a). Roosting habitat appears to include a wider variety of tree species than nesting, and, similarly, foraging habitat a wider variety of trees than roosting.

In the U.S., most Mexican spotted owls (about 91%) occur on USFS land. In the Malpai Borderlands the species has been reported from forested canyons in the Peloncillo Mountains and is known to be resident in the Animas Mountains (in the first case on USFS lands, in the second on private lands). However, surveys in the Peloncillo Mountains in 1997 and 1998 following accepted survey protocols encountered no owls in what is considered the best potential habitat in this area (P. Warren, TNC, pers. comm.).

5.0 Conservation Program

Sections 10(a)(2)(A) and 10(a)(2)(B) of the ESA, together with Federal regulation (50 CFR 17.21 and 17.22), require, among other things, that an HCP specify the steps that will be taken to minimize and mitigate the effects of any taking allowed by the plan, the measures that will be taken to monitor the effects of that taking, and the funding that will be made available to implement the plan. In addition, USFWS policy requires that an HCP include measurable objectives and goals, and Adaptive Management provisions to ensure that relevant new information can be incorporated into the plan, as necessary. Each of these HCP requirements are addressed in this Section (which describes the measures MBG, participating Malpai ranchers, and other HCP participants will undertake to protect and conserve the covered species in the course of carrying out the covered activities), and the following Section 6.0 (which describes the plan's funding mechanisms).

5.1 HCP Goals/Objectives

The MBHCP serves two fundamental conservation purposes and a business purpose, which are, respectively: (1) consistent with MBG's organizational mission, the maintenance of ecologically healthy conditions in the Malpai Borderlands and improvements in those conditions; (2) consistent with the requirements of the ESA, protection and conservation of federally listed endangered and threatened species in the course of carrying out activities covered by the plan ; and (3) consistent with the economic needs of livestock ranching in the Malpai Borderlands, consideration of MBG's organizational interests and the business interests and practices of individual Malpai-area ranchers in the course of carrying out measures necessary to protect and conserve endangered and threatened species.

In light of these purposes, the goals of the MBHCP similarly are threefold:

(1) To maintain and, where necessary, enhance and improve three attributes of ecological health in the Malpai Borderlands (soil stability, biotic integrity, and watershed function);

(2) To ensure the covered grassland improvement activities necessary to achieve the preceding goal, and the covered ranch management activities referred to in the following goal, are undertaken in a manner consistent with protection of the covered species and their habitats; and,

(3) To ensure the measures necessary to protect the covered species are undertaken in a manner consistent with the effective carrying out of the covered grassland improvement activities, the covered ranch management activities, and the preservation of ranching and vigorous ranching economies in the Malpai Borderlands over the long term.

To achieve these goals the MBHCP also establishes three specific sets of objectives:

(1) Grassland Conservation Objectives. The MBHCP's grassland conservation objectives are, to the maximum extent feasible and consistent with available funding:

(a) To minimize sheet erosion and identify, abate, and repair areas exhibiting acute erosion (e.g., channel downcutting, floodplain downcutting, and headcutting) in the Malpai Borderlands, as appropriate;

(b) To halt the encroachment of woody brush species into the area's historical grasslands and correct or reverse such encroachment where it has already occurred; and,

(c) To conserve and restore grassland habitats and grassland productivity in the Malpai Borderlands and, where appropriate, re-establish native grasses and forbs.

(2) Species Conservation Objectives. The MBHCP's species conservation objectives are, consistent with the requirements of the ESA and the business objectives described below:

(a) To ensure that take of the covered species is minimized to the maximum extent practicable in the course of grassland improvement and ranch management activities carried out under the plan;

(b) To ensure that that loss or degradation of the habitats of the covered species is also minimized in the course of these activities; and,

(c) Where possible and consistent with the MBHCP's other purposes and goals, to assist in recovery of the covered species and the conservation of other wildlife and plants native to the Malpai Borderlands.

(3) Business Objectives. The MBHCP's business objectives are to ensure:

(a) A predictable regulatory environment with respect to the effects of the plan on MBG's organizational programs and ranching activities in the Malpai Borderlands;

(b) That the conservation measures required by the plan (whether at plan outset or as a result of its Adaptive Management program) are based on specific, identifiable biological needs and are cost effective and operationally feasible; and,

(c) To the maximum extent possible and consistent with the species conservation objectives, that the discretion of Malpai-area ranchers to manage their lands (privately-owned and state-leased) in accordance with their economic interests and cultural traditions is not significantly diminished, undermined, or eroded as a result of the plan's requirements.

5.2 Take Minimization Measures

Section 10(a)(2)(A)(ii) of the ESA requires that an HCP describe the steps that will be taken to "minimize and mitigate" the effects of the taking provided for in the plan. Similarly, section 10(a)(2)(B)(ii) requires, for an HCP to be approved, that the effects of such taking be "minimized and mitigated" to the maximum extent practicable. These terms describe two of the ESA's fundamental statutory standards for HCPs, with each one representing a particular type or group of conservation actions. This section addresses the first of these, commonly referred to as "take minimization measures."

Take minimization measures consist, typically, of adjustments or modifications to the design of a project or activity or to the way in which the project or activity is carried out, their purpose being to reduce the amount or extent of take of affected species that occurs as a result of the project. As the name suggests, take minimization measures need not eliminate or avoid the possibility of take entirely; they should, however, eliminate conditions or circumstances leading to take that is relatively easy to avoid, and to the maximum extent practicable reduce the likelihood of all takings to relatively minimal levels. Any take that still occurs—i.e., that cannot practicably be avoided—is authorized by an HCP's associated I.T.P.

The take minimization measures proposed by the MBHCP are arranged in the following subsections with respect to the plan's two categories of covered activities described in Section 3.5 (the grassland improvement activities and ranch management activities), and the three subsets of activities applicable to

each of these categories (as described in Sections 3.5.1 and 3.5.2, respectively). The take minimization measures themselves are organized in each subsection with respect to the species assemblages described in Section 4.0 of the plan. Mitigation under the MBHCP is addressed in Section 5.3.

5.2.1 Range Improvement Activities

5.2.1.1 Fire Management

(A) Discussion.

In the Malpai Borderlands, as elsewhere in the southwest, fire has the potential to be an adverse, destructive force or a beneficial component of the landscape. Evidence suggests that the Malpai Borderlands evolved with periodic fire (which exhibited a return interval of approximately 8-12 years) (Kaib 1998) and the benefits of even occasional fire are not in dispute. Fire has been an infrequent event in the Malpai Borderlands for many years; in part the result of the fire suppression policies of the past; and more recently, of various constraints on the application of prescribed fire. This has led to two problems—first, changes in natural nutrient cycling in the historical grasslands of the area and a resulting shift toward brush expansion into those grasslands; and, second, the build-up of excessive fuel loads in some areas that create the potential for fires to be destructive when they do occur(CITATION). Both of these problems can be addressed by the return or application of fire. In light of these circumstances, MBG proposes, in cooperation with its Federal, state, and local partners, to undertake a long-term fire management program designed to restore cyclic, beneficial fire to the Malpai Borderlands.

(1) Fire/Fire Management Types/Cooperation & Coordination. Generally, fire management in the Malpai Borderlands as envisioned by MBG and its cooperators will involve: (a) two types of fire - prescribed fire and wildland fire (see definitions below); (b) two general phases to the fire management process - a burn/fire planning phase and a burn/fire management phase; and (c) a variety of agencies, organizations, landowners, and interests, each of which has a stake and say in the fire management process; and many of which also have responsibilities in the process. Thus, fire management in the Malpai Borderlands will involve relatively complex processes of planning, cooperation and coordination, on-the-ground management, divisions of responsibility and authority, and critical decision-making. Affecting the outcome of these processes, furthermore, are a wide range of technical considerations involving, for example, what to burn and what not to burn, how much to burn, the physical behavior of fire itself, weather and fuel conditions, where decision-making authorities lie, and when to shift from fire suppression to fire management and vice versa.

Much of this is outside the technical scope of the MBHCP. However, the MBHCP is also one of several regulatory authorities governing fire management in the borderlands (which it does on behalf of the interests of endangered and threatened species, and through the take minimization measures applicable to fire management described below). The point, then, is that fire management is a complex process occurring within a broad milieu of regulatory and technical considerations, some of which are the province of the MBHCP, some of which are not. Consequently, the requirements of the plan pertinent to fire management will need to be incorporated into fire management planning and decision-making processes established under the program. Equally, however, the MBHCP's authorities with respect to fire management will need to be integrated with consideration and incorporation of all other fire-related authorities and standards pertinent to the program.

(2) Fire Effects Summary. With respect to the issue of effects, two categories of fire are of interest: (a) managed fire (a term including prescribed fire and wildland fire); and (b) uncontrolled wildfire. Generally, the effects of managed fire are intended to be, and usually are, beneficial, while the effects of uncontrolled wildfire, although greatly dependent on conditions and circumstances, has the potential, at least, to be significantly adverse.

Notwithstanding its usual benefits, managed fire can also yield adverse effects. These are often anticipated (e.g., temporarily increased sediment yields) and are usually minor or transitory. Some, however, can be inadvertent and at times significant; moreover, in some cases managed fire that in every other respect is appropriate might adversely affect endangered and threatened species inhabiting the fire area (e.g., if individuals of such species are killed or injured in the fire). Of the potential for managed fire to adversely effect endangered species, two circumstances are of particular concern: (a) the inherent potential that a controlled (i.e., managed) fire will become an uncontrolled one (i.e., an escaped fire) and burn into non-target vegetation associations important to the covered species; and (b) the fact that the effects of fire are not always direct and dramatic but can also be indirect and cumulative, especially with respect to aquatic ecosystems.

Broadly, of course, the goal of fire management is to achieve—or maximize—the benefits of fire while at the same time to avoiding or minimizing its detriments. The MBHCP has a similar, but more focused, goal, which is to minimize the potential for fire management in the Malpai Borderlands to result in take of federally listed species. That goal is served by the take minimization measures detailed in the following Subsection (B) of this section. Philosophically, however, the HCP's goals with respect to fire management can be said to be threefold: (a) to assist MBG in its pursuit of fire management as an organizational objective; (b) to assist fire management in its pursuit of beneficial ecological objectives; and (c) as above, to maximize the benefits of fire and at the same time to minimize its detriments, especially with respect to the plan's ESA-listed and unlisted covered species.

(3) Definitions. For purposes of both Subsection (A) (above) and Subsection (B) (below) of this Section 5.3.1, the following fire-related terms shall be defined to have the meanings shown. Certain additional fire-related definitions are also shown in Table 5-2.

(a) *Managed Fire*. A wildland fire burning under specific, pre-planned conditions designed to accomplish identified resource management objectives and benefits. Includes both prescribed fire and wildland fire.

(b) *Prescribed Fire*. A wildland fire resulting from a planned, deliberate ignition by fire personnel. In the MBHCP, this type of fire is also referred to as a "prescribed burn."

(c) *Wildland Fire*. A fire resulting from a natural ignition (one resulting from any natural cause) that is designated and managed as a prescribed fire.

(d) *Wildfire*. An unwanted wildland fire not designated and managed as a prescribed fire and requiring appropriate suppression action.

(e) *Fire Use*. The combination of wildland fire use and prescribed fire to meet resource objectives. MBG's overall proposed fire management program is an example of fire use.

(f) *Fire Management Plan*. A plan written and agreed to by all parties which establishes guidelines for determining whether fires resulting from a natural ignition should be treated as a wildland fire, coordinates the response to such fires, and ensures that management objectives and

legal responsibilities are met. Can also include prescribed fires. The Bootheel Fire Management Plan (Smith 2003) is an example.

(B) Take Minimization Measures.

The take minimization measures established below are organized into four subsections corresponding to each of the covered species assemblages described in Section 4.0: (1) the aquatic species; (2) riparian species; (3) montane species; and (4) grassland species. In addition, fifth and sixth subsections are included that describe: (5) take minimization measures pertaining to fire camps; and (6) procedures, roles, and responsibilities with respect to implementing the take minimization measures described throughout the preceding subsections.

(1) Aquatic Species.

The primary risk to the aquatic species assemblage (seven fish, two frogs, one snake, and one plant) stemming from fire management is an indirect one, consisting of the potential for post-fire, downstream effects within any given watershed to degrade aquatic habitats potentially present at the base of the watershed and potentially inhabited by covered aquatic species. The primary agents of such degradation, should it occur, would be sediment and ash mobilized from burn areas and washed downstream and into such habitats by post-fire rainfall. The nature of the degradation would be resulting sedimentation of stream substrates, suspension of sediments in the water columns of affected streams, and changes in water quality and chemistry as a result of ash deposition. Such effects would be most likely to occur when fire events within the watersheds surrounding and upstream of aquatic habitats have been individually or cumulatively extensive (leading to a commensurately high concentration of downstream effects), when the extent of high-severity fire in the watersheds has been relatively great, and when rainfall events following fire events in the watersheds are frequent or intensive.

To minimize the potential for these types of effects, the following measures shall be implemented in the course of fire planning and management under the HCP.

(a) Burn/Fire Limits. These measures consist of limits on the amount, extent, and frequency of fire that may permissibly occur under the MBHCP within any given Malpai Borderlands watershed. The burn caps have two components—a specified time period, and a specified maximum percentage of a watershed within which fire may be undertaken or occur over the course of that period. They have the effect, if and when reached, of prohibiting the undertaking of further managed fire in an affected watershed until the required time periods have fully elapsed (and, thereby, of minimizing the potential cumulative effects of fire). The burn frequency limit establishes a minimum return interval for managed fire at the level of individual burn units (thereby ensuring adequate recovery periods). Thus:

(i) *Watershed Burn Cap: 1-Year*. Not more than twenty-five percent (25%) of the ground surface area of any individual watershed in the covered area shall be burned as a result of the combined total acreage of all managed fires (including prescribed burns and wildland fires) undertaken in the watershed in accordance with the MBHCP together with all wildfires occurring in the watershed within any given one-year calendar period.

(ii) *Watershed Burn Cap: 5-Year*. Not more than fifty percent (50%) of the ground surface area of any individual watershed in the Malpai Borderlands shall be burned as a result of the combined total acreage of all managed fires (including prescribed burns and wildland natural fires) undertaken in the watershed in accordance with the MBHCP together with all wildfires occurring in the watershed within any given five-year calendar period.

(iii) *Burn Frequency Limit*. In addition to burn caps, which apply at the watershed scale, a burn frequency limit applying at the site scale shall be observed. Specifically, managed fire shall not be undertaken within or permitted to occur on any area in the Malpai Borderlandsmore frequently than once every five years.

(iv) *Determining Burn/Fire Limits*. Applicable details about how the one-year watershed caps, five-year watershed caps, and burn frequency limits described, respectively, in paragraphs (i), (ii), and (iii) above will be determined or computed are as follows.

(1) *Determining Burn Area Totals*. For purposes of paragraphs (i) and (ii), the area of any given burn unit or site considered to have been burned (and therefore to contribute to the cumulative total percentage of burning within the subject watershed during the applicable time period) shall be defined to include the entire acreage inside the perimeter or boundaries of the subject burn or fire (i.e., not on the percentage of area burned within such perimeters or boundaries).

(2) *Determining 1-Year/5-Year Periods*. For purposes of paragraphs (i) and (ii), one-year and five-year periods with respect to any given watershed must be based on calendar years (in which case a given period would begin on January 1st and end on December 31st one year or five years later). However, because the effective date of the MBHCP (i.e., the date upon which it is approved and its associated I.T.P is issued) will likely be mid-year, the first year of the first 1-year period and the first 5-year period will necessarily be a partial year.

(3) *Computing 5-Year Periods*. For purposes of paragraphs (ii) and (iii), the five-year period may be figured based on month and year without reference to day. Thus, for example, under the burn frequency limit an area burned in May 2006 could be re-burned beginning anytime in May 2011.

(v) *Fire Types Applicable to Caps*. Three types of fire are applicable to the watershed burn caps described in paragraphs (i) and (ii) above—prescribed burns, wildland fires, and wildfires (those ignited naturally that are undesirable and are suppressed). In other words, with respect to any given Malpai Borderlands watershed, the acreage of the watershed that has burned as a result of all these types of fire within an applicable one-year period or five-year period are considered to count toward the overall cumulative total for the watershed (in watershed area percentage) that has burned during these periods.

For example, if burning within a given watershed as a result of all three types of fire, or as a result of any single type, totals 50 percent of the watershed over four years of a given five-year period, managed fire in that watershed must cease for the remaining year of that five-year period.

(vi) *Watershed Map*. A map showing each individual watershed in the Malpai Borderlands to which the watershed burn caps, the burn frequency limit, and burn/fire records (see below) described in this subsection apply is shown in Figure 5-1. Nine such watersheds have been identified: (1) San Simon Creek; (2) Silver Creek; (3) Black Draw; (4) Aston Spring; (5) Guadalupe Canyon; (6) Clanton Draw; (7) Cloverdale Canyon; (8) Animas Creek; and (9) Playas Creek.

[This page reserved for Figure 5-1.]

(b) Post-fire Grazing Rest. Where grassland improvement generally, and restoration or increase of grass and forb productivity specifically, are primary fire management objectives, grazing rest following a prescribed burn is an essential component of success. Accordingly:

(i) All lands within the defined perimeter or boundary of any prescribed burn (as distinct from a wildland fire) carried out or occurring under the authorities of the MBHCP and undertaken for the primary purpose of improving grassland conditions within affected areas, shall be rested from grazing for the entirety of the first growing season following the subject burn. For purposes of this paragraph, the first growing season following any such burn is defined as the period from the date (or dates) on which the burn is carried to the following October 31st.

(ii) In addition, if precipitation conditions during the first growing season following the subject burn consist of a drought, the period of grazing rest shall, if feasible, be extended through the second growing season following the fire. This rest period will be from the date (or dates) on which the burn is carried out to October 31st the following year. In addition, the specific criterion applicable to the feasibility of this provision (i.e., of extending grazing rest through the second growing season following the subject burn) shall consist of the ability of any affected Malpai rancher to do so without significant financial hardship; if, furthermore, observance of a second season of grazing rest would cause significant financial hardship, the provision may be waived at the sole discretion of the affected rancher, in consultation with MBG.

(iii) To ensure implementation of paragraph (i) above, it shall be a condition of the carrying out of any prescribed burn planned or contemplated under the MBHCP by or in cooperation with MBG), that no such burn may be undertaken unless the owners of such lands (or, in the case of state-trust lands, the lessees of the lands) have agreed in advance to implement grazing rest in applicable areas in accordance with that paragraph. In addition, any such agreements must be formalized through VCAs (Section 5.6.1(2)) duly executed and signed by MBG and affected ranchers prior to the commencement of a prescribed burn. Such VCAs may also include agreements concerning the provisions described in paragraph (ii) above (i.e., grazing rest in the second season following a burn) at the discretion of MBG and the rancher(s) involved in any given burn.

(c) Fire Intensity Management. Research on the effects of wildfire suggests that sediment yields spike sharply when the amount of bare soil following a fire reaches a threshold of about 60-70 percent (Bob LeFevre, USFS, pers. Com.). In addition, experience has shown that prescribed fire in the Malpai Borderlands is typically characterized by low-intensity and moderate-intensity burning (which result in lesser amounts of bare soil) (P. Warren, TNC, pers. comm.). Accordingly, planners and mangers undertaking fire management activities in the Malpai Borderlands:

(i) Will, in the course of fire planning and management, be cognizant of the need to manage burn intensity and post-fire ground cover percentages so as to minimize sediment yields resulting from prescribed fire;

(ii) Will, with respect to planning and management of prescribed burns, and to the maximum extent feasible and appropriate, design and configure burn units so as to maximize inclusion of areas likely to burn with low- to moderate-intensity and minimize inclusion of areas likely to burn with high intensity , and manage such fires in the same fashion; and,

(iii) Will, with respect to wildland fire use, and to the maximum extent feasible and appropriate, plan the response to wildland fires and manage such fires so as to minimize high-intensity burning and maximize low- to moderate-intensity burning.

It is recognized that the measures described in paragraphs (c)(i)-(iii) above are in the form of guidelines and cannot be treated as strict HCP requirements, and that implementation of the measures will require the professional judgment of fire planners and managers actually carrying out the fire management program. However, success in achieving the intended results of the guidelines to some extent will be determined by the results of the prescribed fires themselves as determined by plan monitoring (see Section 5.4). To the extent such monitoring indicates that improved performance in achieving such results is needed, this will be addressed through the plan's Adaptive Management procedures (see Section 5.5).

(vi) In addition, to help meet the objectives of this subsection, the MBHCP establishes maximum and minimum standards with respect to three fire conditions parameters (temperature, relative humidity, and wind speed), which must be satisfied before any prescribed burn carried out under the authorities of the MBHCP may commence (i.e., be ignited) or before any naturally-occurring wildland fire may be managed as a prescribed fire. These are shown in Table 5-1.

Table 5-1:
Mandatory Fire Conditions Parameters for Managed Fire under the MBHCP

Fire Condition Parameter[1]	Maximum Value	Minimum Value
Temperature	95° F	65° F
Relative humidity	30%	10%
Wind speed	65 mph	5 mph

1 On-site conditions with respect to each parameter must fall between the maximum and minimum values before any prescribed burn may commence or any wildland fire may be managed as a prescribed fire.

(d) Maintenance of Burn Records. MBG will maintain detailed, written records about all prescribed burns, wildland fires, and wildfires carried out or occurring under the Malpai Borderlands fire management program and this HCP. Such records shall include, at a minimum,:

Burn/Fire Records--Individual. (i) A copy of the burn plan under which each prescribed burn is carried out; (ii) a copy of any written plan or plans addressing management of wildland fire(s) generally or individually; (iii) a number or similar identifier for each prescribed burn, wildland fire, and wildfire in planning, completed, or having occurred; (iv) the date(s) each managed fire or wildfire occurred; (v) the size (in acres) of each managed fire or wildfire; (vi) a map showing the perimeters or boundaries of each managed fire or wildfire, the area within those perimeters or boundaries, and pertinent features within those areas; fire behaviour parameters recorded during the burn, and (vii) the particular watershed (see Figure 5-1) within which each managed fire and wildfire occurred.

In addition, MBG will maintain, for each Malpai Borderlands watershed within which one or more prescribed burns, managed fires, or wildfires have occurred:

Burn/Fire Records—Watershed. (viii) A map of the watershed showing the location within the watershed of each such burn or fire; and a written record of (ix) each managed burn or fire that has occurred in the watershed; (x) the acreage of each such burn or fire; (xi) the cumulative acreage of all managed burns or fires in the watershed; (xii) the cumulative acreage of all such burns and fires combined; (xiii) the percentage of the watershed represented by that cumulative acreage; and (xiv) the percentage of the watershed represented by that cumulative acreage in relation to the one-year and five-year watershed burn caps described in paragraphs (a)(i) and (a)(ii) above, respectively.

(2) Riparian Species.

Activities contemplated under MBG's proposed fire management program are not likely to affect, adversely or otherwise, the MBHCP's two covered riparian species (the yellow-billed cuckoo and western red bat) or the three aquatic species that also occur in riparian habitat (Chiricahua leopard frogs, lowland leopard frogs, and northern Mexican gartersnakes). This is because, first, relatively few significant riparian corridors or habitats occur in the Malpai Borderlands; second, no fire management activities are planned within riparian areas. Such fire will be carefully avoided in the course of planning and management of fire in the borderlands.

However, there exists the possibility that a managed fire being undertaken near or adjacent to any given riparian area in the Malpai Borderlands might escape into such an area. If this should occur, depending on the circumstances, damage or destruction of riparian vegetation could be significant and take of covered riparian species, leopard frogs, and gartersnakes could result.

(a) Riparian Fire as a Changed Circumstance. Although not planned, escape of prescribed fire into riparian habitat could occur, there fore we propose to treat it as follows:

(i) First, fire management is treated as a covered activity in the MBHCP with respect to covered riparian species, including leopard frogs and gartersnakes.

(ii) However, unlike most of the other covered activities, which are planned, the event of concern with respect to such coverage here—inadvertent escape of managed fire into riparian habitat—would be unplanned, and is therefore treated under the MBHCP as a changed circumstance (see Section 8.3).

Thus, adverse effects of fire management on scarce riparian biotic communities in the Malpai Borderlands (and on covered riparian species) would be expected only in the event a managed fire escapes into such a community. To minimize this potential, the measures shown in paragraph (b) below shall be implemented in the course of the fire program, and with respect to the areas described in paragraph (c) below.

(b) Protection of Riparian Communities. In the course of fire planning in the Malpai Borderlands, MBG and other HCP participants and cooperators, as applicable, shall give due attention to and be vigilant with respect to the location of riparian biotic communities in relation to the locations of any prospective fire(s) being planned. In addition, fire planners shall ensure that appropriate measures to protect and avoid riparian communities in the course of fire are fully incorporated into burn and fire plans. These include, but are not limited to, establishment of buffer distances between burn and riparian areas, employing landscape features to buffer or protect such areas, and establishment of fire lines, where necessary. Similarly, in the course of managing or suppressing fire in the vicinity of riparian areas in the Malpai Borderlands, fire officers shall undertake all reasonable precautions to protect such areas from the direct, indirect, and inadvertent effects of prescribed burns, wildland fire, and wildfire.

(c) Definition. For purposes of the MBHCP, the term "riparian community" is defined to include those areas within the Malpai Borderlands having sufficient surface or groundwater to support relatively complex associations of deciduous vegetation, including large deciduous trees. Herbaceous-dominated wetland habitat, known locally as cienegas, are also included in this category. Such areas specifically include, but are not necessarily limited to: (i) Black Draw (San Bernardino NWR); (ii) Astin Spring (Malpai Ranch); (iii) Guadalupe Canyon (Hadley Ranch); (iv) Cottonwood Creek (McDonald Ranch); (v) Baker Canyon (tributary to Guadalupe Canyon); (vi) Silver Creek; (vii) Clanton Draw; and (viii) the cienega at Diamond A Ranch headquarters.

(3) Montane Species.

Managed fire is not planned within montane biotic communities in the Malpai Borderlands on private or state-trust lands under the MBHCP. It will be carefully avoided in the course of management and planning under the fire program.. Therefore, like theriparian covered species, none of the burn activities contemplated under MBG's proposed fire management program are likely to adversely affect the MBHCP's two covered montane species (the New Mexico ridge-nosed rattlesnake and Mexican spotted owl).

The one event where fire management might affect montane species in the borderlands is the same one addressed in the previous subsection with respect to riparian species—the possibility that managed fire being undertaken below higher-elevation montane areas might inadvertently escape uphill into such areas. Should this occur, depending on the circumstances, damage or destruction of montane communities could be significant and take of montane covered species could result. As with riparian species, however, this possibility is considered unlikely because of the care that will be taken in the course of fire management to keep fire within its planned boundaries.

(a) Montane Fire as a Changed Circumstance. Accordingly, fire management under the MBHCP is treated with respect to montane species and habitats in the Malpai Borderlands in the same fashion as it is with respect to riparian species and habitats—i.e., as a covered activity with respect to the two montane species covered by the plan (spotted owls and ridge-nosed rattlesnakes). However, because the event of concern with respect to such coverage—escape of managed fire into one or another (or one part or another) of two broad montane areas in the borderlands (see definition below)—would be unplanned, it is treated under the MBHCP as a changed circumstance (see Section 8.3).

Thus, as with riparian species, the adverse effects of fire management on montane biotic communities in the Malpai Borderlands (and on covered montane species) would be expected only in the event that escape of managed fire into such a community actually occurred. To minimize this potential, the measures shown in paragraph (b) below shall be implemented in the course of the fire program, and with respect to the areas shown in paragraph (c) below.

(b) Protection of Montane Communities. In the course of fire planning in the Malpai Borderlands, MBG and other HCP participants and cooperators, as applicable, shall give due attention to and be vigilant with respect to the location of montane biotic communities in relation to the locations of any prospective fire(s) being planned. In addition, fire planners shall ensure that appropriate measures to protect and avoid montane communities in the course of fire are fully incorporated into burn and fire plans. These include, but are not limited to, establishment of buffer distances between burn and montane areas, employing landscape features to buffer or protect such areas, and establishment of fire lines, where necessary. Similarly, in the course of managing or suppressing fire in the vicinity of montane areas in the Malpai Borderlands, fire officers shall undertake all reasonable precautions to protect such areas from the direct, indirect, and inadvertent effects of prescribed burns, wildland fire, and wildfire.

(c) Definition. For purposes of the MBHCP, the term "montane community" is defined to include areas within the Malpai Borderlands that are typically above 5,000 feet in elevation, contain relatively rugged, steep terrain dissected by canyons and ridges, and consist primarily of forested areas. With respect to the Malpai Borderlands, such areas specifically include: (i) the Peloncillo Mountains (which run south-to-north through the center of the area, straddling the Arizona/New Mexico border); and the Animas Mountains (located in the southeast quarter of Diamond A Ranch).

(4) Grassland Species.

The potential effects of fire management activities on this species assemblage (consisting of the black-tailed prairie dog, western burrowing owl, Aplomado falcon, and white-sided jackrabbit) differ from their potential effects on all other covered species in that fire management under the MBHCP will routinely be undertaken in the species' habitat. Consequently, the primary potential effects of fire management on grassland species tend to be direct (i.e., killing or injury) as a result of the possibility of fire moving through occupied habitat. However, several factors suggest that the potential effects of fire on these species in most cases will be minimal. First, fire in grassland communities—especially where native plants dominate (as on Diamond A Ranch) and in prairie dog towns (typified by bare ground and low-cropped vegetation)—is normally slow-moving and of low severity. Second, adults of all four species have effective capabilities for surviving such fires (either by taking refuge in deep burrow systems or by flying or running away). Third, the impacts of fire on grasslands are usually minor and transitory, and are generally followed by beneficial effects. However, the nestlings, pups, and juveniles of all species are at risk in the event of fire in grassland communities event of fire occurring directly in their habitats and, in the case of Aplomado falcons, nest tree damage or damage to foraging habitat is possible.

To minimize the potential for take of grassland species, especially juveniles and young, the following measures shall be implemented in the course of fire planning and management under the MBHCP.

(a) All Grassland Species. Although pre-activity surveys are an integral part of take minimization measures for other covered activities, and, for fire management activities, with respect to fire camps as described in Subsection (4)(e), surveys are not otherwise required for fire management activities. This is because the size of burn and fire areas (potentially encompassing thousands of acres) makes it impractical to conduct such surveys on a routine basis. Consequently, in the case of the grassland species, take

minimization needs with respect to fire management are met through two alternate mechanisms: (i) a burn cap applicable to fire activities carried out in grassland vegetation associations; and (ii) in the case of managed fire, implementation of take minimization measures with respect to known locations of the covered grassland species (e.g., nest sites documented independently of subject fire activities). Thus:

(i) *Grassland Burn Cap*. To avoid excessive adverse effects on covered grassland species in the course of MBG's fire management program, not more than 25,000 acres of the area defined in paragraph (2) below shall be burned within any given one-year calendar period as a result of all fire occurring in that area in a calendar year.

(1) *Fire Types Applicable to the Cap*. Three types of fire are applicable to the grassland burn cap—prescribed burns (those ignited purposefully), wildland fires (those ignited naturally that are permitted to burn), and wildfires (those ignited naturally that are undesirable and are suppressed). Thus, if burning within the subject area as a result of all these types of fire, or as a result of any single type, cumulatively totals 25,000 acres in any given calendar year, then managed fire in the area must cease for the remainder of the year.

(2) *Area Subject to the Cap*. For purposes of this subsection, the area to which the grassland burn cap applies is defined as the area described in Map 5-1 (the species habitat map for western burrowing owls) as currently suitable burrowing owl habitat.

(ii) *Avoidance of Known Species Locations/Use of Maps*. Notwithstanding the above, locations of the covered grassland species already known or documented at the time any particular managed fire is planned or carried out under the MBHCP, together with anticipated adverse effects of fire on the grassland species generally, shall be avoided to the maximum extent practicable through implementation of the take minimization measures described in Subsections (b)-(e) below. In addition, determination of known locations of the grassland species within planned or proposed prescribed burn units, and the locations of such species in the vicinity of wildland fires, shall be accomplished through reference to the MBHCP's species habitat maps and species occurrence maps as described in Section 5.2.3 of the plan. However, because prescribed burns are planned in advance, while wildland fires are managed opportunistically in real time, the provisions of this paragraph shall be implemented:

(1) As required, with respect to prescribed fire; and,

(2) As feasible, with respect to wildland fire.

(b) Burrowing Owl Avoidance. In the case of western burrowing owls, owl eggs and nestlings are at the greatest risk of mortality or harm as a result of fire because they are not capable, as are adults, of avoiding the effects of fire by flying away. Avoidance of fire-related impacts to known owl nest sites is therefore the primary objective of take minimization for this species. Planners of prescribed burns (and, as applicable, managers of wildland fire) will satisfy this minimization objective by selecting from among the following options and measures until an endpoint applicable to the burn or fire in question and satisfactory to the objectives of both the MBHCP and the subject burn or fire has been reached.

If it is determined, by consulting the MBHCP's species habitat and species occurrence maps (Section 5.2.3), that the area in which a fire is planned or is occurring, as in the case of a wildland fire,does not exhibit records of burrowing owl pairs, colonies, or nest sites; then no further action under the MBHCP with respect to such fire and this species is necessary. However, if it is determined that the area in which

a fire is planned or is occurring, as applicable, does exhibit such records, the following measures shall apply as indicated.

(i) *Fire Outside the Nesting Season (Take Minimization Not Required).* With respect to any prescribed burn, if the burn can be deferred to or undertaken at a time outside the burrowing owl breeding season, as defined in Subsection (e) below, then impacts to burrowing owl nests, eggs, and nestlings would be avoided and take minimization in the course of the burn and with respect to this species are unnecessary. The same is true with respect to any wildland fire occurring outside the burrowing owl breeding season.

(ii) *Fire Inside the Nesting Season (Take Minimization Required).* If, however, a prescribed burn cannot be deferred to or undertaken at a time outside the burrowing owl breeding season as defined in Subsection (e) (i.e., must be undertaken inside that season), the measures described in paragraph (1) and, if desired, paragraph (2) below shall be implemented. In addition, if a wildland fire meeting criteria for management as a prescribed fire occurs, and is so managed, inside the burrowing owl breeding season, the measures described in paragraph (3) below shall be implemented.

(1) *Prescribed Burns--General.* The burn plan for any such prescribed burn shall be formulated, and the resulting burn carried out, such that all known or recorded burrowing owl nest sites, and all other known or recorded burrowing owl locations (i.e., pair sightings and colonies), determined to be present in the burn area (through reference to the maps described above) are fully protected from direct, fire-related impacts (i.e., from fire burning over or through such areas, and from activities associated with managing the fire). This shall be accomplished by moving the burn perimeter so that affected owl nest sites and locations are excluded from the burn unit, moving the entire burn area to exclude such sites or locations, or, if feasible, fully protecting the sites or locations within the burn unit through appropriate means (e.g., buffers, firelines, blacklines, ground-soaking – without flooding nests, etc.).

(2) *Wildland Fire.* The following measures shall be implemented in the case of any wildland fire occurring in the area defined in paragraph (a)(i)(2) above and being managed inside the burrowing owl breeding season as defined in Subsection (e) below. Immediately upon the determination that a fire is to be so managed, MBG shall consult the MBHCP's species occurrence map for burrowing owls as described in paragraphs (b) above to determine whether any known or recorded burrowing owl locations occur in the vicinity or likely vicinity of the fire; and, if so, shall work with fire managers to ensure to the maximum extent feasible that active or potentially active burrowing owl nest sites in the vicinity of the fire are protected. This shall be accomplished via buffers, firelines, blacklines, etc., as appropriate.

(c) Prairie Dog/Jackrabbit Avoidance. With respect to these species, if it is determined (by consulting the MBHCP's species occurrence maps as described in Section 5.2.3) that the area in which a fire is planned (in the case of prescribed fire) or is occurring (in the case of wildland fire) does not exhibit records of black-tailed prairie dog colonies or is not within the range of the white-sided jackrabbit in the Malpai Borderlands, then no further action under the MBHCP with respect to such fire and these species is necessary. If, however, it is determined that the area in which the fire is planned (or is occurring, as applicable) does exhibit such records or is within this range, the following measures shall apply as applicable and indicated.

(i) *Prescribed Burns.* Because both these species are capable of escaping the direct effects of grassland fire (in the case of prairie dogs, by fleeing into their burrows; in the case of jackrabbits, by

simply fleeing the affected area): (1) avoidance of their colonies and populations, as applicable, is not mandated where burn conditions are expected to result in relatively "cool" fires. However, with respect specifically to white-sided jackrabbit populations, where burn conditions are expected to result in hotter fires, planners and managers shall: (2) undertake such fires in periods that are outside the jackrabbit breeding season as described in paragraph (e) below, where feasible; or, (3) avoid such populations in determining the perimeters, size, and configuration of such fires. With respect to black-tailed prairie dog colonies, where burn conditions are similarly expected to result in hotter fires, take minimization shall consist of either: (4) no action (if, in the judgment of the Incident Commander or a similar fire official or expert, conditions within the colony are not expected to carry the fire); or (5) establishment of a fireline or blackline around the colony (if deemed necessary or advisable by the Incident Commander or similar official in consultation with MBG). In addition, with respect to each species, as applicable, Incident Commanders or similar officials in consultation with MBG shall: (6) avoid burn ignition patterns that limit routes of escape for jackrabbits; and (7) avoid burn ignitions or starting burns within prairie dog colonies.

(ii) *Wildland Fire*. With respect to these species, the following measures shall be implemented in the case of any wildland fire occurring in the area defined in paragraph (a)(i)(2) above. Immediately upon the determination that a fire is to be so managed, MBG shall consult the MBHCP's species occurrence maps for black-tailed prairie dogs and white-sided jackrabbits as described in paragraph (c) above to determine whether any known or recorded prairie dog colonies occur in the vicinity or likely vicinity of the fire, and whether the fire is in or in the vicinity of the white-sided jackrabbit range in the Malpai Borderlands; and,

(1) *Black-tailed Prairie Dogs*. If the former (with respect to prairie dog colonies) is true, measures (1) and (4) in paragraph (c)(i) above shall apply; or, if applicable and feasible, measure (5) in that paragraph shall be implemented; or,

(2) *White-sided Jackrabbits*. If the latter is true (with respect to the jackrabbit range) and the fire is occurring inside the jackrabbit breeding season as described in Subsection (e) below, measure (1) in paragraph (c)(i) above shall apply; or, if measure (1) is not applicable, MBG shall promptly consult with USFWS (if available) and/or NMDGF (if available) and fire managers to determine the most suitable course of action (in which case consideration of the benefits of the fire to jackrabbit habitat, notwithstanding the potential for take of jackrabbits, shall be included in the determination). However, if neither USFWS nor NMDGF can be contacted in a timely fashion in such circumstances, the decision on how to proceed shall lie solely with MBG and fire managers.

(d) Falcon Avoidance. As with western burrowing owls, Aplomado falcon eggs and nestlings are at the greatest risk of mortality or harm as a result of fire, and avoidance of fire-related impacts to known active falcon nest sites is the primary objective of take minimization for this species. With respect to any managed fire, therefore, if it is determined (by consulting the MBHCP's species habitat and species occurrence maps as described in Section 5.2.3) that the area in which a fire is planned (in the case of prescribed fire) or is occurring (in the case of wildland fire) does not exhibit records of Aplomado falcon nest sites, then no further action under the MBHCP with respect to such fire and these species is necessary. If, however, it is determined that the area in which a fire is planned (or is occurring, as applicable) does exhibit such records, the following measures shall apply as indicated.

(i) *Fire Outside the Breeding Season (Take Minimization Not Required)*. With respect to any prescribed burn, if the burn can be deferred to or undertaken at a time outside the Aplomado falcon breeding season, as defined in Subsection (e) below, then:

(1) *Falcon Nests/Eggs/Nestlings*. Impacts to falcon nests, eggs, and nestlings would be avoided and take minimization in the course of the burn and with respect to this species are unnecessary. The same is true with respect to any wildland fire occurring outside the Aplomado falcon breeding season.

(2) *Falcon Nest Trees--Exception*. Notwithstanding the above, falcon nest trees must be protected in the course of managed fire occurring outside as well as inside the breeding season. Consequently, measure (B) in paragraph (ii)(3) below (applying to known inactive nest sites inside the falcon breeding season) shall also apply to known falcon nest sites (specifically, nest trees) in the vicinity of managed fires undertaken outside the breeding season.

(ii) *Fire Inside the Breeding Season (Take Minimization Required)*. If, however, a prescribed burn cannot be deferred to or undertaken at a time outside the Aplomado falcon breeding season as defined in Subsection (e) (i.e., must be undertaken inside that season), the measures described in paragraphs (1)-(3) below shall be implemented. In addition, if a wildland fire meeting criteria for management as a prescribed fire occurs, and is so managed, inside the falcon breeding season, the measures described in paragraph (4) below shall be implemented.

(1) *Prescribed Burns—General*. (A) The burn plan for any such prescribed burn shall be formulated, and the resulting burn carried out, such that all known or recorded Aplomado falcon nest sites determined to be present in the burn area (through reference to the maps described above) are fully protected from direct, fire-related impacts (i.e., from fire burning over or through such sites), impacts related to fire management (e.g., damage or destruction of nest trees as a result of on-ground fire management activities), and disturbance-related impacts (i.e., caused by commotion and noise). With respect to any particular nest site, therefore: (B) neither the direct impacts of the burn, direct impacts of fire management, or disturbance impacts shall be permitted to occur closer than 200 feet from the nest tree(s) within the site.

(2) *Prescribed Burns—Foraging Habitat*. In addition, Aplomado falcon foraging habitat within one mile of a nest tree (or trees) (consisting of riparian corridors and other relatively dense aggregations or clusters of small trees and brush) shall, to the maximum extent practicable, not be burned as the result of a fire.

(3) *Prescribed Burns—Ground-truthing*. Alternately, MBG may, at its option, conduct ground-truthing surveys as described in Appendix C, Section III, Subsection (A)(3) (or arrange to have such surveys conducted) to identify the current status of any known or recorded falcon nests determined to be present in the burn area. If, as a result of such surveys, it is determined that any one or more of such sites do not consist of currently active falcon nests, then: (A) the measures described in paragraph (ii)(1) above may be waived with respect to any locations for which this has been determined; in that event, however (B) the nest tree(s) associated with any such nest site(s) shall be protected through appropriate means, including but not necessarily limited to establishment of a fireline or blackline around any such tree (of a radius sufficient to protect it from fire) and installation of temporary fencing around the tree of a minimum 15-foot radius (to protect it from fire-management activities). For purposes of this paragraph, an inactive Aplomado falcon nest site is defined as one in which no falcons, a single unpaired adult falcon, or one or more sub-adult falcons are present at the site; any site with two adult falcons shall be considered active, however. Also, surveys to determine such status may be undertaken only by qualified individuals as defined in Appendix C, Section III, Subsection (A)(5).

(4) *Wildland Fire*. The following measures shall be implemented in the case of any wildland fire occurring in the area defined in paragraph (a)(i)(2) above and being managed inside the Aplomado falcon breeding season as defined in Subsection (e) below. Immediately upon the determination that a fire is to be so managed, MBG shall consult the MBHCP's species habitat and species occurrence maps for Aplomado falcons as described in paragraph (d) above to determine whether any known or recorded Aplomado falcon nest sites occur in the vicinity or likely vicinity of the fire; and, if so, shall work with fire managers to ensure to the maximum extent feasible that active or potentially active falcon nests in the vicinity of the fire are protected. This shall be accomplished through implementation, as appropriate and applicable, of measure (B) of paragraph (ii)(1), the measures of paragraph (ii)(2), and measures (A) and (B) of paragraph (ii)(3) above.

(e) Breeding/Non-Breeding Seasons. The take minimization measures described in Subsections (b)-(d) above are arranged largely according to those that are applicable or not applicable to the western burrowing owl, white-sided jackrabbit, and Aplomado falcon breeding and non-breeding seasons respectively. Accordingly, these seasons are:

(i) Western burrowing owl	*(breeding season)*:	April 1 to August 14
	(non-breeding season):	August 15 to March 30
(ii) White-sided jackrabbit	*(breeding season)*:	April 15 to August 14
	(non-breeding season):	August 15 to April 14
(iii) Aplomado falcon	*(breeding season)*:	February 1 to July 31
	(non-breeding season):	August 1 to January 31

(5) Fire Camps. Where fire camps are or must be established to support fire suppression or management activities in the Malpai Borderlands—whether for prescribed burns, wildland fires, or wildfires, as the case may be—MBG and other fire planners and managers, as applicable, shall undertake necessary and appropriate measures to ensure that such camps do not result in unnecessary take of the covered species or in destruction or significant damage to important habitats of these species.

(a) Fire Camp Location. Fire camps shall therefore not be established:

(i) With respect to aquatic and riparian covered species, within any riparian habitat area, within any perennial stream, or within 1,000 feet of any such habitat or stream; or,

(ii) With respect to grassland species, within 500 feet of any known active western burrowing owl nest, within 500 feet of any known active black-tailed prairie dog colony, or within 1,000 feet of any known active Aplomado falcon nest; unless:

(iii) Other avoidance distances or measures are approved verbally or in writing: (1) with respect to fire camps in Arizona, by the USFWS and AGFD or a quorum of the MBHCP's Technical Advisory Committee (see Section 5.7 of the plan); or (2) with respect to fire camps in New Mexico, by the USFWS and NMDGF or a quorum of the MBHCP's Technical Advisory Committee.

(b) Pre-burn Surveys. To ensure observance of the measures described above, brief walk-over surveys of any prospective fire camp sites shall be conducted unless otherwise approved as described in paragraph (a)(iii) above; such surveys shall continue until a suitable fire camp location is found.

(6) Implementation of HCP Measures.

Implementation of the fire management requirements of the MBHCP, as detailed in subsections (B)(1) to (B)(5) above, is not simply a matter of carrying out the plan's measures but also of incorporating and integrating those measures into the fire management infrastructure in the Malpai Borderlands. This infrastructure involves many authorities in addition to those of the HCP (see Table 5-2)—each of which has its own particular concerns, demands to meet, and decisions to make.

In light of this, the following procedures are established to define the role of the MBHCP in fire management, to identify roles and responsibilities in implementing its fire-related requirements, and to ensure that those requirements are fully incorporated into MBG's fire management program .

(a) Role of the MBHCP in Fire Management. As seen in Table 5-2, the MBHCP is one of a number of governing fire authorities in the Malpai Borderlands. Each of these consists of an agency, an organization, or a written authority, and each encompasses a particular jurisdiction—i.e., an activity or type of activity (e.g., commanding a prescribed fire), a particular technical or regulatory issue (e.g., the acceptability of burn conditions), or a particular area or type of land ownership (e.g., private lands).

The authorities of the MBHCP arise as a result of the requirements of the Federal ESA in connection with the carrying out of the plan's fire management program, derive from the authorities of that statute, and apply to the conservation of species covered by the MBHCP (see Section 3.3)—particularly those that are ESA-listed. Ultimately, however, it is not the fire management "program" to which the HCP and its regulatory authorities apply, but to the individual actions taken under that program—particularly actions involving the management and, where necessary, suppressing of fire. The role of the MBHCP with respect to fire management can therefore be said to be threefold: (i) to conserve federally listed species in the course of carrying out fire management projects and actions; (ii) to authorize take of such species that may occur in the course of such projects and actions; and (iii) to provide for the preceding with respect to all projects and actions taken under the fire management program collectively and programmatically.

Accordingly, the MBHCP represents a comprehensive regulatory document with respect to the MBHCP's proposed fire management program and any and all requirements of the ESA connected with that program; furthermore, any individual action or set of actions undertaken in the Malpai Borderlands by HCP participants or HCP cooperators in the course of that program: (i) on private or state-trust lands; and (ii) that fully incorporate or are fully consistent with applicable requirements and measures of the MBHCP—including the take minimization measures detailed in this Subsection (B) of Section 5.2.1—shall be considered to be in full and complete compliance with the ESA and with all associated regulatory requirements, when no Federal nexus exists.

