

REINTRODUCTION OF THE MEXICAN WOLF WITHIN ITS HISTORIC RANGE IN THE SOUTHWESTERN UNITED STATES

Final
Environmental
Impact
Statement



Fish and Wildlife Service
U.S. Department of the Interior

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November 1996

Prepared with the assistance of the
Center for Wildlife Law, Institute of
Public Law, University of New Mexico.

Cover illustration: Brian Cobble

Final Environmental Impact Statement on Reintroduction of the Mexican Wolf Within Its Historic Range in the Southwestern United States

Lead agency: United States Department of the Interior, Fish and Wildlife Service.

Cooperating agencies in preparation of the EIS:

Arizona Game and Fish Dep't; New Mexico Dep't of Game and Fish; San Carlos Apache Tribe; U.S. Dep't of Agriculture, APHIS, Animal Damage Control; U.S. Dep't of Agriculture, Forest Service; U.S. Dep't of the Army, White Sands Missile Range.

States and counties where the Preferred Alternative is

located: Arizona: Apache and Greenlee Counties; New Mexico: Catron, *Doña Ana, Grant, *Lincoln, *Otero, Sierra, and *Socorro Counties.

(* indicates counties that are only in the Preferred Alternative if the back-up White Sands Wolf Recovery Area is used.)

Abstract: The U.S. Fish and Wildlife Service (FWS) proposes to reintroduce a nonessential experimental population of Mexican gray wolves (*Canis lupus baileyi*) within part of the subspecies' historic range in the southwestern United States. The endangered Mexican wolf currently is known to exist only in captivity. Under the Preferred Alternative, commencing in 1997 or as soon thereafter as practical, the FWS will gradually release up to 15 pairs or family groups into the Blue Range area of east-central Arizona. If it is determined to be both necessary and feasible, up to five pairs or family groups may be released into the back-up area, the White Sands Missile Range of south-central New Mexico. The objective is to re-establish 100 wild Mexican wolves distributed over 5,000 mi² by about the year 2005. The FWS and cooperating agencies will closely monitor, study, and evaluate the reintroduction. They will have authority under a Mexican Wolf Experimental Population Rule to actively manage the wolves, including preventing dispersal outside the designated wolf recovery areas and moving or removing any wolves causing significant conflicts.

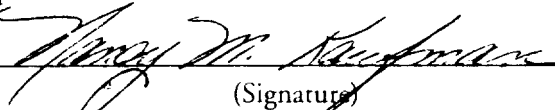
The key impacts of the Preferred Alternative analyzed in the Final Environmental Impact Statement (FEIS) are as follows. After the wolf population grows to approximately 100, it is projected to kill between one and 34 cattle annually, mostly calves. A private livestock depredation compensation fund exists. For the Blue Range Wolf Recovery Area, the net long term effect on wild ungulates is projected to be between 1,200 and 1,900 fewer elk, and between 4,800 and 10,000 fewer deer, than would occur if there were no wolves. If the back-up White Sands Wolf

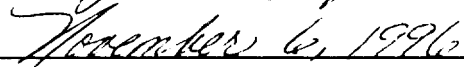
Recovery Area is used, the net long term effect is projected to be between 760 and 2,000 fewer deer than would occur if there were no wolves. Densities of coyotes and mountain lions probably will drop in occupied wolf range. The major regional economic impacts will be reductions in the value of ungulate hunting and in hunting expenditures. Some regional economic benefits are expected from increases in tourism and in non-hunting recreation associated with the wolf. Limited minor land use restrictions may be imposed around occupied release pens, dens, and rendezvous sites, on public lands only, as necessary to prevent disturbance of the wolves. The use of M-44s and choking neck snares in occupied wolf range will be restricted. If the White Sands Missile Range is used, some inconvenience, but no major conflicts with military or testing uses, are expected from wolf reintroduction.

The FEIS also analyzes potential impacts of three alternatives to the Preferred Alternative: 1) reintroduction of nonessential experimental wolves limited to significantly smaller recovery areas, 2) reintroduction of wolves, in the Blue Range Wolf Recovery Area only, with full "endangered" status under the Endangered Species Act and no restriction of wolf dispersal by managers, and 3) a "No Action" alternative that considers the speculative possibility of natural recolonization of wolves from Mexico into southeastern Arizona, southwestern New Mexico, and Big Bend National Park in Texas.

The FEIS will be given to decision makers in the FWS and Department of Interior for a decision. A Notice of Availability of the FEIS will be published in the Federal Register. A Record of Decision can be approved 30 days after publication of the Notice of Availability. Any decision on Mexican wolf recovery in the southwestern United States will be well publicized. Send information requests to: David R. Parsons, Mexican Wolf Recovery Program, U.S. Fish and Wildlife Service, P.O. Box 1306, Albuquerque, NM 87 103.

Approved:


(Signature)


(Date)

Nancy Kaufman
Regional Director, Region 2
U.S. Fish and Wildlife Service

Final Environmental Impact Statement - Reintroduction of the Mexican Wolf Within Its Historic Range in the Southwestern United States

Summary

Introduction

The United States Department of the Interior, Fish and Wildlife Service (FWS), proposes to reintroduce a nonessential experimental population of Mexican gray wolves (*Canis Lupus baileyi*) within part of the subspecies' historic range in the southwestern United States. The endangered Mexican wolf currently is known to exist only in captivity. The FWS has prepared a final environmental impact statement (FEIS) on its reintroduction proposal and three alternative approaches to re-establishing the subspecies under the Endangered Species Act (ESA). This Summary outlines the full FEIS.

Cooperating Agencies in Preparation of the EIS

Arizona Game and Fish Dep't; New Mexico Dep't of Game and Fish; San Carlos Apache Tribe; U.S. Dep't of Agriculture, APHIS, Animal Damage Control; U.S. Dep't of Agriculture, Forest Service; U.S. Dep't of the Army, White Sands Missile Range.

States and Counties Where the Preferred Alternative is Located

Arizona: Apache and Greenlee Counties; New Mexico: Catron, *Doña Ana, Grant, *Lincoln, *Otero, Sierra, and *Socorro Counties.

(* indicates counties that are potentially affected by the Preferred Alternative only if the back-up White Sands Wolf Recovery Area is used.)

Scoping, Public Review, and Changes to the Draft EIS

This FEIS is based on a lengthy period of scoping, preparation, review, and revision of a draft EIS (DEIS). Four public scoping meetings were held in 1991 and 1992 to obtain public input regarding the FWS's general proposal to reintroduce Mexican wolves. A total of 838 people attended. In addition,

public comment periods following the meetings resulted in 1,324 written comments, which the FWS compiled and analyzed. The seven main areas of public concern related to: 1) the FWS's planning of the Proposed Action and the alternatives to it; 2) impacts of wolf depredation on livestock; 3) economic impacts; 4) ecological and biological impacts of wolf recovery; 5) the viability of the captive Mexican wolf population; 6) impacts on wildlife management; and 7) philosophical and ethical concerns. The interagency Mexican Wolf EIS Interdisciplinary Team, which oversaw the writing of the EIS, considered these issues as well as additional issues.

The DEIS was prepared between 1993 and 1995; it was released in June 1995. The public comment period on the DEIS ended more than four months later, on October 3 1. Public review was extensive, with participation by almost 18,000 people or organizations, in a variety of ways. Fourteen public open house meetings were held throughout the potentially affected areas; total registered attendance was 1,186. Three formal public hearings were held in Austin, Texas; Phoenix, Arizona; and Socorro, New Mexico; total registered attendance was 95 1. Each written and transcribed oral comment has been reviewed and considered in the preparation of the FEIS. The public comments are on file and available for inspection at the FWS Regional Office in Albuquerque, New Mexico.

Notable changes from the DEIS to this FEIS are listed below; they largely are in response to comments received on the DEIS or to developments since the DEIS was written. Also, numerous minor corrections, revisions, and updates have been made.

Alternatives

- Re-writing of the Proposed Action as the Preferred Alternative (Alt. A), now specifying use of the biologically preferable Blue Range Wolf Recovery Area (BRWRA) first, with the White Sands Wolf Recovery Area (WSWRA) as a back-up, only to be used if necessary and feasible and if additional information is available that the deer population can support a wolf population. The specific

decision criteria in the DEIS regarding whether to use the BRWRA or WSWRA first have been deleted.

- Deletion of the provision for closing backcountry roads.
- Support for a Citizen Advisory Committee to advise on management.
- Alt. B now proposes reintroductions in both the BRWRA and WSWRA primary recovery zones at the same time.
- Alt. C now proposes **full-endangered** wolf reintroduction into the BRWRA only. The WSWRA is deleted as a potential reintroduction area under Alt. C, largely because the reintroduction objective could be met with releases to just the BRWRA with subsequent unlimited expansion of the reintroduced population. Related discussion of impacts to the WSWRA and the adjacent potential dispersal areas is deleted.
- Rewording of Alt. D to emphasize the “No Action” aspect and that natural recolonization is very speculative. Costs of this alternative are re-calculated. Less quantification is provided in the impact discussion due to greater emphasis on uncertainty.

Clarifications/Corrections

- More discussion of historic information about wolf depredation on livestock, in Chap. 1 under Reasons for Listing.
- New or more clear definitions of “problem wolves,” “rendezvous sites,” and “disturbance-causing land use activities” in the Glossary, Appendix G. The latter definition includes specific activities and types of public access that may not be allowed within a radius of one mile or less around active pens, dens, and rendezvous sites, as well as exemptions, i.e., activities specifically allowed.
- Deletion of the provision for removing wolves when they are “conflicting with a major land use”; addition of a provision for removing them if they endanger themselves

by occurring when and where military or testing activities are scheduled.

- Clarification that modification of wolf habitat (outside the protection areas for pens, dens, and rendezvous sites) by land uses in the recovery areas would not be considered a “take” of nonessential experimental wolves under ESA sec. 9(a).
- Apportionment of potential impacts on deer, elk, hunting, and related economic impacts by whether they would occur in Arizona or New Mexico.
- Discussion of potential impacts on bighorn sheep in the BRWRA.
- More discussion of potential impacts on the San Carlos Apache Reservation.
- Revision and more detailed explanation of cost estimates for each alternative in Appendix B.

Updates

- Updated version of Appendix C, the Proposed Mexican Wolf Experimental Population Rule, as published in the Federal Register.
- Inclusion of the detailed Public Comment Summary and the Agency Comments on the DEIS, both as part of Chap. 5, and both with FWS responses to the comments.
- A summary of the DEIS review process, compilation of the numbers of various types of public comments received, and a listing of personnel involved in the public review process.
- New Mexico League of Women Voters wolf opinion **survey** results.
- Impacts from wolf reintroduction in Yellowstone and Central Idaho to date.

Background

Mexican Gray Wolf Description

The Mexican wolf is the southernmost and one of the smallest subspecies of the North American gray wolf. Adults weigh 50 to 90 lbs., average 4'6" to 5'6" in total length, and reach 26" to 32" in height at the shoulder. Its pelt color varies. The "lobo"-its popular name-is genetically distinct from other wolves and no confirmed population exists outside captivity. It is one of the rarest land mammals in the world. International experts rate recovery of the Mexican wolf subspecies as the highest priority of all gray wolf recovery programs.

Reasons for Listing

Many factors contributed to the Mexican wolf's demise, but the concerted federal eradication effort in the early 1900s was predominant. Other factors were: commercial and recreational hunting and trapping; killing of wolves by game managers on the theory that more game animals would be available for hunters; habitat alteration; and safety concerns, although no documentation exists of Mexican wolf attacks on humans.

Reintroduction Procedures

All Mexican wolves to be released under Alternatives A, B, and C, below, would come from the certified U.S. captive population of 114 animals (as of March 1996) maintained in 24 zoos, wildlife parks, and other facilities located around the country. The wolves have exhibited no major genetic, physical, or behavioral problems affecting their fitness resulting from captivity. The FWS will move male/female pairs identified as candidates for possible release to its captive wolf management facility on the Sevilleta National Wildlife Refuge, north of Socorro, New Mexico. In the event of a decision to proceed with reintroduction, the FWS would select release animals from among the candidate pairs based on reproductive performance, behavioral compatibility, response to the adaptation process, and other factors. Only wolves that are genetically well-represented in the remaining captive population would be used as release stock.

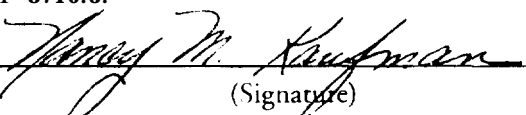
- Drought and management impacts on deer, oryx, and feral horse populations on White Sands Missile Range.
- Proposed reductions in permitted grazing to Apache National Forest allotments in BRWRA.
- Mexican spotted owl recovery in Cumulative Impacts section and discussion on impacts on National Forest management.
- Status of captive Mexican wolf population and genetics, and revision of taxonomy and historic range sections.
- More current information on investigations of whether any Mexican wolves remain in the wild in the U.S. or Mexico (none confirmed).

New Appendices

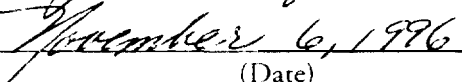
Appendix J - Update on Yellowstone and Central Idaho Gray Wolf Reintroductions and Economic Benefits of Wolf Recovery, and **Appendix K** - Response to Mr. Dennis Parker's Comment on the DEIS.

Future Decision Making

A Notice of Availability of this FEIS is being published in the Federal Register. The FEIS will be given to decision makers in the FWS and Department of Interior. A Record of Decision can be approved 30 days after publication of the Notice of Availability. Any decision on Mexican wolf recovery in the southwestern United States will be well publicized. Send information requests to: David R. Parsons, Mexican Wolf Recovery Program, U.S. Fish and Wildlife Service, P.O. Box 1306, Albuquerque, NM 8710.3.



 (Signature)



 (Date)

Nancy Kaufman
 Regional Director, Region 2
 U.S. Fish and Wildlife Service

Alternatives

Alternative A (the Preferred Alternative): The U.S. Fish and wildlife Service proposes to reintroduce Mexican wolves, classified as nonessential experimental, into the Blue Range Wolf Recovery Area. Wolves will be released into the primary recovery zone and allowed to disperse into the secondary recovery zone. If feasible and necessary to achieve the recovery objective of 100 wolves, a subsequent reintroduction of wolves into the White Sands Wolf Recovery Area will be conducted.

In 1997, the FWS will begin to reintroduce family groups of captive-raised Mexican wolves into the primary recovery zone of the BRWRA (Fig. 1). The FWS will gradually release up to 15 family groups into the BRWRA and later, if necessary and feasible, up to five family groups into the back-up WSWRA (Fig. 1). Reproduction in the wild would increase the populations to approximately the recovery objective. Wolves will be released into the primary recovery zone and allowed to disperse into the secondary recovery zone.

The recovery objective of the Preferred Alternative is to re-establish 100 wild wolves distributed over more than 5,000 mi² by about the year 2005, consistent with the 1982 Mexican Wolf Recovery Plan. The FWS projects that the population will eventually fluctuate near this level as result of natural processes, such as intra-specific aggression and changes in prey abundance and vulnerability, and management actions, such as problem wolf control and translocation. The FWS and its cooperators will monitor, research, evaluate, and actively manage the wolves, including translocating or removing wolves that disperse outside the wolf recovery areas or that cause significant conflicts.

A federal regulation will designate the population to be released as experimental and nonessential to the continued existence of the subspecies. This Mexican Wolf Experimental Population Rule will delineate the precise geographic boundaries (see Box 1) and prescribe the protective measures and management authority that apply. No formal ESA Section 7 consultation would be required regarding potential impacts of land uses on nonessential experimental Mexican wolves, except on National Wildlife Refuges and National Park Service areas.

Reintroduction will occur under management plans that allow dispersal by the new wolf populations from the immediate release areas (“primary recovery zones”) into designated adjacent areas (“secondary recovery zones”) (Fig. 1). However, the FWS and cooperating agencies will not allow the wolves to establish territories outside these wolf recovery area boundaries unless this occurs on private or tribal lands and the land manager does not object. The FWS would attempt to enter into cooperative management agreements with such landowners regarding control of the wolves. If the land manager objects to the presence of wolves on private or tribal lands, field personnel would recapture and relocate the wolves.

The FWS and the cooperating agencies will use a flexible “adaptive management” approach based on careful monitoring, research, and evaluation throughout the release phase. This will include adjusting the numbers actually released according to the needs and circumstances at the time. Initially, to reduce the likelihood of wolf dispersal onto the White Mountain Apache and San Carlos Apache reservations to the west, the wolf releases will occur on the eastern side of the BRWRA primary recovery zone, close to the Arizona/New Mexico border. The FWS will encourage and support the formation of a Citizen Advisory Committee, or similar management oversight body, to assist the FWS and cooperating agencies in responding to citizen concerns.

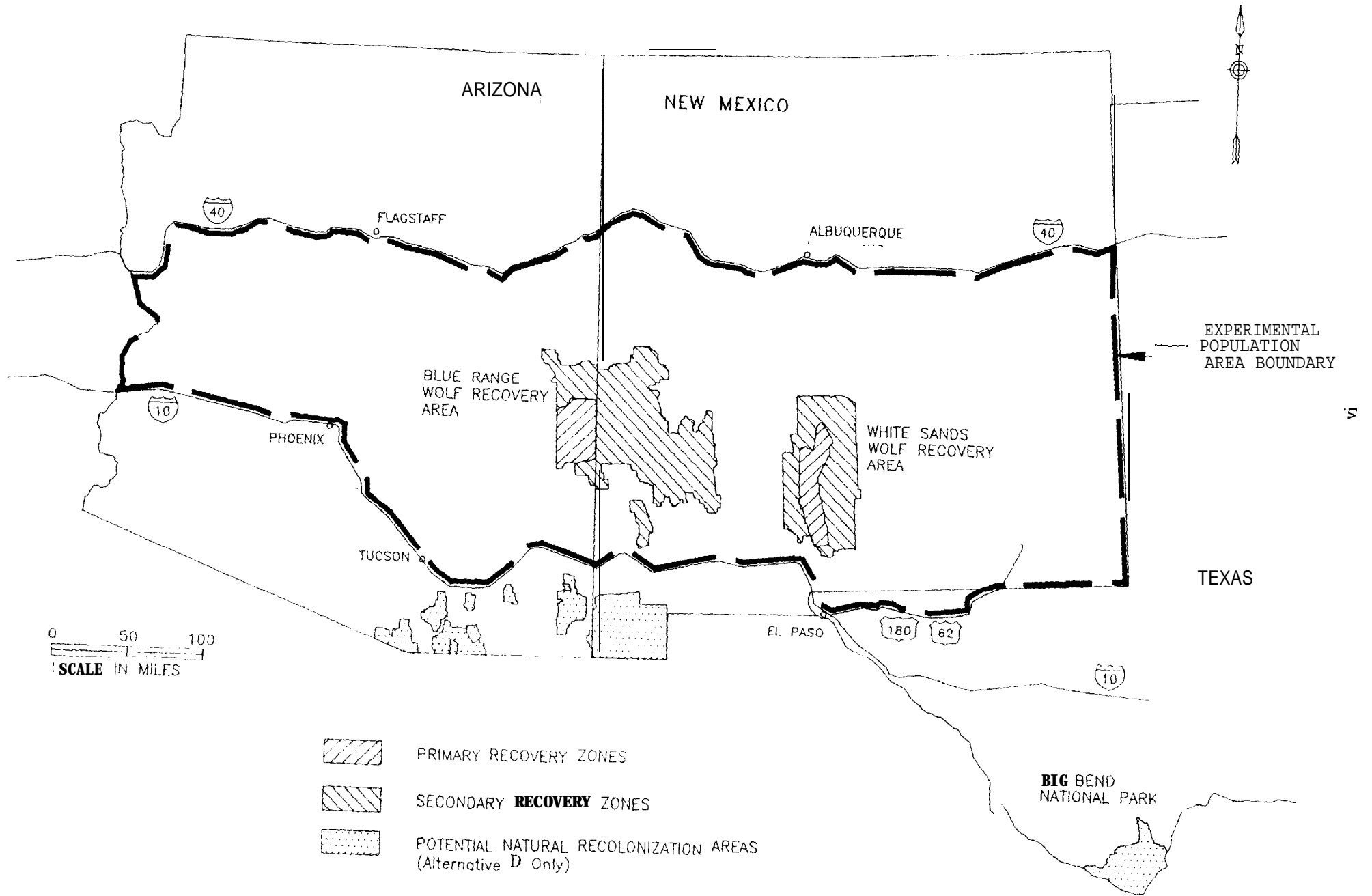
The following future circumstances will be considered in decision-making about using the WSWRA subsequent to initial releases in the BRWRA:

- whether using the WSWRA, in combination with the BRWRA, is necessary to achieve the recovery objective of re-establishing 100 wolves; that is, it would be used if it appears that the initial introduction in the BRWRA will not achieve a total population of 100 wolves,

- whether, based on future research, it appears that the WSWRA deer herd could support a wolf population that would contribute to meeting the recovery objective, and

- other future circumstances that could affect the feasibility of using the WSWRA, such as

Figure 1. Mexican Wolf Geographic Boundaries.