Table 5-2:
Management/Regulatory Authorities Involved in Fire Mgmt In the Malpai Borderlands

Authority	Type	Management/Regulatory Role

U.S. Forest Service/ U.S. Bureau of Land Mgmt.	Federal Agency	Have fire mgmt, fire suppression, and prescribed burn responsibilities on their respective lands. Also have responsibility for assisting in fire mgnt/suppression on non-Federal lands under mutual-aid agreements w/ state and local fire agencies/departments.
Arizona State Lands Dept.	State Agency	Has statutory responsibility for wildfire prevention/suppression on state-trust lands and private lands outside incorporated municipalities in Arizona and authority, through the State Forester, for approving prescribed burns/prescribed natural fires affecting state-trust lands.
N.M. Forestry & Resources Conservation Division.[1]	State Agency	Has statutory responsibility for fire suppression on all non-Federal, non-municipal, non-tribal, and non-pueblo lands in New Mexico and authority, through the State Forester, for approving prescribed burns and prescribed natural fires affecting state-trust lands.
Arizona Dept. of Env. Quality	State Agency	Has statutory responsibility for regulating the air quality impacts of smoke from prescribed fires on non-agricultural state & Federal lands and approving permits for such fires.
Rural/Local Fire Depts.	Local Agency	Local fire agencies typically have mutual-aid agreements with other fire agencies in a region and are often first responders to a wildland fire; consequently, may be first on the scene of a prospective prescribed natural fire and may assist in managing prescribed burns.
Bootheel Fire Mgmt Plan	Planning Document	Applies to private & state-trust lands only. Establishes 15 Fire Mgmt Areas and wildfire response guidelines that consider mgmt objectives for specific sites/ownerships and proximity of structures/other assets; identifies 3 response options for wildfires (contain, confine, control[2]) and weather parameters for ignition of prescribed burns.
Malpai Borderlands Regional Fire Mgmt Map	Planning Document	Shows landowner preference, by ranch, w/ respect to three options for responding to naturally ignited fires (consult with owner/contain & control/suppress immediately). Applies to private & state-trust lands
Malpai Borderlands Group	Organization	With respect to activities under its direct control, has responsibility for ensuring that requirements of the Malpai Borderlands HCP, including those addressing fire mgmt (see below), are implemented.
Malpai Borderlands HCP[2]	Planning Document	Establishes measures to protect Federally and state listed and other covered species in the course of fire mgmt activities in the Malpai area; such measures include watershed burn limits and strategies to avoid damage or destruction of sensitive habitat types and the nests, burrows, colonies, etc. of the covered species.
Incident Commander(s)	Person	The individual(s) representing the agency on whose land(s) a prescribed fire occurs (or which is responsible for fire on private lands) who is in command of managing or suppressing the fire.

[1] Of the New Mexico Energy, Minerals, and Natural Resources Department.

[2] "Contain" means to restrict a wildland fire to a defined area using a combination of natural/constructed barriers that will stop the spread of a fire under prevailing and forecasted weather conditions until the fire is out. "Confine" means to restrict a fire within predetermined boundaries established either prior to or during the fire; these boundaries will confine the fire with no action taken to put the fire out. "Control" means to aggressively fight a wildfire through the skillful use of personnel, equipment, and aircraft to establish firelines around a fire to stop its spread and extinguish all hot spots until the fire is out.

(b) Responsible Parties/Roles and Responsibilities. To ensure proper implementation of the HCP's fire-related requirements, the organizations and individuals responsible for that implementation need to be clearly defined and their roles and responsibilities identified. These are as follows.

(i) *Malpai Borderlands Group*. MBG, as the permittee under the MBHCP (i.e., the holder of its associated I.T.P.; see Section 3.2.2.1) has first and primary responsibility under the plan for ensuring its implementation. This responsibility extends to all plan requirements with respect to which it exercises direct control, including those applying to fire management, and to both phases of

the fire management process (burn/fire planning and burn/fire management). Meeting these responsibilities will involve the undertaking of a variety of activities, including but not limited to:

(1) Meeting with, briefing, and advising agencies, organizations, individuals, and officials involved in fire planning and management in the Malpai Borderlands concerning fire-related measures and requirements of the HCP, as requested or necessary, and, generally providing liaison to all such parties on behalf of the plan;

(2) Assisting in preparation of burn plans and fire management plans for the borderlands; as appropriate, initiating and leading the preparation of such plans; to the extent it is able, ensuring that the MBHCP's requirements are incorporated into such plans; at a minimum reviewing such plans and providing necessary input prior to their approval; and, where appropriate, approving such plans;

(3) Whenever possible, being present in the course of individual fire events for the purpose of observing fire activities as they are being carried out and advising fire officials and commanders, as applicable, concerning MBHCP requirements and measures;

(4) Consulting and coordinating with affected Malpai Borderlands ranchers about burns or fires planned or approved on their lands, and, where appropriate (e.g., see Subsection B.1.c above), securing their commitment to fire-related management requirements, if any, needed to encourage successful burn results; and,

(5) Preparing, maintaining, and regularly updating burn and fire records as required by subsection (B)(1)(d) above, and ensuring that individual burn maps and the watershed map required by that section are also prepared and maintained.

(ii) *Fire Management Liaison*. MBG may, at its discretion, establish a "Fire Management Liaison" (FML) or similarly titled position, or assign FML-type responsibilities to a specified individual, for the purpose of assisting MBG in fulfilling the roles and responsibilities described in this subsection. The FML may be an officer, member, employee, or volunteer of MBG, or a paid agent or any other individual at MBG's sole discretion. The FML may also, if desired, be combined with the Authorized Designee position described in Section 3.2.2.1 of the plan. However, should an FML be hired or established in accordance with this paragraph who is not an MBG principal or employee, MBG understands that it is responsible for any and all actions undertaken by the FML and remains solely responsible for ensuring that the responsibilities assigned to it under the MBHCP and this subsection are carried out.

(iii) *Malpai-area Ranchers/Lease-holders*. Because all managed fires undertaken in the course of the fire management program by definition will be undertaken on private and state-trust lands, the owners of those lands, or the holders of grazing leases applying to those lands, respectively, shall be responsible for observing the grazing rest requirement described in Subsection (B)(1)(b) above and for any other measures to which they have agreed pursuant to a VCA.

(iv) *Fire Control Officers/Incident Commanders*. With respect to each and every fire event carried out or occurring under the authorities of the MBHCP, the official or officials in command of the fire, together with the agencies those officials represent and which have vested such authority with those officials, to the maximum extent feasible shall ensure that all conditions and requirements of the MBHCP as described or incorporated into any applicable burn plan or fire management plan are observed, obeyed, or otherwise carried out. Acceptance of this responsibility is recognized and

agreed to by each applicable agency in accordance with either: (1) their signature on or approval of any applicable burn plan or fire management plan; or their signature on the MBHCP's associated Implementing Agreement (see Section 3.7 and Appendix B of the plan).

(c) Emergency Situations. Notwithstanding the above, it is recognized that emergency situations may periodically arise in the course of a fire in which fire control officers or commanders may have to make rapid decisions and/or issue orders that result in incidental take of the covered species or damage to the habitat of such species in a fashion not authorized by the MBHCP and not otherwise in accordance with paragraph (6)(b)(iv) above (i.e., in which take minimization measures otherwise required by the plan could not be or were not implemented). Accordingly, any such action or actions shall not be considered a violation of the terms of the MBHCP or its associated I.T.P., provided that:

(i) *Conditions*. (1) The action or actions in question were undertaken or carried out in exigent or emergency circumstances as defined in paragraph (ii) below; (2) the action or actions were undertaken by or under the direct orders or supervision of an Incident Commander or similar fire control officer acting in the course of his or her official duties; and (3) the commander or officer involved, in consultation with MBG, prepares a brief, written account of the incident and submits that account to MBG, the USFWS, and his or her superiors or agency heads within five (5) business days of the carrying out of such action or actions. This account shall include, at a minimum, a description of the circumstances surrounding the incident, the specific MBHCP requirements or measures that were not or could not be implemented in the course of the incident, and the results of the incident, if any and if known, in terms of take of the covered species or damage to the habitats of such species.

(ii) *Definitions*. For purposes of this Subsection (c), the term "emergency or exigent circumstances" is defined to mean any circumstances in which the action or actions in question had to be undertaken immediately and/or with little or no opportunity to consider or weigh alternatives in order to: (1) protect human life or safety; or (2) to prevent significant damage to significant public or private structural property (e.g., homes, barns, bridges, and the like).

5.2.1.2 Erosion Control (None will occur in the Montane communities?)

Generally, the potential for adverse impacts or take of the covered species as a result of construction or installation of erosion control activities will be either very minor or very avoidable (see Sections 2.2.2.2 and 3.5.1.2). To the extent they might occur, however, they could consist of direct impacts (e.g., as a result of digging or excavation) to western burrowing owl burrows or nests, black-tailed prairie dog burrows or colonies, and leopard frog habitat (riparian or aquatic); disturbance impacts to burrowing owl, Aplomado falcon, and yellow-billed cuckoo nests and western red bat roosts; and direct or indirect impacts to aquatic species (as a result, respectively, of digging or excavation in, or degradation—through sedimentation—of their habitat). Of these, the grassland species would be most likely to be adversely affected by erosion control projects because most such projects will be undertaken in grassland or similar vegetation associations; and, of the grassland species, western burrowing owls would be most likely to be affected because they are by far the most widely distributed. Riparian and aquatic species would be affected by erosion control projects to the extent they would be undertaken within streambeds to combat stream channel erosion. Also, the juveniles and young of all species (except fish) are significantly more vulnerable than adults to adverse effects resulting from erosion control projects, because of their relative inability to escape.

To minimize the potential for these types of effects, the following measures shall be implemented in the course of planning and constructing or installing erosion control structures.

(1) All species.

(a) Pre-activity Surveys/Waiving of Surveys. The first step in minimizing take of the covered species in the course of erosion control activities is determining whether such species are present at or near the site of any given erosion control project. This will be determined through reference to the plan's species habitat maps and species occurrence maps as described in Sections 5.2.3.1 and 5.2.3.2, respectively; and, as necessary, through pre-activity surveys conducted in accordance with Section 5.2.3.3 and Appendix C. However, because erosion control sites are highly localized, pre-activity surveys in many cases will be relatively simple to carry out and can be combined with site visits undertaken for the purpose of scoping or planning erosion control structures; this is particularly true for the grassland species, although more intensive work may be required for the riparian species (e.g., to determine whether nesting yellow-billed cuckoos are present near a site). In certain cases, however, pre-activity surveys for erosion control projects may be waived, for example if species presence is assumed and take minimization is implemented accordingly.

Thus, pre-activity surveys for erosion control activities are not required with respect to the following species and under the project circumstances indicated.

(i) *Covered Fish*. Except for projects on non-Federal lands in which water is present within or downstream of the project site, and projects on non-Federal lands in which the project site is actually or potentially hydrologically connected to any pond or stream within San Bernardino NWR.

(ii) *Chiricahua/Lowland Leopard Frogs/Northern Mexican Gartersnakes*. For projects undertaken in aquatic or riparian areas, if it is assumed that one, two, or all these species, as applicable, are present and take minimization is implemented accordingly.

(iii) *Yellow-billed Cuckoos/Red Bats*. For projects undertaken in riparian areas, if it is assumed that the species are present and take minimization is implemented accordingly.

(b) Minimizing Ground Surface Impacts. The area of impact (i.e., the area within which ground surfaces are disturbed in any way or by any means) resulting from construction or installation of any and all erosion control structures or projects undertaken under the authorities of the MBHCP will be limited to the minimum necessary to meet project needs.

(c) Impacts Definitions. For purposes of this section , the terms "direct impacts" refers to the potential for direct killing or injury as a result of digging, excavation, or similar activities; "indirect impacts" refers to the potential for habitat degradation (e.g., sedimentation) associated with digging or excavation; and "disturbance impacts" refers to the potential for project-related disturbance of nest sites or roost sites and the possible results of such disturbance (e.g., flushing adults from nests resulting in death or injury to nestlings).

(d) Maintenance of Erosion Control Records. MBG will maintain detailed, written records about erosion control activities or projects carried out in the Malpai Borderlands annually with its assistance, cooperation, or under its sponsorship. Such records shall include, at a minimum: (i) the date(s) each project was carried out; (ii) a map showing the location of projects; (iii) a brief description of the erosion control structure(s) installed or constructed and the type and severity of the erosion problem addressed; (iv) the cumulative number of erosion control projects carried out within the calendar year, both by calendar date and at the year's end; and (v) at each year's end, the cumulative number of erosion control projects carried out since the effective date of the MBHCP.

(2) Aquatic Species.

(a) Minimizing Direct/Indirect Impacts—Fish. Erosion control projects or structures, if any, planned or needed within the stream channel and/or involving the stream bed of any waterway actually or potentially hydrologically connected to any pond or stream within San Bernardino NWR will be carried out either: (i) when the streambed is dry; or (ii) at a minimum, at times when hydrologic conditions ensure that covered fish are likely not present.

(b) Minimizing Direct/Indirect Impacts—Leopard Frogs/Gartersnakes. Erosion control structures, if any, planned or needed in aquatic areas in which Chiricahua leopard frogs, lowland leopard frogs, and/or northern Mexican gartersnakes are known or assumed to occur shall be constructed or installed either: (i) when the streambed is dry, or, at a minimum, at times when hydrologic conditions ensure that leopard frogs and gartersnakes are likely not present; or (ii) during leopard frog non-breeding seasons and gartersnake active period below. However: (iii) if pre-activity surveys have been conducted and no leopard frogs or gartersnakes have been found, construction or installation may proceed without restriction with respect to these species.

Chiricahua leopard frog	*(breeding season)*:	May 1 to Oct. 31 (above 5,900')
		July 15 to Feb. 14 (below 5,900')
	(non-breeding season):	Nov. 1 to April 30 (above 5,900')
		Feb. 15 to July 14 (below 5,900')
Lowland leopard frog	*(breeding season)*:	January 15 to May 14
	(non-breeding season):	May 15 to January 14
Northern Mexican gartersnake	(active season) :	April 1 to October 31 with temperatures from 71° to 91° F

(3) Riparian Species.

(a) Minimizing Disturbance Impacts—Cuckoos/Bats. Erosion control structures, if any, planned or needed in riparian vegetation communities in which yellow-billed cuckoos are known or assumed to occur shall be constructed or installed either: (i) during the cuckoo's non-breeding season as defined below; or (ii) a minimum of 250 feet from any known active cuckoo nest (as determined through reference to the species habitat or species occurrence maps and/or through pre-activity surveys). However: (iii) if pre-activity surveys have been conducted and no yellow-billed cuckoo nests have been found, such construction or installation can proceed without restriction with respect to cuckoos. As for western red bats, because this species may be present in riparian vegetation at any time of the day or year and individual bats are difficult to detect: (iv) where erosion control activities must be undertaken in riparian vegetation communities, such activities shall, with respect to red bats, be carried out: (v) during the red bat's non-pupping season as defined below; and (vi) at all other times of year, employing the least noisy and disturbing methods and over the shortest time period possible.

Western yellow-billed cuckoo	*(breeding season)*:	June 1 to August 14
	(non-breeding season):	August 15 to May 31
Western red bat	*(pupping season)*:	May 15 to July 31
	(non-pupping season):	August 1 to May 14

(b) Minimizing Direct/Indirect Impacts—Leopard Frogs/Gartersnakes. Erosion control structures, if any, planned or needed in riparian vegetation communities in which Chiricahua leopard frogs, lowland leopard frogs, and/or northern Mexican gartersnakes are known or assumed to occur shall be constructed or installed either: (i) when the aquatic areas adjacent to riparian vegetation are dry, or, at a minimum, at times when hydrologic conditions in such areas ensure that leopard frogs or gartersnakes are likely not present; or (ii) during leopard frog non-breeding seasons as defined above. However: (iii) if pre-activity surveys have been conducted and no leopard frogs or gartersnakes have been found, construction or installation may proceed without restriction with respect to these species.

(c) Definition. For purposes of this subsection, the terms "riparian vegetation" and "riparian vegetation communities" are defined as described in Section 5.2.1.1, Subsection (B)(2)(c).

(4) Grassland Species.

(a) Minimizing Direct Impacts—Owls/Prairie Dogs/Jackrabbits. Erosion control structures planned or needed in grassland vegetation associations in which active western burrowing owl, black-tailed prairie dog, or white-sided jackrabbit nests or colonies, as applicable, are known to occur within the project vicinity shall be constructed or installed either: (i) during the owl's or jackrabbit's non-breeding seasons as defined below; or (ii) a minimum of 250 feet from any known active burrowing owl, prairie dog, or jackrabbit nest or colony, as applicable. However: (iii) if pre-activity surveys have been conducted and no western burrowing owl, black-tailed prairie dog, or white-sided jackrabbit nests or colonies have been found, construction or installation may proceed without restriction with respect to these species.

Western burrowing owl	*(breeding season)*:	April 1 to August 14
	(non-breeding season):	August 15 to March 30
White-sided jackrabbit	*(breeding season)*:	April 15 to August 14
	(non-breeding season):	August 15 to April 14

(b) Exceptions/Alternatives. In some cases, technical considerations dictating where an erosion control structure must be placed may complicate observance of the 250-foot buffer described in measure (a)(ii) above or even prevent avoidance of an affected nest or colony itself. In such cases: (i) if the 250-foot avoidance buffer cannot be observed as a result of unavoidable technical considerations, the buffer may be waived or reduced as necessary to carry out the project, provided that the nests or colonies themselves are not disturbed and that it can reasonably be concluded, based on adequate observation by a qualified individual, that the sites involved are not active nests; or (ii) in the rare event that the sites themselves cannot be avoided as a result of the same considerations, the project can nevertheless be undertaken, provided that it can reasonably be concluded, based on adequate observation by a qualified individual, that the sites involved are not active nests.

(c) Minimizing Disturbance Impacts—Falcons. Erosion control structures planned or needed in grassland vegetation associations in which Aplomado falcons are known or assumed to occur within the project vicinity shall be constructed or installed either: (i) during the falcon's non-breeding season as defined below; or (ii) a minimum of 250 feet from any known active owl or falcon nest (as determined through reference to the species habitat or species occurrence maps and/or through pre-activity surveys). However: (iii) if pre-activity surveys have been conducted and no Aplomado faclcon nests have been found, construction or installation can proceed without restriction with respect to these species.

Aplomado falcon	*(breeding season)*:	February 1 to July 31
	(non-breeding season):	August 1 to January 31

5.2.1.3 Mechanical Brush Control

Mechanical brush control activities could affect the covered species either directly or indirectly, depending on the species assemblage involved. Aquatic species would be affected only indirectly, since brush control activities of the type planned under the HCP (i.e., control of woody brush in grassland and shrubland vegetation associations) would not occur directly within aquatic habitats. However, mechanical brush control activities in upland areas surrounding perennial streams could, as with fire management, result in downstream mobilization of sediments that ultimately find their way into these aquatic habitats. In the case of the covered fish, such effects would be confined to brush control activities in the San Bernardino Valley immediately upstream of San Bernardino NWR (where most of these fish occur), although in the case of leopard frogs they could occur in other locations as well. Such effects would also be more likely to occur if brush control activities in any such areas were extensive.

Because mechanical brush control activities by definition employ relatively heavy equipment (e.g., bulldozers, "roller-choppers," etc.), the potential effects of such activities could also include direct, ground-disturbing impacts and disturbance impacts from noise. The former would be most likely to affect the grassland species, because such activities will occur primarily in grassland vegetation where western burrowing owls, black-tailed prairie dogs, and white-sided jackrabbits live on or below the ground; These activities would not be expected to directly affect the riparian species because brush control will not be done in riparian areas.. The noise-related disturbance impacts would be most likely to affect western red bats, but unlikely to affect yellow-billed cuckoos, western burrowing owls, or Aplomado falcons. This is because mechanical brush control is carried out early in the year prior to the growing season and before the nesting cycles of all three of these birds; red bats, however, can be found in their riparian habitats and thus subject to such disturbances year-round.

To minimize the potential for these types of effects, the following measures shall be implemented in the course of planning and carrying out mechanical brush control activities.

(1) All Species.

Pre-activity Surveys/Waiving of Surveys. The first step in minimizing take of the covered species in the course of mechanical brush control activities will be determining whether such species are present in or in the vicinity of any given brush control project site. This will be determined through reference to the plan's species habitat maps and species occurrence maps as described in Sections 5.2.3.1 and 5.2.3.2, respectively; and, as necessary, through pre-activity surveys conducted in accordance with Section 5.2.3.3 and Appendix C. In certain cases, however, pre-activity surveys for brush control projects may be waived, for example if species presence is assumed and take minimization is implemented accordingly.

Thus, pre-activity surveys for mechanical brush control activities are not required with respect to the following species and under the project circumstances indicated.

(i) *Covered Fish*. Except for projects on non-Federal lands in which water is present within or downstream of the project site, and projects on non-Federal lands in which the project site is actually or potentially hydrologically connected to any pond or stream within San Bernardino NWR.

(ii) *Red Bats*. For projects undertaken in riparian communities, if it is assumed that western red bats are present and take minimization is implemented accordingly.

(b) Minimizing Ground Surface Impacts. The area of impact (i.e., the area within which ground surfaces are disturbed) resulting from mechanical brush control activities undertaken under the authorities of this HCP will be limited to the minimum necessary to meet project needs.

(c) Impacts Definitions. For purposes of this Section 5.2.1.2, the terms "direct impacts" refers to the potential for damage or destruction to black-tailed prairie dog colonies or Aplomado falcon nest trees as a result of heavy equipment use; "indirect impacts" refers to the potential for habitat degradation in aquatic areas (e.g., sedimentation) associated with heavy equipment use within such areas; and "disturbance impacts" refers to the potential for project-related disturbance of western red bat roosts as a result of noise and commotion and the possible results of such disturbance (e.g., flushing adult and juvenile bats from their roosts).

(2) Aquatic Species.

(a) Annual Acreage Cap. To minimize the potential adverse effects of mechanical brush control generally, especially with respect to indirect effects on aquatic habitats, and to promote the "distribution" of brush control activities across space and time, the HCP establishes annual acreage "caps" which limit the area, in acres, that may be mechanically treated for brush in the Malpai Borderlands each year. Specifically, mechanical brush control activities carried out under the authorities of this HCP in the borderlands will not be permitted to cumulatively exceed more than 1,000 acres per calendar year.

(b) Maintenance of Brush Control Records. MBG will maintain detailed, written records about mechanical brush control activities or projects carried out in the Malpai Borderlands annually with its assistance, cooperation, or under its sponsorship. Such records shall include, at a minimum: (i) the date(s) each such project was carried out; (ii) the size, in acres, of the project; (iii) a map showing the location and perimeters or boundaries of the project, the area within those perimeters or boundaries, and pertinent features, if any, within that area; (iv) the cumulative acreage of all mechanical brush control projects carried out within each calendar year, both at the time of any given project and at the year's end; and (v) the cumulative acreage, at the time of any given project, of all mechanical brush control projects carried out since the effective date of the MBHCP.

(3) Riparian Species.

(a) Minimizing Disturbance Impacts—Red Bats. Take minimization with respect to mechanical brush control activities and yellow-billed cuckoo and western red bat breeding periods is not needed because such activities are undertaken during the non-growing season (which is outside these breeding periods). As for western red bats, because brush control activities might be undertaken in grassland vegetation associations adjacent to riparian areas, and this species may be present in such areas at all other times of year, such activities undertaken near or adjacent to riparian vegetation shall be carried out either: (i) not closer than 250 feet from the edge of such areas; or (ii) employing hand tools or, where that is impracticable, employing the least noisy and disturbing methods over the shortest time period possible.

(b) Definition. For purposes of this subsection, the terms "riparian vegetation" and "riparian vegetation associations" are defined as described in Section 5.2.1.1, Subsection (B)(2)(c).

(4) Grassland Species.

Minimizing Direct Impacts—Prairie Dogs/Falcons. Take minimization with respect to mechanical brush control activities and active western burrowing owl, Aplomado falcon, or white-sided jackrabbit nest sites is not needed because such activities are always undertaken during the non-growing season

(which is outside the breeding periods of these species). However, take minimization during these activities may be needed with respect to Aplomado falcon nest trees and black-tailed prairie dog colonies. Consequently, mechanical brush control activities planned in grassland vegetation associations in which Aplomado falcon nest trees or black-tailed prairie dog colonies are known to occur in or in the vicinity of the project (as determined through reference to the species habitat or species occurrence maps and/or through pre-activity surveys) shall: (i) be undertaken a minimum of 250 feet from the edge of any such prairie dog colony; and (ii) shall not commence until all Aplomado falcon nest trees present, if any, have been protected through installation of temporary fencing around the base of the trees of a minimum 15-foot radius (to protect the trees from direct, brush control-related impacts). However: (iii) if pre-activity surveys have been conducted and no Aplomado falcon nest trees or black-tailed prairie dog colonies have been found, brush control activities may proceed without restriction with respect to these species.

5.2.2 Ranch Management Activities

5.2.2.1 Livestock Management

As previously discussed, grazing defined as herbivory is not included as a covered activity under the MBHCP, but grazing defined as livestock management is so covered. For purposes of the plan, the term "livestock management" refers to the presence or movement of livestock into, through, or within habitats in the Malpai Borderlands actually or potentially inhabited by the plan's covered species (see Section 3.5.2.1). Based on this definition, the most likely circumstances in the borderlands in which take of the covered species might occur as a result of livestock management would result from the presence of livestock within riparian corridors and/or streambeds for the purpose of watering (in which case take of fish or leopard frogs might occur), and within pastures that might contain (or later contain) Aplomado falcon nests (in which case damage to falcon nest trees might occur). In the following subsections, then, specific examples of circumstances in which covered aquatic, riparian, and grassland species, respectively, might be taken as a result of livestock management are described, and measures to minimize the likelihood of such take then follow.

(1) Aquatic Species (Fish Only).

(a) Description. For purposes of this subsection, aquatic species are considered to include the covered fish species only. These are confined almost exclusively to the San Bernardino NWR, which is managed principally on their behalf and on which no livestock or grazing is permitted. However, in high-rainfall years, some of its resident fish may move upstream to Aston Spring, a small, partially fenced riparian enclave within a 160-acre pasture on the nearby Malpai Ranch. The Malpai Ranch does graze this pasture and cattle occasionally have access to the spring to water (Wendy Glenn, Malpai Ranch, pers. comm.). However, actual contact between livestock and fish at Aston Spring will likely be very infrequent and typically of short duration.

(b) Take Minimization. In high-rainfall events or periods, or otherwise whenever hydrological connection is established between the San Bernardino NWR and Aston Spring, NWR and MBG personnel will work cooperatively and as necessary to: (i) obtain permission from the Malpai Ranch for NWR personnel to access Aston Spring for the purpose of monitoring, on an opportunistic basis, fish presence and use of the spring, and, as necessary, common livestock use; (ii) if conflicts or problems with respect to joint fish and livestock presence or use of the spring are observed or suspected, MBG, NWR personnel, and, if willing, the owners of Malpai Ranch will work together, in accordance with Section 5.6 of the plan, to temporarily resolve the conflict in a mutually satisfactory manner. Also: (iii) to the extent it is believed that a long-term solution to or modification of livestock management in Aston Spring might

be warranted when fish are present in Aston Spring, MBG, NWR personnel, and, as willing, the owners of Malpai Ranch will work together in accordance with Section 5.6, to accomplish this.
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(2) Riparian Species (Including Leopard Frogs).

(a) Description. For purposes of this subsection, Chiricahua leopard frogs and lowland leopard frogs are considered to belong to the riparian species assemblage. With respect to these species, it is assumed that some, perhaps all, Malpai ranchers from time to time water their livestock in aquatic and associated riparian biotic communities. This would be unlikely to affect yellow-billed cuckoos or red bats since both species use the riparian canopy for their activities, which is outside the range of direct livestock impacts. However, the presence of livestock in riparian areas (especially within associated streambeds and similar areas) could, if leopard frogs are present, result in trampling-related death or injury to frogs (especially in the case of eggs, metamorphs, and juveniles), and, possibly, water quality impacts (e.g., increased sedimentation). However, the severity of such effects would depend on the intensity, duration, and timing of livestock use and would tend to be highly localized.

(b) Take Minimization. In light of the above, MBG shall, generally and whenever possible and advantageous, work with Malpai landowners in accordance with Section 5.6 of the plan to protect and improve riparian vegetation communities on their lands by: (i) increasing or improving the availability of man-made stocktanks; (ii) where riparian watering cannot be avoided, encouraging watering regimes that minimize the effects of livestock presence in riparian and associated aquatic areas (see below); (iii) supporting riparian vegetation protection and improvement work through funding and other assistance as appropriate; and (iv) maintaining frog occurrence records in accordance with section 5.2.3.2 of the plan and making these records available to individual Malpai ranchers. With regard to measure (ii) above, watering regimes that would minimize the effects of livestock in riparian and aquatic habitat include, but are not limited to, closure of riparian areas to livestock (via fencing) during frog breeding seasons; and development of "water gaps" (i.e., closure of riparian and associated aquatic areas to livestock via fencing except for sections or "gaps" in the habitats deliberately left open for livestock access).

(3) Grassland Species.

(a) Description. Burrowing species or species who live in burrows routinely co-exist with livestock and prior to the advent of livestock routinely co-existed with naturally occurring large ungulates (e.g., antelope and bison)—the point being that livestock management (i.e., the presence of livestock) in conjunction with the presence of western burrowing owls and black-tailed prairie dogs is unlikely either to significantly adversely effect either of these species, or, in MBG's judgment, to result in take of the species. Aplomado falcons, on the other hand, could be affected by livestock management in a particular way—which consists of the possibility, if a falcon nest or nests should be established within actively used livestock pastures, that livestock could damage or disturb a falcon nest tree (typically consisting of small trees or large yuccas) through direct physical contact with the tree (e.g., by rubbing against it). This has evidently been observed (Patricia Zenone, USFWS, pers. comm.) and possible consequences include destabilization of a nest tree to the extent that the tree might eventually be lost, and, if it occurs during active nesting, disturbance of the nest to the extent that nestling care by adults might be interrupted or compromised.

(b) Take Minimization. So far as is known, Aplomado falcons do not currently nest in the Malpai Borderlands but future such nesting is possible (see Section 4.2.1). In light of this, the USFWS, AGFD, NMDGF, and MBG, working jointly and cooperatively: (i) will monitor known Aplomado falcon nesting within the U.S. portion of the species' range generally and within the Malpai Borderlands specifically; (ii)

when and if it is determined that an Aplomado falcon nest or nests have been established in the Malpai Borderlands, will work with applicable Malpai ranchers to determine the status of livestock management with respect to any such nest; and (iii) if it is determined that any such nest occurs in an area where livestock are or may be pastured, will work with affected ranchers in accordance with Section 5.6 of the plan to protect the nest tree from livestock related disturbance.

However, since in most cases Aplomado falcon nests would not be discovered until nesting has been initiated, protection of any such falcon nest tree shall be accomplished, provided any affected or applicable rancher has entered into a VCA in accordance with Section 5.6: (iv) via construction of permanent fencing (e.g., of posts and barbed wire) around the nest tree at a distance of not less than a 15-foot radius around the base of the structure; (v) the fence shall be constructed after termination of the first falcon nesting season following discovery of the nest and before commencement of the second falcon nesting season following that discovery, in accordance with the falcon breeding season identifiedbelow. In the meantime: (vi) livestock already pastured or scheduled to be pastured in the nest vicinity at the time of nest discovery may remain in or be placed in the pasture as scheduled, unless a reasonable alternative to such pasturing is available or feasible, in which case livestock shall be removed from the pasture as soon as possible after the nest is discovered or not placed into the pasture, as applicable.

Aplomado falcon	*(breeding season)*:	February 1 to July 31
	(non-breeding season):	August 1 to January 31

5.2.2.2 Linear Facility Construction/Maintenance

The effects of linear facility construction and maintenance on the covered species could consist of direct impacts (to ground-dwelling species), disturbance-related impacts (e.g., at nest sites), or indirect impacts (in aquatic habitats). Direct, ground-disturbing impacts would be most likely to affect the grassland species (especially western burrowing owls, black-tailed prairie dogs, and white-sided jackrabbits) and could occur if grading or trenching is carried out in the vicinity of the active nests and/or colonies of these animals. Disturbance-related impacts would be most likely to affect the covered bird species and western red bats, if grading, trenching, or mowing is carried out in the vicinity of the active nests of Aplomado falcons, western burrowing owls, or yellow-billed cuckoos, or the roost sites of western red bats. Finally, indirect impacts to the covered fish are theoretically possible but would occur only if a fence, waterline, road, or utility line is routed directly through Black Draw in San Bernardino NWR or adjacent to the Refuge when fish are present in the stream (all of which are relatively unlikely); however, the routing of any of these facilities through perennial stream corridors could affect the two leopard frogs, directly or indirectly, in a number of locations.

To minimize the potential for these types of effects, the following measures shall be implemented in the course of carrying out linear facility construction and maintenance activities under the MBHCP.

(1) All Species.

(a) Pre-activity Surveys/Waiving of Surveys. The first step in minimizing take of the covered species in the course of linear facility construction and maintenance activities is determining whether such species are present at or near the site of any given linear facility project. This will be determined, especially with respect to construction of such facilities, through reference to the plan's species habitat maps and species occurrence maps as described in Sections 5.2.3.1 and 5.2.3.2, respectively; and, as necessary, through pre-activity surveys conducted in accordance with Section 5.2.3.3 and Appendix C. However, because all these facilities by definition are linear, pre-activity surveys in many cases will be

relatively simple to carry out and to some extent can be combined with site visits undertaken for the purpose of scooping, planning, and routing the facilities. This is particularly true for the grassland species, although more intensive work may be required with respect to the riparian species (e.g., to determine whether nesting yellow-billed cuckoos are present). In certain cases, however, pre-activity surveys for linear facility projects can be waived, for example if species presence is assumed and take minimization is implemented accordingly. Pre-activity surveys for linear facility activities will not therefore be necessary with respect to the following species under the circumstances indicated.

(i) *Covered Fish*. Except for projects n which the project site is actually or potentially hydrologically connected to any pond or stream within San Bernardino NWR.

(ii) *Chiricahua/Lowland Leopard Frogs/Northern Mexican Gartersnakes*. For projects undertaken in aquatic or riparian areas, if it is assumed that one, two, or all these species, as applicable, are present and take minimization is implemented accordingly.

(iii) *Yellow-billed Cuckoos/Red Bats*. For projects undertaken in riparian areas, if it is assumed that the species are present and take minimization is implemented accordingly.

(b) General Measures. In the course of planning and carrying out of linear facility projects, giving due consideration to the results of pre-activity surveys as described above, MBG and/or individual Malpai Ranchers, as applicable, will exercise due caution to avoid destruction of, significant damage to, or disturbance of the habitats of the covered species. Specifically:

(i) *Linear Facility Alignments*. To the maximum extent practicable and consistent with topography, logistics, and other technical considerations, alignments for planned construction of fencelines, waterlines, roads, and utility lines will be routed so as to avoid specific areas known to be occupied by the covered species and specifically known habitat features of the covered species such as burrows and nests; and,

(ii) *Linear Facility Corridors*. Where ground preparation (e.g., clearing of vegetation) is determined to be necessary during planned construction or maintenance of a linear facility, the corridor cleared, otherwise prepared, or maintained will not exceed 35 feet in width.

(c) Linear Facility Construction Records. Any Malpai area rancher who undertakes construction of a linear facility under the terms of a VCA with MBG in accordance with Section 5.6 of the plan shall, within 30 days of completion of the facility, submit to MBG a brief written summary of the project which includes, at a minimum: (i) the date(s) the project was carried out; (ii) a map showing the location of the project; and (iii) a brief description of the facility, including its length and total area. MBG, in turn, will compile and maintain detailed written records about all such linear facility projects for which written summaries are submitted to it, such records to include, at a minimum: (iv) the information described in measures (i)-(iii) above; (iv) the cumulative number of all such projects, by project type, carried out within a given calendar year and their cumulative length; and (v) at each year's end, the cumulative number of all such projects and their length, by project type, carried out since the effective date of the MBHCP.

(2) Aquatic Species.

(a) Minimizing Direct/Indirect Impacts—Fish. Linear facility projects or structures, if any, planned or needing maintenance within the stream channel and/or involving the stream bed of any waterway actually or potentially hydrologically connected to any pond or stream within San Bernardino NWR shall

be constructed or maintained either: (i) when the streambed is dry; or (ii) at a minimum, at times when hydrologic conditions ensure that covered fish are likely not present.

(b) Minimizing Direct/Indirect Impacts—Leopard Frogs/Gartersnakes. Linear facility projects or structures, if any, planned or needing maintenance in aquatic areas in which Chiricahua leopard frogs, lowland leopard frogs, and/or northern Mexican gartersnakes are known or assumed to occur shall be constructed or maintained either: (i) when the streambed is dry, or, at a minimum, at times when hydrologic conditions ensure that leopard frogs and gartersnakes are likely not present; or (ii) during leopard frog non-breeding seasons as defined below. However: (iii) if pre-activity surveys have been conducted and no leopard frogs or gartersnakes have been found, construction or maintenance may proceed without restriction with respect to these species.

Chiricahua leopard frog	*(breeding season)*:	May 1 to Oct. 31 (above 5,900')
		July 15 to Feb. 14 (below 5,900')
	(non-breeding season):	Nov. 1 to April 30 (above 5,900')
		Feb. 15 to July 14 (below 5,900')
Lowland leopard frog	*(breeding season)*:	January 15 to May 14
	(non-breeding season):	May 15 to January 14
Gartersnake	(active period):	April 1 to October 31
		Temperatures 71° to 91°F

(3) Riparian Species.

(a) General Measures. To protect riparian biotic communities generally, the sensitive aquatic areas typically associated with them, and the covered species actually or potentially inhabiting them in the course of linear facility construction, such facilities will, if possible, be routed outside the edge of any riparian areas within the vicinity of the lines, or, if they must be routed through such areas, will follow the shortest distance possible consistent with the facility's purpose. In addition, maintenance of such facilities involving the use of heavy equipment (e.g., bulldozers) shall not be conducted in riparian areas except as necessary to maintain existing roads.

(b) Minimizing Disturbance Impacts—Cuckoos/Bats. Linear facility projects or structures, if any, planned or needing maintenance in riparian vegetation communities in which yellow-billed cuckoos are known or assumed to occur shall be constructed or maintained either: (i) during the cuckoo's non-breeding season as defined below; or (ii) a minimum of 250 feet from any known active cuckoo nest (as determined through reference to the species habitat or species occurrence maps and/or through pre-activity surveys). However: (iii) if pre-activity surveys have been conducted and no yellow-billed cuckoo nests have been found, such construction or installation can proceed without restriction with respect to cuckoos. As for western red bats, because this species may be present in riparian vegetation at any time of the day or year and individual bats are difficult to detect, where linear facility construction or maintenance activities must be undertaken in riparian vegetation communities, such activities shall, with respect to red bats, be carried out: (iv) during the red bat's non-pupping season as defined below; and (v) at all other times of year, employing the least noisy and disturbing methods and over the shortest time period possible.

Western yellow-billed cuckoo	*(breeding season)*:	June 1 to August 14
	(non-breeding season):	August 15 to May 31

Western red bat	*(pupping season):*	May 15 to July 31
	(non-pupping season):	August 1 to May 14

(c) Minimizing Direct/Indirect Impacts—Leopard Frogs/Gartersnakes. Linear facility projects or structures, if any, planned or needing maintenance in riparian vegetation communities in which Chiricahua leopard frogs, lowland leopard frogs, and/or northern Mexican gartersnakes are known or assumed to occur shall be constructed or maintained either: (i) when the aquatic areas adjacent to riparian vegetation are dry, or, at a minimum, at times when hydrologic conditions in such areas ensure that leopard frogs or gartersnakes are likely not present; or (ii) during leopard frog non-breeding seasons as defined in paragraph (2)(b)(iv)-(vi) above. However: (iii) if pre-activity surveys have been conducted and no leopard frogs or gartersnakes have been found, construction or maintenance may proceed without restriction with respect to these species.

(d) Definition. For purposes of this subsection, the terms "riparian vegetation" and "riparian vegetation communities" are defined as described in Section 5.2.1.1, Subsection (B)(2)(c).

(4) Grassland Species.

(a) Minimizing Direct/Disturbance Impacts—Owls, Falcons, Prairie Dogs, Jackrabbits. Linear facility projects or structures, if any, planned or needing maintenance in grassland vegetation communities in which active western burrowing owl, Aplomado falcon, black-tailed prairie dog, or white-sided jackrabbit nests or colonies, as applicable, are known to occur in the vicinity of the planned project shall be carried out either: (i) during the owl's, falcon's, or jackrabbit's non-breeding seasons as defined below; or (ii) a minimum of 250 feet from any known active owl, falcon, prairie dog, or jackrabbit nest or colony, as applicable (if bulldozers, trenching machines, or similar equipment is used) or 200 feet from any known active owl, falcon, prairie dog, or jackrabbit nest or colony, as applicable (if such equipment is not used). However: (iii) if pre-activity surveys have been conducted and no western burrowing owl, Aplomado falcon, black-tailed prairie dog, or white-sided jackrabbit nests or colonies, as applicable, have been found, linear facility construction or maintenance activities can proceed without restriction with respect to these species.

Western burrowing owl	*(breeding season)*:	April 1 to August 14
	(non-breeding season):	August 15 to March 30
Aplomado falcon	*(breeding season)*:	February 1 to July 31
	(non-breeding season):	August 1 to January 31
White-sided jackrabbit	*(breeding season)*:	April 15 to August 14
	(non-breeding season):	August 15 to April 14

5.2.2.3 Stocktank Maintenance/Use/Repair

(A) Discussion.

Stocktanks by definition are used and frequented by livestock; in the Malpai Borderlands they are also likely to be inhabited by two of the MBHCP's covered species—Chiricahua leopard frogs (which are federally listed) and lowland leopard frogs (which are unlisted). As a result of this overlapping use (by livestock and frogs) three routine activities associated with stocktanks may result in "take" of leopard frogs and are therefore potentially relevant issues for the plan—first, use of the tanks by livestock (which results in the potential for trampling-related take); second, stocktank maintenance, especially in the case of stockponds (which must be dredged out every 5 to 10 years); and, third, stocktank repair (e.g., in the case of flood damage). Thus, the regulatory situation with respect to stocktanks (i.e., the circumstances potentially resulting in the need for coverage under the MBHCP) involve three activities (maintenance, repair, and livestock use) and two covered species (Chiricahua leopard frogs and lowland leopard frogs).

This picture is complicated by the fact that two existing ESA authorities in the Malpai Borderlands already address many, but not all, of the activities associated with stocktanks that can affect leopard frogs, and the fact that the effective term (or "lifespan") of one of these cannot reliably be determined. These complications were confronted in the course of MBHCP development during selection of the plan's covered species/covered activities lists (see Technical Workgroup meeting notes; December 14, 2004). To some extent, they return here, specifically in determining what regulatory coverage, and associated take minimization measures, with respect to stocktanks under the MBHCP might be needed in the future, if currently existing authorities should change. These various coverages, or lack thereof, are summarized in Table 5-3 and addressed in the following subsections.

Table 5-3:
Stocktank Activities Covered/Uncovered (C/U) Currently/In the Future w/ Respect to Leopard Frogs by Various ESA Authorities

Activity	4(d) Rule[1]				SHA[1]				MBHCP			
	Current[2]		Future[2]		Current[2]		Future[2]		Current[2]		Future[2]	
	Clf	Llf	Clf	Llf	Clf	Llf	Clf	Llf	Clf	Llf	Clf	Llf
Stocktank Maintenance	C	U	U	U	C[3]	U	C[3]	U	U[5]	U[6]	C[5]	C[6]
Stocktank Repair	C	U	U	U	C[3]	U	C[3]	U	U[5]	U[6]	C[5]	C[6]
Use by Livestock	C	U	U	U	C[3]	U	C[3]	U	U[5]	U[6]	C[5]	C[6]
Return to Baseline[4]	U	U	U	U	C[3]	U	C[3]	U	U	U	U	U

[1] The 4(d) rule is described at USFWS (2002), the Safe Harbor Agreement at Lehman (2004).
[2] With respect to the Chiricahua leopard frog, the term "Current" refers to the time period during which the 4(d) rule is in effect and "Future" refers to the time period after the rule has been revoked, if such a time occurs. The SHA, it is assumed, will remain in effect for 50 years.
[3] The SHA covers Chiricahua leopard frog populations that are above the "baseline" only—e.g., those inhabiting stocktanks into which they have been voluntarily introduced under the SHA.
[4] The term "return to baseline" means returning Ch. leopard frog populations to pre-enrollment levels for sites enrolled under the SHA (i.e., returning stocktanks to an uninhabited condition).
[5] Regulatory coverage for the Chiricahua leopard frog under the HCP would become effective only upon lapse or termination of the 4(d) rule but not before. See Subsection (B)(2) below.
[6] In these columns, the term "Current" refers to the time period prior to the effective date of the HCP; the term "Future" refers to the time period after that date. See Subsection (B)(1) below.

(B) Take Minimization Measures.

As seen in Table 5-3, two ESA authorities with respect to stocktank activities in the Malpai Borderlands currently exist: (a) a special 4(d) rule promulgated by the USFWS with respect to the Chiricahua leopard frog at the time the frog was listed in June 2002 (USFWS 2002); and (b) a Safe Harbor Agreement (SHA) and associated "recovery permit" for the Chiricahua leopard frog approved and issued in March 2004 (Lehman 2004) These mechanisms exist independently of the MBHCP, and, respectively: (a) exempt

from the ESA's take prohibition (in effect, authorize) take of Chiricahua leopard frogs in the course of livestock use of and maintenance activities at all existing and future stocktanks located on private, state, or tribal lands within the species' range; and (b) with respect to stocktanks enrolled in the SHA to which Chiricahua leopard frogs have been voluntarily introduced (or have dispersed into, after enrollment), authorize take as a result of maintenance, repair, conservation activities, and livestock use at such tanks, and as a result of returning such tanks to their pre-agreement "baseline conditions" (see Table 5-3).

Thus, ESA take coverage for Chiricahua leopard frogs currently exists—independently of the MBHCP—with respect to maintenance and livestock use of stocktanks throughout the range of the species (via the 4d rule), and with respect to these activities and others within SHA-covered stocktanks (which do not have existing populations of frogs at the time of enrollment). However, should either of these authorities lapse for any reason, the associated coverage would also lapse. ESA take coverage does not currently exist for lowland leopard frogs (which, although technically unlisted, is treated as if listed for purposes of the plan) with respect to either stocktank activity. Stocktank activities are therefore covered by the MBHCP with respect to lowland leopard frogs, but are not covered by the MBHCP with respect to Chiricahua leopard frogs (except as provided for in Subsection B.2 below). However, should USFWS's 4(d) rule with respect to Chiricahua leopard frogs lapse or significantly change at any time in the future (at least within the term of the plan), it is intended that the MBHCP would "step in" and take over that coverage, and would do so without any lapse in coverage.

These are the circumstances addressed by the take minimization and other measures below.

(1) <u>Lowland Leopard Frog</u>.

(a) <u>Stockpond Maintenance/Repair</u>. This subsection applies primarily to earthen stockponds, although above-ground tanks may also require occasional maintenance or repair. Stockponds must be maintained on a relatively scheduled basis (once every 5 to 10 years) and may also periodically need repair; stockpond maintenance typically consists of dredging out and removing accumulated sediment from the pond, which typically requires heavy equipment use and can have significant impacts to (including take of) leopard frogs inhabiting ponds at the time of maintenance. However, stockpond maintenance and repair activities are undertaken exclusively by individual Malpai-area ranchers, not by MBG, and are therefore outside the scope of the MBHCP—unless such ranchers enter into a VCA with MBG which addresses those activities in accordance with Section 5.6 of the plan. Accordingly, MBG will encourage Malpai ranchers to agree to the following measures through the means of VCAs; however, such agreement is voluntary and the measures below are therefore compulsory on the part of any given rancher only in the event that a VCA has been entered into.

(i) *<u>Forty-five Day Notice</u>*. Within 45 calendar days of planned maintenance of any stockpond known to support lowland leopard frogs (as determined by reference to the MBHCP's species occurrence maps; see below and Section 5.2.3.2), the Malpai rancher operating the stockpond shall provide notice to MBG, verbally or in writing, of his or her intention to commence such maintenance. Within 10 calendar days of receipt of such notice, MBG shall forward the notice, in writing, to the USFWS with a copy to AGFD or NMDGF, as applicable. The purpose of the notice is to provide USFWS (and/or AGFD or NMDGF) with the opportunity to salvage (i.e., capture and move or hold) any resident frogs during maintenance activities. If the USFWS (and/or AGFD or NMDGF) elect(s) to undertake such salvage, it will do so in accordance with paragraph (iii) below. Maintenance operations may then proceed, as applicable: (1) immediately upon salvage of the frogs; (2) immediately upon receipt by MBG or the rancher of notification from USFWS that it declines salvage; or (3) if the USFWS does not respond to the notice, immediately upon the end of the 45-day notice period; and consistently with measure (iv) below.

(ii) *Activities Subject to Notice*. (A) Stocktank maintenance and repair activities subject to this notice shall include any that result in a necessity to dry out a stockpond and/or to significantly disturb the substrate, embankments, or vegetation in and around that portion of the pond that normally holds water and supports an aquatic environment. Forty-five day notice for other maintenance activities is not required. Notice is also not required for maintenance of any stockpond not known to support lowland leopard frogs at the time of planned maintenance; nor, in such cases, are prior surveys required to establish the presence or absence of frogs. (B) However, in the course of routine use of any stockpond, the owners and/or operators of the pond will notify MBG immediately upon observing that frogs of any species inhabit the tank; and MBG, upon receiving such notice will immediately undertake efforts necessary to ensure accurate determination of the species of frog in the tank, and, if Chiricahua leopard frogs or lowland leopard frogs, will record this information on the species occurrence maps as described in Section 5.2.3.2.

(iii) *Access and Salvage/Disposition of Frogs*. In the event the USFWS (and/or AGFD or NMDGF) elect(s) to carry out leopard frog salvage, it will so inform the affected Malpai rancher within 15 days of receipt of the 45-day notice and will arrange with the rancher a suitable time to enter the ranch to carry out the salvage. The Malpai rancher will permit such entry at a time and under such conditions as he or she may specify. Leopard frogs removed from a stockpond pursuant to this subsection may, at USFWS's sole discretion, be returned to the tank at the conclusion of maintenance activities or be transported to another location, except that such frogs may not be introduced into any Malpai Borderlands ranch location not at that time already supporting either Chiricahua or lowland leopard frogs unless the affected landowner (if on private land) or ASLD or NMLO, as applicable, and the affected lessee (if on state-trust land) consent to such introduction.

(iv) *Carrying Out Maintenance Activities*. Maintenance activities at all stockponds known to support lowland leopard frogs shall, to the maximum extent practicable, be undertaken outside the leopard frog breeding season as defined below; and, to the maximum extent practicable, in the course of such maintenance, the vegetation in a small portion of the stockpond bank shall be left undisturbed as a refugium for frogs present in the pond that were not salvaged, if any.

Lowland leopard frog	*(breeding season)*:	January 15 to May 14
	(non-breeding season):	May 15 to January 14

(v) *Emergency Maintenance*. Notwithstanding the above, the 45-day notice of stockpond maintenance activities may be waived in emergency situations and corrective actions in such situations may be undertaken as needed and without delay. However, any Malpai rancher carrying out such emergency action will report the circumstances to MBG within 72 hours after the situation triggering the action has ended or been controlled, and MBG will include a brief description of those circumstances in its annual report to the USFWS. For purposes of this paragraph, an emergency situation is defined as any in which, in the sole judgment of the Malpai rancher, a stocktank is in imminent danger of destruction or significant damage as a result of fire, flood, potential breech, or similar circumstances.

(vi) *Stocktank Maintenance Records*. Any Malpai area rancher who undertakes maintenance of a stockpond under the terms of a VCA with MBG shall, within 30 days of completion of the maintenance, notify MBG verbally or in writing of the outcome of the maintenance. Such notification will include, at a minimum: (1) the date(s) maintenance was carried out; (2) an identifying name or number of the stockpond involved, if any, and a map showing its location; (3) whether or not frogs were salvaged from the pond; (4) if frogs were salvaged, their approximate

number and the location to which they were taken temporarily, if applicable, and/or permanently; and (5) the number of frogs directly impacted or taken during the maintenance activities, if known; MBG, in turn, will compile and maintain detailed written records about all stockpond maintenance activities for which written notices of intent to maintain the tank and, if applicable, notification of the outcome of the maintenance were received; such records will include, at a minimum: (6) the information described in measures (1)-(5) above; (7) the cumulative number of all such stockpond maintenance projects carried out within the subject calendar year and the number of frogs affected, if any and if known; (8) at each year's end, the cumulative number of all such stockpond maintenance projects carried out since the effective date of the MBHCP; and (9) all information described in measures (1)-(8) above, as applicable, with respect to any emergency stockpond maintenance undertaken in accordance with paragraph (iv) above.

(b) Livestock Use of Stocktanks. The MBHCP provides no specific take minimization measures with respect to livestock use of stocktanks for the following reasons: (i) because the sole function of stocktanks, from a ranching standpoint, is watering livestock, there are few if any take minimization measures that can reasonably be implemented without significantly limiting that function; (ii) this approach is consistent with the USFWS's 4(d) rule applying to Chiricahua leopard frogs, which likewise imposes no such measures; and (iii) because the biological rationale underlying the 4(d) rule (and this subsection)—that the long-term benefits stocktanks provide to leopard frogs, in terms of the availability of reliable aquatic habitat, far outweigh the relatively minor effects to the species that may result from occasional livestock-related takings of frogs—appears to justify this decision.

(2) Chiricahua Leopard Frog.

As seen in Subsection (A) above, take of Chiricahua leopard frogs as a result of livestock use of and maintenance at stocktanks in the Malpai Borderlands is currently exempted from the ESA's "take" prohibition by the USFWS's special 4(d) rule applying specifically to this species and these circumstances (USFWS 2002). However, nothing in the 4(d) rule guarantees that it will remain in effect for any particular period of time (unlike the MBHCP, which has a specific term). In short, the USFWS 4(d) rule addressing Chiricahua leopard frog with respect to stocktanks exists at the pleasure of that agency and could be rescinded or terminated at any time—the consequence of which would be that ESA regulatory exemption from take prohibition for this species with respect to stocktank-related activities would lapse.

(a) Termination of the 4(d) Rule as a Changed Circumstance. In light of the above, the MBHCP establishes conditions and measures under which termination of USFWS's 4(d) rule, should it occur, for purposes of the plan would be treated as a "changed circumstance" as defined in Section 8.2 of the plan. This means that so long as the 4(d) rule remains in effect, the MBHCP will not provide coverage for (i.e., has no regulatory effect on) stocktank-related activities as they relate to the Chiricahua leopard frog. However, should the changed circumstance of the 4(d) rule lapsing or terminating occur for any reason, the MBHCP is designed to ensure that its authorities would "take over" for those of the 4(d) rule at that time, that the Chircahua leopard frog and stocktank-related activities would thenceforth be covered for ESA purposes by the MBHCP, and that this transition would take place automatically and without interruption in regulatory coverage.

To accomplish this, the following measures are therefore established.

(i) *Coverage under the 4(d) Rule*. First, so long as the USFWS's 4(d) rule remains in effect, the MBHCP will be considered not to apply to stocktank activities as they relate to Chiricahua leopard frogs[5] and that rule alone, either in its current form or any subsequent revised form, will be

the sole applicable regulatory authority with respect to this species/activity combination. For convenience, the actual terms of the 4(d) rule are as follows:[6]

(1) *What Activities are Prohibited?* With respect to the Chiricahua leopard frog (*Rana chiricahuensis*), except as noted under paragraph (2) below, all prohibitions of 50 CFR 17.31 will apply to the Chiricahua leopard frog.

(2) *What Activities are Allowed on Private, State, or Tribal land?* Incidental take of the Chiricahua leopard frog will not be considered a violation of section 9 of the ESA, if the take results from livestock use at or maintenance activities at livestock tanks located on private, state, or tribal lands. A livestock tank is defined as an existing or future impoundment in an ephemeral drainage or upland site constructed primarily as a watering site for livestock.

(ii) *Coverage under the MBHCP if the 4(d) Rule Terminates*. In the event that USFWS's 4(d) rule is terminated at any future time, the terms described in Subsection (i) above would cease to have any regulatory effect (i.e., would cease to apply) and ESA regulatory coverage with respect to the Chiricahua leopard frog and stocktank-related activities thereafter would be provided solely by the MBHCP and its associated I.T.P. The terms and conditions established by the MBHCP applicable to Chiricahua leopard frogs and stocktank-related activities are described in Subsection (B)(2)(b) below.

(b) Take Minimization Measures under the MBHCP. In the event that the USFWS's special 4(d) rule pertaining to Chiricahua leopard frogs and stocktank activities lapses for any reason or at any future time, the take minimization measures that thereafter would apply to that species and those activities under the authorities of the HCP shall be the same as those pertaining under the plan to lowland leopard frogs as described in Subsection (B)(1) above.

(c) Notification of Revision/Termination. Under the terms of this subsection , the USFWS, should it undertake action at any future time either to revise, rescind or terminate its current 4(d) rule with respect to Chiricahua leopard frogs, agrees to provide notice to MBG in writing that the rule is to be revised, rescinded or terminated. Such notice shall be provided at a minimum at the time any proposed such action with respect to the current 4(d) rule is announced in the *Federal Register* and at the time any final action with respect to the rule is announced in the *Federal Register*.

(3) Northern Mexican Gartersnake.

Because northern Mexican gartersnakes may also inhabit stockponds, take minimization measures as described in Subsection (1) above, paragraphs (a)(ii)(B), (a)(iv), (a)(v), (a)(vi), and (b) as described above for the lowland leopard frog will also be implemented with respect to this species.

Gartersnakes are not covered by a 4(d) rule and mitigation for them is slightly different than that for leopard frogs. (1) All ground disturbing activities will occur during the active season when the snakes are likely to be active - April 1 to October 31 with temperatures from 71° to 91°F. Further optional mitigation could involve the (2) fencing of a portion of the shoreline to provide cover vegetation during the active season. This provides cover for hunting and escape. They are susceptible to predation form avian predators, frogs, and other snakes. This will also reduce harassment by providing cover.

5.2.3 Maps and Surveys

The first step in planning and managing the covered activities (except fire management) with respect to the covered species consists of determining whether any one or more of these species is present in or in the vicinity of any area in which a covered project is being planned or considered. If this is determined to be so, a second step is to identify and incorporate into the project appropriate measures to protect species determined to be present if and at the time the project is carried out. Four methods for determining species presence in areas in which the covered activities (except fire management) are planned or undertaken will be employed under the MBHCP: (1) use of the species habitat maps; (2) use of the species occurrence maps; (3) the carrying out of on-site pre-activity surveys; and (4) where appropriate, assuming species presence in a particular area and with respect to a particular activity and implementing take minimization measures accordingly based on that assumption. Of these methods, the first three will typically be used in combination with each other while the fourth represents an alternative to the other three. All are summarized briefly, as follows, and are further detailed in the following sections.

(1) Species Habitat Maps/Species Occurrence Maps. The purpose of the species habitat maps and species occurrence maps is to assist in the determination of species presence within project areas, and facilitate implementation of the MBHCP's take minimization measures, by providing reference sources for habitat, occurrence, and distribution information for the covered species.

The species habitat maps are described and shown in Section 5.2.3.1 and consist of maps broadly delineating the habitat areas of three of the MBHCP's covered species—the western burrowing owl and Aplomado falcon (of the grassland species assemblage) and the yellow-billed cuckoo (of the riparian species assemblage). The purpose of these maps is to show in general terms what areas of the Malpai Borderlands are considered or likely to be habitat for these species, what the species' distribution in the area is therefore likely to be, and where they might therefore be found in relation to given covered activities and projects. The species occurrence maps are more specific and consist of maps developed and maintained in accordance with Section 5.2.3.2 for the purpose of recording and maintaining known occurrence and distribution information in the borderlands for a specific set of the covered species, consisting of all covered grassland species, both covered riparian species, and three of the covered aquatic species.

However, neither the species habitat maps nor the species occurrence maps, by themselves, can necessarily be relied upon in determining actual species presence on a site (as the habitat maps provide information at the habitat scale only, and the occurrence maps, while more detailed, may not contain all species locations actually present on any given site at any given time). Consequently, a third method of determining species presence in the course of the covered activities—pre-activity surveys—will also be employed in making species presence determinations under the MBHCP.

(2) Pre-Activity Surveys. Pre-activity surveys will fill the need under the plan to determine actual, on-the-ground conditions within planned or proposed project areas and the actual on-the-ground status of the covered species within such areas. Pre-activity surveys will consist of reconnaissance-level, walk-over surveys of areas within which covered activities are planned or proposed, for the purpose of finding the covered species if they are present. While such surveys need not be exhaustive, they should be methodical and of sufficient duration and intensity to reasonably determine the status in a given area of the species in question. Section 5.2.3.3 and Appendix C of the MBHCP therefore contain detailed information about carrying out pre-activity surveys.

(3) Assuming Species Presence. A fourth method of determining species presence under the plan consists of waiving pre-activity surveys altogether; assuming that particular species (i.e., the ones that would otherwise have been surveyed for) are present within a project area whether this is actually known or not; and implementing take minimization measures accordingly based on that assumption. Assuming species presence therefore represents a trade-off between the cost (in time and expense) of the surveys avoided versus the cost (in time, expense, and, potentially, added work) of the take minimization measures accepted and implemented. It can also represent a biological risk, since, in some situations (e.g., if active nest sites are present in a project area), species cannot be protected from an activity if HCP planners do not know they are there. Accordingly, this approach will be employed selectively under the MBHCP (e.g., where the status of the species in question in an area is already generally known; where the costs of fully undertaking surveys clearly outweigh the costs of implementing take minimization; or where the likely effects of the activity in question do not involve direct killing or injury); and is permissible under the plan only where the option is explicitly granted.

5.2.3.1 Species Habitat Maps

Species habitat maps have been prepared for three of the plan's covered species (the western burrowing owl, Aplomado falcon, and yellow-billed cuckoo) and show, in general terms, what areas of the Malpai Borderlands are actual or potential habitat for these species and what the species' distribution in the area is likely to be. The habitat maps thus represent a "first cut," more or less, in the process of determining species presence for these species by showing whether the site of a given project or activity occurs within actual or potential habitat for the species. If this is shown not to be the case, then further efforts to determine presence for the particular species involved may be unnecessary. Accordingly, MBG, Malpai-area ranchers, and other HCP participants, as applicable, should consult the habitat maps routinely in planning covered activities and projects with respect to these species. To facilitate this, the three species habitat maps described above are shown in Map 5-1, Map 5-2, and Map 5-3 in the following pages. In addition, larger, table-sized copies of the three maps are housed in MBG's offices at the Malpai Ranch near Douglas, Arizona; in the USFWS's and AGFD's offices in Tucson, Arizona; and in NMDGF's offices in Sante Fe, New Mexico. These can be inspected at any of these offices during normal business hours upon request.

5.2.3.2 Species Occurrence Maps

The species occurrence maps consist of maps developed and maintained for the purpose of identifying, recording, and maintaining known sighting and occurrence information in the Malpai Borderlands for nine of the plan's covered species. These consist of the four covered grassland species (the western burrowing owl, black-tailed prairie dog, Aplomado falcon, and white-sided jackrabbit); the two covered riparian species (the western yellow-billed cuckoo and western red bat); and three of the covered aquatic species (the Chiricahua leopard frog, lowland leopard frog, and northern Mexican gartersnake). Like the species habitat maps, the species occurrence maps represent a reference tool for determining the status of these species in the vicinity of areas planned or being considered for covered HCP activities and projects. Because they are based on actual sighting information, furthermore, the species occurrence maps will be useful in a number of ways (e.g., by demonstrating a species' presence in a particular location of interest, by suggesting areas to be avoided in the course of particular plan activities, and by narrowing the areas within which pre-activity surveys might be needed; in some cases the information contained in the species occurrence maps may even be sufficient to render surveys unnecessary (see Appendix C). Accordingly, MBG, Malpai-area ranchers, and other HCP participants, as applicable, should consult the species occurrence maps regularly in planning MBHCP activities and projects with respect to these nine species.

(1) Development of Species Occurrence Maps. MBG shall have primary responsibility for coordinating, compiling information for, and preparing the species occurrence maps. However, to ensure timely completion and the technical adequacy of the maps, the USFWS, AGFD, and NMDGF agree, under this paragraph, to cooperate with and assist MBG in development of the maps by: (a) providing technical advice on mapping strategies and methodologies (including the extent to which individual maps may include multiple species); (b) by conveying to MBG all relevant, reasonably retrievable sighting and occurrence information for the nine affected species contained in their respective files (see below); and (c) at MBG's request (and as appropriate and feasible) by helping MBG to actually prepare the maps.

(2) Map Updates. In addition, to ensure that the species occurrence maps remain reasonably current, MBG shall also have primary responsibility for periodically updating the maps as necessary to incorporate relevant new information. The USFWS, AGFD, and NMGFD also agree to assist MBG in this task but only, in this case, to the extent specified in measures (a) and (b) of the preceding paragraph. MBG shall, furthermore, undertake such updates of the species occurrence maps bi-annually, at a minimum.

(3) Information Sources. Information sources for development of the species occurrence maps will consist of timely, relevant, and reasonably available sighting and occurrence records for these species in the Malpai Borderlands maintained or possessed by selected HCP participants and cooperators. These include, but are not necessarily limited to: (a) species sighting and occurrence records present in MBG files; (b) species information known to Malpai-area ranchers as a result of personal observations; (c) sighting and occurrence records resulting from studies and research undertaken in the Malpai Borderlands by HCP cooperators; and (d) any such information maintained in and reasonably retrievable from (i) USFWS files, (ii) AGFD files, and (iii) NMDGF files. For purposes of the MBHCP, such information will be considered timely if the observations or records on which it is based were made or collected not more than 10 years prior to the effective date of the plan.

(4) Housing/Use of the Maps. All species occurrence maps developed in accordance with the above will be housed and maintained at MBG's offices at the Malpai Ranch near Douglas, Arizona. Duplicate copies of the maps may also be maintained by participating Malpai-area ranchers, if desired, provided that any such rancher has become an HCP participant in accordance with Section 5.6 of the plan and has agreed not to distribute the maps. The species occurrence maps will not be maintained or housed in the offices of state or Federal agencies, however, because of their vulnerability in such circumstances to public release under the Federal Freedom of Information Act (in the case of the USFWS) and similar state statutes in both Arizona and New Mexico (in the case of AGFD and NMFGF). MBG considers such release to be undesirable because the species location information contained in the maps in some cases is sensitive (e.g., public release would raise the possibility of attracting unauthorized collection of some species) and because of privacy concerns of affected Malpai-area ranchers. In light of this, the MBHCP's species occurrence maps may be inspected by any legitimate HCP participant or cooperator at MBG's offices during normal business hours upon request; they may not, however, be released from MBG's care except as specified above.

5.2.3.3 Pre-activity Surveys

The third method of determining species presence—pre-activity surveys—is by far the most effective but can also be the most intensive and time consuming. However, the need to have an accurate picture of the presence and distribution of the covered species within certain project areas at times will dictate the carrying out of such surveys.

[This page reserved for Map 5-1.]

[This page reserved for Map 5-2.]

[This page reserved for Map 5-3.]

On the other hand, pre-activity surveys will be relatively limited in extent with respect to some covered activities (e.g., erosion control and fence and waterline construction), need not be undertaken with respect to others (e.g., livestock management and stocktank maintenance and use), and in all cases may be of relatively modest intensity, as their purpose is to demonstrate presence, not confirm absence. Generally, pre-burn and pre-activity surveys under the plan will consist of reconnaissance-level, walk-over surveys of sites in which prescribed fire, mechanical brush control, erosion control, and fence and waterline construction are planned or proposed in areas where the covered species likely or potentially may occur—the latter being among the things determined by reference to the species habitat and species occurrence maps. Such surveys need not be exhaustive; they should, however, be methodical, systematic, and of sufficient duration and intensity to reasonably determine the status in the area of the species in question.

To some degree, survey intensity and extent will vary depending on the species involved. For example, grassland species are relatively easy to detect but occur in vegetation communities that spread across hundreds of square miles. Riparian species, on the other hand, are harder to detect but occur in a biotic community that is highly restricted. Because of this variability, and the need for some degree of standardization among surveys, the MBHCP establishes guidelines for conducting pre-activity surveys for the plan's grassland species, riparian species, and the two leopard frogs. These guidelines appear in Appendix C of the plan. Surveys will not typically be needed for the covered fish or covered montane species. The distribution of the fish is highly restricted and already known (San Bernardino NWR); and none of the covered activities are planned in montane species habitats.

5.3 Mitigation Measures

As seen in Section 5.2, Section 10(a)(2)(A) of the Endangered Species Act requires among other things that an HCP describe the steps that will be taken to "minimize" and "mitigate" the effects of the taking provided for in the plan. Unlike take minimization measures, which are designed to reduce the amount of take, mitigation measures are designed to offset or compensate for the actual effects of take, particularly the effects of take resulting from adverse modification or loss of habitat under the ESA's "harm" definition (see Section 1.4); and conservation measures established to mitigate for such take typically consist of long-term protection of intact habitats of the affected species as a means of compensating for such habitat loss.

As seen in Section 3.1, however, the MBHCP is unusual among HCPs in that the activities covered by the plan are themselves conservation oriented, as are the majority of activities and programs undertaken by MBG (as seen in Section 1.2)—the purpose of both being to maintain and where necessary improve ecological conditions in the Malpai Borderlands; to maintain the area in a natural, undeveloped condition; and to return periodic fire to the borderlands as a functioning component of the ecology of the area. The MBHCP thus includes no activities expected to result in long-term habitat loss or degradation in the Malpai Borderlands. Nevertheless, three habitat-related issues do arise in connection with the plan: (1) those involving the limited amount of species habitat that might be temporarily adversely affected by the covered erosion control and covered ranch management activities; (2) those involving the more extensive, but still temporary, adverse habitat effects of managed fire and mechanical brush control; and (3) those involving the potentially more significant, but unlikely and unplanned, adverse effects of fire on riparian and montane species habitats should managed fire inadvertently escape into such areas. Of these effects, those resulting from the covered erosion control and ranch management activities would be so minor as to be negligible (see Section 7.1); those resulting from the covered fire management and mechanical brush control activities would be transitory (see Section 7.3); and those resulting from inadvertent escape of fire into riparian and montane areas are speculative (they may never occur), unlikely (assuming competent fire management), and would be addressed if they do occur as Changed Cicumstances (see Section 8.2).

On the other side of the equation are the likely or expected habitat benefits of the MBHCP specifically and of MBG programs generally. In particular, the effects of the MBHCP's proposed grassland improvement activities on the covered species and their habitats, while potentially adverse in the short term, are expected to be beneficial over the long term (e.g., by correcting processes, such as erosion and brush encroachment, that are detrimental to those habitats). Another MBG program, moreover—its conservation easement program—is producing immediate and dramatic conservation benefits for the covered species by protecting large portions of the Malpai Borderlands (approximately 75,000 acres to date) from development; and, while the latter is being undertaken independently of the HCP, it nevertheless, together with the grassland improvement activities (which is dependent on the HCP), illustrates the significant conservation orientation and potential of MBG programs overall with respect to virtually all aspects of the ecology and landscape of the Malpai Borderlands.

Returning, then, to the question of mitigation, three conclusions emerge from the considerations outlined above. First, while some temporary habitat modification will likely occur over the course of the MBHCP's covered activities; there will be no habitat loss. Second, considering the relatively limited extent of that modification (in either area or degree), together with the significant extent of the habitat benefits that will result from the plan, the MBHCP can be considered to be essentially self-mitigating (i.e., will provide more habitat benefits for the covered species than habitat detriments). And, third, as a result, the species conservation program established by the MBHCP need not and does not include mitigation measures of any particular kind over and above those already in effect being provided by the plan's covered activities themselves.

5.4 Monitoring

Two types of monitoring are provided for under the MBHCP: (1) compliance (or implementation) monitoring; and (2) biological effectiveness monitoring (or, simply, biological monitoring). The purpose of compliance monitoring is to ensure that the many conservation activities established by the HCP to meet the requirements of the ESA are fully and appropriately carried out (i.e., to track and verify implementation of the plan's regulatory requirements). This is accomplished under the plan primarily through coordination, documentation, and reporting (see Section 5.4.1). Biological monitoring, on the other hand, involves monitoring of two substantial sets of activities (the covered grassland improvement activities and the conservation program activities); two relatively complex issues (the biological effectiveness of the plan, and its ability to meet the species conservation objectives); and, in light of the preceding, three distinct components or parts (two biological monitoring programs and an Adaptive Management program (see Sections 5.4.2.1, 5.4.2.2, and 5.5).

5.4.1 Compliance Monitoring

Ensuring regulatory compliance with (i.e., implementation of) the MBHCP, together with monitoring such compliance, will be accomplished under the plan through a number of means. These can be categorized as: (1) compliance and monitoring efforts by MBG; (2) compliance and monitoring efforts by the USFWS; and (3) compliance efforts by Malpai-area ranchers and other HCP participants; and (4) the mechanisms of annual reporting; (5) project planning and record keeping; and (6) the functioning of the Technical Advisory Committee. Each of these is detailed as follows.

(1) Monitoring/Compliance by MBG. As the permittee under the MBHCP, MBG is the HCP participant primarily responsible for ensuring day-to-day compliance with the plan, both by itself and by

other HCP participants and cooperators acting under MBG's authority or direction. Three such responsibilities are relevant here—the responsibility to carry out its own assigned obligations and tasks under the plan; to monitor compliance with the plan by participating Malpai-area ranchers; and to monitor such compliance by certain HCP cooperators (e.g., fire control officials working on managed fires in the Malpai Borderlands, personnel undertaking biological monitoring activities, etc.). MBG therefore agrees to exercise due diligence in carrying out measures under the plan that are its direct responsibility and to ensure that measures that are the responsibility of others are also carried out. Measures currently specified by the plan to fulfill the latter obligation include those described in paragraphs (5) and (6) below (concerning the annual report and TAC, respectively). In addition to these measures, MBG will also: (a) make reasonable efforts to be present at and help direct and coordinate significant grassland improvement activities and undertakings (whenever possible; (b) will maintain regular communication with participating Malpai-area ranchers to promote and ensure compliance with active VCAs; and (c) at its discretion, will establish and undertake other compliance monitoring activities or procedures as necessary and appropriate.

(2) Monitoring/Compliance by the USFWS. As the relevant ESA authority with respect to the MBHCP (see Section 1.4), the USFWS has ultimate regulatory authority over the plan and its associated permit, and that authority encompasses both certain powers and certain responsibilities. Among the former is the authority to approve the plan and issue the permit, and, conversely, to suspend or revoke the permit (e.g., in the event of non-compliance with the plan); while among the latter is the responsibility to monitor and ensure regulatory compliance with the plan across the board—i.e., not just by MBG but by all HCP participants.. To do this, the Service must have access to sufficient information concerning such compliance, and the measures currently provided under the plan to accomplish this include, in part, a detailed annual report (see below and Section 5.8), and the pivotal role played by the agency on the TAC (see below and Section 5.7). In addition, to further facilitate compliance monitoring under the MBHCP, MBG and the USFWS jointly agree:

(a) *Request for Records*. That MBG will, upon USFWS request, make available to the agency any and all data or pertinent records maintained in MBG files relative to: (i) the carrying out, method of carrying out, or time of carrying out, as applicable, of any covered activity either by itself, by any participating Malpai-area rancher, or any other HCP participant or cooperator, as applicable; (ii) habitat or vegetation conditions of any area in the borderlands of interest to the agency; (iii) numbers, raw data, or other information, if any, pertinent to measures (i) and (ii) above; and (iv) records of correspondence or other communication between MBG and HCP participants or cooperators as applicable and of interest to the agency; and,

(b) *Procedural/Privacy Considerations*. (i) That any such request must be made in writing and allow MBG a minimum of 30 days to compile and deliver the records; (ii) that any such request must be accompanied by certification, also in writing, that any such records or information produced (some of which MBG may consider to be private or sensitive) shall not be released to the public without MBG's express written permission; however, (iii) if, at the time of such a request, the USFWS cannot or has not provided such certification, MBG shall compile but need not deliver the records, and the USFWS instead will examine the records at MBG's offices or at a similar location specified by MBG.

(3) Compliance by other HCP Participants/Cooperators. Other HCP participants, and, in some cases, HCP cooperators, also have compliance obligations under the MBHCP. These are, specifically: (a) in the case of Malpai-area ranchers, the obligations they have voluntarily accepted under active or applicable VCAs; (b) in the case of other HCP participants (e.g., AGFD, NMDGF, and NRCS), the

obligations they have accepted under the plan's associated IA; and (c) in the case of certain HCP cooperators (e.g., fire control officers), the obligations they (or their agencies) have accepted through their signature on burn or fire management plans or other written agreements with MBG. Thus, each of these entities has the responsibility to implement applicable requirements of the MBHCP as a result of these associated plan authorities.

(4) Annual Reporting. MBG's annual report to the USFWS (as described in Section 5.8 of the plan) is essentially and in effect an HCP compliance document. It provides detailed information annually concerning activities carried out under the plan in the previous year, includes information in 16 reporting categories, and represents MBG's certification to the USFWS annually that its obligations (and those, if any, of participating Malpai ranchers) are being satisfied. Preparation of the annual report also occasions a period of time each year devoted to review and summary of activities both carried out and not carried out under the plan, thus providing an opportunity for tasks that might have been overlooked to be discovered and rectified. As seen in Section 5.8, Subsections (B) and (C), annual reporting also includes elements requiring reporting about the carrying out of certain activities by, respectively, participating Malpai ranchers to MBG, and San Bernardino NWR to the USFWS and MBG.

(5) Project Planning/Record-keeping. In addition, MBG (and, to some extent, participating Malpai-area ranchers) will ensure compliance with the MBHCP in part through the mechanisms of project planning and record-keeping. The planning phase for covered projects and activities, for example (especially large-scale projects such as prescribed burns), will help accomplish plan compliance because it is at this point that many HCP measures (e.g., pre-activity surveys and take minimization measures) will be incorporated into project plans and thence into the projects themselves. Record-keeping required by the plan is also an important component of plan compliance as it preserves information relevant to limits on these activities established by the plan and to the plan's annual report.

(6) Technical Advisory Committee. The MBHCP's Technical Advisory Committee (as described in Section 5.7) is also an HCP compliance mechanism (among other things), as it is a forum for communication and coordination among the plan's principal participants, for reviewing conservation needs and directing conservation activities under the plan, and, in effect, for ensuring that the plan's conservation measures and programs are effectively carried out.

5.4.2 Biological Monitoring

Biological monitoring is a crucial HCP component, as it is the basis upon which it is determined whether the plan's biological objectives and goals are being met, whether its conservation program is effective, and whether adjustments to that program are needed through its Adaptive Management procedures.

Biological monitoring under the plan is designed to address two of the HCP's three specific objectives: (1) its grassland conservation objectives; and (2) species conservation objectives.

5.4.2.1 Grassland Conservation Monitoring

(A) Discretionary Measures.

Pursuant to the responsibility assignments described in Section 5.4.3.1 below, or subject to its own discretion, as applicable, MBG, with the assistance of other HCP participants and cooperators, will

undertake both discretionary measures (described in this subsection) and non-discretionary measures (described in the following subsection) to monitor the success of the MBHCP in meeting the grassland conservation objectives specified in Section 5.1, paragraph (1)(a) (concerning erosion control) and Section 5.1, paragraphs (1)(b)-(c) (concerning brush control and grassland restoration). At MBG's option, discretionary measures may include, but are not limited to:

(1) Erosion Control. Periodic monitoring and evaluation of the effectiveness of MBG's and Malpai-area ranchers' efforts to and correct and repair acute erosion in the Malpai Borderlands, and the success of such efforts. Monitoring measures that can be employed with respect to this objective include, but are not limited to: (a) maintenance and evaluation of vegetation transects as described in paragraph (B)(2) below; and (b) periodic visits of erosion control project sites, qualitative visual assessment of such sites (e.g., of gully elimination, floodplain restoration, and re-colonization by grasses and forbs), and photo points established at such sites.

(2) Brush Control/Grassland Restoration. Periodic monitoring and evaluation of the effectiveness and success of MBG's and Malpai-area ranchers' efforts to control or reduce woody brush species, maintain and promote restoration of grassland habitats, and maintain and re-establish the productivity of native grasses and forbs in the Malpai Borderlands. Monitoring measures that can be employed with respect to this objective include, but are not limited to: (a) maintenance and evaluation of vegetation transects as described in paragraph (B)(2) below; (b) at appropriate intervals (e.g., every 5 to 10 years), and subject to available funding, comprehensive evaluation of range conditions (e.g., soil stability, biotic integrity, and watershed function) throughout the Malpai Borderlands; and (c) evaluation of the range and extent of key vegetative indicators within the borderlands (e.g., mesquite as a negative indicator, native grasses as a positive indicator).

(3) Reporting Monitoring Results. In addition to the above, MBG shall briefly summarize the results of any monitoring carried out in each annual report it submits to the USFWS.

(B) Non-discretionary Measures.

In contrast to the discretionary measures described above, the non-discretionary measures described below are requirements of the plan and must be carried out. Two things should be noted with respect to these measures—first, that they represent existing MBG programs already being carried at the time of the MBHCP's development (and which the MBHCP has therefore incorporated as plan requirements); and, second, that the non-discretionary measures below in effect implement some of the suggested discretionary measures above. MBG shall therefore implement the following non-discretionary grassland conservation monitoring measures, with the assistance of other HCP participants and cooperators, as appropriate:

(1) Animas/MBG/RMFRS Permanent Monitoring Plots. A total of 105 permanent ecological monitoring blocks were established by the Animas Foundation on Diamond A Ranch in 1994 and have been monitored annually since to assess rangeland conditions on the ranch; 95 additional such plots (for a total of 200) have since been established and monitored on the balance of the Malpai Borderlands by MBG in cooperation with the USFS's RMFRS. Because these plots represent an excellent means of monitoring ecological conditions generally in the Malpai Borderlands, as well as the success of the MBHCP in meeting its grassland conservation objectives specifically, monitoring and maintenance of these plots shall continue to be carried out on a mandatory basis under the plan so long as funding permits and unless otherwise determined to be necessary by the HCP's TAC.

(2) NRCS Vegetation Transects. A number of Malpai-area ranchers are parties to Cooperator Agreements or CRMPs with NRCS, and included in those agreements in some cases are vegetation transects established and periodically monitored to determine rangeland conditions and trends. Accordingly, Malpai-area ranchers participating in the HCP shall, where such transects occur on their lands, continue to maintain and in cooperation with NRCS evaluate these transects (currently totaling 16 transects on 4 ranches) as a requirement of the MBHCP so long as: (a) NRCS continues to be willing to assist Malpai ranchers in maintaining and evaluating these transects; and (b) funding availability permits this. In addition: (iii) in the event that any Malpai-area ranchers wishing to become HCP participants have not previously entered into such agreements or plans with NRCS, and established such transects, they should be encouraged to do so as part of participating in the plan.

(3) Reporting Monitoring Results. In addition to the above: (a) MBG shall briefly summarize the results of monitoring of the 200 permanent monitoring plots described in paragraph (B)(1) above in each annual report it submits to the USFWS; and (b) Malpai-area ranchers participating in the HCP who have vegetation transects as described in paragraph (B)(2) above on their lands shall, by February 15 of each calendar year, prepare and submit to MBG a brief summary of the results of vegetation transect evaluations, if any, conducted in the previous calendar year, and of how those results compare to the results of previous years' evaluations. MBG, in turn, shall incorporate the information contained in transect summaries submitted to it by participating Malpai ranchers into each annual report submitted to the USFWS, as appropriate.

5.4.2.2 Species Conservation Monitoring

Pursuant to the responsibility assignments described below and in Section 5.4.3.1, MBG and the USFWS, with the assistance of other HCP participants and cooperators, as appropriate, will cooperate in undertaking measures to monitor the MBHCP's effectiveness and success in meeting the species conservation objectives concerning minimizing take of the covered species, concerning minimizing habitat modification for these species, and concerning contributing to the recovery of the species. Such measures shall consist of the following.

(A) Monitoring for Aquatic Species.

(1) Water Quality Monitoring on San Bernardino NWR. To elucidate the effects of fire management and mechanical brush control activities on habitats of the covered aquatic species (particularly the covered fish), San Bernardino NWR shall, subject to available funding and other pertinent conditions, undertake water quality monitoring in aquatic habitats on the refuge as necessary to detect such effects and determine the effectiveness of measures specified by the MBHCP to minimize adverse such effects of these activities. The specific details of such monitoring are left to the discretion of the refuge and the HCP's TAC but shall include, at a minimum and as appropriate (and providing that fire management and/or brush control activities have been undertaken in the San Bernardino Valley watershed), monitoring and evaluation of substrate sediment levels, suspended solids, dissolved oxygen, water pH levels, and other appropriate indicators of water chemistry and quality in such habitats.

(2) Monitoring/Reporting Take. In addition, San Bernardino NWR will also, concurrently with water quality monitoring as described above and in the course of day-to-day refuge management: (a) monitor aquatic habitats on the refuge and remain alert to indications of any type (e.g., above-normal numbers of dead or dying fish) that aquatic species are being killed, injured, or harmed (i.e., taken) as a result of water quality issues connected with the MBHCP's covered activities (particularly fire management and mechanical brush control); and (b) if any such specimens or indications are observed, will promptly report this in writing to the USFWS, Ecological Services Division in Tucson, Arizona and to MBG. Similarly (i.e., opportunistically in the course of livestock management, ranch management

activities, HCP survey activities, etc.): (c) other HCP participants and cooperators, as applicable, will monitor non-refuge aquatic habitats in the Malpai Borderlands (e.g., perennial streams) and remain alert to such indications with respect to the two leopard frogs and the northern Mexican gartersnake; and (d) if any such specimens or indications are observed, will promptly report this to MBG (in the case of participating Malpai ranchers and HCP cooperators), who will then promptly report it to the USFWS, or to MBG and the USFWS, Ecological Services Division (in the case of any HCP participant other than MBG or a Malpai rancher).

(3) Reporting Monitoring Results. In addition to reporting take as described in paragraph (A)(2) above, San Bernardino NWR shall also, as applicable (i.e., in any year in which such monitoring was undertaken), annually report the results of water quality monitoring as described in paragraph (A)(1) above directly to the USFWS and to MBG in accordance with Section 5.8, Subsection (C) of the plan.

(B) Monitoring for Non-aquatic Species.

(1) Monitoring of Non-aquatic Habitats. Efforts similar to those described above (for aquatic species) will also be needed to monitor the effects of the covered activities on habitats of the non-aquatic covered species. This will be accomplished in several ways: (a) with respect to all covered activities, through the monitoring plots and vegetation transects described above; (b) with respect to managed fire events, through monitoring and evaluation efforts that will typically follow such events; (c) in the unlikely event a managed fire should accidentally escape into riparian or montane habitats, through the monitoring and evaluation procedures described in Section 8.2; and (d) through other measures, if any, that MBG and/or the TAC may from time to time specify.

(2) Monitoring/Reporting Take. In addition, MBG, Malpai-area ranchers, and other HCP participants and cooperators, as applicable, will also, concurrently with the monitoring activities described above and with other activities during which monitoring can be opportunistically conducted (e.g., in the course of evaluating the results of managed fire, undertaking routine ranch operations, etc.): (a) will monitor non- aquatic habitats (primarily grasslands) and remain alert to the presence of dead, sick, or injured specimens of the covered species or indications that such species are being or have been killed, injured, or significantly disturbed or harassed (i.e., have been taken) as a result of the covered activities; and (b) if any such specimens or indications are observed, will promptly report this to MBG (in the case of participating Malpai ranchers and HCP cooperators), who will then promptly report it to the USFWS, or to MBG and the USFWS, Ecological Services Division (in the case of any HCP participant other than MBG or a Mapai rancher).

(3) Reporting Monitoring Results. MBG shall briefly summarize the results of any and all monitoring carried out as described in Subsection (B)(1) above in each annual report it submits to the USFWS.

(C) Monitoring Personnel/Reporting to the TAC/Recovery Contributions.

(1) Monitoring Personnel. All monitoring activities described in Subsections (A) and (B) above, except those undertaken opportunistically (i.e., in the course of other activities), shall be conducted by, under the direction of, or with the direct assistance of, qualified botanists, fisheries biologists, or wildlife biologists, as applicable; appropriate USFWS, AGFD, or NMDGF personnel, as appropriate; or other qualified individuals.

(2) Reporting Monitoring Results to the TAC/Adaptive Management. At each TAC annual meeting: (a) San Bernardino NWR and MBG will briefly summarize the results of monitoring activities, including the results of monitoring generally and of monitoring of take; (b) the TAC will consider those results to determine the extent to which the habitat conditions and take levels they reflect are indicative of satisfactory or unsatisfactory circumstances with regard to the effects of the covered activities on the covered species, and the effectiveness of the MBHCP's conservation measures in protecting the covered species; and (c) if determined to be significantly unsatisfactory, the TAC will also consider the need for corrective modification or revision of the conservation measures involved in accordance with the Adaptive Management procedures described in Section 5.5 of the plan.

(3) Assessing Contributions to Recovery. The task of monitoring or assessing contributions of the MBHCP to the recovery of the covered species, to the extent it is determined to be needed, is assigned solely to the USFWS, although other HCP participants (particularly AGFD and NMDGF) may assist USFWS in this task subject to their discretion.

5.4.3 Biological Monitoring Responsibilities

Biological monitoring under the MBHCP is regarded as a shared responsibility and effort by MBG and participating Malpai-area ranchers (the HCP's permittee and sub-permittees); by all other HCP participants (the USFWS, AGFD, NMDGF, ASLD, NMSLO, and NRCS); and, in some cases, by HCP cooperators working under agreement or in cooperation with MBG. Actual monitoring tasks will be undertaken subject to the availability of necessary funding; however, the permittees and HCP participants will work together, through the HCP's TAC and otherwise as appropriate, to secure funding for the monitoring program and to carry out all monitoring program tasks and elements.

5.4.3.1 Responsibilities of the Parties

Specific roles and responsibilities of MBG, participating Malpai ranchers, and other HCP participants and cooperators under the MBHCP's biological monitoring program are as follows.

(1) MBG. Will carry out: (a) the grassland conservation monitoring responsibilities specified in Sections 5.4.2.1, and the reporting responsibilities specified in Section 5.4.2.1.

(2) Participating Malpai Ranchers. Will carry out, wit assistance from MBG: (a) the grassland conservation monitoring responsibilities described in Section 5.4.2.1, consisting of monitoring NRCS vegetation transects); and will permit access to their privately-owned ranchlands for monitoring purposes as specified in Section 5.4.3.2 below.

(3) ASLD/NMSLO. Will permit access to state-trust lands as specified in Section 5.4.3.2 below.

(4) NRCS. Subject to funding availability, will assist participating Malpai ranchers in evaluating vegetation transects as described in Section 5.4.2.1, Subsection (B)(2) above, and will provide other assistance in the support of biological monitoring to the extent specified by the MBHCP through the TAC and to which it agrees.

(5) USFWS (Ecological Services)/AGFD/NMDGF. Subject to funding availability and otherwise to the maximum extent practicable, will assist in seeking and obtaining funding to support biological monitoring from their own funding programs and other programs, as appropriate, and, to the extent specified by the MBHCP through the TAC and to which they agree, will provide in-kind services (e.g.,

staff time, technical assistance, species experts, etc.) to assist in the carrying out of applicable monitoring program elements.

(6) USFWS (San Bernardino NWR). Subject to funding availability and otherwise to the maximum extent practicable, will undertake: (a) water quality monitoring in the refuge as specified in Section 5.4.2.2, Subsection (A)(1) above; (b) take monitoring as specified in the same section, Subsection (A)(2); and (c) and the monitoring reporting responsibilities specified in the same section Subsection (A)(3).

5.4.3.2 Access for Monitoring Purposes

(1) State-trust Lands. ASLD and NMSLO will grant access to the state-trust lands within their respective jurisdictions by MBG, other HCP participants (i.e., USFWS, AGFD, NMDGD, and NRCS), or the duly designated agents or contractors of these entities:

(a) *Purposes*. For the purpose of conducting: (i) any and all monitoring activities specified by the MBHCP; and (ii) any legitimate scientific research, surveys for the covered species, and similar activities not specified by the MBHCP but pertinent to it; however (iii) all such activities to be conducted on state-trust lands must have the endorsement of the USFWS and MBG.

(b) *Right of Entry (Arizona)*. The MBHCP shall serve as the Right of Entry to Arizona state-trust lands by MBG, HCP participants, or duly designated agents or contractors of MBG or HCP parrticipants conducting monitoring activities, research, and similar activites, provided that such activities are specified by the MBHCP and/or have the endorsement of the USFWS and MBG.

(2) Privately-owned Lands. Malpai-area ranchers participating in the MBHCP will grant access to their privately-owned ranchlands by MBG, other HCP participants (i.e., the USFWS, AGFD, NMDGD, and NRCS), or the duly designated agents or contractors of these entities for the purposes described in paragraph (1)(a)(i)-(ii) above, provided that: (a) written or verbal request has been provided to affected landowners a minimum of 10 calendar days prior to such entry or as otherwise provided in the MBHCP; and (ii) affected landowners have granted such permission under circumstances or conditions they may specify; however (iii) all such activities to be conducted on privately-owned ranchlands must have the endorsement of the USFWS and MBG

(3) Information Sharing. Any and all information gathered on private-owned or state-trust lands under the terms of this Section 5.4.3.2 will be made available by the party or parties collecting the information to ASLD, NMSLO, or the affected participating rancher, as applicable, upon ASLD's, NMSLO's, or the landowner's request for the information.

5.4.4 Monitoring Coordination/Priorities

Coordination of the monitoring program is assigned to the HCP's Technical Advisory Committee (see Section 5.7). Within that forum, all HCP parties will work together to marshal the resources necessary to fund and support monitoring under the plan, will seek and solicit the assistance of other HCP cooperators, as necessary, and will coordinate the carrying out of specific monitoring program activities. Given that monitoring funds and resources may be limiting, however, first priority under the program will be given to monitoring the HCP's species conservation objectives and second priority to monitoring the HCP's range conservation objectives.

5.5 Adaptive Management

Adaptive Management is a process that allows the specific terms of an HCP's conservation program to be revised and adjusted through time to ensure that the plan's objectives are being met and that the most up-to-date scientific information available is utilized by the program. In the case of the MBHCP, Adaptive Management is needed in part because there is much about the relationships between the covered species and the covered activities that is currently unclear or unknown. Such uncertainties include what effects, specifically, the plan's covered activities may have on the covered species; where and to what extent these activities may be carried out over the life of the plan; and where, in what numbers, and in what relationship to the covered activities the covered species may occur in the future. The MBHCP's Adaptive Management provisions enable the plan to respond to new information relevant to such questions, and where appropriate to incorporate such information into the HCP in a planned, structured fashion. Without this, the HCP would be a static, inflexible document.

Before turning to the specifics of the program, two points should be made. First, the Adaptive Management process essentially represents a balance between adaptability and predictability in an HCP. A central concern of the MBHCP must be the achievement of its conservation objectives (see Section 5.1), and, to meet those objectives, the plan's parties over time may periodically need to revise its terms to adjust to new information or circumstances. At the same time, the HCP's business objectives (see Section 5.1) require, among other things, that the regulatory effects of the plan on ranchers and ranching in the Malpai Borderlands are predictable and that the plan's conservation measures are operationally feasible, while its "No Surprises" assurances (see Section 8.2) limit restrictions on land use in addition to those specified by the plan that can be imposed as a result of unforeseen circumstances. The HCP's Adaptive Management program therefore is not an "open door" allowing the regulatory requirements of the plan to increase in an unrestricted fashion; rather, it seeks to allow reasonable adjustment to the HCP's conservation program as needed, while also maintaining and respecting regulatory predictability and the plan's regulatory assurances.

The second point involves the question of what, specifically, the HCP's Adaptive Management program applies to. This question arises in part in connection with an excellent discussion of the subject in Sayre (2003), in which the history, principles, and varying interpretations of Adaptive Management are discussed and a number of suggestions are made concerning Adaptive Management needs and approaches in the Malpai Borderlands. Among the scenarios considered by this author in which Adaptive Management is cited as either already taking place or to which it could be applied include grazing management, management of individual ranches, range management generally, and even livestock ranching considered economically. None of these, however, are the specific concern or province of the HCP. The range of issues and/or activities that are subject to Adaptive Management under the HCP are limited and specific, and are described in Subsection 5.5.2 below.

5.5.1 Adaptive Management Principles/Guidelines

According to Sayre (2003), Adaptive Management was intended by its originators not simply as a management approach, but as an integration of management, research, and policy formation encompassing both ecological and socio-economic issues. They specifically characterized Adaptive Management, and stressed that it be understood, in certain ways—ways that represent a shift from the manner in which both science and policy-making are typically approached. These characterizations are cogent and are adopted and paraphrased here as principles and guidelines to which the parties to the MBHCP, in the course of carrying out its Adaptive Management provisions, should make periodic reference. Thus, Adaptive Management, according to Holling (1978) and Walters and Holling (1990):

(1) Does not seek or require "scientific" precision in the conventional sense of statistical significance. In the context of ecosystem management (and, often, species management), "hard" science

in the sense of adherence to strict experimental methods is often impossible or extremely expensive to achieve. In such circumstances Adaptive Management must be designed to learn from uncertainty, and must employ "larger experiments and more crude monitoring," rather than the precise experiments typically favored by ecological researchers (Walters and Holling 1990).