Box 1. Geographic boundaries for Mexican wolf reintroduction (see Fig. 1).

Blue Range Wolf Recovery Area: all of the Apache National Forest and all of the Gila National Forest.

BRWRA primary recovery zone: the area within the Apache National Forest bounded on the north by the Apache-Greenlee County line; on the east by the Arizona-New Mexico State line; on the south by the San Francisco River (eastern half) and the southern boundary of the Apache National Forest (western half); and on the west by the Greenlee-Graham County line (San Carlos Apache Reservation boundary).

BRWRA secondary recovery zone: the remainder of the BRWRA not in the primary recovery zone.

White Sands Wolf Recovery Area: all of the White Sands Missile Range, the White Sands National Monument, and the San Andres National Wildlife Refuge, and the area adjacent and to the west of the Missile Range bounded on the south by the southerly boundary of the U.S. Department of Agriculture Jornada Experimental Range and the northern boundary of the New Mexico State University Animal Science Ranch; on the west by the New Mexico Principal Meridian; on the north by the Pedro Armendaris Grant boundary and the Sierra-Socorro County line; and on the east by the western boundary of the Missile Range.

WSWRA primary recovery zone: the area within the White Sands Missile Range bounded on the north by the road from former Cain Ranch Headquarters to Range Road 16, Range Road 16 to its intersection with Range Road 13, Range Road 13 to its intersection with Range Road 7; on the east by Range Road 7; on the south by U.S. Highway 70; and on the west by the Missile Range boundary.

WSWRA secondary recovery zone: the remainder of the WSWRA not within the primary recovery zone.

Mexican wolf experimental population area: the portion of Arizona lying north of Interstate Highway 10 and south of Interstate Highway 40; the portion of New Mexico lying north of Interstate Highway 10 in the west, north of the New Mexico-Texas boundary in the east, and south of Interstate Highway 40; and that portion of Texas lying north of US Highway 621180 and south of the Texas-New Mexico boundary.

the wolf program budget, management concerns, future military uses of the missile range, and so on.

The Proposed Mexican Wolf Experimental Population Rule was published in the Federal Register on May 1, 1996 (pp. 19237-19248). In summary, the Proposed Rule provides:

No one will be in violation of the ESA for unavoidable and unintentional take of a wolf within the Mexican wolf experimental population area when the take is incidental to a legal activity, such as driving, trapping, and military testing or training activities, and is promptly reported. Anyone may take a wolf in defense of human life.

- No private or tribal land use restrictions will be imposed for wolf recovery without the concurrence of the private owner or tribal government. On public lands, public access and disturbance-causing land use activities may be temporarily restricted within a one-mile radius around release pens, and around active dens between March 1 and June 30 and around active wolf rendezvous sites between June 1 and September 30.

- On *public* lands allotted for grazing, livestock owners and their designated agents: (1) may harass wolves for purposes of scaring them away from livestock provided the harassment is promptly reported, and (2) may be allowed to take wolves actually engaged in attacking livestock.

- Permission for private parties to take wolves on public grazing lands must meet all of these conditions: **1)** six or more breeding wolf pairs occur in the BRWRA, or three or more breeding wolf pairs occur in the WSWRA (if used); **2)** previous livestock loss or injury by wolves has been documented by an authorized FWS, ADC, or state employee and efforts to control the offending wolves have been undertaken but have not succeeded; **3)** physical evidence exists that an attack occurred at the time of the take; and **4)** the take is promptly reported.
- On *private or tribally-owned land*, regardless of location, property owners and livestock owners and their designated agents may harass wolves near livestock, people, buildings, facilities, pets, or other domestic animals at any time and may take wolves attacking livestock under more liberal conditions than those applicable to public grazing lands. That is, such take can occur regardless of the number of recovered wolf pairs in the area and no requirement exists for government agencies to have completed their efforts to take the depredating wolves. However, physical evidence that an attack occurred at the time of the take must be present and the take must be promptly reported.
- Any FWS-authorized person may capture and remove or translocate reintroduced wolves consistent with a FWS-approved management plan or special management measure. These may include wolves that: **(1)** prey on livestock, **(2)** attack domestic animals other than livestock on private land, **(3)** impact game populations in ways which may inhibit further wolf recovery, **(4)** prey on state-endangered desert bighorn sheep on the White Sands Missile Range (if used), **(5)** are considered problem wolves, are a nuisance, or endanger themselves by their presence in a military impact area, or **(6)** are necessary for research.
- The **FWS** does not intend to change the “nonessential experimental” designation to

“essential experimental” or “endangered” and the FWS does not intend to designate critical habitat for the Mexican wolf.

- Any taking of a wolf contrary to the experimental population rule may be referred to the appropriate authorities for prosecution.

Post-release management will follow an inter-agency cooperative management plan. This will include working with the Arizona Game and Fish Department to meet the requirements of its Cooperative Reintroduction Plan and working with the New Mexico Department of Game and Fish. A wolf management team representing the FWS, the State Game and Fish departments, and other cooperating agencies will determine whether particular actions are necessary. The interagency management plan will cover issues such as release pen siting, veterinary management, depredation control, capture and relocation, research, radio tracking, aerial overflights, prey monitoring, and prey habitat management. Field staff will conduct monitoring and research, trapping, depredation investigation, mortality investigation, control, and other on-the-ground actions.

Alternative B: Reintroduction of Mexican wolves, classified as nonessential experimental, into both the Blue Range Wolf Recovery Area and the White Sands Wolf Recovery Area primary recovery zones. Wolves dispersing from the primary recovery zones will be captured and returned to the primary zones or captivity.

In 1997, the FWS will begin to reintroduce family groups of captive-raised Mexican wolves into both the BRWRA and the WSWRA primary recovery zones and actively prevent the populations from expanding beyond these zones (Fig. 1). In the BRWRA primary recovery zone the FWS will release about eight family groups over four years with the goal of reaching a population of 20 wild wolves by 2001. In the WSWRA primary recovery zone the FWS will release about four family groups over two years with the goal of reaching a population of **14** wild wolves by 1999. The total recovery objective will be 34 wolves.

The FWS will designate the population as nonessential experimental under the ESA. The FWS will adopt basically the same Mexican Wolf Experimental Population Rule as under **Alt. A**, but it would apply to the smaller areas. The FWS and its cooperators will follow the same release, monitoring, and management procedures as under **Alt. A**, but on a smaller scale due to the smaller areas involved. Control will be accomplished through a combination of aggressive monitoring and management methods to promptly recapture wolves that leave the primary recovery zones. Wolves could be **translocated** between the two areas as needed.

Alternative C: Reintroduction of Mexican wolves, classified as endangered, into the Blue Range Wolf Recovery Area only. Wolves will be released into the primary recovery zone and unlimited dispersal will be allowed. Wolves will receive full protection under the Endangered Species Act.

In 1997, the FWS will begin to reintroduce family groups of captive-raised Mexican wolves under their current full-endangered status into the primary recovery zone of the BRWRA in east-central Arizona, following the same release procedures as under **Alt.s A and B**. The FWS will gradually release up to 15 family groups into the **BRWRA**. No releases will occur in the WSWRA. The recovery objective of the alternative is to re-establish 100 wild wolves distributed over more than 5,000 mi^2 by about the year 2002, consistent with the Mexican Wolf Recovery Plan. The FWS and its cooperators will monitor and conduct research on the wolves, but they will not actively manage them.

The ESA allows unrestricted dispersal; that is, the FWS will not restrict the population to the designated wolf recovery areas, as under Alternative A, or to the smaller primary recovery zones, as under Alternative B. No attempts will be made to recapture or return wolves with the possible exception of individual depredators.

The wolves will have the full protection against “take” by humans provided by the ESA. Anyone who would “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct” against a Mexican wolf will be violating the ESA. The only exceptions will

be takings to protect human life or by special permit “for scientific purposes or to enhance the propagation or survival of the **affected** species,” 16 USC sec. 1539(a)(1)(A).

Land use restrictions could be imposed under this alternative. Restrictions could include limiting the use of predator control methods that might kill or injure wolves, closing roads, modifying livestock grazing, and imposing other protections to limit any jeopardy resulting from human activities. Other federal agencies would be expected to pursue their responsibilities under the ESA to conserve, and not harm, a recolonizing population. This would include managing to maintain and create high quality ungulate and wolf habitat.

Alternative D: No Action

Under the No Action alternative, the FWS will take no action other than continuing its present course. It will neither release wolves nor take any other steps to directly ensure Mexican wolf recovery. The FWS will neither adopt an experimental population rule nor designate any wolf recovery areas. The agency will continue to support the captive population objectives established in the SSP Master Plan, but the agency will not support breeding for maximum growth.

Based on its current ESA obligations, the FWS would still encourage protection and expansion of wild wolf populations under this alternative, if any were discovered. No evidence exists to indicate a likelihood of natural recolonization in U.S. portions of the historic Mexican wolf range, but the FWS will support continued research on this possibility. Natural recolonization is considered extremely speculative. Based on historical wolf abundance, recent sighting reports alleged to be wolves, proximity to Mexico, and other factors, the most suitable areas for potential natural recolonization by wild wolves probably would be the mountainous parts of southeastern Arizona and southwestern New Mexico, and Big Bend National Park in southern Texas. This alternative analyzes these three areas. No confirmed sighting reports have come from these areas or from Mexico in recent years.

Any wolves that did naturally recolonize would be fully protected as an endangered species in the United States. It would be illegal to harm or harass

them except under very narrow circumstances authorized by an ESA permit.

Land use restrictions could be imposed under this alternative depending on if, and where, wolves occurred. Restrictions could include limiting the use of predator control methods that might kill or injure wolves, closing roads, modifying livestock grazing, and imposing other protections to limit any jeopardy resulting from human activities. Other federal agencies would be expected to pursue their responsibilities under the ESA to conserve, and not harm, a recolonizing population. This would include

managing to maintain and create high quality ungulate and wolf habitat.

Impacts

Table 1 summarizes the features of the four alternatives. Table 2 outlines their projected environmental consequences. The FEIS provides detailed explanations of the impacts, descriptions of the methods of impact analysis, and supporting references.

Table 1. Summary of Mexican wolf re-establishment alternatives.

Key: BR = Blue Range Wolf **Recovery Area**; WS = White Sands Wolf Recovery Area.

Alternative	Description	Areas Analyzed	Definite Boundaries Around Recovery Areas?	Endangered Species Act Protection Status	Area Wolf Population Goal	Estimated Area to be Occupied by Wolves (square miles)
A (Preferred Alternative)	Nonessential experimental releases allowing dispersal into secondary recovery zones; BR first, WS back-up	BR and WS primary and secondary recovery zones	Yes	Per experimental population rule	RR and WS (if used): Total - 100	BR and WS (if used): Total - 5,000
B	Nonessential experimental releases preventing dispersal from primary zones	BR and WS primary recover) zones only	Yes	Per experimental population rule	ws - 14 BR - 20 Total- 34	WS 720 BR - 1,000 Total 1,720
C	Releases under full ESA protection	BR only plus likely dispersal areas	No	Endangered	BR - 100+	BR - >5,000
D	No releases; research and support possible natural recolonization	Southeastern Arizona, Southwestern New Mexico, and Big Bend National Park, Texas	No	Endangered (if wolves discovered)	(speculative) SE Ariz. - 30 S W N M - 2 0 Big Bend NP - 5 Total - 55	(speculative) SE Ariz. - 1,500 SW NM - 1,000 Big Bend N P - 250 Total 2.750

(continued below)

Alternative	Meets 1982 Mexican Wolf Recovery Plan's Population Objective?	Estimated Years to Reach Area Population Goal	Estimated Annual Percentage of Established Population Lost to Control and Other Factors ¹	Major Land Use Restrictions	Intensity of Wolf Management and Control	Total Estimated Implementation Costs ²
A (Preferred Alternative)	BR Yes WS - No Together Yes	BR - 9 ws - 3	BR - 35% ws - 25%	None	Medium	\$7,247,000 (over 14 years)
B	WS No BR - No Together - No	ws - 3 BR - 5	ws - 30% BR - 40%	None	High	\$5,890,000 (over 10 years)
C	BR Yes	BR - 6	RR - 25%	Some possible	Low	\$5,692,000 (over 10 years)
D	SE Ariz. No SW NM - No Big Bend NP - No Together - No	Decades (speculative)	No estimates	Some possible (if wolves discovered)	Low	\$150,000 to \$217,000 per year (period indeterminate)

¹ In addition, about one-third of the captive-raised wolves that are released annually are expected to quickly die, disappear, disperse from the recovery area, or to require recapturing for a variety of reasons, and not to become part of the established population.

² See Appendix B for cost accounting.

Table 2. Summary of key projected impacts under each alternative.

Notes: Chap. 4 provides background for all information summarized here. All impacts in the back-up White Sands Wolf Recovery Area under Alt. A depend on whether the area is used. This table emphasizes quantifiable adverse impacts and is not a cost-benefit summary. Monetary losses are in 1994 dollars.

Key: BR = Blue Range Wolf Recovery Area; WS = White Sands Wolf Recovery Area.

Alternative	Net impact of wolf recovery on wild prey populations (low to high range) ¹	Impact on annual hunter take in area (low to high range) ¹	Annual lost value of hunting (low to high range) ²	Annual lost hunter expenditures in region (low to high range) ²	Number of cattle killed annually (low to high range)
A (Preferred Alt.)	BR: 4,800-10,000 fewer deer; 1,200-1,900 fewer elk	BR: 300-560 fewer deer; 120-200 fewer elk	BR: \$716,800- \$1,336,600	BR: \$579,100- \$1,079,100	UK: 1-34
	ws: 1,200-3,000 fewer deer	WS: 10-24 fewer deer	ws: \$3,000-\$7,100	WS: \$2,900-\$7,000	ws: 0.0-0.3
B	RR: 970-1,900 fewer deer; 230-350 fewer elk	BR: 57-110 fewer deer; 24-33 fewer elk	RR: \$123,100- \$214,800	BR: \$58,200- \$101,500	BR: 0.0-3.1
	ws: 760-2,000 fewer deer	WS: 5-11 fewer deer	ws: \$1,500-\$3,300	WS: \$1,500-\$3,200	WS: 0
C	BR: 3,700-8,800 fewer deer; X70-1,700 fewer elk	BR: 240-480 fewer deer; 90-150 fewer elk	BR: \$582,800- \$1,119,200	RR: \$470,700- \$902,700	BR: 1-34
D ³	not modelled	not modelled (none in Big Bend NP)	not modelled (none in Big Bend NP)	not modelled (none in Big Bend NP)	not estimated (none in Big Bend NP)

¹ Figures given compare prey populations under the wolf reintroduction scenario, at a point in time five years after the wolf population goal for the area is achieved, to what the prey populations are projected to be if wolves are not reintroduced.

² These figures likely overstate the actual losses. Hunters may not actually hunt less overall because of fewer deer and elk in the wolf recovery areas, but instead turn their attention to substitute areas or species. Further, deer and elk hunting in Arizona and New Mexico are dominated by resident hunters. Most of the money not spent by residents as hunter expenditures in the region probably will be spent in some other sector of the state economy.

³ All projected impacts in the potential natural recolonization areas are speculative.

(continued on next page)

Table 2. Continued.

Alternative	Value of cattle killed annually (low to high range)*	Economic benefits	Impacts on ADC activities	Impacts on government policies and plans	Impacts on land use and military activities	Impacts on recreation
A (Preferred Ah.)	BR: \$640-\$21,600 WS: \$10-\$200	HR: increased recreational use value and expenditures WS: little impact	BR: M-44 and neck snare restrictions; limits on other tools WS: little impact	BR: conflict with local ordinances WS: limited conflict with local ordinances	BR: minor access restrictions near pens, dens, and rendezvous sites WS: very limited access restrictions; inconvenience for security administration	BR: increased visitation WS: little impact
B	BR: \$20-\$600 ws: \$0	BR: limited increased recreational use value and expenditures WS: no impact	BR: limited M-44 and neck snare restrictions; limits on other tools WS: no impact	BR: no conflict ws: no conflict	BR: minor access restrictions near pens, dens, and rendezvous sites WS: very limited access restrictions; inconvenience for security administration	BR: limited increased visitation WS: no Impact
C	BR: \$640-\$21,600	BR: increased recreational use value and expenditures	RR: M-44 and neck snare restrictions; limits on other tools	BR: conflict with local ordinances; potential conflict with San Carlos and White Mountain Apaches' tribal sovereignty	BR: access restrictions near pens, dens, and rendezvous sites; restrictions on grazing and other activities	BR: Increased visitation
D ⁴	not estimated (none in Big Bend N P)	All 3 areas: increased recreational use value and expenditures	All 3 areas: M-44 and neck snare restrictions; limits on other tools	All 3 areas: no conflict	All 3 areas: access restrictions near pens, dens, and rendezvous sites; restrictions on grazing and other activities	All 3 areas: increased visitation

⁴ Livestock losses may be compensated by a private depredation compensation fund.

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Chapter 1

Purpose and Need for Action



CHAPTER 1

Purpose and Need For Action

Introduction

This final environmental impact statement (FEIS) addresses the reintroduction of the endangered Mexican gray wolf (*Canis lupus baileyi*), a subspecies of the gray wolf, within part of its historic range in the southwestern United States. Formerly found in many of the mountainous areas of the Southwest and Mexico, the Mexican wolf has been extirpated from the United States and may have been extirpated from Mexico, where it has not been confirmed to exist since the early 1980's. The only known Mexican wolves reside in captivity in a breeding program overseen by the United States Department of Interior, Fish and Wildlife Service (FWS), Region 2, headquartered in Albuquerque, New Mexico, in cooperation with Mexican authorities.

This chapter begins with a discussion of the purpose and need for the reintroduction action proposed by the FWS. Then, an overview description of the Mexican wolf is provided. The public scoping process that helped define the issues to be covered in the draft environmental impact statement (DEIS), then in this FEIS, is then reviewed. Chap. 1 concludes with a list of the various permits and approvals that may be needed to implement a decision arising out of this federal environmental impact assessment process.

Purpose

The Mexican Wolf Recovery Plan, adopted under the authority of the Endangered Species Act (ESA), has two prime recovery objectives: maintaining a captive population and re-establishing at least 100 wild wolves in a 5,000 mi² area within the subspecies' historic range (Mex. Wolf Rec. Team 1982).¹ The purpose of the proposed action (Alter-

native A, now designated as the Preferred Alternative) in this FEIS is to begin implementing the re-establishment objective of the Recovery Plan by releasing Mexican wolves from the captive population into the wild.

Commencing in 1997, or as soon thereafter as practical, the FWS will gradually release up to 15 pairs or family groups into the Blue Range area of east-central Arizona. Also, if it is determined to be necessary and feasible, up to five pairs or family groups may be released into the back-up area, the White Sands Missile Range of south-central New Mexico. The objective is to re-establish 100 wild Mexican wolves distributed over 5,000 mi² by the year 2005. The FWS and cooperating agencies will closely monitor and study the reintroduced wolves. Management of the reintroduction will be constantly evaluated and adapted as new circumstances arise.

This proposal represents the beginning of recovery for the Mexican wolf in the wild within a small part of its former range and the proposal contributes to conservation of the gray wolf species as a whole. Full recovery of the Mexican wolf subspecies likely will require additional reintroduction projects elsewhere and may take several decades to accomplish.² Full recovery is beyond the scope of this EIS.

Need

The FWS is acting under the ESA, which directs the Secretary of Interior to develop and implement recovery plans for species and subspecies such as the Mexican wolf that are in danger of human-caused extinction, 16 USC sec. 1533(f). The FWS also agreed to make "expeditious" progress toward Mexican wolf recovery under a 1993 settlement of a lawsuit filed by several private groups that advocate wolf recovery.³

¹Written materials relied on in this EIS are cited by the author's last name and the year of publication. Full citations are provided alphabetically in Appendix H.