(2) Does not seek static goals such as "purity" or "equilibrium." Ecosystems are recognized as intrinsically dynamic and variable; emphasis falls on maintaining the processes that sustain the resilience of the system rather than setting or achieving abstract or discrete goals.

(3) Seeks knowledge that relates to management needs. Among other things, this entails involving those who are affected in the design and implementation of policy, research, and Adaptive Management, not simply delivering results to them after the fact.

(4) Recognizes that many ecological dynamics are non-linear. And that, because of this, excessively rigid policies and management approaches can create more problems than they solve.

(5) Emphasizes learning by trial and error. In the absence of predictive knowledge, risks must be taken and "failures" treated as opportunities for learning.

(6) Must be flexible and opportunistic. Because ecosystems are dynamic, managers and researchers must be prepared to react quickly and to take advantage of transient circumstances.

5.5.2 Adaptive Management Framework

While it must be flexible and dynamic, Adaptive Management must also have a structural framework within which to function and with respect to which the parties to Adaptive Management can carry out its procedures. This is referred to as an Adaptive Management framework. In the case of the MBHCP, the components and procedures of that framework are as follows.

(1) Adaptive Management Applicability. As noted above, Adaptive Management in the context of the MBHCP *per se* (as opposed to other, broader arenas that may concern MBG and its cooperators) needs to be specified. Accordingly, Adaptive Management as described in this section of the plan applies specifically to the HCP's goals and objectives (Section 5.1), take minimization measures (Section 5.2), biological monitoring measures and programs (Sections 5.4.2 to 5.4.4), and changed circumstances provisions (Section 8.1). Adaptive Management changes to the plan might also occasion revisions to the plan's reporting requirements (Section 5.8) and funding needs (Section 6.0).
Thus, the starting point for Adaptive Management is a determination, based on the availability of new information derived from monitoring or another source, that the circumstances, conditions, or information upon which the HCP's conservation program was originally based have changed, and that some particular aspect or element of the conservation program may therefore need to be changed. The detection of such new information or such a change initiates, or "triggers," the Adaptive Management process. What results from the process is one of two final determinations—that revision of the conservation plan is not warranted, or a revision is warranted, and, in the latter case, determination of what, specifically, needs to be revised. In the latter connection it should be noted that Adaptive Management revisions can either increase or decrease the MBHCP's conservation requirements, depending on the circumstances. However, to the extent such revisions increase the plan's requirements, they must do so in accordance with its business objectives (see Section 5.1), as a practical matter, and "No Surprises" assurances (see Section 8.2).

(2) Elements of Adaptive Management. Adaptive Management under the MBHCP consists of four basic elements or steps: (a) detection of any specific change in the planning area or other information that suggests that Adaptive Management may be needed; (b) in such circumstances, an evaluation process to determine whether an Adaptive Management response or revision is actually warranted; (c) if this is found to be the case, determination of what measures the response or revision will consist of; and (d) implementation of the response or revision.

(a) *Detection*. As noted above, the starting point for Adaptive Management is the detection of new circumstances or the availability of new information that suggests that an Adaptive Management response or revision (A.M. response or revision) may be needed. Such circumstances or information may be detected or derived from two sources—the MBHCP's biological monitoring program (see Section 5.4.2), or any other relevant source (e.g., other monitoring efforts, the scientific literature, species experts, etc.). The plan's own monitoring program is particularly important in this respect as it is designed to address the plan's specific objectives, while information from other sources would likely become available on a more-or-less opportunistic basis.

(i) *A.M. triggers*. The circumstances and information described above that initiate the Adaptive Management process are referred to in the MBHCP as "Adaptive Management triggers" (A.M. triggers). A.M. triggers are defined as specific conditions, events, or information which, if reached or observed (i.e., "tripped"), signal that an A.M. response or revision may be needed. A.M. triggers that might initiate Adaptive Management under the MBHCP include, but are not necessarily limited to, the 14 specific triggers shown in Table 5-5.

(ii) *Notification*. When an A.M. trigger is detected, all HCP participants will need to be informed and appropriate action initiated. Accordingly, any HCP participant who observes or otherwise learns or believes that an A.M. trigger has been tripped will report this to all other participants (unless the participant is a Malpai rancher, in which case the rancher will notify MBG and MBG will notify other participants). The means of notification to some extent will depend on the A.M. trigger involved, will be provided within a time period appropriate to any such trigger involved (e.g., see Table 5-5) and may be delivered via written correspondence, in MBG's annual report, or verbally at any TAC meeting at which a quorum is present.

[This page reserved for Table 5-5.]

(b) *Evaluation*. Once the A.M. process has been triggered, the next step consists of evaluating the circumstances involved to determine whether an A.M. response is warranted. This may or may not be the case because the factors triggering Adaptive Management can vary widely (in terms of type, importance, effects on the covered species, etc.). A.M. triggers under the MBHCP might consist of specific events, particular conditions, or new information, for example, and any of these might be of trivial, moderate, or major relevance or significance depending on the trigger itself, the issue (or issues) represented by the trigger, and the type, status, distribution, and abundance of the species involved. It is therefore important to understand clearly the standards with respect to which Adaptive Management under the plan—and this evaluation component of the process—function.

The central standard guiding Adaptive Management under the MBHCP consists of its goals and objectives (see Section 5.1). These are segregated into three categories—the grassland conservation objectives, species conservation objectives, and business objectives. The objectives, in turn, embody three broad types of standards, which, respectively, can be characterized as ecological, biological, and economic. With respect to the question at hand—whether an A.M. response is warranted (or not warranted) in the event of the tripping of any given A.M. trigger—this must be judged against these three standards. In addition, where an A.M. response or revision is determined to be warranted, any ssuch response provided for or developed under the A.M. process must balance the three standards (i.e., must be consistent with each one).

Procedurally, two outcomes to the A.M. evaluation process are possible: (i) determination that an A.M. response or revision with respect to a particular situation is warranted and the response process would advance to the next step (see following subsection); or (ii) determination that an A.M. response or revision is not warranted and the process would terminate upon that finding. As indicated above, the reasons that the latter determination might be made are many (e.g., triviality of the circumstances, or because the generally good status of a species does not warrant a response). The benefits of the evaluation process are therefore twofold—it prevents HCP participants from being "locked in" to responding to A.M. triggers where there is little justification, and helps ensure that A.M. responses generally under the MBHCP remain commensurate with need. The A.M. evaluation process, like its response process , will be undertaken by the MBHCP's Technical Advisory Committee (TAC) in accordance with procedures described in Section 5.7, Subsection (5)(b) or (6) of the plan.

(c) Response. Once an A.M. response is determined to be warranted in accordance with paragraph (b) above, the next step is to determine the appropriate response. Three types of A.M. responses may be implemented under the MBHCP: (i) prescribed A.M. responses; (ii) collaborative A.M. responses; and (iii) optional A.M. revisions.

(i) Prescribed A.M. Response. A prescribed A.M. response is one that is already determined by the MBHCP or is dictated by other scientific or commonly accepted standards, and for which a deliberative process for determining a response is therefore not needed. In such circumstances, the response dictated by the MBHCP or the applicable standard will be implemented, unless the TAC elects to evaluate the response in accordance with paragraph (b) above and determines that another course of action is appropriate.

(ii) Collaborative A.M. Response. A collaborative A.M. response is one for which no pre-determined response is available, either in the MBHCP, the scientific literature, or other sources, and for which a deliberative process by the MBHCP's participants (through the TAC) must therefore be employed to determine a response that is biologically effective and consistent

with the plan's regulatory assurances. Collaborative A.M. responses will be determined by the TAC in accordance with Section 5.7, Subsections (5)(b) or (6).

(iii) Optional Adaptive Management Revision. An optional A.M. revision is any adjustment to the MBHCP's conservation program determined to be desirable by the TAC independently of the type of specific new information that typically trigger A.M. responses. This is therefore a general A.M. response category that allows the HCP participants to act, within the context of Adaptive Management, solely on their own collective judgment. Like collaborative A.M. responses, optional A.M. revisions will be determined by the TAC in accordance with Section 5.7, Subsections (5)(b) or (6).

(d) *Implementation*. Once a specific A.M. response or revision has been crafted and agreed to, that response/revision must be documented in the MBHCP's administrative record, announced to all HCP participants, and implemented by the participants affected. Documentation of A.M. responses/revisions may consist of pertinent TAC meeting records, written correspondence, or any other form acceptable to all plan participants, but must include, at a minimum, a description of: (i) the specific previous MBHCP measure(s) affected or changed by the A.M. response/revision, if any; (ii) the specific new measure(s) required by the MBHCP as a result of the A.M. response/revision; and (iii) what HCP participants must implement the response/revision or how HCP participants are otherwise affected by the new measure(s). Such documentation will be distributed to all HCP participants (meaning all signatories to the plan's IA) plus all participating Malpai-area ranchers within 30 calendar days following the effective date of the TAC's decision on the matter; it will also: (iv) with respect to MBG and the USFWS, be maintained in the respective administrative files of these entities; and (v) with respect to participating Malpai ranchers, be maintained as an attachment to or component of each rancher's VCA, where applicable (see following section).

(e) Permit Amendments Associated with A.M. Responses/Revisions. In some cases, A.M. responses or revisions may occasion the need for an amendment of the MBHCP's associated I.T.P. in accordance with Section 9.1 of the plan. Whether or not such an amendment is needed will be the sole decision of the USFWS.

Once an Adaptive Management response has been duly enacted in accordance with the procedures described above and in Section 5.7, Subsection (5)(b) or (6), any change to the MBHCP's conservation measures resulting from the response thereafter will represent a change to the legal requirements of the plan and will need to be implemented by all affected HCP participants (i.e., all parties that carry out covered activities or are responsible for conservation measures and are affected by the change).

5.6 Rancher Participation in the HCP

Individual ranchers in the Malpai Borderlands have a somewhat curious relationship to the MBHCP. They are, on the one hand, the sole practitioners of an entire category of the HCP's covered activities (the ranch management activities); play a key role in the carrying out of certain fire management measures under the plan; collectively own over 50 percent of the land area in the borderlands and help manage another 25 percent (see Table 2-1); are the ultimate benefactors of nearly all MBG activities; and yet, on the other hand, they are not ordinarily subject to or bound by the requirements of the MBHCP (as is MBG) nor are direct beneficiaries of its regulatory protections. However, all Malpai ranchers have the option to participate in the plan voluntarily, thereby can become a party to the plan's obligations and benefits, and have a range of options to choose from in terms of the level, degree, and/or timing of participation. Or, if they prefer, they can elect not to participate in the plan.

Malpai-area ranchers therefore have great latitude in determining their relationship to the MBHCP, and how many will sign onto the plan and to what extent cannot be precisely known. Generally, however, it is expected that many ranchers will participate in the plan, in part because they will see this as being in their personal interests (i.e., with regard to the plan's regulatory protections); in part, because they will wish to support the conservation "spirit" of the plan. The purpose of this section, therefore, is to establish clear conditions and procedures under which individual Malpai ranchers may become HCP participants if they elect to do so.

5.6.1 Types of Participation

Individual Malpai-area ranchers can elect to participate in the MBHCP in one of two ways. One of these is incentive-based and is tied to the assistance MBG occasionally provides to its member ranchers. The other is not associated with MBG assistance and is purely voluntary. Both are described in detail in this section and are shown in Table 3-1.

(1) Assistance-based Participation. MBG assists Malpai-area ranchers with activities and projects on their lands in a number of ways, including economic assistance (e.g., cost-sharing), technical assistance (e.g., in designing projects), program development and coordination (fire management, for example), and cooperative implementation of projects (e.g., construction of erosion control structures). For two reasons, any such assistance to ranchers by MBG, where it involves the MBHCP's covered activities, is considered to represent a matter of importance to the plan's purposes—first, because how an activity undertaken as a result of MBG assistance affects the covered species depends in part on how it is carried out; and, second, because MBG has an affirmative responsibility to minimize the effects of the covered activities on the covered species. Accordingly, with respect to MBG providing economic, technical, or program assistance to Malpai-areas ranchers for carrying out the covered grassland improvement activities or covered ranch management activities, and to Malpai-area ranchers receiving such assistance, the MBHCP establishes the following two options:

(a) *Receipt of MBG Assistance/MBHCP Participation Required.* Under this option, any Malpai-area rancher may elect to receive MBG assistance of one or more of the types described above, but, as a condition of receiving such assistance, must, under the terms of this Subsection (1), agree to enroll in and "participate" in the HCP (as the term is defined below). To this extent, therefore, participation in the MBHCP by individual Malpai-area ranchers is mandatory.

(b) *No Receipt of MBG Assistance/MBHCP Participation Not Required.* Notwithstanding the above, however, Malpai-area ranchers can still elect not to participate in the MBHCP, if that is their wish, by simply not seeking or accepting MBG assistance for projects on their lands involving the covered activities. In practical terms, such ranchers would therefore either forego such projects with respect to which they might otherwise have sought MBG assistance, or, to the extent feasible, would have to undertake such projects on their own, without the regulatory coverage of the I.T.P.

(2) Voluntary Participation. Malpai-area ranchers can also "participate" in the MBHCP irrespective of the question of MBG assistance by simply deciding that they wish to do so. As seen above, this they might do because they wish to obtain the regulatory protections of the plan or simply because they wish to support the conservation "spirit" of the plan. In any case, whether a given Malpai rancher participates in the MBHCP or does not participate is at the sole discretion of the rancher.

(3) Rules/Conditions of HCP Participation. In making the decisions allowed for under Subsections (1) and (2) above (i.e., respectively, whether to accept MBG assistance on the condition of MBHCP

participation, or whether to participate voluntarily), Malpai-area ranchers need an understanding of what MBHCP participation means, the scope of participation available to them, and the relative costs and liabilities of participating in the plan versus not participating. The latter topic (costs vs. liabilities) is discussed in Section 3.2.2.2 of the plan.

(a) *Definition of Participation*. Election by any individual Malpai rancher to "participate" in the MBHCP means two things: (i) that the rancher so deciding agrees to implement the conservation measures specified by the plan that are applicable to the activities for which he or she has decided to participate; and (ii) that the rancher so deciding also obtains the regulatory protections of the plan and its associated I.T.P., including authorization for any incidental take of the covered species that occurs as a result of those activities. Thus, participating in the HCP means accepting its responsibilities and obtaining its benefits.

(b) *Enrollment in the HCP*. Once a particular rancher has decided to participate in the MBHCP, "enrollment" in the plan is effected through two written documents established specifically for the purpose. These are described in Section 5.6.2 below and consist of: (1) a Voluntary Conservation Agreement; and (2) a Certificate of Inclusion (which is treated as an attachment to the VCA). Once the enrollment process is completed (i.e., upon the execution of these documents), the enrolled rancher becomes an HCP participant, as the term is defined in Section 3.2.1. Subsection (2) (and, in effect, a sub-permittee to MBG's I.T.P.) and is obligated by the VCA, the COI, and applicable portions of the MBHCP specified in the VCA. The rancher, in addition, remains under these obligations for the period of time specified by the VCA's conservation term, except as otherwise provided for in Section 9.2.

(c) *Availability/Scope of HCP Participation*. Participation in the MBHCP is available to both MBG-member ranchers and ranchers who are not MBG members within the covered area. In addition, any Malpai-area rancher may enroll and participate in the MBHCP: (1) with respect to all sets, any individual set, or any combination of sets of the covered ranch management activities; (2) with respect to both sets or either set of the covered erosion control activities or the mechanical brush control activities; (3) in the case of fire management, with respect to any activities that MBG carries out in cooperation or partnership with individual ranchers; (4) with respect to any individual project or combination of projects; and (5) for any reasonable time period.

5.6.2 Voluntary Conservation Agreements/Certificates of Inclusion

As noted above, two documents are employed to effect participation in the HCP by Malpai-area ranchers: (1) Voluntary Conservation Agreements (VCAs); and (2) Certificates of Inclusion (COIs). Although individual documents, these work together and the latter is treated for purposes of the MBHCP as an attachment to the former. Participation in the MBHCP is therefore effected through a VCA (or through a VCA with an attached COI).

(A) Voluntary Conservation Agreements.

In the context of the MBHCP, a Voluntary Conservation Agreement (VCA or agreement) represents the mechanism by which a Malpai-area rancher's decision to participate in the HCP (i.e., to become an HCP participant) is documented and formalized; by which the details of the commitment(s) made by the rancher under the agreement (i.e., the specific MBHCP conservation measures the rancher agrees to implement) are identified; and by which those commitments are placed into a legally enforceable form. Thus, VCAs under the plan serve a roughly equivalent role with respect to Malpai-area ranchers as the MBHCP itself serves with respect to MBG, and the MBHCP's Implementing Agreement (see Section

3.6) serves with respect to all other plan parties (similarly, as will be seen, the COI serves a roughly equivalent role with respect to Malpai ranchers as the I.T.P. serves with respect to MBG). However, compared to the HCP, VCAs encompass a relatively limited scope—consisting, typically, of a single ranch and rancher or ranching family, a particular set of covered activities, and an associated set of conservation measures.

VCAs will typically involve just two parties (and signatories)—MBG and the Malpai rancher enrolling and participating in the plan through the VCA. A possible exception to this would be if multiple ranchers should, for some reason, decide to participate in the plan under one VCA. However, none of the wildlife regulatory agencies (USFWS, AGFD, or NMDGF) are required to be signatory to VCAs, nor is their review of individual VCA's prior to signature by MBG or the affected rancher required. Thus it can be seen, in light of these conditions and those described in paragraph (3)(d) above, that the process of enrolling and participating in the MBHCP is both simple (involving just two documents with two signatories each) and flexible (allowing for broad discretion in selecting the scope of participation). This is deliberate, as it will encourage participation in the plan in the same way that a complicated and restrictive process would discourage such participation.

(1) MBHCP Enrollment/VCA Development/VCA Terms. When an individual Malpai-area rancher is interested in enrolling and participating in the MBHCP, he or she should notify MBG of this interest verbally or in writing; MBG and the rancher will then work together to determine the specific elements and scope of that participation. Four specific such elements must be identified in a VCA:

(a) *The Covered Area*. As with the MBHCP, VCAs must specify an area to which the agreement applies. This may be, depending on the circumstances, the privately-owned lands on a given ranch, the state-trust lands on a ranch, both privately-owned and state-trust lands, or an area of a ranch determined by a specific project or activity. It is also permissible for two or more ranchers to participate in and enroll lands in the MBHCP jointly under a single VCA, in which case the above would still apply but to more than one ranch.

(b) *The Covered Activities*. The specific activities with respect to which the rancher is enrolling in the MBHCP (i.e., the activities covered by the agreement) must also be specified. As seen in Section 5.6.1, Subsection (3)(d) above, this can be virtually any set or combination of sets of the MBHCP's covered activities.

(c) *Required Conservation Measures*. The conservation measures required by a VCA consist of two types of measures specified in the MBHCP and potentially applicable to the VCA: (i) take minimization measures; and (ii) other conservation measures.

(i) *Take Minimization Measures*. The take minimization measures required by a VCA consist precisely of the measures specified by Section 5.2 of the MBHCP that apply to the covered activities with respect to which a rancher is enrolling in the plan—no more, no less. These can be expressed in the VCA in terms of the section numbers and subsection numbers specified by the MBHCP that encompass the measures applicable to the covered activities. Thus, for example, if the activity enrolled in the MBHCP consists of a single fenceline project expected to traverse grassland habitat only, the conservation measures required by the VCA would consist of all measures specified in Section 5.2.2.2, Subsection (3) of the plan, and all applicable measures specified in Section 5.2.2.2, Subsection (1).

(ii) *Other Conservation Measures*. Other conservation measures required by a VCA consist of those MBHCP measures that are not take minimization measures and that are

specified by the plan as being applicable to Malpai-area ranchers. These consist primarily of the agreement by Malpai ranchers to permit access by HCP participants and cooperators to their lands for the purposes of monitoring and study (see Section 5.4.3.2) and certain monitoring and reporting requirements applying to Malpai ranchers (see Section 5.4.3.1, Subsection 2, and Section 5.8, Subsection B).

(d) *Conservation Term*. The last VCA element that must be specified is the conservation term of the agreement (i.e., the time period during which the VCA will be in effect). Requirements for this VCA element are described in the Subsection (2) below.

The specifics of each of these VCA elements, with the exceptions specified in the following paragraph, are ultimately the decision of the enrolling rancher so long as they are not inconsistent with the purposes, goals, or requirements of the MBHCP. However, MBG will assist the rancher in determining VCA terms that meet the rancher's goals and are generally consistent with the MBHCP.

Finally, to facilitate preparation of VCAs, the MBHCP provides a pre-approved "template" agreement that can be used in preparing actual VCAs. The template includes all required features of a VCA document except the particulars involved in any given rancher's enrollment; the latter, however, can simply be filled in to complete the document, at which point it is ready for signature. A similar pre-approved "template" COI is also provided. Both are shown in Appendix D of the MBHCP.

(2) VCA Terms. Notwithstanding the latitude reserved to Malpai ranchers in determining the terms of MBHCP participation (see above), the following conditions with respect to those terms are, unless otherwise indicated, non-discretionary and must be observed in all VCAs:

(a) *All Applicable HCP Measures Must be Included in the VCA*. This means that all conservation measures specified by the MBHCP that apply to any particular covered activity included in a VCA must also be included in the agreement (including applicable monitoring and reporting measures). Thus, while it is permissible to include in a VCA the conservation measures applying to one particular covered activity but not other covered activities, it is not permissible to include in the VCA some MBHCP measures that apply to a particular activity but not others. A rancher that chooses to participate may select which activities he/she wishes to participate in under the HCP, but with those elected activities come all the mitigation and minimization measures that are associated with activities that are selected by the rancher.

(b) *Determining the Conservation Term*. Regarding the conservation term specified in a VCA, no such term may be less than that minimally necessary to carry out the project or projects, or activity or activities, with respect to which the rancher is enrolling in the MBHCP, or more than the 30-year term of the plan. A suggested (but not required) conservation term for VCA's that are not limited to single or individual projects is five (5) years, as such a term is sufficiently long to be effective and meaningful, but sufficiently short to represent a comfortable commitment on the part of the affected rancher. Longer or shorter conservation terms are permissible, however, except as specified above.

(B) Certificates of Inclusion.

In the context of MBHCP enrollment and participation (and a VCA), COIs serve the purpose of extending the regulatory protections of the MBHCP's associated I.T.P. to the participating rancher. Thus, COIs under the plan serve a roughly equivalent role with respect to Malpai-area ranchers as the I.T.P. itself serves with respect to MBG. Another way to look at the relationships between these various elements is

that the VCA addresses the responsibility side of MBHCP participation by Malpai ranchers, and the COI addresses the benefit site.
In any case, a COI under the plan consists of a simple one-page document, a "template" for which is provided in Appendix D. All that needs to be done by MBG and the enrolling rancher to complete a COI is fill in a few, simple information blanks in the template and sign the document. However, a COI is valueless without an accompanying VCA (and a VCA provides no regulatory protection without an accompanying COI). Consequently, as previously noted, the two documents work together and should be viewed and maintained as a combined pair, with the COI being treated as an attachment to the VCA.

5.7 Technical Advisory Committee

Implementing the MBHCP's conservation program from time to time will involve a variety of technical issues and considerations (e.g., the adequacy of a particular conservation measure, what specific monitoring methods to use in this case or that, etc.). Such questions will often be outside the expertise of MBG, Malpai-area ranchers, and other HCP cooperators, who, nevertheless will have an important stake in such questions and their outcome. In light of this, MBG will establish an advisory committee for the MBHCP to assist MBG in carrying out the conservation program specified by the plan. The name of this committee will be the Malpai Borderlands Technical Advisory Committee, or Technical Advisory Committee (TAC) for short.

(1) TAC Purpose/Responsibilities/Relationship to the SAC. The TAC will play a critical role in the HCP as it will function as the plan's technical and scientific advisory body, its primary decision-making arm, and a cooperative forum for airing and considering important HCP issues that may arise in the future.

The purpose and responsibilities of the TAC are specifically to:

(a) Advise and assist MBG and Malpai-area ranchers on all technical issues arising as a result of or in the course of implementation of the MBHCP;

(b) Function as the primary coordinator and clearinghouse for the MBHCP's monitoring program by: (i) overseeing implementation of the monitoring activities specified by the plan; and (b) tracking monitoring and research activities taking place within the Malpai Borderlands pertinent to the MBHCP that are carried out independently of the plan or by non-HCP participants;

(c) Provide a forum for: (i) discussing and evaluating conditions, events, or information triggering the possible need for an Adaptive Management response or revision to the plan; and (ii) where necessary or appropriate, determining the specifics of any such response or revision;

(d) Provide a forum in which new monitoring or scientific information pertinent to MBHCP implementation can be introduced and discussed, and funding to support monitoring activities (see Section 6.0) can he coordinated and administered; and,

(e) Undertake other tasks or duties as may from time to time arise in the course of MBHCP implementation or which may be delegated to the TAC in accordance with subsection (4) below.

(2) TAC Core Membership. At a minimum, the TAC will be comprised of one representative each from: (a) the MBHCP permittee (MBG or MBG's authorized designee); (b) the MBHCP's permitting agency (USFWS, Ecological Services Division); (c) San Bernardino NWR; (d) AGFD, NMDGF, and NRCS; and (e) ASLD and NMSLO, if they so choose. These representatives constitute the TAC's "core

membership" or "core members." MBG will be considered to represent participating Malpai-area ranchers on the TAC; however, any participating such rancher may, if he or she chooses, observe TAC meetings.

(3) Other TAC Members. Additional individuals may be included in the TAC, or invited to attend TAC meetings, as determined to be necessary or appropriate by its core members. Such individuals include, but are not necessarily limited to, legal advisors; recognized experts in any of the MBHCP's covered species; experts in range management or improvement, fire management, wildlife monitoring, or other pertinent disciplines; and individuals conducting specific monitoring, research, or other projects or activities within the Malpai Borderlands. Although not considered core members, the function of this group of TAC members or attendees is to provide technical expertise in issues pertinent to MBHCP implementation.

(4) TAC Procedures/Protocol.

(a) *Annual Meeting*. The TAC will meet, at a minimum, once annually at a time specified in accordance with the TAC protocol described in paragraph (c) below.

(b) *TAC Chair/Responsibilities of Chair*. (i) The MBG core member will function as the TAC Chair and will preside at all TAC meetings; additional responsibilities of the TAC Chair, unless otherwise specified by the TAC protocol, are to: (ii) announce the time and location of the annual meeting a minimum of 21 calendar days in advance of the meeting; (iii) announce the time and location of other regularly-scheduled meetings and arrange and announce non-regularly scheduled meetings as appropriate; and (iv) maintain a written record of TAC meetings.

(c) *TAC Protocol*. Within 120 calendar days of the effective date of the MBHCP, the TAC's core members will meet for the purpose of developing a written protocol for TAC operations and procedures. The protocol will specify: (i) a schedule for the TAC annual meeting; (ii) schedules for other regularly-scheduled meetings, as needed; (iii) the duties of the TAC Chair if different than those specified in paragraph (b) above, measurers (ii)-(iv); (iv) the duties, if any, of other TAC core members and non-core members in carrying out TAC business; (v) the duties and responsibilities of the TAC generally, if different than those specified in Subsection (1) above; (vi) what constitutes a quorum for holding TAC meetings and conducting TAC business; (vii) procedures for receiving and responding to requests for technical and other assistance from the TAC by participating Malpai-area ranchers; and (vii) such other TAC operations or procedures as the TAC core members may determine to be necessary or desirable.

(d) *Protocol Approval/Revisions*. The TAC protocol described above shall be completed and approved by the mutual consent of TAC core members no later than 180 calendar days following the effective date of the MBHCP. The protocol may thereafter be amended from time to time and as necessary by the mutual consent of the TAC core members.

(5) TAC Decision-making Procedures. Three types of decisions from time to time will need to be made by the TAC: (a) decisions concerning the operation and procedures of the TAC; (b) technical decisions concerning the timing, scope, location, means of implementation, etc. of the MBHCP's species conservation and monitoring activities; and (c) decisions concerning Adaptive Management responses or revisions under the plan's Adaptive Management program. Decisions concerning TAC operations will be made in accordance with subsection (4) above. All other decisions will be made as follows.

(a) *Technical Decisions*. Whenever, in the course of MBHCP implementation, a technical question requiring a specific decision arises, the TAC Chair will ensure that opportunity for discussion of the circumstances involved among a quorum of its members is provided, and that all interested parties present in that quorum have an opportunity to be heard. Subsequent to discussion, TAC core members will make every reasonable effort to reach a decision with the respect to the question by mutual consent. If and when mutual consent is achieved, the decision so determined will be implemented. If, however, mutual consent is not or cannot be achieved, the decision will be made in accordance with paragraph (b), item (ii) below.

(b) *Adaptive Management Decisions*. From time to time, decisions concerning Adaptive Management responses or revisions will need to be made (see Section 5.5.2). As seen in Section 5.5.2, Adaptive Management responses and revisions can be major or minor, but, where they are made can constitute changes to the MBHCP's legal requirements and can significantly affect the biological interests of the covered species, the biological functioning of the plan generally, and the economic interests of MBG and participating Malpai ranchers. Adaptive Management decisions are therefore crucially important and will be made as follows.

(i) *Decision by TAC Consent*. Whenever an Adaptive Management decision is brought before the TAC, the TAC Chair will ensure that opportunity for discussion of the circumstances involved among a quorum of its members is provided, and that all interested parties present in that quorum have an opportunity to be heard. Any such discussion will include, as a requirement of the MBHCP, consideration of both the HCP's species conservation objectives and its business objectives (see Section 5.1). Subsequent to this discussion, TAC core members will make every reasonable effort to reach a decision by mutual consent. If and when mutual consent is achieved, the decision so determined will be implemented in accordance with Section 5.5.1, Subsection (4).

(ii) *Decision by MBG/USFWS Consent*. If, however, mutual consent by all TAC core members is not or cannot be achieved, as determined by the TAC Chair, the decision will be made by the mutual consent of the MBG core member and the USFWS core member only. Under this process, all TAC members or attendees (core or non-core) shall be allowed to present their points of view with respect to the decision being made. In addition, MBG and participating Malpai ranchers may consult as necessary among themselves to reach their own consensus and will be allowed sufficient time to do this. Ultimately, however, under the process described in this paragraph, the decision will be made by MBG and the USFWS alone, and, if and when MBG/USFWS consensus is achieved, the decision so determined will be implemented. In the event, however, that MBG and the USFWS are also unable to reach a decision by consent, the decision at issue will be submitted to dispute resolution as described in subsection (6) below.

(iii) *Administrative Records*. MBG and the USFWS will maintain a written record of the results of all Adaptive Management decisions made pursuant to this subsection (5) in accordance with Section 5.5.1, subsection (4).

(iv) *Adaptive Management Responses/Revisions are Binding*. All Adaptive Management responses or revisions made in accordance with this subsection or subsection (6) below represent legally binding changes to the MBHCP's requirements and must be implemented by affected HCP participant(s), as applicable.

(6) Dispute Resolution Procedures. Notwithstanding the above, the HCP participants recognize that disputes or disagreements concerning MBHCP implementation—especially with respect to Adaptive

Management responses and revisions, and balancing the plan's species conservation objectives with its business objectives—may, from time to time, arise. In light of this, the MBHCP provides for dispute resolution procedures which may be implemented where: (a) MBG and the USFWS, despite good faith efforts, are unable to reach agreement on a particular Adaptive Management response or revision in accordance with subsection (5) above; or (b) any other dispute or disagreement among the HCP participants with respect to MBHCP implementation or requirements has not otherwise been resolved under the normal procedures described in subsection (5) above. These dispute resolution procedures are set forth in detail in Section 12.5 of the MBHCP's IA (see Appendix B).

5.8 Reporting

(A) Reporting by MBG.

MBG, as the permittee under the MBHCP, will submit to the USFWS at the beginning of each calendar year a written report describing the grassland improvement activities, ranch management activities, monitoring activities, and other conservation measures or activities, as applicable, that were conducted or carried out under the MBHCP in the previous calendar year. This report will be due, with respect to the previous calendar year, by March 15 of each year throughout the MBHCP's 30-year term, except that if the MBHCP is approved after July 1st of its first calendar year, activities implemented in that year may be reported in the following year's report. Each annual report submitted by MBG will include, with respect to the preceding calendar year, a summary of:

(1) All records maintained concerning prescribed burns, prescribed natural fires, and wildfires that occurred in the year, by watershed, as described in Section 5.2.1.1, Subsection (B)(1)(d) of the plan;

(2) All records maintained concerning erosion control activities or projects that occurred in the year as described in Section 5.2.1.2, Subsection (1)(b) of the plan;

(3) All records maintained concerning mechanical brush control activities or projects that occurred in the year as described in Section 5.2.1.3, Subsection (2)(b) of the plan;

(4) All pertinent information concerning actions, if any, undertaken by MBG or Malpai-area ranchers in the year in accordance with Section 5.2.2.1 (in the latter case, under the terms of VCAs) to protect riparian or streambed habitats on lands, respectively, in the Malpai Borderlands generally or on lands owned by the rancher undertaking the measures, such information to include, at a minimum, a brief description of: (a) the measures that were carried out; (b) the specific areas affected by such measures; and (c) the date(s) such measures were carried out;

(5) All records maintained by Malpai-area ranchers as described in Section 5.2.2.2, Subsection (1)(c) of the plan and reported to MBG as described in Subsection (C) below concerning linear facilities construction projects undertaken by such ranchers under the terms of VCAs that occurred in the year;

(6) All records maintained by Malpai-area ranchers as described in Section 5.2.2.3, Subsection (B)(1)(a)(v) of the plan and reported to MBG as described in Subsection (C) below concerning stocktank maintenance activities undertaken by such ranchers under the terms of VCAs that occurred in the year;

(7) Activities, if any, covered by the plan and carried out by MBG, MBG cooperators, or Malpai-area ranchers not addressed in paragraphs (1) through (6) above;

(8) A list of the names and addresses of Malpai-area ranchers who, during the subject year, entered into VCAs with MBG with respect to activities specified by the ranchers, together with: (a) the effective dates of any such VCAs and the termination dates; (b) the activities to which the agreements apply; (c) a list of all such ranchers who, during the subject year, terminated their agreements in accordance with Section 9.2, subsection (2) of the MBHCP; and (d) a list, as of the end of each calendar year, of all Malpai–area ranchers then participating in the MBHCP;

(9) All discretionary grassland improvement monitoring, non-discretionary grassland improvement monitoring, and species conservation monitoring activities: (a) as described, respectively, in Sections 5.4.2.1, Subsection (A)(1)-(2); Section 5.4.2.1, Subsection (B)(1); and Section 5.4.2.2, Subsection (B)(1); and (b) as required by, respectively, Section 5.4.2.1, Subsection (A)(3); Section 5.4.2.1, Subsection (B)(3), and Section 5.4.2.2, Subsection (B)(3);

(10) Technical Advisory Committee (TAC) meetings that occurred in the year, together with any changes to TAC membership, operating protocols, or responsibilities that were implemented in accordance with Section 5.7, Subsection (4) in the year; in addition, all written records of the year's TAC meetings will be attached to the annual report;

(11) Any significant issue addressed or decision made by the TAC during the year, including: (a) any conditions or events that triggered an Adaptive Management (A.M.) response or revision in that year; (b) what the A.M. response or revision consisted of, if any or if determined; and (c) all pertinent information pertaining to any such issue or issues;

(12) Occurrence(s) in the year of incidental take of individual specimens of the covered species, if any and if known as a result of monitoring activities described in Section 5.4.2.2, Subsection (B)(2), and, with respect to each such taking: (a) the date(s) the taking occurred; (b) the species involved; (c) the number of specimens taken, if known, and (d) the activity or activities being conducted or carried out when the taking occurred; and, in addition and in accordance with paragraphs (1) through (6) above, the number of acres, to the extent determinable or known, affected by each of the plan's six sets of covered activities;

(13) Any relevant new information known to MBG or reported to MBG by Malpai-area ranchers or other HCP participants or cooperators concerning the occurrence, location, distribution, nesting, etc., as applicable, of the covered species within the Malpai Borderlands; and,

(14) Any other pertinent, available, or important information concerning the carrying out of the MBHCP's covered activities and conservation program activities, the status of the covered species in the Malpai Borderlands, range or habitat conditions in the Malpai Borderlands, or other relevant information.

(B) <u>Reporting by Malpai-area Ranchers</u>.

The MBHCP also assigns certain reporting requirements to individual Malpai-area ranchers who have become HCP participants in accordance with Section 5.6 of the plan. Such ranchers will report the information for which they are responsible to MBG, and MBG, in turn, will incorporate that information into its annual report to the USFWS as described above. Accordingly, by February 15 of the year following any year in which they were HCP participants under the terms of a VCA, participating Malpai-area ranchers will summarize the following information in writing and submit it to MBG:

(1) All linear facility construction projects undertaken by such ranchers in the year as described in Section 5.2.2.2, Subsection (1)(c) of the plan;

(2) All stocktank maintenance activities undertaken by such ranchers in the year as described in Section 5.2.2.3 of the plan, Subsections (B)(1)(a)(v)-(vi), (B)(2) as applicable, and (B)(3);

(3) The results of transect evaluations undertaken in the year (or over a two-year period, as applicable) and of how those results compare to the results of previous years' evaluations, as described in Section 5.4.2.1, Subsection (B)(2); and,

(4) The results of monitoring of take, if any, as described in Section 5.4.2.2, Subsection (B)(2).

(C) Reporting by San Bernardino NWR.

Finally, as described in Section 5.4.2.2, Subsection (A)(3), San Bernardino NWR will submit to the USFWS directly, and also to MBG, a brief written report summarizing water quality monitoring measures conducted or carried out on the refuge in the year in accordance with Section 5.4.2.2, Subsection (A)(1), and the results, if any, of monitoring of take in accordance with Section 5.4.2.2, Subsection (A)(2). This report will be due, with respect to the previous calendar year, by March 15 of each year throughout the HCP's 30-year term or as otherwise applicable, except that if the HCP is approved after July 1st of its first calendar year, activities implemented in that year may be reported in the following year's report.

6.0 Funding

Section 10(a)(2)(B) of the ESA requires that an HCP proposal ensure that funding adequate to implement all conservation commitments and measures established by the plan will be provided. Accordingly, in this section, the activities under the MBHCP that require funding are summarized, the means of the principal HCP participants responsible for funding the activities is described, and a range of actual or potential additional funding sources is identified.

(A) Activities Requiring Funding.

Generally, the components and measures of the MBHCP that require funding, and the MBHCP participants who carry them out, are:

(1) Plan Administration. The primary party responsible for administering the MBHCP is MBG. Administrative-type tasks MBG will carry out under the plan include: (a) coordination with Malpai-area ranchers about the MBHCP's requirements, programs, and options for participation; (b) where ranchers elect to participate in the plan, preparation and execution of VCAs and COIs (see Section 5.6.2); (c) preparation and/or maintenance of project records, annual reports, and species occurrence maps; and (d) chairing and serving on the MBHCP's Technical Advisory Committee. In addition, a few administrative-type responsibilities (e.g., submitting project summaries to MBG) will fall to Malpai-area ranchers participating in the HCP and some HCP cooperators.

(2) Implementation of Conservation Measures. As used here, the term "conservation measures" refers to the MBHCP's take minimization measures (described in Section 5.2) and grassland improvement measures (described in Section 3.5.1). Activities included within each of these categories, and responsibility for those activities, are as follows.

(ii) *Take Minimization Measures*. Consist of measures designed to minimize take of the covered species in the course of carrying out the covered activities. Take minimization activities include pre-activity surveys of proposed project sites or areas, formulating or revising project plans so as to avoid impacts to covered species inhabiting project areas, and carrying out the projects accordingly. Responsibility for implementing take minimization measures lies with those who undertake the grassland improvement and ranch management activities covered under the plan—generally, MBG and Malpai-area ranchers (with respect to all or most such activities); and MBG and state and Federal fire planners and managers (with respect to fire management activities).

(i) *Grassland Improvement Measures*. Activities undertaken will include planning and carrying out or managing prescribed burns and wildland fires, and planning and carrying out erosion control projects and mechanical brush control projects. Responsibility for carrying out the grassland improvement measures is as described in paragraph (i) above.

(iii) *Funding Grassland Improvement Measures*. One point needing clarification here is that assuring funding for the grassland improvement activities proposed under the MBHCP technically is not an HCP requirement. The reason for this is that these measures (along with proposed ranch management measures) constitute the MBHCP's covered activities (i.e., the activities from which the regulatory need for the plan derives) and will be carried out solely at the discretion of MBG and its cooperators. Funding such measures therefore depends on MBG's desire to undertake them, while the plan's species conservation measures are necessitated by the actual carrying out of these measures. As funds are secured for implementation of grassland improvement projects, funding for required minimization and monitoring activities will be included in project budgets.

(3) Implementation of Biological Monitoring Measures. Biological monitoring under the MBHCP included grassland conservation monitoring measures and species conservation monitoring measures. Activities include, but are not necessarily limited to: (i) with respect to grassland conservation, monitoring of 200 permanent plots and 16 NRCS vegetation transects, together with various discretionary but unspecified measures to monitor the results of fire management, erosion control, and mechanical brush control activities; and (ii) with respect to species conservation, monitoring of water quality on San Bernardino NWR, monitoring of the same 200 permanent plots described above, and monitoring of take levels occurring in the course of carrying out the plan's covered activities. Monitoring under the MBHCP will be permitted (i.e., through grants of access by landowners) and implemented from time to time by all or most HCP participants and some HCP cooperators (e.g., the RMFRS).

(B) Funding by MBG/Participating Ranchers.

(1) Funding by MBG. MBG is a non-profit organization supported by tax-exempt contributions from individuals and organizations and grants from public agencies and private foundations. MBG already undertakes and funds all administrative functions required by state law and its own By Laws, and, to date, has funded and undertaken numerous programs and activities related to its objectives and goals and those of its members (see Section 1.2). Furthermore, most conservation activities proposed in the MBHCP are not new but represent a continuation or expansion of existing programs (e.g., fire management, erosion control, monitoring of the existing 200 permanent monitoring blocks, etc.). In addition, as an organization MBG has attracted numerous funding partners that to date have helped support and maintain these programs, as well as partners and cooperators who are often supported by their own funding (RMFRS, for example).

Thus, MBG already has substantial funding mechanisms supporting it, and, while its responsibilities under the MBHCP will likely increase to some extent: (a) this increase will likely be relatively modest since most programs proposed by the plan are already underway and can be absorbed within currently available funding mechanisms; (b) to the extent that additional responsibilities will result from the MBHCP, the plan will also come with additional funding opportunities (e.g., see Subsection C below); and (c) some activities proposed by the plan (e.g., prescribed burns) will not be undertaken unless funding to support them has been secured in advance, and as projects are funded HCP needs will be incorporated into proposals for new funding. These and other factors will help ensure MBG funding adequate to support activities planned under the MBHCP and MBG's responsibilities in carrying them out.

(2) Funding by Participating Ranchers. As with MBG, Malpai ranchers electing to participate in the MBHCP will incur some additional costs as a result of that participation. Malpai-area ranchers who participate in the MBHCP understand therefore: (a) that upon enrollment in the plan, they are responsible for the costs of implementing measures they have voluntarily accepted that are not satisfied by other funding mechanisms; and (b) that any failure to meet such obligations as a result of inadequate funding or other factors reasonably within their control would be grounds for suspension or revocation by MBG (or the USFWS) of their VCAs and associated COIs. On the other hand, the costs of implementing MBHCP measures required of participating ranchers are expected to be relatively minor—consisting primarily of take minimization (e.g., pre-project surveys), notification and reporting requirements, and in some cases measures they would likely undertake irrespective of the plan (e.g., installing waterlines in roadbeds where feasible)—and it is assumed that the costs of such measures can be absorbed within ranchers' current operational and financial resources. Malpai ranchers also have the option of not participating in the plan if they prefer not to take on these responsibilities.

(C) Possible/Potential Funding Sources for MBHCP Activities.

Examples of activities for which additional funding may be sought arecertain components of the monitoring program (e.g., monitoring of the 200 permanent plots) and large-scale prescribed burns. A number of funding programs administered by state and Federal agencies are available that support activities of these types and may therefore represent potential sources of MBHCP funding, and some of these are administered by the state and Federal HCP participants. This subsection lists such programs with respect to each of these two sets of activities.

(1) Additional Potential Funding Sources. Ecological monitoring has been a core componment of MBG's overall programs for ten years (e.g., see Section 5.4.2.1), supported by privately-rasied funds; and although no dedicated, long-term funding for monitoring exists, the MBG endowment generally helps secure the continuity of its programs. Furthermore, biological monitoring under the MBHCP is regarded as a shared responsibility and effort by MBG and participating Malpai-area ranchers; by all other HCP participants; and, in some cases, by HCP cooperators working under agreement or in cooperation with MBG (see Section 5.4.3). All these entities will work together, through the HCP's TAC and otherwise as appropriate, to secure funding for the monitoring program and to carry out all monitoring program tasks and elements. The following sources of funding and other assistance may be available to support biological monitoring under the MBHCP and should be considered as needed.

(a) *USFWS Partners for Wildlife*. Funds may be available through the USFWS which may be used for a variety of purposes, including development and implementation of projects covered by the HCP.

(b) *AGFD/NMDGF Funding Programs and Assistance*. AGFD and NMDGF administer several funding programs for rare, threatened, and endangered species.AGFD's Habitat Stewardship Program, and NMDGF's Share with Wildlife Program. In addition, both agencies conduct a number of non-game wildlife monitoring programs that will contribute to MBHCP monitoring needs, the results of which will be made available to MBG as described in Section 8.4, Subsection (2) of the plan's associated Implementing Agreement.

(c) *Cooperation with Universities*. Universities often sponsor wildlife studies by both students (e.g., Master's Degree and PhD candidates) and faculty, which are typically funded by grants, scholarships, etc. Some university studies have already been conducted or are underway in the Malpai Borderlands (see Section 1.2, Subsection C), and future studies, especially those concerning the MBHCP's covered species, will be accommodated and encouraged under the plan whenever possible.

(d) *Water Protection Fund (WPF) Grants*. Administered by the Arizona Department of Water Resources, WPF grants provide funding assistance for projects that protect or improve riparian areas. The Altar Valley Conservation Alliance, a rancher coalition near Tucson, Arizona, has utilized WPF grants for two projects to date—a fairly large-scale mapping project, and a report documenting historic livestock grazing and range improvement practices in the Altar Valley (R. Humphreys, AVCA, pers. comm.). Various MBG projects, including monitoring and/or grassland improvement activities, may be similarly eligible for WPF grants.

(2) Funding Grassland Improvement Measures. Grassland improvement measures contemplated under the MBHCP by MBG, Malpai-area ranchers, and HCP cooperators range from relatively simple, inexpensive activities (e.g., installation of erosion control structures), to moderately expensive activities (e.g., brush control projects), to relatively complicated and expensive undertakings (e.g., prescribed burns). Like the plan's monitoring program, implementation of its grassland improvement measures will

require funding assistance at varying levels, and potential state, Federal, and other funding sources potentially available to support such measures include the following.

(a) *Environmental Quality Incentives Program (EQIP)*. Administered by NRCS under the Farm Bill, EQIP funds are available on a competitive, cost-share basis and can cover up to 50 percent of eligible projects with a limit of $450,000 per producer during the five years of the current Farm Bill. Construction of stocktanks, fence lines, waterlines, and wells, shrub control, prescribed fire, and other rangeland conservation practices could potentially qualify for EQIP funding.

(b) *Water Quality Improvement Grants*. Funded by the Environmental Protection Agency (EPA) under section 319(h) of the Clean Water Act, and administered by the Arizona Department of Environmental Quality, Water Quality Improvement grants are intended to help implement EPA-approved state non-point source pollution management programs. Grants are available on a competitive, cost-share basis and could be used to help fund erosion and mesquite control measures.

(c) *Farm Services Agency Cost-Share Programs*. Administered by the Farm Services Agency with technical assistance from NRCS, these programs provide cost-sharing to individuals and groups for emergency conservation projects, such as those designed to mitigate the effects of fire, flood, and drought. Programs include Long-term Agreements, which provide cost-share funding and require commitments by landowner from 3 to 10 years (depending on the project), and Pooling Agreements, which are used to fund efforts by groups of farmers or ranchers who join together to address land or water use problems of mutual concern.

(d) *Water Protection Fund (WPF) Grants*. See Subsection (1) above, paragraph (d).

(e) *NRCS Assistance*. NRCS has played an important role in range monitoring and improvements in the Malpai Borderlands through the EQIP program it administers (see above) and by providing technical assistance to ranchers through Cooperative Agreements and CRMPs (see Section 2.2.1.2). Such assistance will continue to play a role in meeting the MBHCP's grassland improvement and monitoring objectives—e.g., through ongoing administration of Cooperative Agreements and monitoring of NRCS vegetation transects established under those agreements (see Section 5.4.2.1). NRCS technical assistance is supported by two funding programs—the Conservation Operations Program and Grazing Lands Conservation Initiative—which, although they do not fund landowner projects directly, provide the funding for much of NRCS's technical assistance activities.

(f) *Private Foundations/Non-profit Conservation Organizations*. Many foundations and non-profits have funding programs for conservation projects. MBG has pursued these periodically to date, and will continue to do so under the MBHCP.

7.0 Effects of the Take

7.1 Types/Sources of Take

The MBHCP's covered species might be taken under the plan in four ways: (1) they might be directly harmed or killed as a result of the covered activities; (2) they might be indirectly harmed as a result of habitat-related effects; (3) they might be indirectly harassed as a result of disturbance effects; and (4) they might be directly harmed or killed or indirectly harassed during trapping or capture (e.g., in the case of leopard frogs being salvaged from a stocktank undergoing maintenance). MBG's I.T.P. would authorize the first three of these types of take, while the fourth, depending on who actually undertook such trapping or capture, would be authorized by the USFWS's, and AGFD's, or NMDGF's direct regulatory authorities, or by research and recovery permits issued pursuant to section 10(a)(1)(A) of the ESA and held by other individuals undertaking such activities.

Potential sources of the first three types of take are discussed below.

(1) Fire Management Activities.

Aquatic Species. The primary risk to the aquatic species assemblage resulting from fire management is an indirect one, consisting of the potential for post-fire, downstream effects within a given watershed to degrade aquatic habitats present in the watershed. Such degradation could occur during post-fire rainfall events if sediment and ash from burn areas washes downstream into such habitats. This could result in sedimentation of stream substrates, suspension of sediments in the water columns of affected streams, and changes in water quality and chemistry as a result of ash deposition. Such effects would most likely occur when fire events within the watersheds surrounding and upstream of aquatic habitats have been individually or cumulatively extensive, when the extent of high-severity fire in the watersheds has been relatively great, and when rainfall events following fire events in the watersheds are frequent or intensive.

Riparian Species. Managed fire is not planned in riparian areas under the MBHCP; therefore, take of riparian species would occur only if a prescribed burn (or a wildland fire) inadvertently escaped into riparian habitat. Should this occur, however, the effects to both the habitat and these species could be locally significant. Because of the vegetative structure of riparian areas (i.e., relatively dense vegetation and large trees), fire in such areas would likely carry forcefully, burn hot, and possibly crown. Such a fire would likely be stand replacing within the affected area, although this would depend on the density of understory vegetation and the presence of ladder fuels. If a fairly severe fire were to occur, the effects on the covered species could be significant and might include: (a) possible harm or harassment of adult yellow-billed cuckoos and roosting western red bats present at the time of the fire (e.g., as a result of displacement effects); (b) direct mortality to cuckoo eggs or nestlings if active cuckoo nests are present at the time of the fire (and if the fire should crown); (c) direct mortality to leopard frogs and Mexican garter snakes, if present in associated aquatic habitats at the time of the fire; and (d) harm to resident leopard frogs as a result of post-fire sedimentation and ash deposition.

Montane Species. Managed fire is not planned in montane areas under the MBHCP but, as with riparian species, prescribed burns (or wildland fires) could affect the covered montane species if it inadvertently escapes into montane habitat, and could burn severely and be stand-replacing. The effects of this on the covered montane species would likely be similar to those described above for the riparian species and might include: (a) possible harm or harassment of adult Mexican spotted owls present at the time of the fire (e.g., as a result of displacement effects); (b) direct mortality to spotted owl eggs or nestlings if active owl nests are present at the time of the fire (and if the fire should crown); (c) harm to

New Mexico ridge-nosed rattlesnakes as a result of starvation, predation, or exposure stemming from the destruction of vegetative cover; and (d) direct mortality to any ridge-nosed rattlesnakes present at the time of the fire (as a result of suffocation in their burrows if the fire is severe, or burning if caught on the ground surface).

Grassland Species. The potential effects of fire management activities on the covered grassland species differ from their potential effects on all other covered species in that managed fire activities under the MBHCP will routinely be undertaken within the species' habitat. Consequently, the primary potential effects on these species will be direct harm or mortality as a result of fire moving through their grassland habitats. However, where native plants dominate (as on Diamond A Ranch) and in prairie dog towns (typified by bare ground and low-cropped vegetation), fire is typically slow-moving and of low severity; that such fires typically burn in a mosaic pattern (i.e., do not affect the entire burn unit). Adults of all four grassland species also have effective capabilities for surviving such fires (e.g., by taking refuge in deep burrow systems or by flying or running away), and the habitat impacts of fire on grasslands are usually minor and transitory with generally beneficial effects overall. However, the nestlings, pups, and juveniles of all species would be at risk in the event of fire occurring directly in their habitats and, in the case of Aplomado falcons, nest tree damage or damage to foraging habitat is possible.

(2) Erosion Control Activities.

Generally, erosion control projects under the MBHCP will involve impacts not worse than minor ground surface disturbances associated with materials procurement and site preparation and use of hand tools, wheel barrows, pick-up trucks, and four-wheel ATVs; and the potential for adverse impacts or take of the covered species as a result of these activities therefore will generally be either minor or avoidable.

Aquatic Species. Aquatic species would be affected by erosion control activities relatively rarely, for the reason that such activities will not ordinarily be undertaken in aquatic habitats or, if they are, would typically be undertaken when conditions are dry. A possible exception are projects to control downcutting in streambeds, which could result in indirect impacts as a result of digging and excavation in stream substrates and subsequent downstream sedimentation effects when water flow returns to an affected stream (possibly affecting fish, leopard frogs, gartersnakes, and their eggs or young). Such effects would be temporary, however, and the end result of such efforts ordinarily would be a reduction in sediment mobilization in affected streams.

Riparian Species. Because relatively few erosion problems occur in riparian communities (a possible exception being downcutting in stream channels; see above), and because the covered riparian species occupy the canopies of riparian vegetation (i.e., well above areas of ground disturbance), erosion control activities would affect these species relatively rarely and only indirectly as a result of disturbance. Such disturbance would also be minor (consisting of the noise made by work crews, vehicle use, etc.); however, if undertaken close enough to western yellow-billed cuckoo nests or western red bat roosts, such activities could flush adult cuckoos from their nests (resulting in interruption in the care of eggs or nestlings) or red bats from their roosts (resulting in possible displacement effects). Potential for take of leopard frogs and Mexican garter snake also exists due to the possibility of their being run over by vehicles during these activities.

Montane Species. Because erosion control activities will not be undertaken within or near montane biotic communities under the MBHCP, neither direct harm or mortality nor indirect harm or harassment of the species in this assemblage is likely as a result of such activities.

Grassland Species. Erosion control activities would be most likely to affect the grassland species (because most such activities will be undertaken in grassland or similar vegetation associations), and could affect such species both directly (as a result of digging or excavation) and indirectly (as a result of noise and activity). Direct impacts would consist primarily of possible damage or destruction of western burrowing owl burrows or nests and black-tailed prairie dog burrows or colonies (if erosion control activities are undertaken in their immediate vicinity); while disturbance-related impacts could affect burrowing owl and Aplomado falcon nests (i.e., by flushing adult owls or falcons from their nests). Of the grassland species, the western burrowing owl would be most likely to be affected by erosion control activities because it is by far the most widely distributed. Also, the juveniles and young of all grassland species are significantly more vulnerable than adults to the potential impacts of erosion control because of their relative inability to escape such impacts by flying or running away.

(3) Mechanical Brush Control Activities.

Aquatic Species. Mechanical brush control activities would only affect aquatic species indirectly, since brush control activities of the type planned under the MBHCP (i.e., control of woody brush in grassland vegetation associations) would not occur directly within aquatic areas. However, mechanical brush control activities in upland areas surrounding perennial streams could, as with fire management, result in downstream mobilization of sediments that ultimately find their way into such areas. In the case of the covered fish, such effects would be confined to brush control activities in the San Bernardino Valley immediately upstream of San Bernardino NWR (where most of these fish occur), although in the case of leopard frogs they could occur in other locations as well. Such effects would also be more likely to occur if brush control activities in any such areas were extensive.

Riparian Species. Because mechanical brush control activities will not be undertaken within riparian biotic communities, direct harm or mortality of the species in this assemblage is unlikely. Furthermore, because mechanical brush control is carried out early in the year prior to the growing season (and before the yellow-billed cuckoo nesting cycle), the potential for disturbance impacts (e.g., as a result of noise) would be limited to western red bats, which can be found in the Malpai Borderlands area year-round.

Montane Species. Because mechanical brush control activities will not be undertaken within or near montane biotic communities under the MBHCP, neither direct harm or mortality nor indirect harm or harassment of the species in this assemblage is likely as a result of such activities.

Grassland Species. Because mechanical brush control employs relatively heavy equipment (e.g., bulldozers, "roller-choppers," etc.), the covered grassland species would be affected by the activity primarily through direct, ground-disturbing impacts and indirect disturbance impacts (e.g., as a result of noise). The former would be most likely to affect three of the grassland species—the western burrowing owl (as a result of the potential for damage to owl burrows), white-sided jackrabbit (as a result of the potential for direct harm to jackrabbit nestlings), and Aplomado falcon (as a result of the potential for damage to nest trees). Black-tailed prairie dogs are unlikely to be directly affected by mechanical brush control because the activity is unlikely to be undertaken in prairie dog colonies. Because mechanical brush control is carried out prior to the breeding cycles of the grassland species (see above), the potential for disturbance-related impacts as a result of this activity would be unlikely.

(4) Livestock Management Activities.

Aquatic species. For purposes of this subsection, aquatic species are considered to include the covered fish species only. These are confined almost exclusively to the San Bernardino NWR, which is managed principally on their behalf and on which no livestock or grazing is permitted. However, in high-

rainfall years, some of its resident fish may move upstream to Aston Spring, a small, partially fenced riparian enclave within a 160-acre pasture on the nearby Malpai Ranch. Malpai Ranch does graze this pasture and cattle occasionally have access to the spring to water (Wendy Glenn, Malpai Ranch, pers. comm.). As a result, effects to fish, if present, could include: (a) direct mortality or harm as result of trampling effects; and (b) possible harm, also due to trampling, as a result of sedimentation effects

Riparian Species. Also for purposes of this subsection, the Chiricahua leopard frog, lowland leopard frog, and northern Mexican gartersnake are considered to belong to the riparian species assemblage. With respect to these species, it is assumed that some, perhaps all, Malpai ranchers from time to time water their livestock in aquatic and associated riparian areas. This would be unlikely to affect yellow-billed cuckoos or red bats since both species use the riparian canopy for their activities (nesting and roosting, respectively), which is outside the range of direct livestock impacts. However, the presence of livestock in riparian areas and associated streambeds could result in: (a) direct trampling-related mortality or harm to leopard frogs (especially in the case of eggs, metamorphs, and juveniles) and gartersnakes; (b) possible indirect trampling-related water quality impacts (e.g., increased sedimentation); and (c) possible indirect harm (over the long-term) if such use is sufficient to inhibit growth and replacement of riparian vegetation. However, the occurrence and severity of all such effects would depend on the intensity, duration, and timing of livestock use and would tend to be highly localized.

Montane Species. Because livestock management activities will not be undertaken within or near montane biotic communities under the MBHCP, neither direct harm or mortality nor indirect harm or harassment of the species in this assemblage is likely as a result of such activities.

Grassland Species. Two of the grassland species (the western burrowing owl and black-tailed prairie dog) utilize underground burrows for reproduction and shelter, which, theoretically, could be subject to damage as a result of livestock trampling. However, these species routinely co-exist with livestock, and prior to the advent of livestock in the American west routinely co-existed with naturally occurring large ungulates (e.g., antelope and bison); consequently, livestock management (i.e., the presence of livestock; see Section 3.5.2.1) in conjunction with the presence of western burrowing owls and black-tailed prairie dogs is unlikely either to significantly adversely effect either of these species, or to result in take of the species. The effects of livestock management on white-sided jackrabbits are also likely to be minor, resulting at most in flushing jackrabbits from daytime shelters from time to time (this, however, could conceivably result in predation if the animal does not regain shelter quickly). Aplomado falcons, on the other hand, could be affected by livestock if an active nest is disturbed through direct physical contact by livestock with the nest tree (e.g., by rubbing against it). This has been observed (Patricia Zenone, USFWS, pers. comm.) and could result in destabilization of a nest tree to the extent that the tree might eventually be lost, and, if it occurs during active nesting, disturbance of the nest to the extent that nestling care by adults might be interrupted or compromised.

(5) Linear Facility Construction/Maintenance.

Aquatic Species. Linear facility construction would be most likely to affect the aquatic species through indirect impacts (e.g., downstream sedimentation effects), which might occur if new fences, waterlines, roads, or utility lines were routed directly through perennial stream corridors. This would affect the covered fish only in the unlikely event that such facilities were routed directly through Black Draw in San Bernardino NWR or adjacent to the Refuge when fish are present in the stream; however, the two leopard frogs and gartersnake could be affected if such facilities were routed through any perennial stream corridor in the Malpai Borderlands area. Linear facility maintenance would be most likely to affect the aquatic species if heavy equipment (e.g., bulldozers) were used on such facilities already present within perennial stream corridors, which could also result in downstream sedimentation effects.

Riparian Species. Because the covered riparian species occupy the canopies of riparian vegetation, well above the area of direct ground-related disturbance, linear facility construction and maintenance would affect these species primarily as a result of disturbance-related impacts. These could occur if grading or trenching is carried out in the vicinity of the riparian nest sites of yellow-billed cuckoos (which might flush adult cuckoos from their nests and interrupt the care of eggs or nestlings), or in the vicinity of western red bat roosts (which might flush adult and juvenile bats from their roosts and result in displacement effects).

Montane Species. Because linear facility construction and maintenance activities will not be undertaken within or near montane biotic communities under the MBHCP, neither direct harm or mortality nor indirect harm or harassment of the species in this assemblage is likely as a result of such activities.

Grassland Species. The grassland species could be affected by linear facility construction and maintenance through direct ground-disturbing impacts and disturbance-related impacts. The former would most likely affect the grassland species, especially western burrowing owls, black-tailed prairie dogs, and white-sided jackrabbits, and could occur if grading or trenching is carried out in the vicinity of the burrows and/or colonies of these animals. Similarly, the latter could affect burrowing owl and Aplomado falcon nests (e.g., as a result of noise) if grading or trenching is carried out in the vicinity of the nest sites of these species (possibly resulting in interruptions in the care of eggs or nestlings).

(6) Stocktank Maintenance and Use.

Leopard Frogs/Gartersnakes. Stocktank maintenance and use are likely to affect three of the covered species only (the Chiricahua leopard frog, lowland leopard frog, and northern Mexican garternsake) because only these species routinely use or inhabit stocktanks. The potential effects of these activities on leopard frogs and gartersnakes are threefold: (a) direct mortality or harm as result of trampling effects (this would most likely affect frog eggs and metamorphs, and be most likely to occur in stockponds; see Section 5.2.2.3); (b) harm through water quality degradation as a result of trampling; and (c) direct mortality or harm as a result of heavy equipment use in the course of stocktank maintenance.

Other Covered Species. Because stocktank maintenance and use will not be undertaken directly within natural aquatic areas or riparian, montane, or grassland biotic communities, neither direct harm or mortality nor indirect harm or harassment of the species in these assemblages (except for the leopard frogs and gartersnake) are likely as a result of such activities.

7.2 Anticipated Take Levels

(1) Estimating Take Levels. An important question for the MBHCP is the levels of take of the covered species likely to occur over the course of implementing the plan and its various components. For several reasons, however, the number of individuals of the covered species that might be taken in the course of the plan is difficult to predict. This is because, first, the specific population numbers of these species in the Malpai Borderlands is not known nor can be determined in a cost-effective manner; and, second, even if such numbers were known, it is equally difficult to predict how many individuals of each species might be taken as a result of the covered activities over the MBHCP's 30-year term. In light of this, it is customary in HCP's to employ the number of habitat acres likely to be affected by the covered activities as a "surrogate" for expressing anticipated take levels, and the authorized take is then expressed as the number of habitat acres that may be developed, modified, used, etc. under the plan.

However, in the MBHCP this approach may also be infeasible with respect to some species—e.g., where the number of acres of current and future suitable habitat for such species is unknown, or where the number of habitat acres likely to be affected by the covered activities is uncertain. In these cases, take levels may not be specifically quantifiable by any means, and the HCP must depend on other mechanisms (e.g., its biological objectives, conservation measures, and monitoring and Adaptive Management programs) to ensure that take of affected species does not exceed levels that can be biologically or legally justified.

The MBHCP therefore expresses take (or, in the case of the Huachuca water umbel, anticipated habitat effects) in four ways: (a) as an unquantified number of individuals of a species that may be taken; (b) as an unquantified number of habitat units (i.e., acres or stocktanks) that may be affected in such a manner as to cause take; (c) as a quantified number of habitat units (i.e., acres) that may be affected in such a manner as to cause take; and (d) in the case of Huachuca water umbel, as a quantified number of habitat acres that may be affected in such a manner as to cause death or injury of individual plants.

(2) Anticipated/Authorized Take Levels. Based on the framework described above, the MBHCP identifies and, through its associated I.T.P., expressly authorizes take of each of the covered species (or effects on the habitat of the Huachuca water umbel) anticipated to occur in the course of the plan's covered activities as follows.

(a) *Covered Fish Species*. Take of an 100% of the fish in Black draw channels of the seven covered fish species as a result of: (i) harm resulting from prescribed fire within the covered area, but as limited by the measures described in Section 5.2.1.1, Subsection (B)(1)(a) and Subsection (B)(4)(a)(i); and (ii) harm resulting from mechanical brush control activities within the covered area not to exceed 1,000 acres per calendar year as described in Section 5.2.1.3, Subsection (2);

(b) *Northern Mexican Gartesnakes*. Take of up to 5northern Mexican gartersnake adults or young as a result of: (i) harm resulting from prescribed fire within the covered area but as limited by the measures described in Section 5.2.1.1, Subsection (B)(1)(a) and Subsection (B)(4)(a)(i); and (ii) harm resulting from mechanical brush control activities within the covered area not to exceed 1,000 acres per calendar year as described in Section 5.2.1.3, Subsection (2);

(c) *Chiricahua Leopard Frogs/Lowland Leopard Frogs*. Take of up to 5 Chiricahua leopard frog adults, eggs, or metamorphs and/or lowland leopard frog adults, eggs, or metamorphs, as applicable, as a result of: (i) harm or direct mortality or injury resulting from livestock use of riparian or stream habitat or other areas periodically occupied by frogs, or of leopard frog adults as a result of being struck by any vehicle anywhere within the covered area; (ii) are not to exceed all individuals within the annual 10 acre limits may be harm or direct mortality or injury resulting from erosion control activities and linear facility construction and maintenance per calendar year throughout the covered area; (iii) harm or direct mortality or injury of lowland leopard frogs resulting from maintenance and livestock use of stocktanks in the covered area ; and (iv) harm or direct mortality or injury of Chiricahua leopard frogs resulting from maintenance and livestock use of stocktanks in the covered area, if the USFWS's ESA section 4(d) rule for this species should lapse or be terminated (see Section 5.2.2.3).

(d) *Western Burrowing Owls/Aplomado Falcons*. Take of an unquantified number of western burrowing owls and/or Aplomado falcons as a result of: (i) inadvertent harassment of owls or falcons or active owl or falcon nests resulting from any covered activity within the grassland habitats of these species; (ii) harm or direct mortality or injury of these species in an unspecified area of

grassland habitats resulting from the failure of take avoidance measures for owls and falcons in the course of prescribed fire or from other unanticipated adverse effects of prescribed fire in such habitats (see Section 8.3); Potential take of burrowing owls and Aplomado falcons is quantified indirectly based on the number of acres of habitat effected per year, which may be up to 25,000 acres per year of potential habitat effected by fire, or up to 100 acres per year effected by mechanical brush control.

(e) *Black-tailed prairie dogs/White-sided Jackrabbits*. Take of an unquantified number of black-tailed prairie dogs and white-sided jackrabbits as a result of: (i) direct mortality or injury resulting from prescribed fire within the grassland habitats of these species but as limited by the measures described in Section 5.2.1.1, Subsection (B)(1)(a) and Subsection (B)(4)(a)(i); and (ii) inadvertent harassment of an unspecified number of prairie dogs or jackrabbits or active owl or falcon nests resulting from any covered activity within the grassland habitats of these species Potential take of prairie dogs and white-sided jackrabbits is quantified indirectly based on the number of acres of habitat effected per year, which may be up to 25,000 acres per year of potential habitat effected by fire, or up to 100 acres per year effected by mechanical brush control.

(f) *Western Yellow-billed Cuckoos/Western Red Bats*. Take of an unquantified number of yellow-billed cuckoos and/or western red bats as a result of: (i) inadvertent harassment of an unspecified number of active cuckoo nests or active bat roosts resulting from the occurrence of any covered activity in or near riparian habitats in the Malpai Borderlands; and (ii) harm or direct mortality or injury in an unspecified area of riparian habitat resulting from the escape of prescribed fire into such habitat (see Section 5.2.1.1, Subsection B.2 and Subsection (B)(4)(a)(i); and Section 8.3); and Potential take of cuckoos and western red bats is quantified indirectly based on the number of acres of habitat effected per year, which may be up to 100 acres per year of potential habitat effected by fire;

(g) *New Mexico ridge-nosed Rattlesnakes/Mexican Spotted Owls*. Take of an unquantified number of New Mexico ridge-nosed rattlesnakes and/or Mexican spotted owls as a result of harm or direct mortality or injury in an unspecified area of montane habitat resulting from the escape of prescribed fire into such habitat (see Section 5.2.1.1, Subsection B.3 and Subsection (B)(4)(a)(i); and Section 8.3 Potential take of ridge-nosed rattlesnakes and spotted owls is quantified indirectly based on the amount of habitat effected per year, which may be up to ten potential habitat patches, as shown by the habitat map of Holycross, et al. (2003) per year effected by high-intensity fire in the Peloncillo Mountains, or 500 ares of potential canyon woodland habitat effected by high-intensity fire per year in the Animas Mountains.

(3) Conditions of Authorization. These take authorizations: (a) apply only to MBG (as the permit holder), to any individual Malpai rancher who has entered into a VCA with MBG in accordance with Section 5.6 of the plan (i.e., has become an HCP participant), and, with respect to fire management, to any and all non-Federal plan cooperators undertaking fire-related actions in cooperation or partnership with MBG; (b) are contingent upon full implementation of all applicable requirements and responsibilities specified by the plan; and (c) with respect to authorization of unquantified take levels, are contingent upon the proper biological functioning of the HCP. The latter means that the MBHCP's goals and objectives generally, and species conservation objectives particularly, are achieved and maintained throughout the permit term as determined by the plan's monitoring program (see Section 5.4), Adaptive Management procedures (see Section 5.5), and Technical Advisory Committee responsibilities (see Section 5.7).

7.3 Effects of the Take

This section describes the anticipated effects on the covered species of take authorized in the previous section. These effects will depend on several factors, including the biological status of each of the affected species, the types of take of the species that actually occurs and their relative amounts, and the balancing or offsetting effects of the HCP's conservation program.

In most cases, take levels as a result of direct mortality or injury under the MBHCP are expected to be minimal, and to consist primarily of relatively rare events (e.g., should a prescribed fire accidentally kill newborn white-sided jackrabbit pups or inadvertently burn into riparian or montane vegetation). This is because many of the covered species (i.e., all the fish yellow-billed cuckoos, western red bats, Aplomado falcons, and the leopard frogs) and many of the covered activities (e.g., ranch management, erosion control, and fence and waterline construction) occur or will occur in the covered area in a highly localized fashion, and, therefore, can be expected to come into conflict with each other relatively rarely. It is also due to the numerous take minimization measures that will be implemented under the plan (see Section 5.2). The only exception is stocktank maintenance, which may come into conflict with the two leopard frogs and the northern Mexican gartersnake more frequently than in most other cases.

Take levels as a result of harm or harassment have the potential to be more significant. This is because several of the covered activities (chiefly, fire management and mechanical brush control) have the potential to result in adverse effects on the habitat of the covered species and are sufficiently widespread to result in potential inadvertent harassment of some species (e.g., western burrowing owls, Aplomado falcons, and yellow-billed cuckoos at their nest sites and western red bats at their roost sites). Here again, however, the actual effects of these activities are likely to be minimal because most habitat-related effects of the covered activities will be transitory, and will be largely controlled through the plan's conservation program (see below).

An important consideration in evaluating the effects of the covered activities on the covered species is the relationship between short-term effects and long-term effects (especially in the case of the grassland improvement activities). All the covered activities will potentially result in some level of adverse effect on the habitats in which they occur. These effects include, primarily, temporary removal or reduction of vegetation as a result of prescribed fire, erosion control, and mechanical brush control activities, and ground surface disturbance as a result of mechanical brush and erosion control activities. However, the ultimate goal of the grassland improvement activities under the MBHCP is to correct and ameliorate ecological problems currently existing in the Malpai Borderlands (see Section 2.2.2) and to improve overall ecological conditions in the area. Thus, the MBHCP's grassland improvement activities represent a trade-off between short-term adverse effects and long-term beneficial effects, with the balance being in favor of the long-term benefits, and this is true for both grassland conditions generally and the habitats of the covered species specifically.

Among the likely long-term benefits to the covered species of the grassland improvement activities are the following: (1) reductions, through properly managed fire and brush control, in (a) fuel loads and, consequently, in fire intensities overall, resulting in preservation of habitats that might otherwise be severely damaged by more destructive fires, and in (b) brush encroachment and densities in the area's grasslands, which favors all the covered grassland species; (2) promotion, through properly managed fire and brush control, of regeneration and restoration of grasses and forbs (especially those that are native) which favors the grassland species as well as the aquatic species by reducing sheet erosion and its potential for downstream sedimentation of aquatic habitats; and (3) reductions, through erosion control, in downstream sedimentation of aquatic habitats resulting from stream channel and gully erosion.

Two benefits to the covered species will also result from the MBHCP's covered ranch management activities. One of these is the ability of Malpai-area ranchers to better manage livestock—and the range—as a result of fence and waterline construction (fencing by increasing rest-rotation grazing capabilities, waterline construction by increasing livestock watering locations). The other consists of the benefit to Chiricuahua leopard frogs, lowland leopard frogs, and northern Mexican gartersnakes resulting from the maintenance and use of stocktanks in the Malpai Borderlands, which are an important habitat resource for these species.

Additional benefits of the MBHCP include the guidance provided by its goals and objectives; the capability for adjustment to the plan's conservation program under its monitoring, Adaptive Management, and Technical Advisory Committee provisions; and the fact that the vast majority of species habitats in the Malpai Borderlands will remain under the plan either unchanged or will be improved.

Such benefits notwithstanding, it is recognized that fire management under the MBHCP has the potential to benefit ecological conditions in the Malpai Borderlands (and in its habitats) but also to seriously damage those conditions (and habitats). Such damage could result from inadvertent escape of managed fire into riparian and montane habitats (see Section 5.2.1.1, Subsections B.2 and B.3); the possibility of managed fire burning with unanticipated severity or effect (see Section 8.3); and the possibility of mortality and harm to the covered species as a result of fire (e.g., through damage to habitats and nests, killing of vulnerable juveniles and young, etc.). However, the potential for such problems are addressed by the plan—in the take minimization measures its establishes to protect the covered species (and their habitats) in the course of fire; and in the contingency strategies it establishes (through its Adaptive Management and changed circumstances measures) to address unanticipated or unplanned effects of fire. The MBHCP thus seeks generally to balance the benefits of fire with its potential risks, and, specifically, to maximize those benefits while minimizing its potential for adverse effects on the covered species.

Therefore, MBG concludes the following: (1) that take of the covered species in the course of the HCP's covered activities (both as a result of direct mortality and injury and as a result of harm and harassment) will, in most cases, be minimal; (2) that, where the likelihood of take is possible, it will be appropriately minimized through the plan's take minimization measures and strategies; (3) that all of the plan's covered grassland improvement activities will result in appreciable and in some cases significant long-term conservation benefits to the covered species; (4) that two of its covered ranch management activities will also result in modest benefits to the covered species; and (5) that the long-term benefits of the HCP on the covered species, in general, will far outweigh its short-term adverse effects. MBG further concludes, based on the above, that the MBHCP fully meets the statutory requirements of Section 10(a)(2)(B) of the ESA and that approval and implementation of the plan is not likely to appreciably reduce the likelihood of survival and recovery of the covered species in the wild

To complete the processing we need the following:

What is the total acreage of each habitat type in the covered area.

What is the acreage within each watershed we are using for burn caps.

8.0 Changed and Unforeseen Circumstances

8.1 Unforeseen Circumstances/"No Surprises"

Under the MBHCP, and consistent with the USFWS's "No Surprises" regulations [50 CFR 17.22(b)(5) and 17.32(b)(5)], the USFWS provides MBG and other parties to the plan (e.g., participating Malpai-area ranchers) with specific regulatory assurances addressing the occurrence of "unforeseen circumstances" within the Malpai Borderlands over the plan's 30-year term. "Unforeseen circumstances" are defined by Federal regulation (50 CFR 17.3) to mean, "changes in circumstances affecting a species or geographic area covered by a conservation plan [in this case, the MBHCP] that could not reasonably have been anticipated by plan developers and the [USFWS] at the time of the [plan's] negotiation and development, and that result in substantial and adverse changes in the status of the covered species." The "No Surprises" assurances essentially mean that, in the face of such circumstances, the USFWS will not require additional conservation measures by MBG, any participating Malpai-area rancher, or any other HCP participant or cooperator in addition to those specified by the plan without MBG's (or that participant's or cooperator's) consent, and, therefore, that all plan parties are protected throughout the permit term against the imposition of conservation measures to which they did not agree in the MBHCP at the time it was approved. There is, however, an exception to this assurance, which is described in paragraph (2) below and explained following paragraph (4).

The specific terms of the "No Surprises" regulations are as follows:

(1) In negotiating unforeseen circumstances, the USFWS will not require the commitment of additional land, water, or financial compensation or additional restrictions on the use of land, water, or other natural resources beyond the level otherwise agreed upon for the species covered by the conservation plan without the consent of the permittee.

(2) If, however, additional conservation and mitigation measures are deemed necessary to respond to unforeseen circumstances, the USFWS may require additional measures of the permittee where the conservation plan is being properly implemented, but only if such measures are limited to modifications within conserved habitat areas, if any, or to the conservation plan's operating conservation program for the affected species, and maintain the original terms of the conservation plan to the maximum extent possible. Additional conservation and mitigation measures will not involve the commitment of additional land, water, or other natural resources otherwise available for development or use under the original terms of the conservation plan without the consent of the permittee.

(3) The USFWS will have the burden of demonstrating that unforeseen circumstances exist, using the best scientific and commercial data available. These findings must be clearly documented and based upon reliable technical information regarding the status and habitat requirements of the affected species. The USFWS will consider, but not be limited to, the following factors:

(a) Size of the current range of the affected species;
(b) Percentage of the range adversely affected by the conservation plan;
(c) Percentage of the range conserved by the conservation plan;
(d) Ecological significance of that portion of the range affected by the conservation plan;
(e) Level of knowledge about the affected species and the degree of specificity of the species' conservation program under the conservation plan; and,
(f) Whether failure to adopt additional conservation measures would appreciably reduce the likelihood of survival and recovery of the affected species in the wild.

(4) Nothing in [the "No Surprises" rule] will be construed to limit or constrain the USFWS, any Federal, state, local, or tribal government agency, or a private entity, from taking additional actions at its own expense to protect or conserve a species included in a conservation plan.

In paragraph (2) above, the term "operating conservation program" is defined by Federal regulation (50 CFR 17.3) to mean, "those conservation management activities which are expressly agreed upon and described in a conservation plan or its Implementing Agreement, if any, and which are to be undertaken for the affected species when implementing an approved conservation plan, including measures to respond to changed circumstances." Operating conservation programs typically involve take minimization measures, buffer or avoidance zones, seasonal restrictions, etc. The result of paragraph (2) is therefore to permit USFWS to impose changes to these types of measures—notwithstanding the assurances otherwise provided by the "No Surprises" regulations—if unforeseen circumstances are determined by the agency to have occurred. However, the paragraph also limits permissible changes to these "operating conservation" measures and does not extend them to the typically more costly type of conservation measures described in paragraph (1).

MBG and the USFWS therefore understand and agree that, while some changes to the MBHCP's operating conservation program not otherwise provided for in the plan might be necessary in the future to address unforeseen circumstances, such changes will maintain the original terms of the MBHCP (or, under Adaptive Management, the HCP's adjusted terms) to the maximum extent possible, and will not involve the removal of private or state-trust rangelands or related areas from ranching uses beyond the level established by the HCP without the consent of MBG and/or any affected Malpai-area rancher. MBG and the USFWS further understand and agree that, should any change to the MBHCPs operating conservation program beyond that provided for by the plan be needed due to unforeseen circumstances, any such changes would, to the maximum extent possible, be developed jointly and collaboratively by the MBHCP's Technical Advisory Committee.

8.2 Changed Circumstances

Federal regulation (50 CFR 17.3) defines the term "changed circumstances" to mean "changes in circumstances affecting a species or geographic area covered by [an HCP] that can reasonably be anticipated by plan developers and the [USFWS] and that can be planned for (e.g., the listing of new species, or a fire or other natural catastrophic event in areas prone to such events") (50 CFR 17.3). The specific terms of the "No Surprises" regulations with respect to changed circumstances are as follows:

(1) Changed Circumstances Provided for in the Plan. If additional conservation and mitigation measures are deemed necessary to respond to changed circumstances and were provided for in the [HCP's] operating conservation program, the permittee will implement the measures specified in the plan.

(2) Changed Circumstances not Provided for in the Plan. If additional conservation and mitigation measures are deemed necessary to respond to changed circumstances and such measures were not provided for in the [HCP's] operating conservation program, the USFWS will not require any conservation and mitigation measures in addition to those provided for in the plan without the consent of the permittee, provided the plan is being properly implemented.

These two paragraphs simply mean that any changed circumstances (as distinct from unforeseen circumstances) that may occur over the life of an HCP, and that have been provided for in the plan, will be addressed as the plan specifies. However, any changed circumstances that may occur that were not provided for in the HCP would be addressed (i.e., additional conservation and mitigation measures would

be imposed) only with the consent of the permittee. Thus, the exception provided for under the "No Surprises" regulations with respect to unforeseen circumstances (as described in Section 8.1 above) does not apply to changed circumstances.

8.3 Changed Circumstances Provided for in the Plan

The MBHCP provides for nine situations involving the possibility of changed circumstances: (1) managed fire escaping into and damaging riparian vegetation communities or montane vegetation communities; (2) managed fire resulting in unanticipated damage to targeted areas; (3) occurrence of high-severity managed fire; (4) occurrence of large-acreage wildfire; (5) drought; (6) occurrence of significant flooding; (7) termination or lapse of the USFWS's ESA section 4(d) rule concerning Chiricahua leopard frogs and maintenance and use of stocktanks; (8) possible future ESA-listing of species not covered by the MBHCP; and (9) possible future ESA-designation of new critical habitat. Each of these is addressed, respectively, in the following subsections.

(1) Escape of Fire into Riparian/Montane Habitat. The MBHCP recognizes the possibility that managed fire (i.e., a prescribed burn or wildland fire) could at some point over the life of the plan inadvertently burn into a riparian area (see Section 5.2.1.1, Subsection B.2) or a montane area (see Section 5.2.1.1, Subsection B.3) and cause significant habitat damage. Should this occur, the following measures will be implemented.

(a) *Assessment Phase*. Within 90 calendar days of the occurrence of such an event, an assessment of the fire will be undertaken and completed to determine: (i) how or why the fire occurred; (ii) the damage that resulted from the fire, including habitat damage and take of federally listed species that may have occurred, if any; and (iii) what steps to correct that damage and restore the habitat, if any, are needed. This assessment will be undertaken by or under the supervision of the MBHCP's TAC (see Section 5.7) and will involve site visits, evaluation, and the enlistment of outside technical help as needed. In addition, within 45 calendar days of completion of the assessment, MBG, with the assistance of the TAC, will prepare a brief, written report summarizing the results of the assessment and will submit the report to the USFWS, AGFD, and NMDGF, as well as ASLD and/or NMSLO if the fire or any portion thereof occurred on the lands of these agencies.

The first of the above determinations will help prevent future occurrences of the same type (e.g, through recommendations for future burn plans and prescriptions), and will be undertaken in consultation with the fire officials in charge of the fire at the time it escaped. The second determination will characterize damage to the affected habitat in terms of soil damage, vegetation damage, and extent and severity. The third determination will evaluate and describe the steps needed to correct the damage and facilitate recovery of the habitat. These might involve, among other things, erosion control measures and monitoring.

(b) *Correction Phase*. Once the assessment phase described above has been completed, correction of fire-related damage can begin. However, how and by whom this is accomplished may vary depending on the extent and severity of the damage, the scope of work needed, and funding needed. Generally, therefore, implementation of the correction phase in the event of such changed circumstances will be carried out by or under the supervision of the TAC; and, unless correction needs are relatively minor, funding of this phase will be regarded under the MBHCP as the joint and collaborative responsibility of all non-Federal HCP participants whose regulatory or resource management interests have been affected by the circumstances.

(2) Unanticipated Fire Damage to On-site Habitats. While the escape of managed fire into off-site habitats is one concern under the MBHCP (see above), another is the possibility of adverse on-site fire-

related effects (i.e., effects to habitats inside targeted burn areas that were not anticipated or planned). This type of changed cicumstance might occur, fore example, if the severity of a fire should be greater than planned within its targeted boundaries (see following subsection); if particular on-site habitat areas (e.g., Aplomado falcon foraging habitat) should be inadvertently damaged as a result of fire; or if the reason for such damage was the failure of particular take minimization measures established by the plan to protect covered species and habitats from the adverse effects of fire. These types of occurrences would typically become known or be determined either immediately (i.e., in the course of a fire) or soon thereafter (through post-fire monitoring).

The response to this changed circumstances will consist of three elements: (a) evaluation (of effects); (b) correction (of fire-related damage, as necessary); and (c) prevention (of future similar circumstances). The first two of these will be undertaken under the same terms as described, respectively, in paragraphs (1)(a) and (1)(b) above with respect to escaped fire; while the third will involve modification of inadequate or ineffective measures or procedures, as necessary, through the MBHCP's Adaptive Management procedures (see Section 5.5.2). All will be undertaken by or under the supervision of the TAC and, unless evaluation and correction needs are minor, funding for the response will be regarded as the joint responsibility of all HCP participants whose regulatory or resource management interests have been affected by the circumstance.

(3) Occurrence of Large-acreage Wildfire. Another changed circumstance possible under the MBHCP is the occurrence of relatively extensive wildfires in the Malpai Borderlands—which, if large enough, could negate or significantly reduce the effectiveness of the same burn/fire limits described in Subsection (3) above. For this reason, the plan measures establishing these limits require wildfire to be included (along with prescribed fire and wildland fire) in the cumulative acreage totals applicable to the limits. Thus, in the event that a wildfire large enough to cause any of these limits to be exceeded occurs in the Malpai Borderlands: (a) managed fire in the particular watershed(s) affected by the wildfire (and/or in grasslands, as applicable) will cease for the remainder of the time period applicable to any such limit (i.e., for the remaining part of the year, or the remaining years in a given five-year period, as applicable); and (b) acreage burned as a result of the wildfire in excess of an applicable annual, 1-year, or 5-year limit, if any, will be applied toward the limit for the following annual, 1-year, or 5-year time period.

(4) Drought. Drought is a periodic, natural occurrence in the Malpai Borderlands and at times can continue for years. Particularly severe droughts are known to have occurred in the area from 1891-1893, 1898-1904, and the mid 1950s, for example (see Section 2.2.1.1); in addition, some of the ecological problems currently present in the borderlands may have commenced (or been augmented) as a result of the combination of drought and other factors (see Section 2.2.2). This suggests that some activities otherwise normally carried out under the MBHCP may need to be curtailed or discontinued in drought periods—both to avoid adverse ecological effects, and because conditions during such periods may not be conducive to the success of the activities. The following measures will therefore be implemented should significant drought occur in the Malpai Borderlands over the life of the plan.

(a) *Deferral of Activities*. Normally, managed fire and mechanical brush control projects should not be undertaken in the midst of drought periods because both activities require productive growing seasons (i.e., adequate rainfall) subsequent to a project if optimal results are to be achieved. Consequently, MBG, participating Malpai ranchers, and other HCP cooperators, as applicable: (a) will defer the carrying out of managed fire and mechanical brush control activities and projects during drought periods (i.e., until after the first rains following a drought); unless (b) it is determined through consultation with applicable experts, authorities, or other knowledgeable individuals (e.g.,

the TAC) that a given such project can be undertaken with a reasonable expectation of success, and without an expectation that significant adverse biological or ecological effects would result

(b) *Definition of Drought*. For purposes of this subsection, whether or not drought exists at the time a managed fire or mechanical brush control project is being considered will be determined based on NOAA's Palmer Drought Index, which can be accessed at this agency's Internet website.[7]

[7] See http://lwf.ncdc.noaa.gov/oa/climate/research/prelim/drought/palmer.html.

(5) Occurrence of Significant Flooding. Floods are also a natural occurrence in the Malpai Borderlands and, depending on their magnitude, can result in significant adverse effects. These include initiation (or worsening) of gully erosion (in stream channels, washes, on hillsides, etc.); high levels of sheet erosion (the result of the rainfall accompanying floods); high levels of sediment movement in all these locations; and, in stream channels, damage to streambanks, streambeds, aquatic vegetation, and associated riparian vegetation (as a result of high velocity flood flows). Flood severity can vary widely and, with respect to any particular flood event (actual or theoretical), is sometimes expressed as the frequency with which floods of similar magnitudes occur (e.g., a 50-year flood would be equal in magnitude to those occurring, on average, once every fifty years). Of interest to the MBHCP are flood events severe enough to cause significant damage to the habitats of the covered species—particularly aquatic habitats (and species), which are susceptible to both the direct impacts of flooding (e.g., instream flood flows) and its indirect impacts (e.g., potentially, sedimentation effects from throughout an entire watershed). It is estimated that flooding of this magnitude in the Malai Borderlands might occur approximately once every one hundred years. Thus:

(a) Definition. In the Malpai Borderlands, flooding considered to constitute a changed circumstance under the MBHCP is specifically defined as the occurrence of a 100-year flood; and,

(b) Response. The response to such a flood will: (i) be undertaken by or under the supervision of the TAC; (ii) consist of an assessment phase (to evaluate damage) and a correction phase (to repair flood damage, where feasible). In addition: (c) correction would focus on repairing adverse erosion effects (particularly the most sever of those effects); and (d) unless evaluation and correction needs are relatively minor, would be regarded as the joint responsibility of all HCP participants whose regulatory or resource management interests have been affected by the circumstance.

(6) Termination of USFWS's 4(d) Rule for Chiricahua Leopard Frogs. This changed circumstance concerns possible future lapse of the USFWS's ESA section 4(d) rule for Chiricuahua leopard frogs and stocktank maintenance and use, in which case the regulatory coverage provided by the rule would also lapse. All measures needed to fully and adequately address this changed circumstance are addressed in Section 5.2.2.3, Subsection (B)(2).

(7) Designation of New Critical Habitat. This changed circumstance would consist of future designation under the ESA of critical habitat with respect to currently-listed species for which critical habitat is not designated, or currently-unlisted species which might become listed in the future and for which critical habitat might be designated at that time. No response to this circumstance under the MBHCP would be required, however

9.0 Permit Administration

MBG, or Malpai-area ranchers participating in the MBHCP, may from time to time find it necessary or desirable to amend the MBHCP, its associated I.T.P., or VCAs under the permit, or to terminate their commitments under the plan or associated VCAs. In addition, although not necessarily anticipated, procedures may occasionally be needed to address periodic failures (by one party or another) to implement all the MBHCP's requirements, or to transfer the rights and obligations of the permit from MBG to another entity. This section addresses these and other procedural issues.

9.1 Amendments

(1) Amendment of the MBHCP and Permit. The MBHCP may occasionally require amendment to: (a) add or remove a species to or from its covered species list; (b) revise the HCP's covered area or list of covered activities; (c) extend the permit term; or (d) otherwise revise the HCP in a manner that is significantly beyond the scope of the plan as originally written and approved, and that is therefore beyond the assumptions about the effects on federally and state listed species upon which the original plan was based. Any HCP amendment of this type—i.e., which affects key or substantive HCP provisions or results in new or significantly different effects on the covered species—would also require amendment of its associated I.T.P. The MBHCP and permit may therefore be amended for any such reason in accordance with the regulatory requirements applicable or in force at the time of any such amendment.

Under current USFWS permit regulations (50 CFR Parts 13 and 17), amendment of an I.T.P. is treated in much the same manner as a permit application, and requires, at a minimum: (a) a revised HCP or HCP addendum incorporating the desired changes and analyzing their effects on the covered species, or, at a minimum, a written description of the amendment, an explanation of why it is needed, and an analysis of its effects on the covered species; (b) publication of a *Federal Register* notice announcing the proposed HCP and permit amendment; and (c) a 30-day public comment period. Whether or not a proposed permit amendment would also require a new or revised NEPA (National Environmental Policy Act) document would be at the discretion of the USFWS.

(2) Amendment of the MBHCP Only. Amendment of the MBHCP may in certain circumstances be accomplished without amending its associated I.T.P. Many amendments to the MBHCP's conservation program, for example, may be effected without permit amendment under the plan's Adaptive Management provisions (see Section 5.5). In addition, amendments of a minor or technical nature not described in the plan's Adaptive Management provisions may also be effected without a permit amendment, provided that: (a) any such amendment is not expected to result in effects on the covered species or the environment, or in changes to the plan's operating conservation program, that are significantly different from those analyzed in the original HCP and NEPA document; (b) MBG submits to the USFWS a written description of the proposed amendment, an explanation of why it is needed, and an explanation of why the amendment is not expected to result in such significantly different effects; and (c) the USFWS concurs with any such finding in writing.

9.2 Permit/Agreement Termination

(1) Voluntary Termination of the Permit. MBG may terminate its obligations under the MBHCP and its I.T.P. at any time if, in its view and/or the views of its membership, the MBHCP is no longer necessary, desirable, or applicable. MBG may terminate the permit by providing to the USFWS and all other HCP participants written notice with a written explanation a minimum of 90 calendar days prior to the proposed effective date of termination. Upon such notification, any HCP participant may request a

meeting of all HCP participants to discuss pertinent or final issues that may be raised by the termination announcement, and each HCP participant will honor any such request within the 90-day notification period. The MBHCP and its associated I.T.P. will then be considered terminated as of the end of the 90-day period, provided that all obligations under the plan have been satisfied as described in paragraph (3) below. In addition, MBG will, in writing and within 60 days of the effective date of permit termination, notify all Malpai-area ranchers who at the time are party to active VCAs that the permit is to be terminated and that all VCAs will be considered terminated as of the effective date of permit termination.

(2) Early Termination of VCAs. The HCP participants recognize that Malpai-area ranchers participating in the plan may occasionally wish to terminate a VCA prior to its specified expiration date. This might occur for a number of reasons, including but not limited to emergency or exigent circumstances. Consequently, any participating Malpai rancher who wishes to terminate a VCA prior to its specified expiration date may do so by giving MBG written notice of such termination, together with a written explanation of the reason for termination, a minimum of 60 calendar days prior to the effective date of the termination. Upon such notification, the VCA with respect to that rancher will be considered terminated as of the end of the 60-day period, provided that the conditions described in paragraph (3) below are satisfied. Furthermore, no such early termination of a VCA will require USFWS approval, also provided that the conditions described in paragraph (3) below are satisfied. However, MBG will inform USFWS of all such early terminations occurring in a given year in its annual report (see Section 5.8).

(3) Requirements for Voluntary/Early Termination. MBG, should it request voluntary termination of its I.T.P., and any participating Malpai rancher requesting early termination of a VCA, understand that voluntary or early termination of either MBG's permit or a VCA under that permit is allowable only if all obligations and measures required by the MBHCP and incumbent upon the requestor at the time of the proposed effective date of termination have been fully implemented or satisfied, and that neither the USFWS or MBG is obligated to terminate the permit or VCA, respectively, or to consider the permit or VCA terminated unless or until this is the case. MBG, or any Malpai rancher requesting early termination of a VCA, also understands that the benefits provided by the MBHCP—regulatory or otherwise—also cease as of the effective date of termination of the permit or VCA, as applicable.