²Downlisting and delisting would occur after meeting population and other recovery criteria to be defined in a revised Mexican Wolf Recovery Plan, currently in the revision process. Complete restoration throughout the subspecies' former range is neither required nor planned.

³Wolf Action Group, et al. v. United States, et al., U.S. District Court for the District of New Mexico, Civil Action No. CIV-90-0390-HB.

Overview of the Mexican Wolf

Other federal agencies are required by the ESA to take actions within their authority to conserve threatened and endangered species, 16 USC sec. 1531(c)(1). This is to be done in consultation with the FWS, 16 USC sec. 1536(a)(1). States that have entered into cooperative agreements with the Secretary of Interior, which include Arizona, New Mexico, and Texas, also have responsibilities to conserve threatened and endangered species, 16 USC sec. 1535. The State of New Mexico has its own endangered wildlife law that provides for conservation of listed species including the gray wolf, the Wildlife Conservation Act (Secs. 17-2-37 through 17-2-46, NMSA 1978) and State Game Commission Regulation No. 682 (Amending the Listing of Endangered Species and Subspecies of New Mexico 1990). Arizona's Game and Fish Department also has a policy supporting endangered species recovery (AGFD 1987). The Department has drafted a "Cooperative Reintroduction Plan for the Mexican Wolf in Arizona" that calls for a joint reintroduction effort with the FWS in the Blue Range area (Groebner et al. 1995).

Additional duties to recover the Mexican wolf arise from international law. Both Mexico and the United States signed the Convention on Nature Protection and Wildlife Preservation in the Western Hemisphere, which took effect in 1942. Its preamble states the parties desire "to protect and preserve in their natural habitat representatives of all species and genera of their native flora and fauna." Mexican wolf recovery would serve to implement this convention (anon. 1985).

Recovery programs for the gray wolf are underway elsewhere in the United States; however, they involve less rare subspecies. Experts have rated recovery of the Mexican wolf subspecies as the highest priority of all such programs.⁴ The subspecies is genetically distinct from other wolves (Wayne et al. 1992), and no confirmed population exists outside captivity. It is one of the rarest land mammals in the world.

Description

The Mexican wolf is among the smallest of the North American gray wolves. Adults weigh 50 to 90 lbs., average 4'6" to 5'6" in total length, and reach 26" to 32" in height at the shoulder (Young and Goldman 1944, Brown 1983). Its pelt color varies. The "lobe"-its popular name-is the southernmost subspecies of what once was the most wide-ranging species of the North American mammals (Paradiso and Nowak 1982).

Appendix A summarizes what is known about Mexican wolf life history and ecology. However, little scientific research was done while the animal existed in the wild. The only field data came from a period of rapidly dwindling numbers when human activities had disrupted pack structures and natural prey populations.

Taxonomy

Hall and Kelson (1959), relying heavily on the prior work of Young and Goldman (1944), described 24 subspecies of gray wolves (*Canis lupus*) in North America, five of which occurred in the southwestern United States and Mexico: *C. l. baileyi*, *C. l. mogollonensis*, *C. l. monstrabilis*, *C. l. nubilus*, and *C. l. youngi*. A taxonomic revision proposed by Bogan and Mehlhop (1980 and 1983), and adopted by the Mexican Wolf Recovery Team and the FWS (Mex. Wolf Rec. Team 1982, USFWS 1984), lumped *C. l. mogollonensis* and *C. l. monstrabilis* into *C. l. baileyi*. In a recent reclassification of North American gray wolves, Nowak (1995) proposed reducing the original 24 named subspecies to five, of which *C. l. baileyi* is one. However, Nowak's reclassification differs from that proposed by Bogan and Mehlhop in that Nowak includes *C. l. mogoffonensis* and *C. l. monstrabilis* with *C. l. nubilus* rather than with *C. l. baileyi*. It should be noted that no individual taxonomist or publication has official or ruling status on questions of mammalian taxonomy.

*The Wolf Specialist Group, a worldwide body of experts on wolves organized under the International Union for the Conservation of Nature (the World Conservation Union), Species Survival Commission, has endorsed Mexican wolf recovery "as its highest priority project" (Mech 1990).

The classifications proposed by Hall and Kelson (1959), Bogan and Mehlhop (1980), and Nowak (1995) were based on comparisons of morphological characteristics, primarily skull measurements. They all concluded that *C. l. baileyi* is a morphologically distinct subspecies of gray wolf. Molecular genetic analyses have identified distinct attributes of Mexican wolves (Garcia-Moreno 1995, Hedrick 1995, see Appendix K). Thus, consensus exists among experts that *C. l. baifqi* is a distinct gray wolf subspecies. However, the lingering question of which of the formerly recognized subspecies (Hall and Kelson 1959) belong to *C. l. baifqi* continues to confuse the delineation of the Mexican wolf's historic distribution.

Historic Distribution

As indicated above, the drafters of the original Mexican Wolf Recovery Plan accepted the recommendations of Bogan and Mehlhop (1980) and included the ranges of the former *C. l. mogollonensis* and *C. l. monstrabilis* in the range of *C. l. baileyi* (Mex. Wolf Rec. Team 1982). However, in Nowak's (1995) opinion, the original core geographic range of *C. l. baifqi* extended just north of the Gila River, which bisects the Gila National Forest. This brings into question the taxonomic affinity of specimens collected from the Gila National Forest area (Nowak 1995). Nowak does not describe the limits of the northeastern portion of his proposed range for the Mexican wolf, but the line on his map appears to bisect White Sands Missile Range then turns southeast through western Texas and enters Mexico just east of Big Bend National Park. Nowak (1995) speculates that individuals from the core geographic range of *C. l. baileyi* regularly dispersed into the range of populations to the north. He found that, following the large-scale extermination of wolves in the southwestern U.S., the later occurrence of wolves in these areas was attributable to *C. l. baileyi* dispersing from Mexico (Nowak 1995).

In reality, the boundaries between ranges of adjacent gray wolf subspecies were wide zones of intergradation where genetic mixing between subspecies occurred, rather than distinct lines on a map

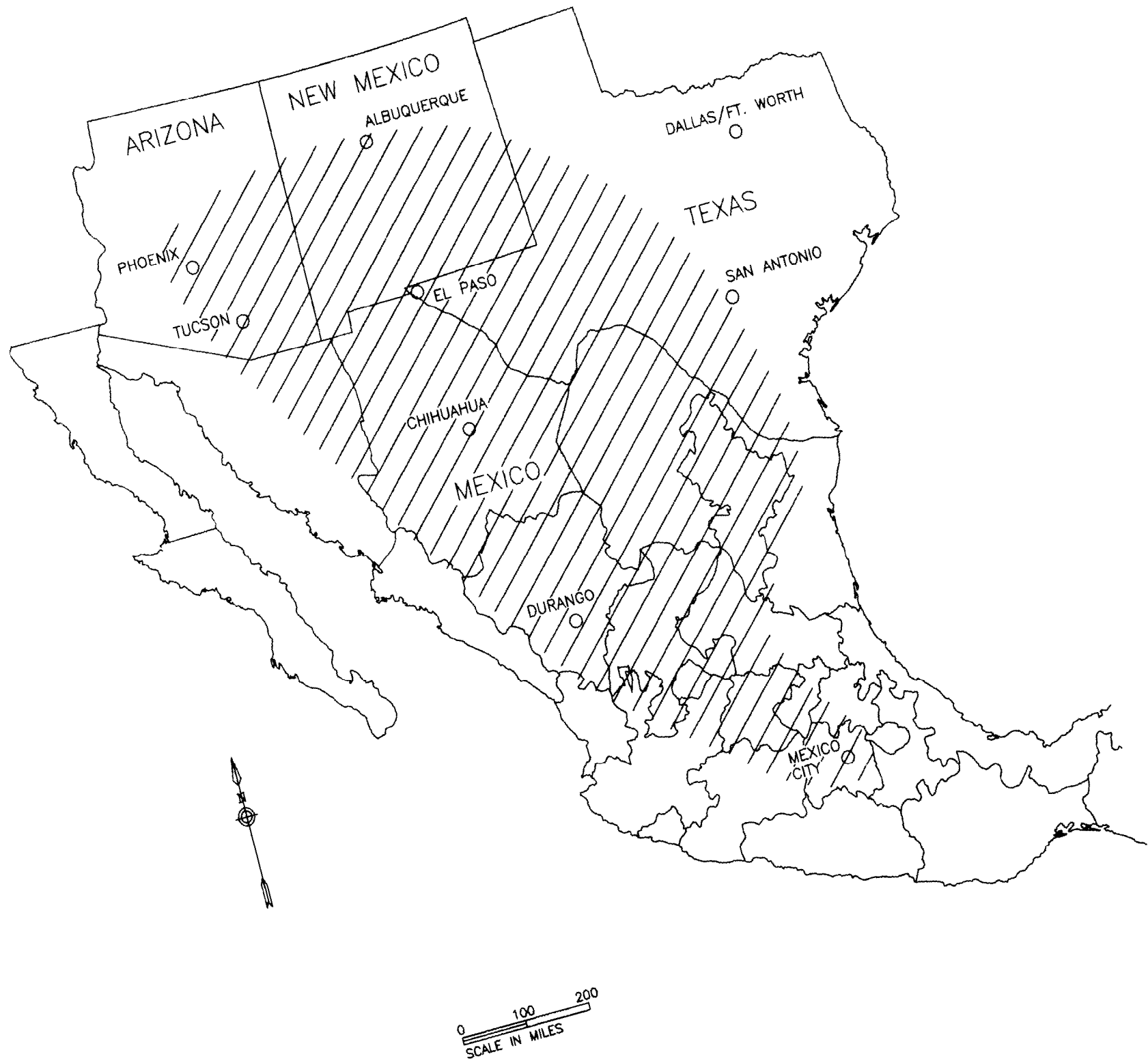
(Mech 1970, Brewster and Fritts 1994). The width of these zones relates to the ability of wolves to disperse. They are capable of dispersing hundreds of miles, with the longest known dispersal exceeding 550 miles (Fritts 1983). Thus for gray wolves, these zones of subspecies intergradation were likely hundreds of miles wide.