9.3 VCA/Permit Suspension/Revocation

A Malpai-area rancher's VCA may be suspended or revoked for cause by either MBG or the USFWS, acting jointly or separately, if: (1) the rancher has failed to satisfy any specific responsibility or condition required by the MBHCP and VCA; (2) MBG and/or the USFWS have made reasonable, good faith efforts to cooperatively work with the rancher to correct the deficiency; (3) the deficiency remains uncorrected, even after MBG's and/or the USFWS's good faith efforts; and (4) written notice has been provided to the affected rancher alerting the rancher of the pending suspension or revocation a minimum of 30 days prior to the effective date of the suspension or revocation. Similarly, the USFWS may suspend or revoke MBG's I.T.P. for cause in accordance with Federal regulations applicable or in force at the time of the suspension or revocation (such regulations are currently codified at 50 CFR Parts 13 and 17). However, no such suspension or revocation of MBG's permit by the USFWS may be inconsistent with or in violation of the regulatory assurances described in Section 8.1 of the MBHCP.

9.4 Participant Severability

Each COI issued by MBG or its authorized designee to a Malpai-area rancher is severable with respect to MBG's I.T.P., and with respect to COIs issued by MBG or its authorized designee to other Malpai-area ranchers. Thus, failure by one rancher to comply with the requirements of a COI (and the VCA of which

it is a part), potentially invalidating that rancher's permit coverage, does not affect the rights and obligations of other ranchers under their respective COIs, or MBG's rights or obligations under its I.T.P., provided that MBG or other such ranchers are themselves in compliance with the requirements of the MBHCP, the I.T.P., or their COIs, as applicable.

9.5 Permit Transfer/Succession

Although not anticipated, in the event that MBG should cease operations or otherwise be unable to carry out its responsibilities as permittee under the MBHCP, MBG's I.T.P. may be transferred to another entity in accordance with Federal or state regulations applicable or in force at the time of the transfer (such regulations are currently codified at 50 CFR 13.24 and 13.25). An appropriate successor in the event of a such a transfer would generally include a suitable state agency or conservation organization.

10.0 Alternatives Considered

Section 10(a)(2)(A) of the ESA requires an HCP to specify the alternatives to the taking (i.e., to the take or take levels proposed in the plan) that the HCP applicant considered and the reasons why such alternatives were not utilized. Accordingly, this section describes three alternatives to the MBHCP (or its programs or measures) that MBG considered in the course of developing the plan but did not include or adopt: (1) a "No Action" alternative; (2) development of a "Focused HCP/"No Take" Agreement"; and (3) inclusion of livestock grazing (defined as herbivory) as a covered activity.

10.1 No Action

Under this alternative, no HCP for the Malpai Borderlands would have been prepared and no I.T.P. for federally listed species inhabiting the area would be issued to MBG. This, in fact, has been the situation over the recent past, and under these circumstances, and this alternative, a number of things have been and would continue to be true.

First, MBG's proposed grassland improvement activities on private and state-trust lands (particularly fire management) would continue to be significantly limited as a result of unresolved ESA considerations. This is because, in the absence of the MBHCP, incidental take of endangered and threatened species potentially occurring in the course of those activities would not be authorized and no agreement between MBG and the USFWS governing that take would exist. Carrying out of these activities would therefore represent a potential legal risk (i.e., if an unauthorized take of listed species occurred as a result). Because of this all three grassland improvement activities would likely be foregone altogether on private and state-trust lands or would be undertaken at substantially reduced levels compared to those achievable under the MBHCP. This, in turn, would mean that the ecological problems addressed by the activities (ineffective fire management, erosion, and brush encroachment into grasslands) would likely get worse, or, at a minimum, would be unlikely to improve. This would be contrary to the objectives and/or land-use interests of MBG, Malpai-area ranchers, ASLD, NMSLO, and NRCS.

As with rangeland improvements, most of the conservation benefits the MBHCP provides to the covered species would be foregone or limited under the No Action alternative. These include: (1) the MBHCP's access provisions (which provide for access by HCP participants and cooperators to private and state-trust lands for the purpose of monitoring, managing, and studying these species); (2) the plan's mapping program (which ensure accurate, detailed mapping of species habitats and occurrence in the Malpai Borderlands); (3) implementation of the plan's comprehensive take minimization program; (4) establishment and operation of the Malpai Borderlands Technical Advisory Committee; (5) the monitoring and Adaptive Management programs provided by the plan; and, generally (6) significantly increased integration of grassland improvement activities with species protection needs.

It is true that some such benefits to federally listed species might occur in the absence of the plan (take minimization, for example, could be implemented with or without it). It is also true that some adverse effects to listed species would not occur if the MBHCP were not implemented—since some of its covered activities (and their associated take) likely would not be undertaken or would be undertaken only minimally if the plan were not in place. However, some of the MBHCP's most important benefits (e.g., formalized take minimization, increased awareness by MBG and Malpai ranchers of the need for species conservation, the TAC, and its comprehensive, integrated approach) would also be lost. With respect to effects, furthermore, while the short-term, relatively minor adverse effects to endangered and threatened species as a result of the grassland improvements would be avoided in the plan's absence, this would be at the expense of the long-term benefits these programs are expected to produce (see Section 7.3).

Also foregone under the No Action alternative, from the point of view of MBG and Malpai-area ranchers, would be the regulatory protections the MBHCP provides (including its associated I.T.P., "No Surprises" assurances, and a generally more predictable regulatory climate); and, from the point of view of the wildlife regulatory agencies (USFWS, AGFD, and NMDGF), the more predictable, tractable, and favorable circumstances for the covered species in the Malpai Borderlands also provided by the plan.

In light of all these considerations, the No Action alternative has been rejected.

10.2 Development of a Focused HCP/No Take Agreement

Under this alternative, the relatively comprehensive HCP represented by this document would not have been prepared in favor of a more limited HCP. Both types of plans were contemplated in a report entitled "Problem Assessment: Endangered Species Act Compliance Issues and Needs in the Malpai Borderlands of Southern Arizona and New Mexico" (Lehman 2003), which was prepared to evaluate ESA regulatory needs in the Malpai Borderlands. This assessment evaluated the advantages and disadvantages to MBG of development of a "Multi-species/Multi-activities HCP" versus a "Focused HCP" and recommended, among other things, preparation of the latter together with an associated "No-Take Agreement" for the area. The idea of developing a Focused HCP/No-Take Agreement (as opposed to a broader plan) persisted into the early stages of development of the MBHCP and was originally advocated by MBG'sconsultants and agreed upon by MBG (see Section 1.3).

As defined by the problem assessment, a Focused HCP for the Malpai Borderlands would have centered on fire management and the aquatic species, and also possibly included mechanical brush control, one or two additional activities, and the Aplomado falcon. The rationale for this was that of all activities MBG and its member-ranchers planned or proposed in the borderlands, fire management and mechanical brush control had the greatest likelihood to result in take of endangered and threatened species, and that, of these, the aquatic species were most likely to be taken. All other take potentially resulting from planned MBG and rancher activities, it was felt, could be avoided through suitable take avoidance measures, and the No-Take Agreement was to consist of a written understanding between MBG and the USFWS about what such measures would be needed to avoid take in the course of the other activities.

Thus, all or most of the erosion control, livestock management, linear facility construction and maintenance, and stocktank maintenance and use activities covered by the MBHCP would not have been covered by the Focused HCP, nor would all or most of the unlisted species covered by the MBHCP been covered under the focused plan. However, for two reasons the regulatory effects of these exclusions (on MBG and Malpai-area ranchers), and the conservation effects (on the species excluded), would have been relatively minor. From a regulatory standpoint, because these species are not currently listed, carrying out the excluded activities would not have involved any legal or regulatory risk under the ESA (in the immediate future at least). Second, from a conservation standpoint, at least some of the take minimization measures included in the MBHCP with respect to these activities and species (see Section 5.2) would also have been implemented under the Focused HCP (i.e., through the No-Take Agreement). As a result, many of the conservation benefits to these species occurring under the MBHCP would also likely have occurred under the Focused HCP. In addition, the regulatory benefits to the carrying out of fire management and mechanical brush control, and the conservation benefits to the aquatic species, under the Focused HCP alternative would have been equivalent, roughly, to such benefits under the MBHCP.

That said, some benefits of the more comprehensive MBHCP (and its associated I.T.P.) would not have occurred under the Focused HCP/No-Take Agreement alternative. These consist of the regulatory protection the MBHCP provides with respect to possible future ESA listing of currently unlisted species (which, under the Focused HCP, would have to be incorporated through permit amendments at the time of

such listings); the broader regulatory protection provided by the MBHCP with respect to currently listed species (i.e., and with respect to non-fire and non-brush control activities); and the generally broader, more complete conservation benefits of the MBHCP as well compared to the Focused HCP alternative. Indeed, it was because of these longer-term, more comprehensive benefits that MBG ultimately elected to develop the Multi-species/Multi-activities MBHCP and rejected the Focused HCP/No-Take Agreement alternative.

10.3 Inclusion of Herbivory as a Covered Activity

As explained in Section 3.6, MBG and its member-ranches, at the outset of development of this HCP, gave serious consideration to including livestock grazing defined as herbivory as a covered activity in the plan, but, in the end, decided against this. The primary reason for this decision was MBG's belief that herbivory is not significantly likely to result in take of any of the plan's covered species (and therefore need not be included within its permit coverage. The rationale for this belief is explained below.

In evaluating this likelihood, two types of take must be considered: (1) direct mortality or injury to the covered species as a result of herbivory; and (2) take as a result of the indirect effects of herbivory on the habitats of the covered species under the ESA's "harm" definition (see Section 1.4).

(1) Direct Mortality or Injury. The central question here is whether any of the MBHCP's covered species might periodically be killed or injured as a direct consequence of herbivory—which could happen only if livestock actually ate a covered species, and, therefore, could happen only with respect to plants. The MBHCP addresses only one plant, however (the Huachuca water umbel), and the distribution of this species in the planning area is confined to the San Bernardino NWR, where livestock are not present and grazing (or herbivory) does not occur. Hence, herbivory is not likely to result in take of the covered species as a result of direct mortality or injury.

It should be mentioned that grazing defined as livestock management (see Section 2.2.1.2) could result in direct killing or injury of certain covered species (e.g., through trampling effects; see Section 7.1), and it was because of this dichotomy in the effects of these two grazing components that grazing was segregated in this manner in the plan. For this reason as well, grazing defined as livestock management is included as a covered activity in the MBHCP (see Section 3.5.2.1) as is use of stocktanks by livestock (see Section 3.5.2.3).

(2) Take as a Result of Harm. Under the ESA's harm definition, habitat modification or degradation constitutes take if it results in significant impairment of essential behavioral patterns (breeding, feeding, or sheltering) to the extent that individual animals are actually injured or killed. The question here is whether or not grazing defined as herbivory (and as practiced in the Malpai Borderlands), would be expected to have these results.

Theoretically, take of the HCP's covered species through harm could occur as a result of: (a) the impacts of herbivory on the vegetative characteristics in an area (in terms of its amount, type, or structure) to the extent that the particular characteristics needed by the covered grassland and riparian species to meet their various life history components would be significantly compromised; or (b) the impacts of herbivory on the vegetative cover of an area to the extent that inadequate vegetation would trigger erosion that, in turn, would degrade downstream aquatic habitats and, thereby, kill or injure their constituent covered species.

The first of these effects has already been seen in the Malpai Borderlands, in the form of brush encroachment into grasslands, which evidently was caused in part by overgrazing in the late 1800s and early 1900s (see Section 2.2.1.2) and evidently has adversely affected the numbers and distribution of

white-sided jackrabbits in the Animus Valley (see Section 4.2.4). Other such possible effects would be degradation, as a result of over-utilization, of vegetative cover and structure in riparian areas to the extent that such areas would not support nesting by yellow-billed cuckoos or roosting by western red bats; and in grassland areas to the extent that Aplomado falcon nest trees or foraging habitat would be significantly adversely affected, or western burrowing owl or black-tailed prairie dog nesting, sheltering, or foraging habitat would be so affected (e.g., in both cases through insufficient nesting sites, vegetative food, or vegetative cover supporting prey bases being available); or in grassland areas to the extent that degradation of vegetative cover would be so intense as to trigger erosion over and above existing levels and to the extent that downstream aquatic habitats would suffer significant sedimentation effects. With respect to the latter, furthermore, such effects on fish could occur for the most part in San Bernardino NWR only (since that is their primary location), and sedimentation would have to cross the refuge itself to make it into the aquatic habitats on the refuge (since grazing does not occur on the refuge itself).

These effects of overgrazing are well documented (see, for example, the description in USFWS 1997c), and significant overgrazing clearly could have all of the effects described above, particularly when it is combined with drought. However, the effects of moderate grazing is another matter, and MBG is aware of no documentary evidence suggesting that moderate, well-managed herbivory (of the type that occurs in the Malpai Borderlands; see Section 3.6) is likely to have such effects to the extent that they would rise to the level of take (i.e., would result in death or injury to the covered species by impairing essential behavioral patterns). MBG is also unaware of any conditions or circumstances in the Malpai Borderlands attributable to the current effects of grazing suggesting that well-managed herbivory at present is having any such effects in the area. Consequently, MBG does not believe that herbivory as practiced in the Malpai Borderlands is likely to result in take of the HCP's covered species through harm and has therefore not included it within the plan's regulatory coverage.

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The Appendices

Introduction: Summary of the Appendices

Four appendices are included with the Malpai Borderlands HCP. Three have a functional purpose (or operating role) with respect to the HCP itself (and, consequently, a regulatory effect under the Endangered Species Act); while one has an explanatory purpose only with respect to the HCP, but, at the same time, serves a specific purpose under another regulatory authority (the WCA; see below). All four are summarized below (concerning their specific purpose and the section or sections of the plan that necessitate or describe them) and all appear, following this introduction, in the same order in which they are referenced in the HCP.

Appendix A: Treatment of Species Listed under the WCA. Appendix A addresses issues arising in connection with the New Mexico Wildlife Conservation Act (WCA), an ESA-like statute in force in the State of New Mexico. Species are listed under the WCA as threatened or endangered just as they are under the ESA, and all species that are WCA-listed species and occur or may occur in the Malpai Borderlands are included as covered species under the MBHCP. Appendix A therefore describes, for purposes of the WCA, how the plan benefits the conservation interests of such WCA-listed species and how the requirements of the WCA with respect to such species are otherwise addressed; it has, however, no direct effect on the HCP itself. The WCA is described in Section 1.4 of the plan.

Appendix B: Implementing Agreement. Appendix B consists of the MBHCP's Implementing Agreement (IA), an regulatory document prepared under the authorities of section 10(a)(2)(B) of the ESA and signed by all parties to the HCP except individual Malpai-area ranches. The IA is essentially a supplement to the HCP and its associated I.T.P which, among other things, extends the authorities of the plan to non-permittees and formalizes and makes binding agreements under the plan that are not regulated by the permit itself. The IA is described in Section 3.7 of the plan.

Appendix C: Guidelines for Conducting Pre-burn/Pre-Activity Surveys. Appendix C derives from the provisions of Sections 5.2.2.1, Subsection (B)(4)(a) and Section 5.2.3 of the MBHCP and concerns the process (generally) of determining the status of the HCP's covered species in the context of individual projects carried out under the plan, and the process (specifically) of conducting on-the-ground surveys to determine such status (which is one of several methods for determining this allowed for by the plan). The appendix thus provides guidelines specifically: (a) for determining whether on-the-ground surveys are required to assess species status with respect to individual projects; (b) if not, for selecting from among the various methods for this that are available; and (c) if so, for actually undertaking such surveys.

Appendix D: VCA/COI Templates. Appendix D consists of "templates" for two documents (Voluntary Conservation Agreements and Certificates of Inclusion) which play a key role in the MBHCP—that of effecting the enrollment of individual Malpai-area ranchers as participating parties in the HCP. Each template accomplishes this by acting as a pre-set pattern or beginning point for preparing actual VCAs and COIs (i.e., with all the basic, "boilerplate" information needed) and can be completed with respect to individual cases by simply inserting into specified blanks in the templates the case-specific information involved. Both documents are signed by two parties (the enrolling rancher and MBG) and participation in the plan by the rancher commences from the date of that signature. Each also serves a particular purpose in the process—the VCA formalizing the conservation commitments being made by the rancher, the COI extending the authorities of the HCP's associated permit to the enrolling rancher. Rancher participation in the HCP and the VCA/COI process are described in the HCP in Sections 5.6 and 5.6.2, respectively.

Appendix A

Treatment of Species Listed under the New Mexico Wildlife Conservation Act

DRAFT FOR REVIEW -- 30 January 2006

APPENDIX A

MALPAI BORDERLANDS GROUP HABITAT CONSERVATION PLAN: STATE LISTED WILDLIFE AND SPECIES OF CONCERN IN NEW MEXICO

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Contents

1.0. INTRODUCTION

This appendix to the Malpai Borderlands Habitat Conservation Plan (HCP) has been developed to address wildlife species that are currently protected or in the foreseeable future may be protected under the New Mexico Wildlife Conservation Act and that are known or are likely to occur in the New Mexico portion of the Malpai Borderlands Group (MBG) study area addressed in the HCP. The purpose of this document is to identify these species and their status in the area, review possible threats to their persistence, and present recommendations on how to avoid or minimize impacts to these species by MBG activities covered in the HCP. The intent is to provide guidance to the MBG to ensure that implementation of the HCP complies with New Mexico state law governing protected wildlife and to provide recommendations that may serve to benefit wildlife species listed under the WCA or that potentially could be listed.

2.0. OVERVIEW OF THE WILDLIFE CONSERVATION ACT

The New Mexico Wildlife Conservation Act (WCA; New Mexico Statutes Annotated [NMSA] 17-2-37 through 17-2-46, 1978) was passed in 1974 and revised in 1995 to provide legal authority to the New Mexico Game Commission and the New Mexico Department of Game and Fish (NMDGF) to manage, protect, and conduct research on native wildlife species at risk of extirpation in the state. Wildlife, as defined in the WCA, includes any non-domestic species of mammal, bird, reptile, amphibian, fish, mollusk, or crustacean, including any part, egg, or offspring of a live or dead example of any such species.

In the 1995 revision of the WCA, the following listing categories were established:

An **Endangered** species is one "whose prospects of survival or recruitment within the state are in jeopardy due to any of the following factors: (1) the present or threatened destruction, modification or curtailment of its habitat; (2) overutilization for scientific, commercial or sporting purposes; (3) the effect of disease or predation; (4) other natural or man-made factors affecting its prospects of survival or recruitment within the state; or (5) any combination of the foregoing factors. The term may also include any species of fish or wildlife appearing on the United States list of endangered native and foreign fish and wildlife as set forth in Section 4 of the Endangered Species Act of 1973 as endangered species, provided that the commission adopts those lists in whole or in part."

A **Threatened** species is one "that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range in New Mexico; the term may also include any species of fish or wildlife appearing on the United States list of endangered native and foreign fish and wildlife as set forth in Section 4 of the Endangered Species Act of 1973 as threatened species, provided that the commission adopts the list in whole or in part...."

A third category, **Restricted**, applies to species that are regulated under the Convention on International Trade in Endangered Species (CITES). In New Mexico, this category includes seven species of cats, only one of which (Jaguar) has occurred in New Mexico and has any relevance to the HCP planning process.

Habitat and Take under the WCA

The WCA bears some similarity to the federal Endangered Species Act (ESA) in scope and language, but differs in some important respects. The WCA does not include any provisions for protection of habitat occupied by an Endangered or Threatened species, such as the ESA's "critical habitat" designation. It does provide protection for species listed as Endangered under the act:

> *Except as otherwise provided in the Wildlife Conservation Act [17-2-37 to 17-2-46 NMSA 1978], it is unlawful for any person to take, possess, transport, export, process, sell or offer for sale or ship any species of wildlife appearing on any of the following lists: (1) the list of wildlife indigenous to the state determined to be endangered within the state as set forth by regulations of the commission; and (2) the United States lists of endangered native and foreign fish and wildlife as set forth in Section 4 of the Endangered Species Act of 1973 as endangered or threatened species, but only to the extent that those lists are adopted for this purpose by regulations of the commission; provided that any species of wildlife appearing on any of the lists set forth in this subsection, transported into the state from another state or from a point outside the territorial limits of the United States and which is destined for a point beyond the state, may be transported across the state without restriction in accordance with the terms of any federal permit or permit issued under the laws or regulations of another state or otherwise in accordance with the laws of another state.*

"Take" or "taking" as defined under the WCA, is " to harass, hunt, capture or kill any wildlife or attempt to do so" [17-2-38 L]. No provision exists for "incidental take" as in the ESA. Take, use, and transport of species listed as Endangered and Threatened under the WCA is authorized as follows:

> *The director may authorize by permit the taking, possession, transportation, exportation or shipment of species or subspecies which have been deemed by the commission to be in need of management as provided in the Wildlife Conservation Act, so long as such use is for scientific, zoological or educational purposes, for propagation in captivity of such wildlife or to protect private property.* [17-2-42 C]

> *Endangered species may be removed, captured or destroyed where necessary to alleviate or prevent damage to property or to protect human health. Such removal, capture or destruction may be carried out only by prior authorization by permit from the director, unless otherwise provided by law; provided, that endangered species may be removed, captured or destroyed without permit by any person in emergency situations involving an immediate threat to human life or private property. [17-2-42 D]*

Therefore, the demonstration of a "scientific, zoological, or educational purpose" is vital in establishing justification for take of state-listed wildlife. A "scientific or zoological purpose" could be considered as one that results in an overall benefit to the species in New Mexico.

Possible Conflicts between ESA and WCA Authorizations

As stated above, the WCA does not provide for protection of habitat of listed species and therefore does not prohibit land management activities, such as those proposed by the MBG, that may impact listed species. However, one potential area of legal conflict is where a species is both listed under the ESA (as Endangered or Threatened) and listed under the WCA as Endangered. This potential conflict is especially relevant to land management activities such as would be covered under the HCP. In the event that an incidental take permit were to be issued for a Federally listed species that was also listed as Endangered by the State, the possibility of take under New Mexico law could be triggered. Whereas NMDGF would not normally pursue law enforcement against persons and activities that result in "take" of state Endangered species as a result of habitat modification activities, establishment of a written, federal take statement provides documentation that may make the acting party (or parties) increasingly vulnerable to consequences for possible violation of the WCA. (NMDGF could also be legally vulnerable for not acting on a potential violation of the WCA under these circumstances.)

Authorization for permitting take under the WCA does not include land management activities, therefore no legal mechanism exists under NMDGF's permitting authority to allow incidental take that is permissible under the ESA. In such situations, NMDGF would likely recommend avoidance of the potential take rather than issuance of a federal incidental take permit.

A different legal mechanism may exist that could prevent conflict between ESA and WCA authority. The WCA authorizes the use of agreements with other entities, including private landowners, that facilitate management of Endangered species:

> *In carrying out programs authorized by the Wildlife Conservation Act [17- 2-37 to 17-2-46 NMSA 1978], the director may enter into agreements with federal agencies, political subdivisions of the state or with private persons for administration and management of any program established under this section or utilized for management of endangered species. [17-2-42 B]*

The provision for "agreements" is further defined in NMDGF rule 19 NMAC 36.2, approved by the New Mexico State Game Commission under authority of the WCA. The rule allows for the identification of "designated cooperators," such as private landowners, that are exempted from permitting otherwise required under the Act, provided that the activities in question are for "scientific purposes" including research and management of Endangered species.

The use of the "designated cooperator" rule has potential use in working with the MBG in the management of WCA-listed species in Hidalgo County, although to date it has not been legally tested as a means to avoid conflict with ESA authority and would likely require a Memorandum of Understanding or other formal agreement to establish cooperator status.

Species Listed under Both ESA and WCA

The following wildlife species of those identified in Table A-1 (and discussed in more detail in Section 3.0 below) are listed as Endangered or Threatened under the ESA (or are otherwise covered in the HCP as those that may be federally listed in the foreseeable future) and are also listed as Endangered or Threatened under the WCA or are likely to be listed under the WCA in the near future. Although species listed as Threatened under the WCA are not subject to the same protections as Endangered, the possibility exists that they may be uplisted to Endangered in the foreseeable future based on new information or changes in their status. These wildlife species are identified as those for which potential conflict between ESA and WCA authority could occur in the context of MBG activities.

Southern Long-nosed Bat
Mexican (Lesser) Long-nosed Bat
Mexican Gray Wolf
White-sided Jackrabbit
Aplomado Falcon
New Mexico Ridge-nosed Rattlesnake
Chiricahua Leopard Frog
Lowland Leopard Frog

3.0 ANNOTATED LIST OF SPECIES

The following annotated list of species identified in Table A-1 provides information on those state listed wildlife species and species of concern that occur in the New Mexico portion of the HCP study area. Information is derived in part from NMDGF (2004). Abbreviations: USFS = U.S. Forest Service sensitive species list; SoC = NMDGF list or Fish and Wildlife Service list of Species of Concern. Almost all species are also informally listed as Species of Greatest Conservation Need as identified by NMDGF (2005) for habitat management purposes in the New Mexico Comprehensive Wildlife Conservation Strategy. Species flagged with an asterisk (*) in this section are also covered in the HCP proper.

3.1. MAMMALS

Arizona Shrew (*Sorex arizonae*)

Conservation Status: State of NM – Endangered.
Distribution: In New Mexico, known only from higher elevations (circa 2400 m and possibly higher) in the Animas Mountains.
Habitat: Mesic woodlands of Douglas fir, quaking aspen, and netleaf oak and in proximity to springs. Areas with downed woody debris are preferred.
Times of Occurrence: Year round.
Recommendations: Protection of spring sites and riparian areas with live understory vegetation and downed woody debris is important for the conservation of this species. Drying of spring sites and destruction of overstory and understory vegetation, such as by fire, are the greatest threats to persistence of this species in the Animas Mountains.

Mexican Long-tongued Bat (*Choeronycteris mexicana*)

Conservation Status: Federal –USFS; State of NM – SoC.
Distribution: In New Mexico, primarily southern Hidalgo County.
Habitat: Mixed oak-conifer woodlands, riparian forests, Chihuahuan Desert shrublands, and canyons. Caves, mines, and similar rock shelters, as well as buildings are used as roosts. Night-blooming plants, primarily agaves, are an important food source and a critical requirement for the bat's presence in the HCP area.
Times of Occurrence: Early or mid July to mid September, but may vary somewhat depending on food availability in the HCP area and elsewhere; greatest numbers are usually present from early August to mid September (M. Bogan, pers. comm.).
Recommendations: Protection of agave plants from destruction and the prevention of disturbance at roost sites are the primary conservation concerns.

Southern (Lesser) Long-nosed Bat (*Leptonycteris curasoae*)

Conservation Status: Federal – Endangered; State of NM – Threatened.

Distribution: In New Mexico, known only from southern Hidalgo County where it has been confirmed in the Animas, Peloncillo, and Big Hatchet mountains, Guadalupe Canyon, and in the Animas and Playas valleys.

Habitat: Canyons and nearby areas in desert grasslands and shrublands, including the lower edges of oak, oak-pine, and juniper woodlands.

Times of Occurrence: Early July to early October, but may vary somewhat depending on food availability in the HCP area and elsewhere; greatest numbers are present from early August to mid September (M. Bogan, pers. comm.).

Recommendations: Avoidance of large-scale destruction of food plants, mainly agaves in flower, is critical to protecting summer populations of long-nosed bats in the HCP area. Protection of established agave stands from disturbance is recommended. Caves and mines that provide day roosts for this and other bat species should be protected from human disturbance and closure. The abandoned building at OK Bar on the Diamond A is an important night roost for this and the following species of long-nosed bat (Hoyt et al. 1994); protection and maintenance of this structure is strongly recommended.

Mexican (Big) Long-nosed Bat (*Leptonycteris nivalis*)

Conservation Status: Federal – Endangered; State of NM – Endangered.

Distribution: In New Mexico, known only from southern Hidalgo County where it has been confirmed in the Animas, Peloncillo, and Big Hatchet mountains, Guadalupe Canyon, and in the Animas and Playas valleys.

Habitat: Canyons and nearby areas in desert grasslands and shrublands, including the lower edges of oak woodlands.

Times of Occurrence: Early July to early October, but may vary somewhat depending on food availability in the HCP area and elsewhere; greatest numbers are present from early August to mid September (M. Bogan, pers. comm.).

Recommendations: Same as those for Southern Long-nosed Bat (see above).

***Western Red Bat (*Lasiurus blossevillii*)**

Conservation Status: Federal – SoC, USFS; State of NM – SoC.

Distribution: In New Mexico, primarily the southwestern counties of the state. Known from the vicinity of the Animas and Peloncillo Mountains.

Habitat: Riparian forests of cottonwood and sycamore; also oak woodlands in or near riparian zones.

Times of Occurrence: Mainly May through August.

Recommendations: Protection of riparian zones and gallery forests as roost and forage areas, as well as perennial ponds as watering sites, will benefit this bat. Additional surveys for this little-known species in Hidalgo County are needed.

Western Yellow Bat (*Lasiurus xanthinus*)

Conservation Status: State of NM – Threatened.
Distribution: In New Mexico, confirmed from Guadalupe Canyon and the Animas Mountains, Hidalgo County. Based on recent records in Texas, may occur elsewhere in southern New Mexico.
Habitat: Riparian zones with cottonwood, sycamore and Arizona white oak. Known to use palm trees and occasionally yucca as roosts elsewhere in range.
Times of Occurrence: Primarily May-September; not known to winter in New Mexico.
Recommendations: Same as for Western Red Bat (above).

Mexican Gray Wolf (*Canis lupus baileyi*)

Conservation Status: Federal – Endangered; State of NM – Endangered.
Distribution: In New Mexico, introduced wolves are currently present primarily in the recovery area within Grant and Catron counties, north of the HCP area. Dispersing individuals and pairs have ranged outside of this area.
Habitat: Occurs in a variety of forested and woodland habitats including pine-oak, pinyon-juniper, and ponderosa pine stands, and in grasslands interspersed in wooded areas; generally above 1372 m (4500 feet).
Times of Occurrence: Year round; presently only a potential transient in the HCP area.
Recommendations: At present, the experimental population occurs north of the HCP area. Monitoring of the New Mexico population to assess status and dispersal is an ongoing effort by NMDGF, Fish and Wildlife Service, and other cooperators.

Jaguar (*Panthera onca*)

Conservation Status: Federal – Endangered; State of NM – Restricted.
Distribution: In New Mexico, this species is of marginal occurrence. Recent records are from the Peloncillo Mountains near the HCP area.
Habitat: May occur in a wide range of habitats including riparian areas and densely vegetated desert-scrub habitat.
Times of Occurrence: Year round, although individuals in the New Mexico portion of study area may be transient animals.
Recommendations: Predator control activities, including snares for mountain lions, pose a potential threat to jaguars. Maintenance of water sources and dense riparian areas is probably beneficial to the few individuals that may enter the study area.

Desert Bighorn Sheep (*Ovis canadensis mexicana*)

Conservation Status: Federal – USFS; State of NM – Endangered.
Distribution: In New Mexico portion of the HCP area, extant populations are in the Peloncillo Mountains, primarily north of the MBG properties but individuals and small herds may wander long distances. Has occurred in the Animas Mountains in recent years but no established population there.

Habitat: In New Mexico, primarily in dry, rocky areas with steep gradients and cliffs and with limited shrub and tree cover.
Times of Occurrence: Year round as a transient.
Recommendations: Desert bighorns are of marginal occurrence in the MBG area. Any activity that reduces shrub cover in rocky, upland areas could potentially provide suitable habitat for this animal but most suitable habitat lies north and east of the HCP area.

Southern Pocket Gopher (*Thomomys umbrinus*)

Conservation Status: State of NM – Threatened.
Distribution: In New Mexico, known only from the Animas Mountains. The subspecies *T. u. emotus* is endemic to this range.
Habitat: In New Mexico, found mainly at the higher elevations (above 7200 feet) of the Animas in canyons and clearings with friable soils and suitable forage plants. May follow canyons downslope into foothills of the range.
Times of Occurrence: Year round.
Recommendations: At present the Animas population is likely secure from threats. Additional survey efforts to assess population size and distribution are warranted.

Yellow-nosed Cotton Rat (*Sigmodon ochrognathus*)

Conservation Status: Federal – SoC; State of NM -- SoC.
Distribution: In New Mexico, in and near the Animas and Peloncillo mountains.
Habitat: Grassy slopes in or adjacent to pine-oak woodlands from foothills, where it may be found with Chihuahuan Desert shrub species, to upper elevations of mountains.
Times of Occurrence: Year round. Population density likely peaks in the Fall.
Recommendations: Maintenance of dense grass cover in uplands and on bajadas is necessary for the persistence of this species. Livestock management, erosion protection projects, and possibly prescribed burns that serve to maintain grass cover in pine-oak habitat are beneficial. Additional study of this species, including as an indicator of healthy range conditions on slopes, is warranted.

***White-sided Jackrabbit (*Lepus callotis*)**

Conservation Status: Federal -- USFS; State of NM – Threatened.
Distribution: Southern Animas Valley and, at least formerly, the southern Playas Valley in Hidalgo County.
Habitat: Plains vegetated with tobosagrass, buffalograss, and grama and largely free of shrubs and forbs. As shrub cover increases, presence by this species declines.
Times of Occurrence: Year round.
Recommendations: White-sided jackrabbits would likely benefit from range management activities, such as prescribed fire, that would reduce shrub density and improve native grass cover. However, avoidance of burning in suitable habitat during breeding season (mid April to mid August) is recommended. Pre-burn surveys to determine presence-absence of the species should be conducted.

3.2. BIRDS

Gould's Wild Turkey (*Meleagris gallopavo mexicana*)

Conservation Status: Federal – USFS; State of NM – Threatened.

Distribution: The Gould's subspecies of the Wild Turkey, typical of Mexico's Sierra Madre, occurs naturally in the United States only in the Peloncillo and Animas ranges and the intervening Animas Valley in southern Hidalgo County, New Mexico. It occurs in all major canyons and adjacent foothills areas in the Peloncillo Mountains, from Guadalupe Canyon north primarily to the Skeleton Canyon area but with smaller numbers farther north, and in the Animas Mountains, from Deer Creek north to Indian Creek and Double Adobe Creek, as well as along Animas Creek in the middle Animas Valley.

Habitat: Occurs primarily in pine-oak forested canyons and adjacent slopes, and in cottonwood-sycamore riparian situations. Important habitat components include water and tall trees for roosting. Nests are placed on ground in low vegetation, often next to downed logs or at the base of a shrub or tree. Elevations of occurrences in southern Hidalgo County range from about 4400 ft to 7500 ft or higher.

Seasonal Occurrence: Year round resident, breeding from March/April to July/August; most hatching occurs in June.

Conservation Concerns: Threats to this taxon in Hidalgo County include habitat loss from removal of vegetation, wildfire, competition with livestock (cattle, hogs), lack of water sources, hybridization with non-native turkeys, and human killing and disturbance.

Recommendations: Monitor population to identify distribution and trends. Identify and protect (from fire, cutting) roost trees. Avoid livestock grazing in riparian areas. The local population appears well-adapted to local conditions, hence, augmentation with stock from elsewhere (e.g., Mexico) is not recommended.

Northern Goshawk (*Accipiter gentilis*)

Conservation Status: Federal – USFS; State of NM – SoC.

Distribution: Breeding birds found primarily at middle and higher elevations in the Peloncillo and Animas mountains, with reports from most major canyons in both ranges; migrants and wintering birds found more widely. The local breeding birds are usually separated as *A. g. apache* ("Apache" Goshawk); birds in migration and winter likely include the widespread *A. g. atricapillus*.

Habitat: In the Peloncillo and Animas mountains, breeds primarily in forested canyon bottoms in the pine-oak zone, with most nests in large Chuhiahua pines and placed 30-60 ft above ground. Most reported breeding territories are above 5400 ft; migrant and wintering individuals found lower.

Seasonal Occurrence: Presumably resident in the Peloncillo and Animas mountains, but relatively few winter reports. Breeding occurs from April through July, with most active nests in the Peloncillos reported from early May to mid-July.

Conservation Concerns: The small breeding population is threatened by habitat loss or alteration, especially loss of large pines. Disturbance to nesting birds is a concern, as is illegal take for falconry.

Recommendations: Traditional nesting territories should be protected from habitat loss and from human disturbance. The ban on take of nestlings for falconry in the Peloncillo and Animas ranges should be continued.

Common Black-Hawk (*Buteogallus anthracinus*)

Conservation Status: Federal – USFS; State of NM –Threatened.
Distribution: In southern Hidalgo County, this neotropical raptor has been recorded occasionally in Guadalupe Canyon, in the Animas Valley in the vicinity of Clanton Cienega and along Animas Creek, and along lower Deer Creek in the southern Animas Mountains.
Habitat: A riparian-obligate species, breeding birds require mature broadleaf forest stands (cottonwood, sycamore) located near permanent streams where the principal prey (fish, amphibians, reptiles) is available. Nests are placed in large cottonwoods or sycamores near water. Migrants and wandering individuals found in similar habitats, with most occurrences in southern Hidalgo County associated with surface water (including flowing streams) in wet years.
Seasonal Occurrence: A neotropical migrant, present in southwestern New Mexico only during the warm season, arriving in mid-March and departing by October. To date, known only as a transient in southern Hidalgo County, with no breeding records.
Conservation Concerns: Lack of suitable permanent water in southern Hidalgo County largely precludes breeding.
Recommendations: Clanton Cienega and other well-watered riparian areas in the Animas Valley offer the best opportunities for breeding birds to become established. Management decisions that maintain high water tables and hence surface water and large trees in such areas are encouraged.

***Aplomado Falcon (*Falco femoralis*)**

Conservation Status: Federal – Endangered; State of NM – Endangered.
Distribution: In southern Hidalgo County, historically occurred in open grasslands in the Animas, Playas, and Hachita valleys. Last specimen was taken in the Animas Valley in 1939; last reported nest was on the international border west of Antelope Wells in 1952. Reports in recent years primarily from the Animas Valley.
Habitat: Open desert grasslands with high grass cover and low shrub density. Nests in old stick nests (hawk, raven), most commonly in tall yuccas.
Seasonal Occurrence: Historically, was resident where found. Breeding in southern New Mexico occurs March-July.
Conservation Concerns: Alteration or degradation of grassland habitat, primarily through reduction of grass cover and increase in woody vegetation, this resulting from excessive livestock grazing. Loss of yuccas, also resulting from livestock impacts, reduces available nest sites.
Recommendations: Manage grasslands to provide for suitable habitat in order to encourage natural recolonization to proceed in Hidalgo County and elsewhere in southern New Mexico.

Peregrine Falcon (*Falco peregrinus*)

Conservation Status: Federal – USFS; State of NM – Threatened.
Distribution: In southern Hidalgo County, breeds in middle and higher elevation canyons in the Peloncillo and Animas mountains, typically in areas with high habitat diversity. Migrant and wandering individuals have been reported widely in the area (e.g., Animas Valley) but are often associated with tanks or other water areas where prey species (birds) concentrate.
Habitat: Breeds on cliffs in mountain canyons. As an aerial hunter, it forages widely for avian prey.
Seasonal Occurrence: In southern Hidalgo County, breeding territories are occupied from early March into July or August.
Conservation Concerns: Disturbance to breeding birds is the principal concern in southern Hidalgo County. Illegal take of nestlings for falconry is likewise an important concern.
Recommendations: Suitable habitat should continue to be identified and protected from disturbance. Potentially disruptive activities (prescribed fires; road/trail maintenance, etc.) should be scheduled during the non-breeding September-February season. Maintain strict confidentially regarding location of breeding territories, this to avoid disturbance by the curious and illegal take by falconers. The current Department monitoring program should continue.

Mountain Plover (*Charadrius montanus*)

Conservation Status: State of NM – SoC.
Distribution: Historically, nested in the Animas Valley, with several reports through the 1920s but with the last documented breeding in 1933.
Habitat: A species of open, flat to rolling, shortgrass plains and mesas, often associated with prairie dog activity or other forms of surface disturbance (cattle concentrations) that provide some bare ground. Elevations of occurrence in southern Hidalgo County are about 5000 ft.
Seasonal Occurrence: Migrates through southern Hidalgo County, to and from wintering areas to the west and south, in early spring (March) and again in fall (September-November). Historically, local breeders present April-July, with young reported by early May. Although the species winters (at lower elevations) not far to the west and south of the Animas Valley, it is not known to winter in Hidalgo County.
Conservation Concerns: Loss of local breeding population by the 1930s possibly related to local elimination of prairie dogs.
Recommendations: Allowing prairie dogs to thrive in McKinney Flats and elsewhere in southern Hidalgo County (e.g., Animas Valley) should benefit Mountain Plovers.

Common Ground-Dove (*Columbina passerina*)

Conservation Status: Federal – USFS; State of NM – Endangered.

Distribution: In southern Hidalgo County, found most frequently in Guadalupe Canyon, in the Animas Valley from the vicinity of the XT Camp, Dunagan's, and 44-Well south to Clanton Cienega, along Double Adobe Creek at the north end of the Animas Mountains, and along lower Deer Creek (Culberson Camp to Granite Gap) at the south end of the Animas Mountains. Also found north in the Peloncillo Mountains to Post Office Canyon and the vicinity of Rodeo.

Habitat: Prefers brushy, well-watered valleys, frequenting riparian woodlands and shrublands, especially mesquite thickets along streams and canyon bottoms, foraging in adjacent fields, farms, and ranch yards. Typically associated with semi-open habitats containing low brush and grasses. Nests are placed low in shrubs or small trees, rarely more than 10-15 ft above ground. This is a species of low elevations, generally found below 5000 ft in southern Hidalgo County.

Seasonal Occurrence: Primarily a warm season resident in southern Hidalgo County, with most reports from April into September. Less regular in fall and early winter, but perhaps overlooked at those seasons. Territorial singing heard from April through August, with peak of breeding activity May-June.

Conservation Concerns: Loss of native shrublands in lowland riparian areas, through clearing, excessive livestock grazing, or watertable lowering, is the chief concern. No documented breeding records from Hidalgo County for many years.

Recommendations: Protection and enhancement of shrubby riparian habitats, and provision of surface water in such areas, would be beneficial. Department survey and monitoring programs in Guadalupe Canyon, the Animas Valley, and the Animas Mountains should be continued.

Whiskered Screech-Owl (*Megascops trichopsis*)

Conservation Status: State of NM – Threatened.

Distribution: In New Mexico, occurs only in Hidalgo County, where found regularly in several Peloncillo Mountain canyons (e.g., Skeleton, Whitmire, Cottonwood, Clanton) and occasionally in the Animas Mountains (Indian Creek Canyon).

Habitat: A species of dense pine-oak woodlands, and dense oak woodlands just below the pine-oak zone, especially favoring oak riparian situations in mountain canyons and dense woodlands on adjacent north facing slopes. Nests in cavities in snags or dead portions of living trees. Resident in the Peloncillo Mountains from about 4800 ft up to 5700 ft; found up to 6300 ft (and occasionally higher) in the Animas Mountains.

Seasonal Occurrence: Permanent resident in the Peloncillo Mountains; possibly resident in the Animas Mountains. Breeding season generally February/March into July.

Conservation Concerns: Loss of pine-oak and oak woodlands in the Peloncillo and Animas mountains, especially in canyon bottom situations, through vegetation removal or fire (natural or prescribed) is the principal concern. Cavity trees (snags, etc.) are especially vulnerable to fire and woodcutting.

Recommendations: Continue to survey for and monitor the limited New Mexico population. Encourage public and private land managers to protect pine-oak and oak woodlands, especially in canyon riparian situations.

***Mexican Spotted Owl (*Strix occidentalis lucida*)**

Conservation Status: Federal – Threatened; State of NM – SoC.

Distribution: In southern Hidalgo County, resident only the highest reaches of the Animas Mountains, including upper Indian Creek Canyon, Aspen Spring, and adjacent forested slopes and high canyons. Occasional transient in the Peloncillo Mountains.

Habitat: In the Animas Mountains, resident in cool, relatively moist canyons and adjacent slopes characterized by dense, mature mixed conifer forests of Douglas-fir/ponderosa pine with Gambel's oak understory, typically above 7000 ft. A shrubby, grassy understory with much dead and down woody debris is necessary for supporting small mammal prey base. Nests situated in large trees, especially in mistletoe clumps, old stick nests, or tree cavities; will also nest on cliff ledges and in caves.

Seasonal Occurrence: Year round resident in higher portions of Animas Mountains. Generally, courtship begins in March, egg laying is in April, young are in nests May-June, and dependant fledglings are seen in July.

Conservation Concerns: Loss of very limited mixed conifer habitat in higher Animas Mountains canyons is the principal concern. Human disturbance of this small population, especially during the nesting season, is likewise a concern.

Recommendations: Maintain available habitat in the higher Animas Mountains. Burning in these canyon habitats is not recommended. To promote understory for prey species, areas should be protected from grazing. Human disturbance should be minimized.

Buff-collared Nightjar (*Caprimulgus ridgwayi*)

Conservation Status: Federal – USFS; State of NM – Endangered.

Distribution: First discovered in the United States in 1958 in the New Mexico portion of Guadalupe Canyon, where apparently breeding at the time.

Habitat: Rocky desert canyons characterized by thickets of mesquite, acacia, hackberry, and other brush, with scattered junipers on adjacent slopes. Nest is a scrape on the ground. Elevations of occurrence in upper Guadalupe Canyon about 4500 ft.

Seasonal Occurrence: Apparently only a warm season resident, reported April-August; breeding primarily during May and June.

Conservation Concerns: Not found in New Mexico's Guadalupe Canyon since 1985, and possibly extirpated there.

Recommendations: Habitat protection to allow for nesting and roosting cover and to provide for adequate prey base would be a first step. Such protection may include prevention of fires, protection from grazing, and a moratorium of vegetation clearing.

Broad-billed Hummingbird (*Cynanthus latirostris*)

Conservation Status: Federal – USFS; State of NM -- Threatened.

Distribution: In Hidalgo County, summers regularly in Guadalupe Canyon and immediately adjacent side canyons. Also occurs farther north in the Peloncillo Mountains, most regularly in Skeleton and Post Office canyons and occasionally in Clanton and Cottonwood canyons. Also reported in the northern Animas Mountains along Double Adobe Creek.

Habitat: Prefers arid to semiarid habitats in higher desert canyons and washes, riparian woodlands, and foothills, especially groves of sycamores and cottonwoods with dense thickets of small trees and shrubs, including hackberry, juniper, algerita, and mesquite. Nest in small tree or shrub (e.g., hackberry), placed quite low, usually 3-4 ft above ground. Most occurrences in the 4400-5600 ft range.

Seasonal Occurrence: A neotropical migrant, present during the warm season only. An early arriving species, typically present from mid-March into September; extremes are 8 March and 3 October. Extended breeding season, lasting from late March into early September.

Conservation Concerns: The principal concern is loss of riparian woodlands in Guadalupe Canyon and similar canyons, from clearing (brush removal, tree cutting), burning, or other impacts (lowered watertable; excessive livestock grazing).

Recommendations: Preservation and enhancement of riparian woodlands and adjacent xeric habitats in Guadalupe Canyon and other canyons in southern Hidalgo County.

White-eared Hummingbird (*Hylocharis leucotis*)

Conservation Status: Federal – USFS; State of NM – Threatened.

Distribution: In southern Hidalgo County, occurs primarily in the higher reaches of the Animas Mountains (upper Indian Creek Canyon, Aspen Spring, upper Bear Creek Canyon, Cistern Saddle). Occasionally reported in the Peloncillo Mountains (upper Clanton Canyon, Post Office Canyon) but no evidence of regular occurrence there.

Habitat: Prefers relatively moist montane forests and forested canyons; in the Animas Mountains, found most commonly in mixed conifer, pine, and pine-oak zones. Nests are placed low in shrubs or small trees. Elevations of most Hidalgo County occurrences are above 6000 ft.

Seasonal Occurrence: A neotropical migrant, found from mid-May to early October, with most reports from June-July. Breeding season is mid-summer (July into August) and is likely linked to the summer rainy season.

Conservation Concerns: As a species restricted to moist mountain canyons and adjacent forested slopes, this hummingbird is vulnerable to loss of that limited habitat from actions or events including fires, mining, and excessive livestock grazing; acid rain from regional smelters likewise may impact these high mountain forests.

Recommendations: Protection of forested canyon habitats in the higher reaches of the Animas Mountains. Department surveys of potential habitat in the Animas Mountains should continue.