In light of these considerations, the Mexican Wolf Recovery Team has determined that the probable historic range of the Mexican wolf included the core geographic range of *C. l. baifqi*, plus an approximately 200-mile extension to the north and northwest of that area (Fig. 1-1) (D. Parsons, USFWS, pers. comm.). This range delineation includes the core range of *C. l. baileyi* as described by Young and Goldman (1944), Hall and Kelson (1959), and Nowak (1995); includes much of the expanded range resulting from the consolidation of subspecies proposed by Bogan and Mehlhop (1980); accommodates the range expansion of *C. l. baileyi* following extermination of adjacent wolf populations described by Nowak (1995); and is consistent with the dispersal capability of gray wolves. Fig. 1-1 delineates the probable historic range of *C. l. baifqi* for purposes of reintroducing the subspecies into the wild with experimental status, 50 CFR 17.81(a). Chap. 3 on the Affected Environment summarizes the historical evidence of wolves for each of the recovery areas under consideration.

The last 100 years have seen the Mexican wolf's range, which in the past may have sustained a population of many thousands, shrink very severely. Not all habitat types within the area in Fig. 1-1 were occupied by these wide-ranging predators, however. Historic reports refer to the Mexican wolf as primarily associated with forested mountainous terrain (Bednarz 1988). While it does not require particular vegetation, it reportedly most often occurred above 4,500 feet elevation in or near woodlands of pine⁵, oak, or pinon-juniper, interspersed with grasslands (Brown 1983).

⁵Appendix I provides a List of Scientific Names for all species mentioned.

Figure 1-1. Approximate historic range of the Mexican wolf.



Reasons for Listing

Many factors contributed to the Mexican wolf's demise, but its reputation as a livestock killer, which led to concerted federal eradication efforts, was predominant (Brown 1983, McBride 1980). Other less important factors were: commercial and recreational hunting and trapping; killing of wolves by game managers on the theory that more game animals would be available for hunters (Leopold 1944); habitat alteration; and human safety concerns (although no documentation exists of Mexican wolf attacks on humans).

Fig. 1-2 illustrates the subspecies' rapid decline in New Mexico and Arizona following initiation of federal eradication efforts in 1915. After about 15 years of trapping, shooting, and poisoning of adults, and "denning" of pups (digging them out of dens and killing them), very few Mexican wolves remained. The last killings by control agents occurred around 1960. A similar decline occurred in Texas (Scudday 1977). Eradication efforts were stimulated by bounties offered by federal, state, and local governments, as well as livestock associations and individual ranchers (Mex. Wolf Rec. Team 1982).

It is difficult now to assess the accuracy of reports regarding the Mexican wolf's historic impact on livestock (see Appendix A, Livestock Depredation section). Some representative quotes from commentators illustrate the animal's reputation as a livestock killer:

"In *my* opinion, the lobo is the cruelest, most wanton killer of all our Southwestern predators. Bears and lions do sometimes become stock killers, and both do sometimes kill wantonly, beyond the need for food. But such animals are the exceptions to the rule: whereas the opposite is true, in my opinion of the lobo.... A favorite method of killing large animals is to hamstring the animal, breaking him down and making him completely helpless.... A few incidents like this will teach anyone to hate wolves.... The Fish and Wildlife Service (formerly The Biological Survey) has rendered an invaluable service to the livestock and game interests of the Southwest by the determined warfare they have carried on against the lobo." (Evans 1951).

"The gray wolf was abundant in northern Mexico (present day New Mexico), where 'they sometimes make dreadful havoc among the cattle, frequently killing and devouring even mules and horses'" (Gregg, quoted in Young and Goldman 1994).

"Wolves' hunting techniques changed when ranchers began to settle the West and bring in livestock. Deer, always difficult for canids to obtain, became increasingly scarce under the pressure of subsistence hunting by homesteaders, miners, and cowboys. More importantly, livestock were easy picking everywhere. Once set, this table was too easy to resist.... the adaptable wolves readily abandoned their natural prey and turned almost entirely to cattle." (D.E. Brown 1983).

"The big wolves, the worst predatory enemy of cattle, have been brought under control.... We are concerned merely to the extent of preventing reinfestation from Mexico." (Ligon 1927).

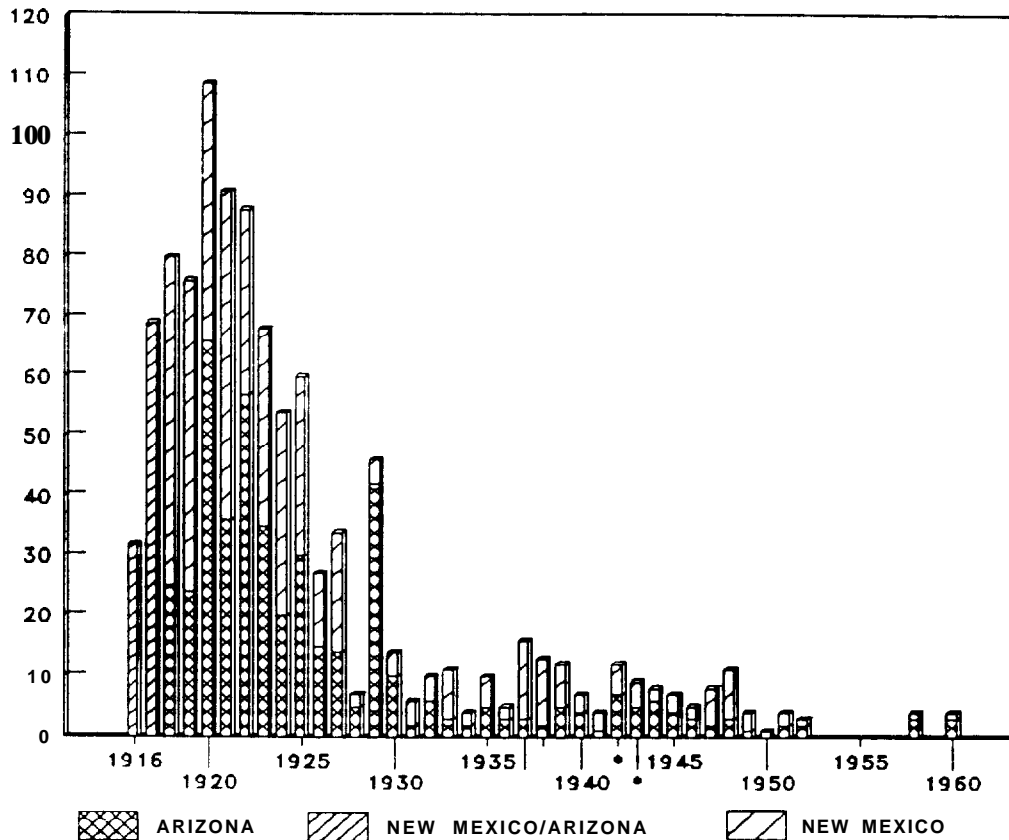
The apparently high historical depredation rates are inconsistent with the situation now in other areas where gray wolves and cattle co-exist, such as the northern Rocky Mountains and northern Minnesota, where depredation is quite uncommon relative to livestock numbers available (range: 0.004% to 0.09% of available cattle killed by wolves annually; Mack et al. 1992). Gipson (quoted in McIntyre 1994) questions the validity of historic accounts of wolf depredation rates.

Status

The subspecies is now considered extirpated from the southwestern United States because no wild wolf has been confirmed to exist since 1970. Occasional sightings of "wolves" continue to be reported from U.S. locations but, to date, none have been confirmed through clear evidence, despite continuing investigation (Girmendonk 1994a, Whitaker et al. 1995, Wolok 1994).

Survival of the animal in the wild in Mexico also remains unconfirmed. Based on field surveys in 1977-1978, McBride (1980) estimated that "some 50 wolves may still inhabit Mexico." Computer

Figure 1-2. Wolves reported taken by federal and state cooperative hunters in Arizona and New Mexico, fiscal years 1916 through 1960.



Notes: Based on annual reports of Arizona and New Mexico districts of the Predatory Animal and Rodent Control (PARC) bureau. May include some wolves not discussed in PARC reports and some animals that were not wolves.

*Estimates

SOURCE: Brown (1983)

simulations by Ardura (1992), based on McBride's estimate, indicated a high probability that this suggested population of 50 remnant wolves would be extinct by 1994 (although the simulations relied on unverifiable assumptions). Recent field research has revealed few reports, and no confirmation, of wolves remaining in Mexico (Carrera 1994). Investigation is continuing.

The Mexican wolf was listed as an endangered subspecies in 1976 (41 FR 17736). In 1978, the gray wolf species in North America south of Canada was listed as endangered, except in Minnesota where it was listed as threatened (43 FR 9607). This listing of the species as a whole continued to recognize valid biological subspecies for purposes of research and conservation (43 FR 96 10). The Directors of the FWS and the Mexican Direccion General de la Fauna

Silvestre approved the Mexican Wolf Recovery Plan in 1982 (Mex. Wolf Rec. Team 1982). The Plan recognizes that the subspecies' recovery depends on re-establishment in suitable habitats within its historic range.

Two males and one pregnant female captured in the wild in Mexico from 1977 to 1980 and the uncaptured mate of the pregnant female founded the certified captive population of Mexican wolves. In 1995, the Mexican Wolf Recovery Team approved the addition of two other captive Mexican wolf lineages, representing four additional founders, into the certified population, based on state-of-the-art genetic analysis. One is known as the Ghost Ranch lineage, some of which were kept and bred at the Ghost Ranch Living Museum in northern New Mexico; the other is the Aragon lineage based at the

Aragon Zoo in Mexico City. As of March, 1996, the total certified captive population in the three lineages stood at 139 animals; 114 are held at 24 facilities, mostly zoos and wildlife sanctuaries, in the United States and 25 are held at five facilities in Mexico. The FWS also has a captive population management facility on the Sevilleta National Wildlife Refuge in central New Mexico to hold surplus wolves from the other facilities (USFWS 1994a). These surplus animals would be the potential release stock if the FWS undertakes the proposed reintroduction effort.

Environmental Impact Statement Scoping

Public Involvement

The FWS has involved the public, pursuant to 40 CFR sec. 150 1.7, in determining the significant questions that this EIS should address. At the time of the public scoping in 1991 and 1992, five candidate areas for releasing Mexican wolves were under consideration. These five areas had been identified by the FWS and the Arizona, New Mexico, and Texas state wildlife agencies as potentially suitable for wolf release (USFWS 1992). The areas were centered on: 1) the Blue Range, 2) the Chiricahua Mountains, 3) the Galiuro and Pinaleno Mountains, and 4) the Atascosa and Patagonia Mountains, all in Arizona; and 5) the White Sands Missile Range in New Mexico.

The FWS held four public meetings, two in Tucson, Arizona, one in Las Cruces, New Mexico, and one in Albuquerque, New Mexico. Written comment periods followed each meeting and followed publication of the FWS's Notice of Intent to Prepare an Environmental Impact Statement (USFWS 1992). Over 838 people attended the meetings and the FWS received a total of 1,324 written comments during the comment periods (Jenkins 1993). These consisted of individual letters, form letters, responses to opinion questionnaires sent

out by private groups, and petitions. All comments were tabulated. The 65 oral comments made during the three recorded public meetings were transcribed and tabulated. Also, numerous other agencies and experts have been consulted (see Chapter 5 - Coordination and Consultation).'

Alternatives and Impact Questions Raised in Scoping

The public raised approximately 112 definable questions in eight general categories (Jenkins 1993). Some questions related to the alternative actions to be considered; most related to the potential impacts of wolf releases. Table 1-1 identifies the most common questions and the alternatives or environmental impacts to which the questions relate.

The Mexican Wolf EIS Interdisciplinary Team, charged with overseeing the writing of this document, determined which of the questions raised in the public scoping process represented reasonable alternatives or potentially significant impacts meriting treatment in the FEIS, pursuant to 40 CFR sec. 150 1.7(a) (2).⁷ Table 1 - 1 indicates the Interdisciplinary Team's determinations for the most common questions.

Alternatives and Impact Questions Addressed in this FEIS

Alternatives

The Notice of Intent to Prepare an Environmental Impact Statement (USFWS 1992) preliminarily identified three alternative actions under consideration for the candidate areas:

- reintroduction of captive-raised Mexican wolves classified as a nonessential experimental population,
- reintroduction under full protection of the

"The scoping process occurred prior to the issuance of President Clinton's 1994 Executive Order, No. 12898, entitled "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations." Environmental justice issues were not commonly raised in the scoping process. Based on the analysis in this FEIS, the proposed action is not expected to significantly impact minority or low-income populations.

⁷Members of the Interdisciplinary Team are identified in the List of Preparers in Chapter 5.

Table I-1. Most common questions raised during public scoping and their treatment in this final environmental impact statement.

Key: 1 = addressed in Chap. 1 on purpose, need, and Mexican wolf overview,
 2 = addressed in Chap. 2 on alternatives
 3 = addressed in Chap. 3 on affected environment
 4 = addressed in Chap. 4 on consequences
 A = addressed in Appendix A on Mexican wolf life history and ecology
 X = alternative or impact question not addressed directly in FEIS, see text for explanation

Treatment

Questions Related to Alternatives or Planning

X A: Should release sites in Mexico be considered?
X B: Should release sites in Texas be considered!
 2 C: Should reintroduced Mexican wolves be designated as experimental and non-essential to the continued existence of the species?
 2 D: Should reintroduced Mexican wolves retain full endangered species status and related protection?
 2 E: Should additional areas be considered as release sites?
 2 F: Should more than one initial release site be considered?
 2 G: Should wolves that disperse off of target recovery areas be controlled?

Questions Related to Potential Impacts

1. Livestock Depredation Impacts

4 A: Will wolves prey on domestic livestock?
 4 B: Will livestock depredation impacts be significant?
 2,A C: Could changes in livestock management practices reduce the depredation impacts?

2. Economic Impacts

2 A: Should livestock owners be compensated for wolf-caused losses?
 2,4 B: Will compensation programs be effective?
 4 C: Will hunting license sales be impacted by wolf reintroduction?
 x D: Should states be compensated for game losses?
 4 E: Will wolf reintroduction adversely impact local economies in New Mexico and Arizona?
 X F: Can costs of Mexican wolf recovery be justified?

Table 1- 1. Continued.

3. Ecological/Biological Impacts

- X** A: Does maintenance of ecosystem health require the presence of native predators and a balanced predator-prey relationship?
- 4,A B: Will wolf predation adversely impact other wildlife populations?
- 3.4** C: Are prey populations in the potential recovery areas adequate to support wolf populations?
- 4,A D: Do wolves perform an important evolutionary service to prey species by removing unfit animals from their populations?
- 3** E: Is White Sands Missile Range within the historic range of *Canis lupus baileyi*?
- 2** F: Has life in captivity caused Mexican wolves to lose their fear of humans?
- 2** G: Has life in captivity impacted the Mexican wolves ability to survive in the wild?
- X** H: Are wolves an essential component of the ecosystem?

4. Population Viability Considerations

- 1,2 A: Does recovery and long-term survival of the Mexican wolf require its reintroduction to the wild?
- 2** B: Is inbreeding depression evident in the captive population?

5. Wildlife Management Impacts

- 4** A: Will wolves compete with human hunters for the same prey?
- A B: Do wolves pose a threat to human safety?
- A C: Will reintroduction of the Mexican wolf pose any significant disease-related impacts?

6. Philosophical/Ethical Considerations

- X** A: Do wolves have a right to exist?
- X** B: Do wolves have a right to exist in a natural environment/ecosystem?
- X** C: Should wild lands be restored and conserved?

7. Other Impacts/Considerations

- 4** A: Will existing land uses or land use plans be impacted by wolf reintroduction?
- A B: Will wolves kill pets?
- 1,3 C: Do Mexican wolves still exist in the wild?
- 4** D: Will wolf reintroduction on White Sands Missile Range impact the operations there?
- 1** E: Is the wolf an endangered species?
- X** F: If the wolf is released in Arizona, what will be the impact if it disperses into Mexico?
-

ESA, and

- no action, in which Mexican wolves are not reintroduced.

The second and third of these alternatives have not changed fundamentally in this FEIS (see Chapter 2 - Alternatives Including the Proposed Action, which describes the alternatives in detail). However, public input and further scoping by the Interdisciplinary Team led to dividing the first-listed alternative, above, into two alternatives, as follows:

- reintroduction of captive-raised Mexican wolves, classified as nonessential experimental, under management plans to **allow** dispersal from the primary recovery zones into secondary recovery zones (the Preferred Alternative), and
- reintroduction as nonessential experimental under management plans to **prevent** dispersal from the primary recovery zones.

This change reflects that a key distinction among the alternatives is the degree of control the FWS would exert over the movements of the population. The first alternative allows the released wolves and their progeny to establish territories well away from the release areas (or “primary recovery zones”), while the latter alternative calls for the FWS to prevent the wolves from dispersing beyond the primary recovery zones.

The alternatives scoping process also included the selection of two of the five candidate areas within the subspecies’ former range as the most suitable for releasing Mexican wolves. This involved comparing and ranking all the candidates based on key suitability attributes (see Chapter 2 - Selection of Potential Areas for Releasing Mexican Wolves). The two candidates selected were the Blue Range area in east-central Arizona and the White Sands Missile Range in south-central New Mexico. Largely in response to comments on the DEIS, the Interdisciplinary Team and the FWS have decided that the Preferred Alternative (Alt. A) should focus on the Blue Range area for the initial releases and treat the White Sands area as a back-up, to be used only if necessary and feasible. In summary, the wolf recovery areas selected-and the alternative actions for

these areas considered in this FEIS-reflect agency, expert, and public input.

Impacts

This FEIS addresses most of the major impact questions raised by other agencies, outside experts, and the public. Those impacts judged to be potentially significant receive detailed, alternative-by-alternative, analysis in Chapter 4 - Environmental Consequences. The Interdisciplinary Team determined that alternative-by-alternative analysis was appropriate for six of the impacts most stressed by the public and for three additional potentially significant impacts that released wolves could cause. The three additional impact topics were impacts on: 1) predator control activities, especially of USDA’s Animal Damage Control division, 2) agency, tribal, and local government policies and plans, and 3) recreational uses in the areas involved. In sum, the nine potentially significant impact topics are:

- Impacts on wild prey of wolves
- Impacts on hunting
- Impacts on livestock
- Impacts on predator control programs
- Impacts on agency, tribal, and local government policies and plans
- Impacts on land use
- Impacts on military activities
- Impacts on recreation
- Impacts on regional economies

Chapter 4 describes the scope of these topics in detail.

Alternatives and Impact Questions Not Addressed in this FEIS

Alternatives

The following questions that relate to alternatives or planning were considered but dropped from detailed analysis in this EIS because they were determined not to raise reasonable alternatives meriting consideration (see Table 1-I regarding the treatment of all alternative or planning issues):

Should release sites in Mexico be considered? This is not addressed because the FWS lacks any authority over recovery actions in Mexico. Further, the FWS lacks information on potential impacts there. Obtaining this information for purposes of analyzing such an alternative would present major logistical and diplomatic difficulties. Mexican wildlife authorities may consider wolf reintroductions in the future.

Should release sites in Texas be considered? This is not addressed here because suitable areas to support a reintroduced wolf population have not been identified or designated in Texas. However, this FEIS does consider Big Bend National Park, Texas, as a potential natural recolonization area that could support a very small wolf population that would not be independently viable (see Chapter 2 - Alternative D). Release sites adjacent to the Mexican border are generally undesirable, absent further cooperation with Mexico, because of the likelihood that wolves would then disperse into Mexico beyond the protection of the ESA and beyond the control of U.S. agencies.

Should wolves be captured in Mexico and released in the United States? This is not addressed because no evidence of a viable wild population exists from which suitable release stock could be drawn. (However, the original breeding stock of the captive population proposed here for release was captured in Mexico.) Further, the FWS would lack any authority to undertake such actions in Mexico even if sufficient numbers of wolves were found and it is uncertain whether the Mexican government would approve such actions.

Should captive-raised wolves be released as an essential experimental population, under section 10(j) of the ESA, 16 USC sec. 1539? This is not addressed because the FWS determined that the nonessential experimental classification fits the Mexican wolf's status. Only wolves surplus to the captive breeding program will be released. (See Appendix C - Proposed Mexican Wolf Experimental Population Rule, section on Findings Regarding Reintroduction, and Appendix D - Section 7 Consultation on Proposed Action, section on Effects on Mexican Gray Wolf, regarding definition of "surplus" wolves and significance of their **removal** from the captive population.) Their loss would not jeopardize the continued

survival of the subspecies. The nonessential experimental classification allows for management flexibility deemed vital to successful wolf recovery (USFWS 1993a). The essential experimental classification in many ways could be similar to the alternative of releasing wolves classified as fully endangered, which this FEIS does address (Chap. 2 - Alternative C). Alternatively, if a very flexible experimental population rule was adopted, then the essential experimental classification could be similar to the nonessential experimental approach, analyzed here as Alternative A. Detailed analysis of the essential experimental classification would be redundant.