Violet-crowned Hummingbird (*Amazilia violiceps*)

Conservation Status: Federal – USFS; State of NM – Threatened.

Distribution: In Hidalgo County, found regularly only in Guadalupe Canyon. Rarely found north in the Peloncillo Mountains to Clanton and Skeleton canyons, and to Double Adobe Creek, north Animas Mountains.

Habitat: In Guadalupe Canyon, broadleaf riparian woodlands of sycamore, cottonwood, hackberry, and oak, especially clumps of mature sycamores. Occupied habitats are characterized by much herbaceous ground cover. Agaves are important food plants. This species often visits pools of water, if available. Nests in tall deciduous trees, almost always in tall sycamores; nests placed relatively high, averaging over 20 ft above ground, up to over 40 ft.

Seasonal Occurrence: A neotropical migrant, present during the warm season only. A late arriving species, typically present from early June to mid-September, nesting from mid-June through August.

Conservation Concerns: Threatened by loss of low elevation broadleaf riparian and adjacent xeric habitats, such losses occurring from fire, clearing, overgrazing, and lowering watertables. Fire poses a significant threat if scarce large-tree riparian habitats are burned or food sources such as agaves are destroyed by fire. Grazing in canyon bottoms may remove necessary dense understory vegetation and impede regeneration of riparian trees.

Recommendations: Maintain suitable riparian woodland and adjacent xeric habitats in Guadalupe Canyon. Annual Department monitoring in Guadalupe Canyon should continue.

Lucifer Hummingbird (*Calothorax lucifer*)

Conservation Status: Federal – USFS; State of NM –Threatened.

Distribution: In Hidalgo County, occurs regularly only in several mid-elevation canyons in the Peloncillo Mountains, most regularly Post Office, Skeleton, Cottonwood, and Clanton canyons; occasionally in Guadalupe Canyon.

Habitat: Prefers rugged canyons and slopes in dry mountain ranges, especially rocky hillsides, talus slopes, and dry washes vegetated with desert scrub, such as shrubby trees (juniper, pinyon, oak), cactus, yucca, ocotillo, and agave. Most nests are in cane cholla, ocotillo, or agave, typically about 5 ft above ground. Ranges up to about 5700 ft.

Seasonal Occurrence: Early arriving neotropical migrant, typically present from late March until late September or early October. Nesting can occur both early and late during this season.

Conservation Concerns: Loss of native dry canyon/hillside habitats, including loss or reduction of native food plants from burning or overgrazing.

Recommendations: Protection of native vegetation in preferred dry canyon/hillside habitats. Effects of fire (prescribed or otherwise) on nectar resources, particularly on plants such as agaves, require serious study.

Costa's Hummingbird (*Calypte costae*)

Conservation Status: Federal – USFS; State of NM – Threatened.

Distribution: In Hidalgo County, found most regularly in Guadalupe Canyon but also occurs farther north in the Peloncillo Mountains in Clanton, Skeleton, and Post Office canyons; rarely north to Granite Gap and in the Animas Valley.

Habitat: An arid-land species favoring hot, dry desert scrub. In Guadalupe Canyon, nests in dry washes adjacent to the main canyon, in areas of southern exposure, and characterized by xeric shrubs such as mesquite, sumac, and acacia and an absence of large trees. Nests in open situations with good visibility. Nests in weeds, shrubs (algarita), and small trees (hackberry, small oaks). Nests are placed low, typically only 3-7 ft above ground.

Seasonal Occurrence: A very early arriving neotropical migrant, present from March into September or later. Breeding in New Mexico is primarily from late March into early June, with most activity in April and May. Many summer and early fall records likely represent post-breeding migrants from farther west.

Conservation Concerns: Loss of native xeric hillside vegetation and adjacent canyon bottom riparian habitats, through burning, clearing, or excessive livestock grazing.

Recommendations: Protection of canyon bottom habitats and associated xeric hillsides in Guadalupe Canyon and similar canyons in the Peloncillo Mountains.

Elegant Trogon (*Trogon elegans*)

Conservation Status: Federal – USFS; State of NM – Endangered.

Distribution: In Hidalgo County, summers regularly, and breeds, only in Skeleton Canyon, Peloncillo Mountains. Occurs irregularly in the Animas Mountains, most frequently in Indian Creek Canyon and once in Pine Canyon. There are single records for Guadalupe Canyon and the Big Hatchet Mountains.

Habitat: Prefers oak or pine-oak forested mountain canyons with sycamore, cottonwood, walnut, oak and/or juniper along canyon bottoms. Forages for insects and small fruits and berries on slopes as well as along canyon bottoms. Nests in natural cavities or old woodpecker holes, either in live or dead tree; most nests in sycamore, fewer in oaks. Breeds at about 5000 ft in the Peloncillo Mountains and occurs at about 6000 ft in the Animas Mountains.

Seasonal Occurrence: A neotropical migrant present from mid-April until mid-September; extremes are 9 April and 4 October. Nesting in the Peloncillos primarily May-July.

Conservation Concerns: Small breeding population (one-two pairs annually) threatened by loss of limited breeding habitat (including large trees with suitable cavities) and foraging habitat (including fruiting shrubs) from wood-cutting, fire, excessive livestock grazing, reduced water table, road construction and other developments. Human disturbance during the nesting season can be a serious limiting factor.

Recommendations: Preservation and enhancement of mid-elevation montane riparian habitats in the Peloncillo and Animas mountains is necessary, including maintaining water tables in canyons sufficient to support sycamores. Protection of breeding territories and nesting birds from human disturbance is another priority. Annual Department monitoring of breeding population should continue.

Gila Woodpecker (*Melanerpes uropygialis*)

Conservation Status: Federal – USFS; State of NM – Threatened.
Distribution: Resident in southern Hidalgo County in Guadalupe Canyon, in the Animas Valley, and in the Animas Mountains along Double Adobe Creek and lower Deer Creek; occasionally found north in the Peloncillo Mountains to Skeleton Canyon.
Habitat: In southern Hidalgo County, generally restricted to well-developed broadleaf riparian woodlands characterized by extensive groves of mature cottonwoods and sycamores. Nests in cavities excavated in dead wood in large trees, including dead snags. Elevations of occurrence generally 4400-5400 ft.
Seasonal Occurrence: Permanent resident. Nesting begins by April and continues into July; most young leave the nest during June.
Conservation Concerns: Habitat loss, especially cutting or burning mature cottonwood/sycamore stands and including progressive fragmentation of remaining habitat patches.
Recommendations: Preservation and restoration of extensive riparian woodlands, particularly mature groves of cottonwoods and sycamores. Livestock grazing practices that preclude regeneration of such stands should be avoided. Fires, prescribed or otherwise, that may kill large trees should be excluded from riparian woodlands. Annual Department survey and monitoring programs should continue in Guadalupe Canyon and elsewhere.

Northern Beardless-Tyrannulet (*Camptostoma imberbe*)

Conservation Status: Federal – USFS; State of NM – Endangered.
Distribution: In Hidalgo County, summers regularly, and breeds, only in Guadalupe Canyon. Occasionally reported elsewhere in the Peloncillo Mountains (Skeleton Canyon, Post Office Canyon) and the Animas Mountains (Double Adobe Creek, lower Deer Creek), but no evidence of breeding in those areas.
Habitat: A low-elevation riparian species that prefers dense thickets of mesquite, acacia, hackberry, and similar vegetation, typically along stream courses. Nests in outer branches of trees or large shrubs, often in mistletoe clump if available.
Seasonal Occurrence: A neotropical migrant, present from March to mid-August; extremes are 27 February and 18 October; nesting typically from late April or May into July.
Conservation Concerns: The very small and localized Guadalupe Canyon population is vulnerable to loss of required riparian habitat from burning, clearing, reduced water table, and (if allowed) excessive livestock grazing.
Recommendations: Preservation and enhancement of native riparian and associated habitats in Guadalupe Canyon. Annual Department monitoring of Guadalupe Canyon population should continue.

Thick-billed Kingbird (*Tyrannus crassirostris*)

Conservation Status: Federal – USFS; State of NM – Endangered.
Distribution: In Hidalgo County, occurs regularly, and breeds, only in Guadalupe Canyon. Occasionally reported along Animas Creek (vicinity of Dunagan's), and in the Animas

Mountains along Double Adobe Creek in the north and lower Deer Creek in the south. Vagrant elsewhere, with single records in the Alamo Mountains and the Dog Mountains northeast of Antelope Wells.

Habitat: Requires well-developed broadleaf riparian woodlands characterized by mature cottonwoods and sycamores. Nests in upper branches of tall trees; all New Mexico nests placed in sycamores, 30-65 ft above ground.

Seasonal Occurrence: A neotropical migrant that is typically present May-August, rarely late April and early September; nesting primarily from late May to early August.

Conservation Concerns: Loss of mature broadleaf riparian woodlands, especially large cottonwoods and sycamores, from fire (prescribed or otherwise), cutting, reduced water table, and grazing that suppresses regeneration. The small Guadalupe Canyon population has declined in recent years.

Recommendations: Public and private land managers should protect and enhance broadleaf riparian habitats in Guadalupe Canyon and elsewhere. In particular, fires in riparian areas that kill large trees should be avoided. Annual Department monitoring of Guadalupe Canyon population should continue.

Bell's Vireo (*Vireo bellii*)

Conservation Status: Federal – USFS; State of NM – Threatened.

Distribution: In southern Hidalgo County, summers regularly in Guadalupe Canyon. In the foothills of the Animas Mountains, found frequently along Double Adobe Creek (vicinity of Double Adobe Camp) and lower Deer Creek (vicinity of Granite Gap). Elsewhere in southern Hidalgo County, recorded in the Alamo Hueco Mountains (Sycamore Well), Little Hatchet Mountains, and the southern Hachita Valley.

Habitat: Dense, brushy, low streamside or canyon bottom thickets of mesquite, acacia, hackberry, willow, seepwillow, or other shrubby plants, including saltcedar. Although surface water is not a requirement, the water table must be sufficiently high to support adequate plant growth. Nests placed in shrub or low tree, usually 2-5 ft above ground. New Mexico breeding populations typically found below 5000 ft.

Seasonal Occurrence: A neotropical migrant, present in New Mexico only during the warmer months. Typically arrives by mid-April and departs by mid-September. Some nests initiated by late April but most nesting occurs in May and early June, with re-nesting efforts continuing into July.

Conservation Concerns: Loss of dense, shrubby and woody riparian habitats from clearing, grazing, firewood cutting, and water table lowering, plus high rates of brood parasitism by cowbirds (leading to reduced productivity), are the principal threats.

Recommendations: Encourage public and private land managers to preserve and restore riparian and adjacent shrubby habitats along lowland streams. Cowbird control may be useful in localized areas (e.g., Guadalupe Canyon), but it should be recognized that cowbird parasitism is only a symptom of larger habitat problems. Annual Department monitoring of Guadalupe Canyon population should continue.

Gray Vireo (*Vireo vicinior*)

Conservation Status: Federal – USFS; State of NM – Threatened.

Distribution: In southern Hidalgo County, occurs most regularly, and breeds, in Guadalupe Canyon and on adjacent slopes. Also found north in the Peloncillo Mountains in Skeleton Canyon, and in lower Indian Creek Canyon, Animas Mountains. Formally found in the Big Hatchet Mountains, but no recent records there.

Habitat: Most often found in arid juniper woodlands at the bases of foothills and mesas, these sometimes associated with oaks and pinyons and often with a well-developed grass component. Nests placed in thorny or twiggy shrub or tree (mature juniper, shrubby oak); placed low, usually only 2-8 ft above ground.

Seasonal Occurrence: A neotropical migrant, present only during the April-September period. Nest initiation occurs from late April into mid-July, with young in nests into August.

Conservation Concerns: Loss of quality juniper savannah habitat, including through burning, clearing, wood-cutting, or overgrazing, is the principal concern. Nest parasitism by cowbirds can severely impact local populations by suppressing productivity.

Recommendations: Identify and maintain quality juniper savannah and other occupied habitats. Land management activities aimed at eliminating junipers should be discouraged, and all such activities should be scheduled outside the April-August breeding season. Expanded early breeding season (April-June) surveys are needed, especially in Animas Mountains foothills (e.g., just north of San Luis Pass).

Botteri's Sparrow (*Aimophila botterii*)

Conservation Status: State of NM – SoC.

Distribution: New Mexico's only significant population breeds in the floodplain of the middle Animas Valley (vicinity of XT Camp to vicinity of 44-Well/Middle Well). The only additional locality with more-or-less regular occurrence is along lower Deer Creek in the vicinity of Granite Gap. Occasional individuals noted elsewhere in southern Hidalgo County (McKinney Flats, Clanton Cienega), but with no evidence of breeding.

Habitat: A tall-grass specialist. In Hidalgo County, essentially restricted to dense, tall (6 ft) senescent stands of giant sacaton with scattered shrubs and small trees. Nests placed on the ground, either under or deep inside tall, thick grass clumps with much overhanging canopy and dead thatch.

Seasonal Occurrence: A late-arriving neotropical migrant, typically returning in May and departing by mid-September; extremes are 1 May and 28 September. Territorial singing begins by late May and nesting is underway by mid/late June and continues through July to mid-August; adults with fledglings are present into early September.

Conservation Concerns: The small local population is severely limited by available giant sacaton habitat, and so is vulnerable to loss or alteration of this special habitat. Fire and grazing are the principal concerns. Available data suggest that 3-4 years is required for re-occupancy following fire, and full re-occupancy may not occur for 6 or more years following fire. However, that does not hold true when burned areas receive moderate to heavy grazing following fire, as that reduces necessary vegetative structure, resulting in reduced occupancy.

Recommendations: Prescribed burning of sacaton stands may be desirable, to reduce the potential for large wildfires. Such burns should be staggered over many years, with no more than one-sixth of available habitat treated in any one year; livestock should be excluded from burned areas for at least a year following treatment. Burning should not occur during the May-August breeding season. Given the uniqueness of the giant sacaton stands in the middle Animas Valley, permanent exclusion of livestock there would enhance both the sacaton bottoms and adjacent riparian woodlands. Annual Department monitoring of the breeding population should continue.

Arizona Grasshopper Sparrow (*Ammodramus savannarum ammolegus*)

Conservation Status: State of NM – Threatened.

Distribution: In New Mexico, this unique subspecies breeds only in southern Hidalgo County in the southern Animas Valley and the western Playas Valley (McKinney Flats area).

Habitat: Requires extensive, well-developed desert grasslands characterized by grama and other bunchgrasses and generally lacking woody vegetation. Abundant thatch and dry grasses are needed for cover. Nests are built into the bases of grass clumps and depend on dense, dead grasses for concealment. Occupied grasslands in southern Hidalgo County are at about 5000 ft.

Seasonal Occurrence: The *ammolegus* subspecies is present from late spring (April or May) into early autumn (September or October). Males begin singing by late May, with breeding occurring in June-July and into August. Apparently, it withdraws from the area in winter, and is replaced by wintering Grasshopper Sparrows of other subspecies, although some *ammolegus* may over-winter locally. Migrants of other subspecies arrive by August.

Conservation Concerns: The main threat to this taxon's continued survival in southern Hidalgo County is loss, degradation, and fragmentation of its native grassland habitat, primarily from excessive livestock grazing leading to reduced grass cover and increased brush encroachment. Ill-timed fires (especially those occurring late spring-early summer) may severely depress recruitment. Since 1992, both the Animas and Playas populations have experienced steep, persistent declines; the once sizable Playas (McKinney Flats) population is nearing extirpation.

Recommendations: Employ livestock grazing practices and burning programs that perpetuate suitable grassland habitat for this unique subspecies. In particular, consideration should be given to reducing stocking rates in times of drought. The two populations should continue to be monitored each June, and surveys for additional populations (e.g., southwest of Cloverdale) should be conducted.

Baird's Sparrow (*Ammodramus bairdii*)

Conservation Status: Federal – USFS; State of NM – Threatened.

Distribution: In southwest New Mexico, occurs most regularly in southern Animas Valley grasslands, and should be expected in similar grasslands elsewhere (e.g., McKinney Flats).

Habitat: A grassland specialist, in southwest New Mexico requiring dense, expansive desert grasslands characterized by grama and other bunch grasses with little or no shrub component.

Typically found at around 5000 ft in the Animas Valley, but occurs even higher in grassy openings and meadows in the Animas and Peloncillo mountains.

Seasonal Occurrence: Strictly a migrant and occasional wintering species in New Mexico. In southwest New Mexico, fall migrants arrive as early as mid-August, and continue to pass through from September through November. A few winter December-January if suitable grassland habitat exists. Spring migrants occur from late February into early April.

Conservation Concerns: Progressive loss and degradation of dense grassland habitat, this due to excessive livestock grazing leading to loss of grass cover (and increased bare ground), reduction in available seed crop, invasion of forbs, and shrub encroachment.

Recommendations: Any program that protects grasslands in southwest New Mexico will preserve Baird's Sparrow habitat. Managers should promote grazing practices that perpetuate suitable grassland habitat, including allowing for production of grass seeds that would be available through fall and winter.

Yellow-eyed Junco (*Junco phaeonotus*)

Conservation Status: Federal – USFS; State of NM – Threatened.

Distribution: In Hidalgo County, resident only in the higher reaches of the Animas Mountains, primarily Cistern Saddle, upper Bear Canyon, upper Indian Creek Canyon, and immediately adjacent areas. Individuals occasionally wander to the nearby Peloncillo and Big Hatchet mountains, but no evidence of breeding in those areas.

Habitat: Largely confined in the breeding season to the limited mixed conifer forests of Douglas-fir/ponderosa pine with relatively open understory of oaks, with grassy openings for ground foraging, typically above 7000 ft in the Animas Mountains. Nests are placed in a depression on the ground, with overhead protection provided by grass clump, shrub, or log.

Seasonal Occurrence: Year round resident in the Animas Mountains. Breeding in the Animas Mountains extends from April into August, with peak activity from May to mid-July.

Conservation Concerns: The very small and restricted Animas Mountains population is vulnerable to loss or degradation of its limited habitat. This junco is especially sensitive to livestock grazing, which has been found to reduce nesting success by reducing vegetative cover over nests. In addition, recruitment may suffer in years when dry conditions suppress breeding.

Recommendations: Land managers should protect this junco's limited habitat in the Animas Mountains, including restricting livestock grazing from the higher reaches of that range. The current Department monitoring program should be continued.

Varied Bunting (*Passerina versicolor*)

Conservation Status: Federal – USFS; State of NM – Threatened.

Distribution: In southern Hidalgo County, summers regularly only in Guadalupe Canyon.

Habitat: An arid-land bunting that requires a combination of low, dense thorny brush and hilly terrain as found in foothills canyons and washes. In Guadalupe Canyon, prefers low mesquite thickets with a scattering of taller trees nearby; elevations of occurrences there generally below 4500 ft. Nests built in thorny shrub, tangle of vines, or low tree, rarely more than 5 ft above ground.

Seasonal Occurrence: A neotropical migrant, present in the warm season only. A few arrive as early as mid-April, but species typically not in evidence until mid-May, departing by early September; extremes are 12 April and 3 October. Breeding in Guadalupe Canyon occurs from early June into August.

Conservation Concerns: Loss of brushy habitats, through clearing, burning, or overgrazing, are the principal threats. The small, relatively isolated Guadalupe Canyon breeding population is vulnerable to cowbird parasitism.

Recommendations: Preserving or restoring dense shrubby (e.g., mesquite) thickets in Guadalupe Canyon and similar desert canyons is key to maintaining this species in Hidalgo County. Annual Department monitoring of the Guadalupe Canyon population should continue.

3.3. REPTILES

Slevin's Bunchgrass Lizard (*Sceloporus slevini*)

Conservation Status: Federal - USFS; State of NM – Threatened.

Distribution: Within New Mexico, this species is confined to grasslands in the lower Animas Valley on the Diamond A Ranch. Populations extend to just north of Geronimo Trail.

Habitat: In New Mexico, this species is restricted to the intermountain grasslands between the Animas and Peloncillo mountains.

Times of Occurrence: Year round.

Recommendations: Maintenance of high quality grasslands will help conserve this species in New Mexico. Widespread overgrazing and summer (= hot/dry season) fires (wildfire or management ignited) could significantly impact populations of this lizard.

Canyon Spotted Whiptail (*Aspidoscelis burti*)

Conservation Status: Federal - USFS; State of NM – Threatened.

Distribution: Within the New Mexico portion of the HCP area, this species is known only from Guadalupe Canyon.

Habitat: This species is known only from riparian areas dominated by sycamore, cottonwood, ash and various grasses and forbs. It is found in shaded areas among rocks, logs, and leaf litter in the vicinity of streams. Open areas of bunch grass within these areas are also occupied.

Times of Occurrence: Year round.

Recommendations: Additional surveys of similar habitat within the NM HCP area should be conducted. Removal of deciduous shrub cover by any method (mechanical, prescribed fire) could impact this localized population.

Mountain Skink (*Eumeces callicephalus*)

Conservation Status: Federal - USFS; State of NM – Threatened.
Distribution: Within the New Mexico portion of the HCP area, this species is known only from Guadalupe Canyon and in the Peloncillo Mountains along the upper elevations of Geronimo Trail.
Habitat: Individuals are usually found in sheltered, mesic areas in leaf litter or under rocks and logs. Habitat is characterized by loose rocky soils with numerous tree species including sycamore, walnut, various oaks and mesquite.
Times of Occurrence: Year round.
Recommendations: Additional surveys of similar habitat within the HCP area should be conducted. Removal of shrub cover by any method (mechanical, prescribed fire) could impact this localized population.

Gila Monster (*Heloderma suspectum*)

Conservation Status: Federal - USFS; State of NM – Endangered.
Distribution: The Gila Monster is widespread throughout the New Mexico portion of the HCP area. Areas where the species is known to be locally common include Granite Gap and Guadalupe Canyon. Individuals are occasionally encountered throughout the lower elevations of the Peloncillo Mts.
Habitat: Individuals are most often found in desert shrub, although often seen in woodland and grassland habitat associated with rocky regions of mountain foothills and canyons. They have also been observed in agricultural areas near Silver City and Cotton City. Sometimes encountered in the lower fringes of pinyon-juniper and oak woodlands. Generally prefers SE facing slopes during the Spring and SW-facing slopes during the Fall and Winter.
Times of Occurrence: Year round.
Recommendations: Additional surveys of similar habitat within the NM HCP area should be conducted. Removal of shrub cover by any method (mechanical, prescribed fire) could impact this localized population. Species should be strictly protected against overcollecting.

Green Ratsnake (*Senticolis triaspis*)

Conservation Status: Federal - USFS; State of NM – Threatened.
Distribution: Within the New Mexico portion of the HCP area, this species is known only from Guadalupe Canyon and Post Office Canyon. The species has been observed in the Peloncillo Mountains along the upper elevations of Geronimo Trail, although these observations have not been verified by museum specimens.
Habitat: Individuals are usually found in sheltered, mesic areas. Habitat is characterized by loose rocky soils with numerous tree species including sycamore, walnut, various oaks and mesquite.
Times of Occurrence: Year round.
Recommendations: Additional surveys of similar habitat within the HCP area should be conducted. Removal of shrub cover by any method (mechanical, prescribed fire) could impact this localized population. Species should be strictly protected against overcollecting.

Yaqui Blackhead Snake (*Tantilla yaquia*)

Conservation Status: State of NM – SoC.
Distribution: Within New Mexico this species is known only from Guadalupe Canyon and Antelope Pass, ca. 8 mi W of Animas. The species is expected to occur in the Peloncillo Mountains although expected low population numbers and its secretive nature makes detection difficult.
Habitat: Little is know about the habitat of this secretive species in New Mexico. Habitats where individuals have been found include areas characterized by loose rocky soils with numerous tree species including sycamore, walnut, mesquite, and various oaks. A single individual was collected dead on the road in rocky desert shrub dominated by creosotebush and mesquite.
Times of Occurrence: Year round.
Recommendations: Additional surveys of similar habitat within the NM HCP area should be conducted. Removal of shrub cover by any method (mechanical, prescribed fire) may impact this localized population.

***New Mexico Ridge-nosed Rattlesnake (*Crotalus willardi obscurus*)**

Conservation Status: Federal - Threatened; State of NM – Endangered.
Distribution: Within New Mexico this species is known only from higher elevations of the Animas and Peloncillo mountains. It is expected to occur in the New Mexico portion of the Sierra San Luis although its occurrence there has not been documented by museum specimens or verified observations.
Habitat: Within its range this species is a habitat generalist, ranging from mesic canyon bottoms to montane talus slopes. Habitat includes various tree species including Apache and Chihuahua pine, alligator bark juniper, Arizona madrone, manzanita, and various oaks.
Times of Occurrence: Year round. Inactive during colder months.
Recommendations: Ongoing ecological studies and population monitoring in the Animas Mountains should continue. Development of improved census techniques, especially in areas of low population density (e.g, Peloncillo Mts.) should receive research priority. Removal of shrub cover, especially in canyon bottoms by any method (mechanical, prescribed fire) could impact this localized population. The species should be strictly protected against overcollecting.

Desert Massasauga (*Sistrurus catenatus*)

Conservation Status: Federal - USFS; State of NM – SoC.
Distribution: Within the New Mexico portion of the HCP study area, this species is known only from a single specimen collected near Rodeo. It is expected to occur in lower elevation grassland habitats in the Animas Valley.
Habitat: Desert grasslands or shortgrass prairie.
Times of Occurrence: Year round.

Recommendations: Additional surveys of similar habitat within the NM HCP area should be conducted. Overgrazing of grasslands could impact this localized population. Species should be strictly protected against overcollecting.

3.4 AMPHIBIANS

Sonoran Desert Toad (*Bufo alvarius*)

Conservation Status: Federal – USFS, SoC; State of NM – Threatened.
Distribution: An uncommon species that occurs in along Stateline Road, in the vicinity of Rodeo, and at scattered localities in the Animas, Peloncillo, and Guadalupe mountains, including Deer Creek, along Geronimo Trail, and Guadalupe Canyon.
Habitat: Species has been encountered in desert shrub characterized by broad, flat expanses of creosote bush and mesquite, in rocky riparian zones grown to cottonwood and sycamore, in ponds with abundant aquatic vegetation, and in muddy stock ponds.
Times of Occurrence: Year round.
Recommendations: Presence-absence surveys are recommended in low-elevation foothill regions of the MBG area. Removal of deciduous shrub cover by any method (mechanical, prescribed fire), or draining of stock tanks could impact localized populations. Species should be protected from unauthorized take.

*Chiricahua Leopard Frog (*Rana chiricahuensis*)

Conservation Status: Federal - Threatened; State of NM - SoC.
Distribution: Within the New Mexico portion of the HCP study area, this species is known as natural populations only from Cloverdale Creek and perhaps Guadalupe Canyon, although persistence at the latter site is unlikely since specimens have not been encountered there since 1985. Semi-captive populations recently occur(ed) at High Lonesome Tank and Lard Tank on the Diamond A Ranch, although natural ingress and egress into these populations is not possible.
Habitat: A rapidly declining species found in a variety of aquatic habitats, including intermittent creeks and stock tanks.
Times of Occurrence: Year round.
Recommendations: Maintenance of stock tanks and spring-fed wetlands would help prevent decline of this species. Historic habitat should be restored by providing permanent flow to wetlands and providing permanent water sources during drought years. Removal of deciduous shrub cover within riparian areas by any method (mechanical, prescribed fire) could impact this localized population.

*Lowland Leopard Frog (*Rana yavapaiensis*)

Conservation Status: Federal - USFS; State of NM – Endangered.
Distribution: Within the New Mexico portion of the HCP area, this species is known only from Guadalupe Canyon, although specimens have not been encountered there since August 2000. The species is believed to be extirpated from historic sites at Double Adobe Creek and

elsewhere in the NM HCP area. The species is abundant along stretches of Canon Bonito in Sonora.

Habitat: A rapidly declining species found in a variety of aquatic habitats, including intermittent creeks and stock tanks.

Times of Occurrence: Year round.

Recommendations: Maintenance of stock tanks and spring-fed wetlands would help prevent decline of this species. Historic habitat should be restored by providing permanent flow to wetlands and providing permanent water sources during drought years. Removal of deciduous shrub cover within riparian areas by any method (mechanical, prescribed fire) could impact this localized population.

3.5. INVERTEBRATES

Shortneck Snaggletooth (*Gastrocopta dalliana dalliana*)

State Conservation Status: Endangered.

Distribution: *Animas Mountains:* Indian Creek Canyon, 5900 ft.; east slope of Animas Peak, 5790-5830 ft. *San Luis Mountains:* Lang Canyon, 5890 ft. *Guadalupe Mountains:* Guadalupe Canyon, ca. 0.9 mile downstream of Spring of Contention, 4660 ft. (A. Metcalf, unpub. data).

Habitat: Species occurs in deciduous leaf litter and soil mold over a broad range of low-elevation habitats from mesic wooded riparian corridors of Indian Creek Canyon and Guadalupe Canyon to xeric slopes dominated by grassland/mixed shrub-succulent savanna.

Times of Occurrence: Year round.

Recommendations: The species may be more widespread than previously thought. Presence-absence surveys are recommended in low-elevation foothill regions of the MBG area. Removal of deciduous shrub cover by any method (mechanical, prescribed fire) could impact localized populations.

Animas Mountains Tubeshell (*Holospira animasensis*)

State Conservation Status: SoC.

Distribution: North end of Animas Mountains, 11 air km SE of Animas, NM; T28S, R18W, section 7 center; north slope at base of limestone cliff; 5742 ft. (see Gilbertson and Worthington 2003).

Habitat: An endemic calciphile species apparently restricted to a limestone outcrop in the upper quarter of the NE side of a NW-SE trending hill. Vegetation consists of xeric-adapted grasses, woody monocots, mixed shrubs, and cacti.

Times of Occurrence: Year round.

Recommendations: Removal of deciduous shrub cover by any method (mechanical, prescribed fire) could impact this localized population. Any mining activity in and immediately adjacent to the limestone outcrop could adversely impact this species

Animas Peak Woodlandsnail (*Gastrocopta dalliana dalliana*)

State Conservation Status: SoC.
Distribution: North slope of Animas Peak extending south ca. 2.5 miles to "Mearns Peak", from 6600 ft. to highest elevations within the range (Metcalf and Smartt 1997, Lang 2000).
Habitat: This endemic species occurs most commonly in igneous talus sprawls densely wooded with deciduous shrubs, especially *Quercus* spp.
Times of Occurrence: Year round.
Recommendations: Removal of deciduous shrub cover by any method (mechanical, prescribed fire) could impact localized populations.

Unnamed Talussnail (*Sonorella hachitana peloncillensis*)

State Conservation Status: SoC.
Distribution: This species is known only from Skull Canyon, Peloncillo Mountains. The type locality was vaguely described as "Skull Canyon." Miller (1968) reported collecting numerous empty shells "about 1.5 miles up from the mouth of the canyon." A live specimen and 4 empty shells were collected from a site located in T30S, R21W, Section 17 center, 5410 ft. (Brian Lang and Lance Gilbertson, unpub. data).
Habitat: An endemic species restricted to igneous talus sprawls with sparsely vegetated margins consisting of *Pinus edulus*, *Quercus arizonica*, *Garrya*, and *Rhus choriophylla*.
Times of Occurrence: Year round.
Recommendations: In general, the distribution of *Sonorella* in the Peloncillo Mountains is poorly known. Recommend field surveys in Skull Canyon and canyons north and south thereof. Removal of deciduous shrub cover by any method (mechanical, prescribed fire) could impact localized populations.

Lang Canyon Talussnail (*Sonorella* n. sp.)

State Conservation Status: SoC.
Distribution: Known only from the highest elevations on the south-facing slope of northeastern recesses of Lang Canyon, San Luis Mountains, 6380 ft.
Habitat: Igneous talus sprawls on xeric slopes sparsely vegetated with grasses, woody monocots, mixed shrubs, and cacti.
Times of Occurrence: Year round.
Recommendations: Recommend surveys in canyons of San Luis Mountains located north of Lang Canyon. Removal of deciduous shrub cover by any method (mechanical, prescribed fire) could impact localized populations.

"Guadalupe Canyon Talussnail" (*Sonorella* n. sp.)

State Conservation Status: SoC.
Distribution: South canyon wall of Guadalupe Canyon, ca. 0.9 mile south of Spring of Contention, 4660 ft.

Habitat: Found under igneous talus scattered over loose soil along riparian corridor of Guadalupe Creek.

Times of Occurrence: Year round.

Recommendations: An undescribed species that merits collection of additional voucher material to complete taxonomic study (L. Gilbertson, pers. com.). Geographic range of taxon in Guadalupe Canyon is unknown. Recommend additional survey work in this general area. Removal of riparian vegetation by any method (mechanical, prescribed fire) could impact localized population(s).

4.0 GENERAL RECOMMENDATIONS

The NMDGF recognizes that actions being proposed by the MBG (and discussed in detail in the HCP proper), including use of prescribed fire, are designed to manage and improve ecological conditions on the MBG properties that will benefit wildlife in addition to sustaining long-range agricultural activities. The following general recommendations are provided here with the focus on wildlife species listed under the WCA or of state concern in the New Mexico portion of the HCP area. Many are in agreement with existing MBG practices and/or with guidelines presented in the HCP. Additional recommendations for specific species are provided in the species accounts in Section 3.0.

Grasslands

1. Avoidance, where possible, of prescribed burning during April-August in extensive areas of grassland and shrubland areas where listed or sensitive bird species are known to nest.

Foothills and Canyons

1. Avoidance, where possible, of prescribed burning during summer monsoon season in extensive areas of lower montane and canyon habitats when surface activity by terrestrial wildlife is greatest.

2. Maintenance of existing oak, pine-oak, and Chihuahuan Desert shrub communities and their associated herbaceous plant communities.

Riparian and Aquatic Areas

1. Protection and enhancement of intermittent stream channels through use of check dams and similar structures that enhance water retention, reduce erosion, and encourage wetland development.

2. Protection and enhancement of riparian woodlands through livestock management, streambank protection structures (where needed), and sediment traps to foster woody plant recruitment.

3. Maintenance of existing earthen and metal stock tanks that provide important watering and breeding areas for wildlife.

Surveys and Monitoring

1. Solicit informal consultation with species recovery/advisory teams and other researchers prior to major rangeland improvement projects, including prescribed burning. Pre-burn surveys and/or assessments for selected wildlife species are recommended to identify important wildlife areas, such as nest sites and population centers, within proposed burn areas that potentially can be avoided.

2. Continue to allow survey and monitoring efforts by NMDGF and other biologists and cooperators to improve current information on WCA listed and sensitive wildlife species within the HCP area. Some particular survey and research needs are identified in the species accounts in Section 3.0.

5.0. LITERATURE CITED

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Appendix B

Implementing Agreement

Implementing Agreement

By and Among

the Malpai Borderlands Group and U.S. Fish and Wildlife Service, Natural Resources Conservation Service, Arizona Game and Fish Department, New Mexico Game and Fish Department, Arizona State Land Department, and New Mexico State Land Office

TO ESTABLISH A CONSERVATION PROGRAM FOR FEDERALLY-LISTED ENDANGERED AND THREATENED SPECIES INHABITING PRIVATE AND STATE-TRUST RANGELANDS IN THE MALPAI BORDERLANDS OF COCHISE COUNTY, SOUTHEASTERN ARIZONA AND HILDAGO COUNTY, SOUTHWESERN NEW MEXICO PURSUANT TO THE MALPAI BORDERLANDS HABITAT CONSERVATION PLAN.

This Implementing Agreement (hereinafter, IA or Agreement), made and entered into as of the ___ day of _____, 2006, by and among the MALPAI BORDERLANDS GROUP (hereinafter, MBG) and the U.S. FISH AND WILDLIFE SERVICE, ECOLOGICAL SERVICES DIVISION (hereinafter, USFWS), U.S. FISH AND WILDLIFE SERVICE, SAN BERNARDINO NATIONAL WILDLIFE REFUGE (hereinafter, San Bernardino NWR), NATURAL RESOURCES CONSERVATION SERVICE (hereinafter, NRCS), ARIZONA GAME AND FISH DEPARTMENT (hereinafter, AGFD), NEW MEXICO DEPARTMENT OF GAME AND FISH (hereinafter, NMDFG), ARIZONA STATE LAND DEPARTMENT (hereinafter, ASLD), AND NEW MEXICO STATE LAND OFFICE (hereinafter, NMSLO), hereinafter collectively called the "Parties," defines certain roles and responsibilities of the Parties and provides a common understanding of actions that will be undertaken under the Malpai Borderlands Habitat Conservation Plan (hereinafter, MBHCP or plan) prepared pursuant to section 10(a)(1)(B) of the Endangered Species Act of 1973, as amended (hereinafter, ESA) to protect and conserve the federally listed endangered and threatened species and other species covered by the MBHCP in the course of carrying out the activities covered by the MBHCP.

1.0 RECITALS

This Agreement is entered into with regard to the following facts and considerations:

WHEREAS, the Malpai Borderlands of southern Arizona and New Mexico has been determined through consultation with the USFWS, AGFD, and NMDFG, and after appropriate environmental review, to be habitat for at least 19 federally listed, state-listed, or rare or declining species of fish, wildlife, and plants; and,

WHEREAS, the Malpai Borderlands Group, with technical assistance from the USFWS, AGFD, NMDFG, and NRCS, has developed a program of measures, described in the MBHCP, which it proposes to implement to protect and conserve the above-referenced covered species and their associated habitats in the course of carrying out certain grassland improvement and ranch management activities also covered by the plan; and,

WHEREAS, the MBHCP also includes certain measures which the USFWS, AGFD, NMDFG, NRCS, ASLD, and NMSLO have agreed to implement in furtherance of the purposes of the plan;

NOW, THEREFORE, the Parties hereto do hereby understand and agree as follows:

2.0 DEFINITIONS

The following terms as used in this Agreement shall have the meanings set forth below:

2.1 Terms used in the Agreement and specifically defined in the ESA or in applicable implementing regulations of the ESA have the same meaning as in the ESA or those regulations, unless the Agreement expressly provides otherwise.

2.2 The term "MBHCP" or "plan" means the Malpai Borderlands Habitat Conservation Plan prepared by MBG in cooperation with the USFWS and the other Parties.

2.3 The term "Permittee" or "MBG" means the Malpai Borderlands Group. The term "Sub-permittee" means any Malpai-area rancher who has become an HCP participant as defined in Section 3.2.1, Subsection (2) of the MBHCP and in effect is a sub-permittee under MBG's I.T.P.

2.4 The term "Permit" or "I.T.P." means the Incidental Take Permit issued by the USFWS to MBG pursuant to Section 10(a)(1)(B) of the ESA for take of the MBHCP's Covered Species incidental to the carrying out of its Covered Activities.

2.5 The term "Permit Area" within the Agreement has the same meaning as the term "covered area" in the MBHCP and means the geographic area to which the MBHCP and its associated I.T.P. applies, consisting specifically of all private and state-trust lands within the Malpai Borderlands as depicted in Map 2-1and defined in Section 3.3 of the plan.

2.6 The term "Covered Species" means the 19 federally listed and unlisted species to which the coverage of the plan's associated I.T.P. applies as identified in Table 3-2 of the MBHCP, each of which the plan addresses in a manner sufficient to meet all criteria for issuing an I.T.P. pursuant to Section 10(a)(1)(B) of the ESA.

2.7 The term "Covered Activities" means the grassland improvement activities and ranch management activities proposed by MBG and Malpai-area ranchers as described in Section 3.5 of the MBHCP to which the coverage of the plan's associated I.T.P. apply.

2.8 The term "Listed Species" means a species (including a subspecies and distinct population segment of a vertebrate species) that is listed as endangered or threatened under the ESA.

2.9 The term "Unlisted Species," for purposes of the MBHCP and this Agreement, means a species that is not currently listed under the ESA but may become so listed over the life of the plan.

2.10 The term "Take," for purposes of the MBHCP and this Agreement, means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect any listed or unlisted species covered by the plan or to attempt to engage in any such conduct. The term "harm" in this definition means an act that causes significant habitat modification or degradation where it actually kills or injures such species by significantly impairing essential behavioral patterns, including breeding, feeding, and sheltering. The term "harass" in this definition means "an intentional or negligent act or omission which creates the likelihood of injury to such wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding or sheltering.

2.11 The term "Parties" means the eight signatories to the Agreement (MBG, USFWS, San Bernardino National Wildlife Refuge, NRCS, AGFD, NMDFG, ASLD, and NMSLO) collectively, and has the same meaning as the term "HCP participants" in the MBHCP, as defined in Section 3.2.1, Subsection (2) of the plan, except that Malpai-area ranchers who elect to participate in the plan are included among the HCP participants but are not Parties to this Agreement.

2.12 The term "Unforeseen Circumstances," for purposes of the MBHCP and this Agreement, means changes in circumstances affecting the covered species or the Malpai Borderlands that could not reasonably have been anticipated by MBG, the USFWS, or the other Parties at the time of the plan's negotiation and development, and that result in substantial and adverse changes in the status of the covered species.

2.13 The term "Changed Circumstances," for purposes of the MBHCP and this Agreement, means changes in circumstances affecting the covered species or the Malpai Borderlands that could reasonably be anticipated by MBG, the USFWS, or the other Parties at the time of the plan's development, and that have therefore been planned for, as described in Section 8.3 of the plan.

3.0 INCORPORATION OF HCP

Pursuant to the provisions of section 10(a)(1)(B) of the ESA, MBG has prepared the Malpai Borderlands Habitat Conservation Plan and submitted it to the USFWS with a request that the agency issue a Permit to allow the Covered Species to be incidentally taken in the course of carrying out the Covered Activities within the Permit Area. The MBHCP proposes a conservation program for the Covered Species and their habitats that is fully consistent with the ESA's requirements for HCPs as described in section 10(a)(2)(A) of the ESA. The MBHCP and each of its provisions are intended to be, and by this reference are, incorporated herein. However, in the event: (1) of any direct contradiction between specific terms appearing in this Agreement and in the MBHCP, the terms of the Agreement shall control; (2) that specific terms appear in this Agreement but not in the MBHCP, the terms of the Agreement shall control; and (3) that specific terms appear in the MBHCP but not this Agreement, the terms of the MBHCP control. Otherwise, the terms of this Agreement and the terms of the MBHCP shall be interpreted to be supplementary to each other.

4.0 LEGAL REQUIREMENTS

In order to fulfill the requirements that will allow the USFWS to issue the I.T.P., the MBHCP sets forth measures that are intended to ensure that any take occurring within the Permit Area will be incidental; that the impacts of the take will, to the maximum extent practicable, be minimized and mitigated; that procedures to deal with unforeseen circumstances will be provided; that adequate funding for the MBHCP will be provided; and that the take will not appreciably reduce the likelihood of the survival and recovery of the Covered Species in the wild. It also includes measures that have been suggested by the USFWS, AGFD, NMDFG, and NRCS as being necessary or appropriate for purposes of the plan.

5.0 COOPERATIVE EFFORT

In order that the legal requirements set forth in Section 4.0 hereof are fulfilled, each of the Parties must undertake certain specific activities and tasks as set forth in the MBHCP and, with respect to many such activities, must work together to ensure the proper functioning of the plan. The MBHCP thus describes a cooperative program by MBG and state and federal agencies to provide for the long-term conservation of the Covered Species and their habitats in the Malpai Borderlands.

6.0 PURPOSES

The purposes of this Agreement are:

6.1 To provide the means for making binding and enforceable on Parties to the IA who are not subject to the terms of the I.T.P. (i.e., San Bernardino NWR, NRCS, AGFD, NMDFG, ASLD, and NMSLO) the carrying out of tasks and responsibilities described in the MBHCP (and Section 8.0 hereof) to which those Parties have agreed.

6.2 To ensure implementation of each of the terms of the MBHCP and define the respective rights and obligations of the Parties with respect to such implementation;

6.3 To describe remedies and recourse should any Party fail to perform its obligations, responsibilities, and tasks as set forth in the MBHCP and this Agreement; and,

6.4 As stated in Section 11.4, Subsection (1) hereof, to provide assurances to the Permittee, the non-Federal Parties to the Agreement, and HCP participants who are not Parties to the Agreement, that as long as the terms of the MBHCP, the I.T.P. issued pursuant to the MBHCP, and this Agreement are fully and faithfully performed, no additional conservation requirements will be required of those Parties or participants except as otherwise provided for in the MBHCP and this Agreement or as required by law.

7.0 TERM

This Agreement shall become effective on the date the USFWS issues to MBG the I.T.P. requested in the MBHCP and shall remain in full force and effect for a period of 30 years or until termination of the Permit, whichever occurs sooner.

8.0 OBLIGATIONS OF THE PARTIES

All Parties to this Agreement have specifically-defined tasks and responsibilities under the MBHCP which derive either from the obligations of the Permit (in the case of MBG and the USFWS) or because they were voluntarily agreed to in the interests of furthering the purposes of the plan (in the case of the other Parties, and USFWS where such tasks exceed its regulatory permit responsibilities). As stated above, furthermore (see Section 6.1), tasks and responsibilities voluntarily accepted by those Parties under the MBHCP are accepted as enforceable obligations under this Agreement (i.e., pursuant to their signature hereto). This section therefore summarizes the obligations of each of the eight signatory Parties to the Agreement deriving from both the Permit and the Agreement.

8.1 MBG. The Malpai Borderlands Group, as Permittee under the MBHCP, is the Party primarily responsible for implementing and administering the plan and ensuring that its requirements are fully carried out. Specific obligations, in part, are to:

(1) Fire Management. Coordinate integration of the proposed fire management program with requirements of the MBHCP applicable to that program (see Section 5.2.1.1 of the plan) by, among other things:

(a) Coordinating regularly with fire control agencies and officials in the Malpai Borderlands concerning those requirements;

(b) Coordinating similarly with Malpai-area ranchers on whose lands fire management activities are carried out;

(c) Ensuring that that applicable take minimization measures are incorporated into burn and fire planning and planning documents;

(d) Ensuring that the 1-year/5-year burn/fire limits, the annual grassland burn limit, and the burn frequency limit described in the MBHCP are observed; and,

(e) Maintaining records of fire management activities in the Malpai Borderlands as specified by the plan;

(2) Erosion and Brush Control. Coordinate and, as appropriate, assist in the carrying out and funding of the MBHCP's erosion control and mechanical brush control activities (see Sections 5.2.1.2 and 5.2.1.3 of the plan, respectively) by, among other things:

(a) Ensuring that pre-activity surveys of planned work sites and areas are undertaken as needed and that applicable take minimization measures are implemented in the course of carrying out those activities;

(b) Ensuring that applicable brush control limits are observed; and,

(c) Maintaining records of erosion and brush control activities as specified by the MBHCP;

(3) Coordination with Ranchers. Coordinate with individual Malpai-area ranchers to, among other things:

(a) Educate and inform them about the MBHCP and its obligations and protections (see Section 3.2.2.2 of the plan);

(b) Encourage their participation in the plan (particularly with respect to fire management, mechanical brush control, and livestock management activities (see Sections 5.2.1.1, 5.2.1.3, and 5.2.2.1 of the plan, respectively);

(c) Where ranchers wish to voluntarily participate in the MBHCP, effect such participation by helping develop and execute Voluntary Conservation Agreements (VCAs) with such ranchers in accordance with Section 5.6 of the plan; and,

(d) Monitor and enforce compliance with the MBHCP by Malpai-area ranchers participating in the plan (see Section 5.4.1 of the plan).

(4) Species Occurrence Maps. Prepare, maintain, and as necessary distribute and make available the MBHCP's species occurrence maps (see Section 5.2.3.2 of the plan);

(5) Technical Advisory Committee. Coordinate establishment of the MBHCP's Technical Advisory Committee (hereinafter, the TAC) and undertake all applicable responsibilities thereto (see Section 7 of the plan), which include:

(a) Acting as the TAC Chair;

(b) Undertaking all administrative and leadership functions assigned to the Chair including, but not limited to, coordinating preparation of the TAC operations protocol announcing and presiding at TAC meetings; and,

(c) Promoting and taking part in collaborative decision-making by the TAC with respect to technical and Adaptive Management issues that arise in the course of implementing the plan;

(6) Monitoring. Subject to available funding and as applicable, undertake, assist in the undertaking of, and/or assist in the funding of:

(a) Discretionary and non-discretionary grassland conservation monitoring measures and activities specified in Section 5.4.2.1, Subsection (A) and Subsection (B)(1) of the MBHCP; and,

(b) Species conservation monitoring measures and activities specified in Section 5.4.2.2, Subsections (B)(1)-(2) of the plan.

(7) Reporting. Prepare and submit to the USFWS:

(a) By March 15 each year, the annual report specified in Section 5.8 of the MBHCP;

(c) Any report or other information requested by the USFWS in accordance with Section 5.4.1. Subsection (2); and,

(c) The reports described in Sections 9.2, 10.1(c), and 10.2(c) of this Agreement.

(8) Certification of Reports. Each report described in Paragraph (7) above will include the following certification from a senior MBG official(s) who prepared or supervised or directed preparation of the report or is otherwise responsible for the report:

Under penalty of law I certify, to the best of my knowledge and after appropriate inquiries of all relevant persons involved in the preparation of this report, that the information contained in the report is true, accurate, and complete.

8.2 USFWS. Three separate organizational divisions of the USFWS are relevant to the MBHCP: (1) the Regional Office for the agency's Southwest Region (Region 2) located in Albuquerque, New Mexico (responsible for all agency activities in the states of Arizona, New Mexico, Oklahoma, and Texas); (2) the Ecological Services Division (responsible for administering the ESA); and (3) the Refuges Division (responsible for managing the nation's National Wildlife Refuge System). The organizational units under those divisions involved in the MBHCP are, respectively: (1) the Ecological Services Division in the agency's Regional Office in Albuquerque, New Mexico (responsible for processing MBG's permit application); (2) the Fish and Wildlife Offices in the cities of Tucson and Phoenix, Arizona, and Albuquerque, New Mexico (involved in both development and implementation of the plan); and (3) San Bernardino NWR located in the Malpai Borderlands (and responsible for managing most remaining populations of the MBHCP's covered fish species). Under the MBHCP, the USFWS (and its particular organizational unit) will:

(1) Issue and Monitor the Permit. Upon an affirmative finding that the MBHCP is adequate and complete:

(a) The USFWS Regional Office will issue to MBG the requested I.T.P.; and,

(b) Upon issuance thereof, the USFWS Regional Office and above-referenced Fish and Wildlife Offices will monitor and, if necessary and in accordance with applicable federal regulation, enforce compliance with the MBHCP and the Permit.

(2) Serve on the TAC. The above-referenced Fish and Wildlife Offices, collectively, and San Bernardino NWR:

(a) Division of Refuges and Ecological Services will each have a representative serveing on the MBHCP's TAC; in addition,

(b) Each such appointee will carry out the TAC activities and tasks designated to it by Section 5.7 of the MBHCP and any operating protocols enacted by the TAC in accordance with that section.

(3) Monitoring/Adaptive Management. The USFWS Regional Office and above-referenced Fish and Wildlife Offices will, to the maximum extent feasible and consistent with available funding:

(a) Assist MBG in obtaining funding from funding programs administered by the agency and from other programs, as appropriate, to support species conservation monitoring specified in Section 5.4.2.2, Subsections (B)(1)-(2) of the MBHCP; and,

(b) Provide in-kind services (e.g., staff time, technical assistance, species experts, etc.) to assist in the carrying out of applicable monitoring and Adaptive Management program elements;

(4) Water Quality Monitoring/Take Monitoring/Reporting. Subject to available funding and in accordance with Section 5.4.2.2, Subsections (A)(1)-(3) and Section 5.8 of the plan, San Bernardino NWR will:

(a) Undertake water quality monitoring of aquatic areas on the Refuge to determine the effects, if any, of fire management, mechanical brush control, and other covered activities on those areas;

(b) Monitor such areas for indications (e.g., above-normal numbers of dead or dying fish) that aquatic species are being killed, injured, or harmed as a result of water quality impacts connected with these activities; and,

(c) Report the results of such monitoring to the USFWS and/or MBG as applicable.

(5) Leopard Frog Salvage. Upon receipt of notification from MBG that a participating Malpai rancher plans to conduct periodic maintenance activities at any stockpond within the Permit Area, the above-referenced Fish and Wildlife Office, as applicable (depending on the state in which the maintenance is to occur) will at its discretion:

(a) Determine whether it wishes to salvage lowland leopard frogs in accordance with Section 5.2.2.3, Subsection (B)(1) of the MBHCP and/or Chiricahua leopard frogs in accordance with Subsection (B)(2) of that section;

(b) If so, inform the affected Malpai rancher of this and either: (i) undertake the salvage itself; (ii) undertake the salvage in cooperation with AGFD or NMDFG, as applicable; or (iii) request AGFD or NMDFG to undertake the salvage and return any salvage frogs to original site as applicable.

8.3 NRCS. The NRCS assists Malpai-area ranchers in maintaining healthy rangeland conditions on their ranches through voluntary Cooperator Agreements and Coordinated Resource Management Plans, and assists ranchers in assessing rangeland conditions over time through establishment and monitoring of vegetation transects on ranches subject to such agreements. Accordingly, under the MBHCP NRCS will:

(1) Serve on the TAC. Serve on the MBHCP's TAC and carry out the TAC activities and tasks designated to it by Section 5.7 of the plan and by any operating protocols enacted by the TAC in accordance with that section; and,

(2) Monitoring/Adaptive Management. To the maximum extent feasible and subject to continuing NRCS commitment to its rancher assistance programs and available funding:

(a) Assist MBG in obtaining funding from funding programs administered by NRCS and from other programs, as appropriate, to support grassland conservation monitoring specified in Section 5.4.2.1, Subsection (A) of the MBHCP;

(b) In accordance with Section 5.4.2.1, Subsection (B)(2), maintain and continue monitoring currently existing NRCS vegetation transects on Malpai-area ranches and establish new such transects when the opportunity arises; and,

(c) Provide in-kind services (e.g., staff time, technical assistance, etc.) to assist in carrying out such monitoring.

8.4 AGFD and NMDFG. AGFD and NMDFG are each responsible for managing and conserving fish and wildlife populations generally in their respective states and for managing and conserving non-game species, in some cases under specific or special legislation. NMDFG, for example, administers the New Mexico Wildlife Conservation Act (an ESA-like statute that protects rare and declining species; see Appendix A of the MBHCP), and AGFD administers the Heritage Database Management System (which tracks the status and distribution of such species). Both agencies have therefore played key roles in development of the MBHCP and have continuing interests and responsibilities in implementing the plan. Under the terms of the MBHCP, AGFD and/or NMDFG, as applicable:

(1) Serve on the TAC. Will serve on the MBHCP's TAC and carry out the TAC activities and tasks designated to it by Section 5.7 of the plan and by any operating protocols enacted by the TAC in accordance with that section;

(2) Monitoring/Adaptive Management. Will, to the maximum extent feasible and subject to available funding:

(a) Assist MBG in obtaining funding from funding programs administered by each agency and from other programs, as appropriate, to support species conservation monitoring specified in Section 5.4.2.2 of the MBHCP; and,

(b) Provide in-kind services (e.g., staff time, technical assistance, species experts, etc.) to assist in the carrying out of applicable monitoring and Adaptive Management program elements;

(3) Leopard Frog Salvage. Upon receipt of notification from the USFWS that a participating Malpai rancher plans to conduct periodic maintenance activities at any stockpond within the Permit Area and if requested, AGFD or NMDGF, as applicable (depending on the state in which the maintenance is to occur), will:

(a) Determine whether it wishes to salvage lowland leopard frogs in accordance with Section 5.2.2.3, Subsection (B)(1) of the MBHCP and/or Chiricahua leopard frogs in accordance with Subsection (B)(2) of that section; and,

(b) If so, will either: (i) assist the USFWS in undertaking the salvage; or (ii) undertake the salvage on behalf of the USFWS.

8.5 ASLD/NMSLO. ASLD and NMSLO administer state-trust lands in the Malpai Borderlands (on the Arizona side and New Mexico side, respectively; see Section 2.1.1.2 of the MBHCP) under their own statutory authorities. As a result of such authorities, both agencies have one responsibility under the MBHCP (see following paragraph) and are not otherwise constrained or obligated by the plan in any manner.

(1) Access for Fire Management/Monitoring Purposes. In accordance with Section 5.4.3.2 of the MBHCP, ASLD and NMSLO will grant access to the lands in the Malpai Borderlands under their respective jurisdictions iby MBG personnel, the USFWS, NRCS, AGFD, NMDFG, any duly designated agents or contractors of these entities, and fire control officers and personnel of local, state, and federal agencies for the purpose of: (a) conducting monitoring activities and studies specified by the MBHCP (as well as research and similar activities not specified by the plan but pertinent to it); and (b) planning and undertaking fire management activities (including prescribed burns and wildland fires); however (c) all such monitoring activities and studies, research, or similar activities to be conducted on state-trust lands must have the endorsement of the USFWS and MBG; and (d) all fire management activities to be conducted on state-trust lands must be undertaken pursuant to site-specific burn plans or area-specific fire management plans approved by ASLD or NMSLO, as applicable.

(2) Right of Entry. In accordance with the above, the MBHCP and this Agreement: (a) shall serve as the Right of Entry to ASLD and NMSLO lands by applicable agencies or duly designated agents or contractors conducting monitoring activities, and fire control agencies and personnel conducting fire management activities, provided that (b) all such activities are carried out with the endorsements specified in measure (1)(c) above or under the plans specified in measure (1)(d) above, respectively.

9.0 ADAPTIVE MANAGEMENT

9.1 TAC-initiated Adaptive Management. MBG, through and in cooperation with the TAC:

(1) Will implement the Adaptive Management provisions described in Section 5.5.2 of the MBHCP when revision or modification of the plan's conservation program is necessary to achieve its species conservation objectives or to respond to the results of monitoring or new scientific information.

(2) In addition, MBG and the TAC may enact and implement Adaptive Management revisions or modifications to the conservation program they deem necessary in accordance with Section 5.7, Subsection (5) or (6) of the plan without prior review and approval by the USFWS; however,

(3) MBG will include a summary of all Adaptive Management actions taken in a given calendar year, if any, in its annual report for the year in accordance with Section 5.8 of the plan.

9.2 USFWS-initiated Adaptive Management. If the USFWS determines that one or more of the Adaptive Management triggers described in Section 5.5.2, Subsection (2)(a) and Table 5-5 of the MBHCP have been reached, and that MBG and the TAC have not responded in accordance with Subsections (2)-(4) of that section, the USFWS will so notify MBG in writing. Within sixty (60) calendar days of receiving such notice, MBG and the TAC will develop an appropriate Adaptive Management response to the conditions or circumstances involved and report this decision to the USFWS in writing.

9.3 No Increase in Take. The MBHCP's Adaptive Management provisions do not authorize any modification to the plan that would result in the amount and nature or increase the impacts of take of the Covered Species beyond that analyzed under the original MBHCP and any amendments thereto. Any such modification would therefore have to be enacted under a permit amendment under Section 13.3 of the Agreement and Section 9.1 of the HCP.

10.0 CHANGED CIRCUMSTANCES

10.1 MBG-initiated Response to Changed Circumstances. MBG, or MBG through and in cooperation with the TAC, as applicable:

(1) Will respond to the Changed Circumstances described in Section 8.3, Subsections (1)-(6) of the MBHCP whenever such circumstances are determined to have occurred within the Permit Area: (a) by giving notice to the USFWS in writing within fourteen (14) calendar days after learning of such a Changed Circumstance; and (b) as soon as practicable thereafter but not later than the timeframes specified in Section 8.3, by modifying its activities or taking action in accordance with that section as necessary to correct or mitigate the effects of the Changed Circumstance on the Covered Species;

(2) May do so without prior review and approval by the USFWS; but,

(3) Will report to the USFWS in writing the decision made or action taken within thirty (30) calendar days of the making of such a decision or the taking of such action.

10.2 USFWS-initiated Response to Changed Circumstances. If the USFWS:

(1) Plans or intends to terminate its ESA section 4(d) rule for Chiricahua leopard frog as described in Section 8.3, Subsection (7) of the MBHCP, or to designate new critical habitat as described in Subsection (9) of that section, it will notify MBG of this intention in writing as specified in each of these subsections respectively;

(2) Plans or intends to list a species not then ESA-listed and not covered by the MBHCP as described in Subsection (8) of that section, it will: (a) notify MBG of this intention in writing as

specified in that subsection; (b) work with MBG to determine whether the plan's covered activities are likely to result in take of the species and, if so, whether the existing conservation measures are sufficient to minimize the effects of that take; and (c) if existing conservation measures are not sufficient, will specify the "no-take/no-jeopardy" measures (i.e., measures to avoid take of or jeopardy to the Covered Species in the course of such activities) it identifies as being necessary; in addition (d) MBG will implement such no-take/no jeopardy measures unless or until it applies for an amendment to the MBHCP and I.T.P. to incorporate the species and the USFWS approves any such amendment or unless or until USFWS otherwise notifies MBG that such measures are no longer necessary; or,

(3) Determines that one or more of the Changed Circumstances described in Section 8.3 Subsections (1)-(6) of the MBHCP have occurred, and that MBG and the TAC have not responded in accordance with these subsections, it will so notify MBG in writing. As soon as practicable thereafter but not later than the timeframes specified in those subsections, MBG and the TAC will develop an appropriate response to the conditions or circumstances involved and report this decision to the USFWS in writing.

11.0 FUNDING

11.1 By the Permittee. MBG warrants that its funding mechanisms and sources are sufficient to fulfill its obligations under the MBHCP, and, to demonstrate this, will provide the USFWS with a copy of its annual financial report in each year that the MBHCP and I.T.P. are in effect. Each such report will be submitted as an attachment to MBG's annual HCP report, and, in each year, will be attached to the next annual HCP report following its completion. Alternately and in lieu of a financial report, MBG may submit to the USFWS annually any other reasonably available financial information that it and the Service mutually agree will provide adequate evidence of MBG's ability to fulfill its obligations under the plan. MBG also warrants that it will vigorously and in good faith pursue such additional funding as may from time to time or on a periodic basis be available in the funding programs it administers or employs to support the MBHCP's species conservation monitoring activities and programs as described in Section 8.0 of the Agreement and Section 5.4.3 of the MBHCP; and that, if necessary, it will promptly notify the USFWS of any material change in its financial circumstances that might negatively affect its ability to meet these obligations.

11.2 By the Other Parties. The other Parties also warrant, within the limitations described in Section 14.8 of the Agreement, that they will undertake every effort reasonable and necessary to ensure that funding and staff necessary to discharge their obligations and commitments under the MBHCP and this Agreement will be available; and, as applicable, that they will vigorously and in good faith pursue such additional funding as may from time to time or on a periodic basis be available in the funding programs they administer to support the MBHCP's species conservation monitoring activities and programs as described in Section 8.0 of the Agreement and Section 5.4.3 of the MBHCP.

12.0 REMEDIES, ENFORCEMENT, DISPUTE RESOLUTION

Except as set forth below, each Party shall have all remedies otherwise available to enforce the terms of this Agreement, the Permit, and the MBHCP, and to seek remedies for any breach hereof, subject to the following:

12.1 No Monetary Damages. No Party shall be liable in damages to the any other Party or other person for any breach of this Agreement, any performance or failure to perform a mandatory or

discretionary obligation imposed by this Agreement or any other cause of action arising from this Agreement. Notwithstanding the foregoing:

(1) Retain Liability. All Parties shall retain whatever liability they would possess for their present and future acts or failure to act without existence of this Agreement.

(2) Land Owner Liability. All Parties shall retain whatever liability they possess as an owner of interests in land.

12.2 Enforcement Authority of the United States. Nothing contained in this Agreement is intended to limit the authority of the U.S. government to seek civil or criminal penalties or otherwise fulfill its enforcement responsibilities under the ESA or other applicable law.

12.3 Injunctive and Temporary Relief. The Parties acknowledge that the Covered Species are unique and that their loss as species would result in irreparable damage to the environment and that therefore injunctive and temporary relief may be appropriate to ensure compliance with the terms of this Agreement.

12.4 Limitations on and Extent of Enforceability.

(1) No Surprises Policy. Subject to the availability of appropriated funds as provided in Section 14.8 hereof, and except as otherwise required by law, no further conservation measures for the effects of the Covered Activities upon the Covered Species may be required from MBG or any Malpai-area rancher who is an HCP Participant if MBG or any such rancher has otherwise abided by the terms of the MBHCP, except in the event of unforeseen circumstances; provided that any such additional mitigation may not require additional land use restrictions or financial compensation from MBG without its written consent or from a participating Malpai rancher without his or her written consent.

(2) Private Property Rights and Legal Authorities Unaffected. Nothing in this Agreement shall be deemed to restrict the rights of MBG, ASLD, NMSLO, or any Malpai-area rancher who is an HCP Participant to the use or development of their lands, or interests in their lands, with the Permit Area.

(3) Damages from Certain Causes. Except to the extent of intentional or negligent acts or omissions attributable to the Permittee or any Sub-permittee, the Permittee or any Sub-permittee shall not be liable or responsible to the USFSW for any loss or damage to or trespass to any real property or person occasioned by theft, fire, act of God, public enemy, injunction, riot, strike, insurrection, war, court order, requisition or order of governmental body or authority, or any cause beyond the Permittee's or Sub-permittee's control.

(4) Attorney's Fees. If any action at law or equity, including any action for declaratory relief, is brought to enforce or interpret the provisions of this Agreement, each party to the litigation shall bear its own attorney's fees and costs. However, attorney's fees and costs against the United States shall be governed by applicable law.

12.5 Dispute Resolution. The Parties recognize that disputes concerning implementation of, compliance with, or termination of this Agreement, the MBHCP, and the Permit may arise from time to time. The Parties therefore agree to work together in good faith to resolve such disputes, using the informal dispute resolution procedures set forth in this section, or such other procedures

upon which the Parties may later agree. However, if at any time any Party determines that circumstances so warrant, it may seek any available remedy without waiting to complete informal dispute resolution.

(1) Informal Dispute Resolution Process. Unless the Parties agree upon another dispute resolution process, or unless an aggrieved Party has initiated administrative proceedings or suit in federal court as provided in this section, the Parties may use the following process to attempt to resolve disputes.

(a) The aggrieved Party will notify the other Parties of the provision that may have been violated or is in dispute, the basis for contending that a violation or significant disagreement has occurred, and the remedies it proposes to correct the alleged violation or disagreement.

(b) The Party or Parties alleged to be in violation or the subject of the dispute will have thirty (30) days, or such other time as may be agreed to, to respond. During this time such Party or Parties may seek clarification of the information provided in the initial notice. The aggrieved Party will use its best efforts to provide any information then available to it that may be responsive to such inquires.

(c) Within thirty (30) days after such response was provided or was due, the Parties, or representatives of the Parties having authority to resolve the dispute, will meet and negotiate in good faith toward a solution satisfactory to all Parties, or will establish a specific process and timetable to seek such a solution.

(2) Non-binding Mediation. If any issues cannot be resolved through such negotiations, the Parties will consider non-binding mediation and other alternative dispute resolution processes and, if a dispute resolution process is agreed upon, will make good faith efforts to resolve all remaining issues through that process.

13.0 AMENDMENTS/PERMIT ADMINISTRATION

13.1 Amendment of the Agreement. Except as otherwise set forth herein, this Agreement may be amended consistent with the ESA and with the written consent of each of the Parties hereto. However, no such amendment should involve a significant change or modification to the MBHCP's conservation measures or program (or bring the Agreement into significant disaccord with those measures) unless the MBHCP and, if necessary, the Permit are also amended in accordance with Sections 13.2 and 13.3 below, respectively, to maintain consistency between the documents.

13.2 Minor Amendment of the MBHCP. Any Party may propose minor amendments to the MBHCP in accordance with paragraphs (a) and (b) below by providing notice to the USFWS with a copy to all other Parties, such notice to include a statement describing the reason for the proposed amendment and a brief analysis of its environmental effects and effects on the Covered Species. Any such proposal will become effective upon written notification to the Parties by the USFWS that it concurs with the proposed amendment, such notification to be provided within 90 calendar days of receipt of the proposal.

(1) Impermissible Minor Amendments. However, the USFWS will not approve any such amendment if: (i) it determines that the amendment would result in effects on the environment or the Covered Species that are significantly different than those identified in the original

MBHCP and National Environmental Policy Act (NEPA) document or result in additional take not analyzed in the original MBHCP and NEPA document; or (ii) if any Party objects to the proposed amendment in writing. In either such case, the amendment would be processed as an amendment to the permit in accordance with Section 12.3 below.

(2) Permissible Minor Amendments. Permissible minor amendments to the MBHCP include, but are not limited to: (i) corrections of typographical, grammatical, or similar editing errors in the MBHCP that do not change its intended meaning; (ii) correction of maps, figures, tables, etc. in the MBHCP to correct errors or to reflect previously-approved changes in the MBHCP or the Permit; and (iii) minor changes to survey, monitoring, or reporting protocols.

13.3 Amendment of the Permit/Major Amendment of the MBHCP. Amendment of the Permit, major amendment of the MBHCP (i.e., amendment in a fashion that significantly modifies its effects on the environment and the Covered Species), and, if necessary, joint amendment of both may be undertaken as follows: (a) first, such amendments must be processed and approved in accordance with procedures that are essentially equivalent to the original Permit application (i.e., all applicable ESA, NEPA, and federal regulatory requirements must be satisfied, including a public comment period); (b) second, any Party may propose such Permit and/or MBHCP amendments; (c) third, no such amendment, to the extent it would affect the Covered Species or the carrying out of the Covered Activities on privately-owned lands, may be submitted to the USFWS for formal processing without the consent of the Permittee; and (d) fourth, the proper forum for proposing, considering, and reaching decisions with respect to Permit and/or MBHCP amendments of this type is the plan's TAC as described in Section 5.7 of the plan.

13.4 Permit Suspension/Revocation. The USFWS may suspend or revoke the Permit for cause in accordance with the laws and regulations in force at the time of such suspension or revocation [currently codified at 50 CFR 13.28(a), 17.22(b)(8), and 17.32(b)(8)]. Such suspension or revocation may apply to the entire Permit Area and all Covered Species and Covered Activities, or only to specified Permit Areas, Covered Species, or Covered Activities. The Permittee's obligations under this Agreement and the MBHCP may continue beyond the suspension or revocation, however, if the USFSW determines that any such obligations were outstanding or unsatisfied at the time of the suspension or revocation.

13.5 Permit Extension. Upon agreement of the Parties and in compliance with all applicable laws, the Permit may be extended beyond its initial 30-year term under Federal regulations in force at the time of such extension. If the Permittee desires to extend the Permit, it will so notify the USFWS at least 180 days before the then-current term is scheduled to expire. Extension of the Permit in effect constitutes extension of the MBHCP and this Agreement for the same amount of time as the Permit is extended subject to any modifications the USFWS may require at the time of the extension.

13.7 Severability. Violation of the Permit by any Sub-permittee, or of this Agreement by any Party other than MBG with respect to any particular obligation(s) of the MBHCP, the Permit, and/or the Agreement, or to any one or more particular parcels of land or portions thereof owned, controlled or within the jurisdiction of any such Sub-permittee or Party shall not adversely affect or be attributed to, nor shall result in a loss or diminution of any right, privilege, or benefit hereunder, of the Permittee, any other Sub-permittee, or any other Party, so long as the Permittee and any such other Sub-permittee or Party are themselves in compliance with the MBHCP, the Permit, and/or the Agreement.

13.8 Treatment of Unlisted Covered Species. All Covered Species currently not listed under the ESA will for purposes of the MBHCP and this Agreement be treated as if they are listed. This means, on the one hand, that the conservation measures specified by the MBHCP that are applicable to such species must, under the terms of the plan and the Agreement, be implemented in the course of carrying out the Covered Activities; but, on the other hand, that if such species should become ESA listed in the future, no action by the Permittee or the other Parties, and no amendment of the Permit or the MBHCP, will be needed to meet resulting ESA requirements with respect to such species. The Permit will be become effective with respect to such species automatically upon being listed under the ESA.

14.0 MISCELLANEOUS PROVISIONS

14.1 No Partnership. Except as otherwise expressly set forth herein, neither this Agreement nor the MBHCP shall make or be deemed to make any Party to this Agreement the agent for or the partner of any other Party.

14.2 Successors and Assigns. This Agreement and each of its covenants and conditions shall be binding on and inure to the benefit of the Parties hereto and their respective successors and assigns.

14.3 Notice. Any notice permitted or required by this Agreement shall be delivered personally to the persons set forth below or shall be deemed given five (5) days after deposit in the U.S. mail, certified and postage prepaid, return receipt requested and addressed as follows or at such other address as any Party may from time to time specify to the other Parties in writing:

Executive Director
Malpai Borderlands Group
6226 Geronimo Trail Road
P.O. Box 3536
Douglas, Arizona 85608

Regional Director
U.S. Fish and Wildlife Service
500 Gold Avenue SW
Albuquerque, New Mexico 87102

Refuge Manager
San Bernardino National Wildlife Refuge
P.O. Box 3509
Douglas, Arizona 85608

Field Supervisor
U.S. Fish and Wildlife Service
Arizona Ecological Services Field Office
2321 West Royal Palm Road, Suite 103
Phoenix, Arizona 85021

Regional Assistant Chief
Natural Resources Conservation Service
1201 NE Lloyd Boulevard, Suite 1000
Portland, Oregon 97232

Director
Arizona Game and Fish Department
2221 W. Greenway Road
Phoenix, Arizona 85023

Director
New Mexico Game and Fish Department
P.O. Box 25112
Santa Fe, New Mexico 87504

Commissioner
Arizona State Land Department
1616 W. Adams Street
Phoenix, Arizona 85007

Commissioner of Public Lands
New Mexico State Land Office
310 Old Sante Fe Trail
Santa Fe, New Mexico 87501

14.4 Entire Agreement. This Agreement, together with the MBHCP and the Permit, constitutes the entire Agreement between the Parties. It supersedes any and all other agreements, either oral or in writing among the Parties with respect to the subject matter hereof and contains all of the covenants and agreements among them with respect to said matters, and each Party acknowledges that no representation, inducement, promise or agreement, oral or otherwise, has been made by any other Party or anyone acting on behalf of any other Party that is not embodied herein.

14.5 Captions. The headings of the various sections hereof are for convenience only and shall not affect the meaning of any provision of this Agreement.

14.6 Counterparts. This Agreement may be executed in multiple counterparts, all of which shall constitute but one and the same instrument.

14.7 Elected Officials Not to Benefit. No member of or delegate to Congress shall be entitled to any share or part of this Agreement, or to any benefit that may arise from it.

14.8 Availability of Funds. Implementation of this Agreement and the MBHCP by the USFWS, San Bernardino National Wildlife Refuge, and NRCS are subject to the requirements of the Anti-Deficiency Act and the availability of appropriated funds. Nothing in this Agreement will be construed by the Parties to require the obligation, appropriation, or expenditure of any money from the U.S. Treasury. The Parties acknowledge that the USFWS, San Bernardino National Wildlife Refuge, and NRCS will not be required under this Agreement to expend any Federal agency appropriated funds unless and until an authorized official of that agency affirmatively acts to commit to such expenditures as evidenced in writing.

14.9 Duplicate Originals. This Agreement may be executed in any number of duplicate originals. A complete original of this Agreement, together with all amendments thereto, shall be maintained in the official records of each of the Parties hereto.

14.10 Third Party Beneficiaries. Without limiting the applicability of the rights granted to the public pursuant to the provisions of 16 U.S.C. § 1540(g), this Agreement shall not create any right or interest in the public, or any member thereof, as a third party beneficiary hereof, nor shall it authorize anyone not a Party to this Agreement to maintain a suit for personal injuries or property damages pursuant to the provisions of this Agreement. The duties, obligations, and responsibilities of the Parties to this Agreement with respect to third parties shall remain as imposed under existing Federal or State law.

14.11 Relationship to the ESA and Other Authorities. The terms of this Agreement shall be governed by and construed in accordance with the ESA and other applicable laws. In particular, nothing in this Agreement is intended to limit the authority of the USFWS to seek penalties or otherwise fulfill its responsibilities under the ESA. Moreover, nothing in this Agreement is intended to limit or diminish the legal obligations and responsibilities of the USFWS as an agency of the Federal government.

14.12 References to Regulations. Any reference in this Agreement, the MBHCP, or the Permit to any regulation or rule of the USFWS shall be deemed to be a reference to such regulation or rule in existence at the time an action is taken.

14.13 Applicable Laws. All activities undertaken pursuant to this Agreement, the MBHCP, or the Permit must be in compliance with all applicable State and Federal laws and regulations.

14.14 Estoppel Certificates. Within twenty (20) days after written request from any Party hereto, the other Parties shall execute and deliver to any person designated by the requesting party a written instrument: (a) identifying this Agreement and the MBHCP and any amendments or modifications thereto; (2) stating that all conditions under this Agreement and the MBHCP to be performed by the requesting party have been performed (stating exceptions, if any); and (3) stating such other information as the requesting party reasonably requires.

IN WITNESS WHEREOF, THE PARTIES HERETO have executed this Implementing Agreement to be in effect as of the date last signed below.

By_____ Date_____
Bill McDonald
Executive Director, Malpai Borderlands Group

By_____ Date_____
Benjamin Tuggle, PhD.
Acting Regional Director, U.S. Fish and Wildlife Service

By_____ Date_____
Bill Radke
Refuge Manager, San Bernardino NWR

By_____ Date_____
Bruce J. Newton
Reg. Asst. Chief, Natural Resources Conservation Service

By_____ Date_____
Duane L. Shroufe
Director, Arizona Game and Fish Department

By_____ Date_____
Bruce Thompson
Director, New Mexico Department of Game and Fish

By_____ Date_____
Mark Winkleman
Commissioner, Arizona State Land Office

By_____ Date_____
Patrick H. Lyons
Commissioner, New Mexico State Land Office

Appendix C

Guidelines and Requirements for Conducting Species Status Determinations and Carrying out Pre-burn and Pre-activity Surveys under the Malpai Borderlands HCP

Introduction

As seen in the introduction to the appendices, Appendix C concerns two key, inter-related components of the MBHCP—the process of determining the status of the HCP's covered species in the context of individual activities and projects carried out under the plan; and the process of conducting on-the-ground surveys to determine such status. These components derive from one of the plan's two central conservation objectives—that of protecting the HCP's 19 covered species (and four species assemblages) in the course of carrying out its two categories (and six sets) of covered activities through: (a) determining whether covered species are present in areas in which the covered activities (and the individual projects making up those activities) are carried out; and (b) if so, implementing measures specified by the plan to minimize "take" of such species that might occur as a result of such projects. The latter of these two processes are described in detail in Sections 5.2.1 and 5.2.2 of the plan and the former in general terms in Section 5.2.3. The covered activities and projects themselves, in turn, are the means of accomplishing the HCP's second conservation objective—the maintenance of ecologically healthy rangeland conditions in the Malpai Borderlands.

Section 5.2.3 of the MBHCP specifies four methods for assessing species status in individual project areas under the plan: (a) use of plan's species habitat maps; (b) use of its species occurrence maps; (c) carrying out on-the-ground surveys for the covered species within affected project areas[1]; and (d) where appropriate, assuming that the covered species in question are present in a project area and implementing take minimization measures accordingly based on that assumption.

[1] Where fire management activities are involved, on-the-ground surveys are referred to in the HCP and this appendix as pre-burn surveys; where all other activities are involved, they are referred to as pre-activity surveys. In this appendix, however, the term pre-activity survey is sometimes used by itself for the sake of brevity; in such cases, unless indicated otherwise, the term should be understood to also include pre-burn surveys.

Purposes. The specific purposes of Appendix C are: (a) to identify the conditions and circumstances under which pre-burn and pre-activity surveys with respect to individual projects and activities are required, not required, or optional under the MBHCP; (b) to establish procedures and a decisional framework for determining which method (or methods) available for assessing species status under the HCP to employ in specific and individual cases; and (c) where surveys are required (or are undertaken electively), to establish guidelines that ensure such surveys are carried out appropriately and in a relatively standardized fashion whenever or wherever they might occur.

Organization. These purposes are addressed in the appendix in three parts, which are entitled: (a) Part I: Survey Applicability Guidance; (b) Part II: Procedures for Selecting Species Determination Methods; and (c) Part III: Survey Guidelines.

STATE OF NEW MEXICO
DEPARTMENT OF GAME & FISH

One Wildlife Way
Post Office Box 25112
Santa Fe, NM 87504
Phone: (505) 476-8012
Fax: (505) 476-8123

September 8, 2006

Ms. N. Joyce Johnson, Chief
USFWS-Federal Assistance Division
PO Box 1306
Albuquerque, NM 87103

Attn: Ms. Debra Jones, Grant Manager

Dear Ms. Johnson,

Enclosed please find two annual performance reports for the Hunter Education Grant (w-120-S-34) and the Aquatic Education Grant (F-57-E-17) for your review. Enclosed also is the final performance report for the Section 6/Development of a Multi-Species HCP for the Malpai Borderlands Region (E-59-HP-1). We appreciate your review of these reports and if you have any questions regarding these reports, please contact me at (505) 476-8012 or alexandra.sandoval@state.nm.us.

Sincerely,

Alexandra Sandoval
Resource Partnerships Manager

GOVERNOR
Bill Richardson

DIRECTOR AND SECRETARY
TO THE COMMISSION
Bruce C Thompson

STATE OF NEW MEXICO
DEPARTMENT OF GAME & FISH

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STATE GAME COMMISSION
Guy Riordan Chairman
Albuquerque, NM

Dr Tom Arvas, Vice-Chairman
Albuquerque NM

Alfredo Montoya, Commissioner
Alcalde, NM

David Henderson, Commissioner
Santa Fe, NM

Peter Pino, Commissioner
Zia Pueblo, NM

Leo Sims, Commissioner
Hobbs NM

M H "Dutch" Salmon Commissioner
Silver City, NM

August 23, 2005

Ms N Joyce Johnson, Chief
USFWS-Federal Assistance Division
P O Box 1306
Albuquerque, NM 87103

Attn: Ms. Debra Jones, Grant Manager

Dear Ms Johnson

Enclosed please find an interim performance report and Financial Status Report for grant number E-59-HP-1, "Development of a Multi-Species HCP for the Malpais Borderlands Region" for your review and approval

Both of these reports are delinquent and I apologize for the delay If you have any questions or require additional information, please do not hesitate to contact me at lisa evans@state nm us or (505) 476-8012

Sincerely,

Lisa B Evans

Lisa B Evans
Resource Partnerships Manager

Attachments (2)

cc Mary Medina
Chuck Hayes
Jim Stuart

PROJECT ANNUAL INTERIM REPORT

ESA Section 6, Habitat Conservation Planning Grants

State: New Mexico **Project Number:** E-59-HP-1

Project Title: Development of a Multi-species HCP for the Malpai Borderlands Region

Contract Period: 1 October 2003 **To:** 30 June 2006

Contacts: Chuck Hayes, Jim Stuart (New Mexico Dept Game & Fish), 505-476-8101

I. Grant Narrative Objective

To provide guidance for a regional, multi-species Habitat Conservation Plan for the Malpai Borderlands ecosystem that will create the greatest possible benefit for native habitats and species, and provide guidance on specific activities to minimize possible adverse effects of activities to listed, candidate, and other sensitive species

II. Timeline of Project

The project deadline was extended from 30 September 2005 to 30 June 2006 due to delays in implementing the work caused by problems in coordinating the scope of the project between NMDGF and Arizona Game and Fish Department These conflicts have been resolved and the project is proceeding on schedule

III. Need

The work proposed is the final step in plan development for a long-range program being undertaken by the Malpai Borderlands Group and the state wildlife agencies of Arizona and New Mexico, working in an 800,000 acre area along the U S /Mexico border, to protect the area from development and to improve the condition of natural habitats The goal of the proposed project is to create a multi-species Habitat Conservation Plan (HCP) that will provide a framework for cooperation among participating organizations, agencies, and landowners to guide restoration and management activities for listed and sensitive species in grassland, oak woodland and riparian habitats of the Malpai Borderlands region of southeastern Arizona and southwestern New Mexico This area includes one of the few large intact landscapes that covers the entire range of ecological gradients from valley bottom grasslands to forest and woodlands on the mountain tops with no significant landscape fragmentation Many listed and sensitive species associated with these habitats are continuing to experience population declines as the Basin and Range landscape

of the Southwest is fragmented by development Over 50 state or federally listed or sensitive species occur within the project area The Malpai Borderlands Group (MBG) is working to protect this region from habitat loss due to development and landscape fragmentation, by promoting a cooperative approach to management and restoration of natural habitats The proposed plan will benefit numerous listed species and sensitive species that occupy these habitats by improving watershed conditions, restoring more natural fire conditions, improving livestock management practices and creating opportunities for recovery of listed species

IV. Expected Results and Benefits

The purpose of this project is to prepare a HCP for the entire Malpai Borderlands ecosystem Within this area the MBG is working to protect the integrity of the landscape through use of conservation easements to prevent subdivision, as well as working to promote ecologically sustainable land management There are two general program areas that will result in benefit to wildlife The first is the protection of private land from subdivision and development through use of conservation easements The MBG has already protected over 25,000 acres with conservation easements and is working on more The second area is improved management and restoration of grassland and woodland habitat through cooperative projects with neighboring landowners

The HCP will address the management activities for which the MBG intends to pursue opportunities for cooperation among landowners, ranchers and agencies in the area The plan will provide guidance for each of these activities to minimize possible adverse effects to listed, candidate, and other sensitive species, and to create the greatest possible benefit for native habitats and species The management activities that will be considered in the plan will include prescribed fire, livestock grazing, management of livestock water systems, control of woody species, erosion control structures, and possibly others that are considered appropriate

This project has been conducted in two phases The first phase (phase one, completed) was to prepare a background document that discusses 1) the population status and trends of state and federally listed, candidate, and other sensitive species that occur in the area, 2) the habitat needs and management concerns of the species being considered, and 3) the recommendations for management activities that would likely be included in a HCP The background document as been completed and reviewed by the MBG and other cooperators The second phase of the project will be to prepare a HCP The HCP will provide detailed recommendations for the activities that are considered, and it will result in agreements for habitat management and permitting for the affected listed and candidate species, most likely including species such as the Chiricahua leopard frog, aplomado falcon, New Mexico ridgenose rattlesnake, and black-tailed prairie dog The plan will specifically address potential for introduction of selected aquatic species such as Chiricahua leopard frog and Yaqui topminnow into managed waters such as stock tanks The draft HCP will be reviewed by the MBG and the other cooperators to determine the feasibility of implementing the agreement

V. Approach

1 The work already completed was a background review that will serve as the foundation for a HCP The background review (phase one) was completed in March 2003 The work proposed (creation of a HCP, phase two) is to be completed by June 2006 This document will be produced by reviewing the pertinent literature for the region and consulting with the recognized experts for the species of concern

Accomplishments on Item #1

Major topics of discussion at meetings of the HCP Technical Working Group include

- scope of land management activities to be conducted by the Malpai Borderlands Group (MBG) that are proposed for coverage under the HCP,
- a final list of Federally listed and candidate species to be included in the HCP, their habitat requirements and distribution in the MBG area, and their natural history as it relates to human activities in the area,
- incorporation of species listed under the New Mexico Wildlife Conservation Act into the HCP to ensure compliance with the Act for all covered land management activities,
- the role of prescribed fire in land management in the MBG area and its effect to aquatic ecosystems,
- take minimization measures for each identified activity to be included in HCP,
- scope and focus of species monitoring activities to be defined in the HCP, and
- unforeseen circumstances ("no surprises") provisions to be included in HCP

These topics have been thoroughly discussed during meetings of the Technical Working Group and will be fully addressed in the HCP presently being drafted by the contractor

2 The primary coordination for this project will be done by the Malpai Borderlands Group, with Peter Warren serving a lead role Bill Lehman served as the main technical analyst and writer for the completed background review and will continue in this role for the HCP The New Mexico Department of Game and Fish will take the lead in developing background information for a subset of the listed and sensitive species in the New Mexico part of the study area, particularly those protected under the state's Wildlife Conservation Act, and will develop a comprehensive set of conservation and recovery recommendations for these species

Accomplishments on Item #2

Bill Lehman and Peter Warren have served as the primary organizers for meetings, document review, and setting deadlines for developing HCP components Mr Warren has served as the primary liaison between the HCP Working Group and the MBG and has briefed the latter organization on the progress of the HCP at regular meetings of the MBG The NMDGF, represented by Jim Stuart, has provided background information on the New Mexico Wildlife Conservation Act and its place in the HCP and has been actively involved in regular meetings of the HCP Working Group by providing and reviewing wildlife information relevant to the New Mexico portion of the HCP study area The NMDGF Endangered Species Program developed and refined a list of species that are listed under the Wildlife Conservation Act and that are known or likely to occur in the New Mexico portion of the study area The NMDGF is presently developing conservation recommendations for these species, based on the planned HCP scope and activities identified by the Technical Working Group A list of the species to be addressed by NMDGF in the HCP is appended to this report

3. As was done during development of the background review, the project will be guided by a steering committee (the HCP Technical Working Group) composed of representatives from each of the cooperating organizations We plan to organize periodic meetings (approximately bimonthly) of this committee during the course of the project Purposes of these meetings will be to decide upon the species to be included and the structure of the plan, to discuss progress, and to review drafts of the plan Meetings will generally be located in southern Arizona, with at least some in New Mexico (Albuquerque or Santa Fe) Knowledgeable experts for the species of concern will also be invited to these meetings, and their input will be individually solicited as well. Preliminary habitat management guidelines will be presented for each species with specific reference to cooperative land protection and management activities proposed by the Malpai Borderlands Group

Accomplishments on Item #3

Recent meetings of the HCP Technical Working Group were held on 18 June 2004, 6 August 2004, 20-21 October 2004 (site visit to SE Arizona), 14 December 2004, 18 January 2005, 2 March 2005, 25 May 2005, 6 July 2005, and 8 August 2005 Most meetings were held in Arizona, and New Mexico group members participated by teleconference in those meetings Participants at these meetings in addition to the agency and organization representatives have included HCP specialist from the U S Fish and Wildlife Service, endangered species experts from NMDGF, and members of the Malpai Borderlands group

4 Cooperators in this project will include at least the Malpai Borderlands Group, Arizona Game and Fish Department, New Mexico Department of Game and Fish, Arizona

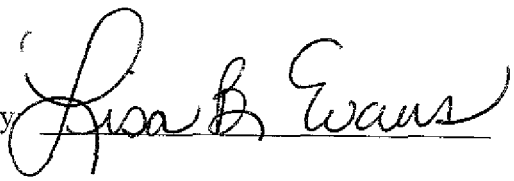
Ecological Services Field Office, New Mexico Ecological Services Field Office, Natural Resources Conservation Service, Animas Foundation, Border Ecology Institute, U S Forest Service, the University of Arizona and the Nature Conservancy

Accomplishments on Item #4

Most of the above-mentioned agencies and organizations have been represented at regular meetings Meeting notes and materials and topics of discussion are regularly distributed to representatives of all these entities via e-mail

Prepared by _____

James N Stuart
Conservation Services Division, NMDGF

Approved by 

Lisa Evans
Federal Aid Coordinator, NMDGF

Listed and Sensitive Species of the Malpai Borderlands Region Revised 6 August 2004
New Mexico Department of Game and Fish

Common Name	Scientific Name	Federal Status	State Status	Habitat
Mammals				
Arizona Shrew	*Sorex arizonae*		NM-E	Mountain canyon
Mexican Long-tongued Bat	*Choeronycteris mexicana*	USFS	NM-SC	Multiple
Southern Long-nosed Bat	*Leptonycteris curasoae*	Endangered	NM-T	Multiple
Mexican (Lesser) Long-nosed Bat	*Leptonycteris nivalis*	Endangered	NM-E	Multiple
Western Red Bat	*Lasiurus blossevillii*	USFS	NM-SC	Multiple
Western Yellow Bat	*Lasiurus xanthius*	USFS	NM-T	Multiple
Mexican Gray Wolf	*Canis lupus baileyi*	Endangered (Ext)	NM-E	Extirpated
Jaguar	*Panthera onca*	Endangered	NM Restr	Multiple
Desert Bighorn Sheep	*Ovis canadensis mexicanus*	USFS	NM-E	Mountain
Southern Pocket Gopher	*Thomomys umbrinus*		NM-T	Mountain
Yellow-nosed Cotton Rat	*Sigmodon ochrognathus*	SoC		Mountain canyon
White-sided Jackrabbit	*Lepus callotis*	USFS	NM-T	Grassland
Birds				
Northern Goshawk	*Accipiter gentilis*	USFS	NM-SC	Mountain canyon
Common Black-Hawk (transient)	*Buteogallus anthracinus*	USFS	NM-T	Riparian
Aplomado Falcon	*Falco femoralis*	Endangered	NM-E	Grassland
Peregrine Falcon	*Falco peregrinus*	USFS	NM-T	Mountain canyon
Gould's Turkey	*Meleagris gallopavo mexicana*	USFS	NM-T	Mountain canyon
Mountain Plover	*Charadrius montanus*		NM-SC	Grassland
Common Ground-Dove	*Columbina passerina*	USFS	NM-E	Riparian
Mexican Spotted Owl	*Strix occidentalis lucida*	Threatened	NM-SC	Mountain canyon
Whiskered Screech-Owl	*Otus trichopsis*		NM-T	Mountain canyon
Buff-collared Nightjar	*Caprimulgus ridgwayi*	USFS	NM-E	Mountain canyon
Gila Woodpecker	*Melanerpes uropygialis*	USFS	NM-T	Riparian
Violet-crowned Hummingbird	*Amazilia violiceps*	USFS	NM-T	Mtn canyon/Rip
Lucifer Hummingbird	*Calathorax lucifer*	USFS	NM-T	Mountain canyon
Broad-billed Hummingbird	*Cynanthus latirostris*	USFS	NM-T	Riparian/Mt Cyn
White-eared Hummingbird	*Hylocharis leucotis*	USFS	NM-T	Mountain canyon
Costa's Hummingbird	*Calypte costae*	USFS	NM-T	Mountain canyon
Elegant Trogon	*Trogon elegans*	USFS	NM-E	Mountain canyon
Northern Beardless-Tyrannulet	*Camptostoma imberbe*	USFS	NM-E	Riparian
Thick-billed Kingbird	*Tyrannus crassirostris*	USFS	NM-E	Riparian
Gray Vireo	*Vireo vicinior*	USFS	NM-T	Mountain canyon
Bell's Vireo	*Vireo bellii*	USFS	NM-T	Riparian
Varied Bunting	*Passerina versicolor*	USFS	NM-T	Riparian
Botteri Sparrow	*Aimophila botterii*		NM-SC	Grassland
Baird's Sparrow	*Ammodrammus bairdii*	USFS	NM-T	Grassland
Arizona Grasshopper Sparrow	*Ammodrammus savannarum ammolegus*		NM-T	Grassland
Yellow-eyed Junco	*Junco phaeonotus*	USFS	NM-T	Mountain canyon
Amphibians and Reptiles				
Sonoran Desert Toad	*Bufo alvarius*	USFS	NM-T	Multiple
Chiricahua Leopard Frog	*Rana chiricahuensis*	Threatened	NM-SC	Aquatic
Lowland Leopard Frog	*Rana yavapaiensis*	USFS	NM-E	Aquatic
Slevin's Bunch Grass Lizard	*Sceloporus slevini*	USFS	NM-T	Grassland
Canyon Spotted Whiptail	*Aspidoscelis burti*	USFS	NM-T	Desertscrub

Mountain Skink	*Eumeces callicephalus*	USFS	NM-T	Mountain canyon
Gila Monster	*Heloderma suspectum*	USFS	NM-E	Desertscrub
Green Ratsnake	*Senticolis triaspis*	USFS	NM-T	Mountain canyon
Yaqui Blackhead Snake	*Tantilla yaquia*		NM-SC	Riparian/Desertscrub
New Mexico Ridgenosed Rattlesnake	*Crotalus willardi obscurus*	Threatened	NM-E	Mountain canyon
Desert Massasauga	*Sistrurus catenatus*	USFS	NM-SC	Grassland

Invertebrates

Shortneck Snaggletooth Snail	*Gastrocopta dalliana dalliana*	NM-E	Mountain canyon
Cockerell Holospira Snail	*Holospira animasensis*	NM-SC	Mountain canyon
Animas Peak Woodlandsnail	*Ashmunella animasensis*	NM-SC	Mountain canyon
Animas Talussnail	*Sonorella animasensis*	NM-SC	Mountain canyon
Peloncillo Mountain Talussnail	*Sonorella hachitana peloncillensis*	NM-SC	Mountain canyon
Lang Canyon Talussnail	*Sonorella* sp (undescribed)	NM-SC	Mountain canyon
Guadalupe Canyon Talussnail	*Sonorella* sp (undescribed)	NM-SC	Mountain canyon

Federal Status
Threatened (under ESA)
Endangered (under ESA)
USFS (Forest Service, sensitive list)
SoC = USFWS Species of Concern
State Status
NM-E = State Endangered
NM-T = State Threatened
NM-SC = State Species of Concern (informal category)
NM-Restr = restricted under CITES