Impacts

The following questions relating to impacts were considered but dropped from detailed analysis because they were determined either to lie outside the reasonable scope of this EIS or not to raise potentially significant impacts (see Table 1-1 regarding the treatment of all impact issues):

Should any game losses to state governments be compensated? This is a policy choice rather than an environmental impact. There is no objective answer. Nevertheless, Chap. 4 does estimate the hunting-related economic losses in Arizona and New Mexico.

Can impacts to taxpayers because of costs of Mexican wolf recovery be justified? This also is a policy choice without an objective answer. However, Chap. 2, Table 2-8, and Appendix B do provide cost estimates for the four alternatives.

Impacts involving long-term evolutionary or philosophical concerns. These include "are wolves an essential component of the ecosystem?", "should wild lands be restored and conserved?", and "do wolves have a right to exist?" These are policy questions involving value judgments rather than environmental impacts. Their consideration is either not required by the National Environmental Policy Act or would be beyond the reasonable coverage of this EIS.

Are there possible impacts in Mexico if wolves were released in the United States? This question is not addressed because the two areas considered for releasing wolves are well north of the border and the

proposal calls for retrieval of wolves that disperse out of the designated recovery areas. Impacts in Mexico, while remotely conceivable, are not likely. It should be noted that if wolves did naturally recolonize border areas from further south in Mexico under Alternative D—that is, without a release of captive-raised wolves—then associated impacts in Mexico would be anticipated. The probability of natural recolonization actually occurring is considered very low.

Permits and Clearances

The following regulatory approvals and cooperative arrangements may be necessary prior to releasing captive Mexican wolves:

- a) NEPA required the FWS to submit a draft EIS, subject to an agency and public review period. The draft EIS was approved on June 8, 1995, and the comment period on the draft ended October 31 (see Chapter 5 for further information on the public input on the draft). The revision of the draft has led to this FEIS, which is to be followed by a decision on which action to take, 42 USC sec. 4321 et seq. The Record of Decision will follow issuance of the FEIS by at least 30 days, 40 CFR sec.s 1505.2 and 1506.10. Also, before construction of the proposed release pens, the agencies involved would need to cooperatively decide on precise pen locations within the primary recovery zone or zones and then prepare one or more environmental assessments under NEPA of the potential site-specific impacts.
- b) The FWS would need to promulgate an experimental population rule describing protection and management of the proposed nonessential experimental population, 16 USC sec. 1539(j). The provisions of the FWS's Proposed Mexican Wolf Experimental Population Rule are summarized in Chapter 2 and provided in full in Appendix C. This version was officially published in the Federal Register on May 1, 1996, pages 19237- 19248. Various changes have been made to the proposed action between the DEIS and this FEIS that are not reflected yet in the proposed experimental population rule re-printed in Appendix C. A decision to proceed with the proposed action, or any alternative that involves experimental reintroduction, would need to be followed by issuance of a final experimental population rule. Pursuant to 50 CFR sec. 17.8 1 (d), the rule is being developed in consultation with appropriate state fish and wildlife agencies, local governmental entities, affected agencies, landowners, and others. The EIS process has provided the opportunity for such consultations to occur (see Chap. 5 for additional information on consultation and coordination). In addition, a consultation and public hearing process specific to the proposed rule has been undertaken.
- c) The FWS would need an internally-issued endangered species permit authorizing movement of captive wolves for purposes of release, 16 USC sec. 1539(a). Also, the FWS would need an internal Section 7 consultation regarding potential impacts of the proposal on federally-listed threatened and endangered species, 16 USC sec. 1536. This has been undertaken and no adverse effects are anticipated (Appendix D). A similar consultation has been provided by the New Mexico Game and Fish Department regarding state-listed species (Hubbard 1994), under New Mexico's Wildlife Conservation Act, NMSA 17-2-37 to -46.
- d) Action by the Arizona Game and Fish Department will follow its process for approving endangered species releases (AGFD 1987) (Appendix E). The Department has drafted a "Cooperative Reintroduction Plan for the Mexican Wolf in Arizona" that calls for a joint reintroduction effort with the FWS in the Blue Range area (Groebner et al. 1995). It sets forth minimum criteria to be considered in evaluating implementation of the plan.
- e) Various agencies, tribes, and local governments have policies and plans that could be affected by the final decision. The FWS has

attempted to cooperate with these parties in the EIS process through meetings and sharing information. They may need to follow their own decision making procedures regarding their participation in future wolf recovery actions.

- f) Other arrangements with federal, state, and tribal agencies covering such matters as access, trapping, research, radio-tracking, and airplane overflights would need to be formalized through one or more interagency cooperative management plans or agreements. These would follow the Record of Decision.

Chapter 2

Alternatives including the Proposed Action



CHAPTER 2

Alternatives Including the Proposed Action

Introduction

This chapter begins with an overview of the Mexican gray wolf recovery program and the “soft release” approach to wolf reintroduction, followed by an outline of the selection process for potential areas for releasing wolves in the Southwest. These background sections are important for understanding why, how, and where the alternative actions would occur.

The chapter then describes the Fish and Wildlife Service’s (FWS) Proposed Action (Alt. A), now designated as the “Preferred Alternative.” This incorporates a cooperative reintroduction plan proposed by the Arizona Game and Fish Department. The Preferred Alternative is followed by two other approaches to reintroducing the Mexican wolf (Alt.s B and C) and a “No Action” approach (Alt. D). Numbers of animals proposed for release, population growth scenarios, foreseeably affected areas, and impact mitigation measures are given for each alternative. The chapter concludes with summary tables comparing the features of the four alternatives and comparing their environmental consequences.

The Mexican Wolf Recovery Program

All Mexican wolves to be released will come from the captive population, which now numbers **114** animals maintained in 24 zoos and wildlife sanctuaries in the United States. The Mexican Wolf Species Survival Plan (SSP) Management Group, made up of representatives from those facilities, coordinates the population’s management. Cooperation also occurs with the managers of a smaller population in Mexican zoos. The wolves have exhibited no major genetic, physical, or behavioral problems affecting their fitness resulting from captivity (Siminski 1994a, see Appendix K - Fish and Wildlife Service Response to Dennis Parker’s Comment on the DEIS).

The SSP Management Group has paired the certified population for maximum breeding potential every breeding season since 1990 (Siminski 1994b). Also, the FWS has undertaken genetic

analysis of two other captive lineages. In 1995, the Mexican Wolf Recovery Team found these other two lineages to be pure Mexican wolves and recommended that they be added to the certified Mexican wolf population, to enhance its genetic diversity as well as its size. The SSP Management Group’s goal of having at least **100** certified animals in the U.S. captive population prior to a reintroduction effort has been exceeded. The population is ready to support a reintroduction effort.

The FWS will move male/female pairs identified as candidates for possible release to its captive wolf management facility on the Sevilleta National Wildlife Refuge, north of Socorro, New Mexico. Native prey recognition, predatory skill trials, aversive conditioning to livestock and humans, and other measures to improve adaptation of the wolves to life in the wild may be initiated at this facility. In the event of a decision to proceed with reintroduction, the FWS would select from among the candidate pairs based on reproductive performance, behavioral compatibility, response to the adaptation process, and other factors. Only those individual wolves that are genetically well-represented in the remaining captive population would be used as release stock. The actual releases under each of the reintroduction alternatives described below (Alt.s A, B, and C) would be “soft releases.”

The Soft Release Approach

Experts developed the soft release approach to wolf reintroduction in order to reduce the likelihood of quick dispersal away from the release area (USFWS 1993a, Fritts 1992; see Appendix A - Wolf Movements section). This involves a holding period of up to several months in secure, temporary pens at the release sites, where exposure to humans is minimized. Following adaptation to local conditions the wolves-wearing standard telemetry collars-are allowed to leave the pens. Field managers may leave carcasses of native prey nearby until the wolves begin hunting on their own. Movements of initial groups of released wolves provide valuable information guiding future releases (Phillips 1992). Annual

releases are made this way until it appears that the recovery goals will be met through reproduction in the wild.

No soft release of captive-raised gray wolves has occurred previously; however, the FWS is currently undertaking a series of annual soft releases of wild-caught gray wolves from Canada into Yellowstone National Park (USFWS 1993a, see Appendix J - Update on Yellowstone and Central Idaho Gray Wolf Reintroductions).

Also, the reintroduction of the red wolf (*Canis rufus*) in eastern North Carolina was largely by soft releases of captive-raised animals (Phillips 1992). Both of these release programs, conducted under nonessential experimental population rules, have largely succeeded to date. The Mexican Wolf Recovery Program will apply knowledge gained from these experiences.

Selection of Potential Areas for Releasing Mexican Wolves

Identification of potential areas for releasing Mexican wolves began in 1986 when the FWS, pursuant to the 1982 Mexican Wolf Recovery Plan, solicited candidates from the wildlife management agencies of New Mexico, Arizona, and Texas. This led to evaluation of five areas for their relative suitability. These areas were centered on: 1) the Blue Range, 2) the Chiricahua Mountains, 3) the Galiuro and Pinaleno Mountains, and 4) the Atascosa and Patagonia Mountains, all in Arizona; and 5) the White Sands Missile Range (WSMR) in New Mexico (Fig. 2-1). Arizona's Game and Fish Department analyzed the four Arizona candidates (Johnson et al. 1992). Bednarz (1989), under a contract with the FWS, analyzed the WSMR.

The FWS compared and ranked the five candidates based on the following attributes: area of vegetation associated with typical Mexican wolf habitat, wild ungulate density, water availability, livestock density, potential effects on other threatened or endangered species, human population density, and road density (USFWS 1993e) (Table 2-1). The ranking did not attempt to consider every possible facet of the long-term suitability of these areas for wolf recovery. Long-term suitability will to some extent depend on future ecological changes and management actions.

Overall, the WSMR ranked highest followed closely by the Blue Range area. However, the WSMR ranked lowest of all five candidates in total area of vegetation associated with typical Mexican wolf habitat. Bednarz (1989) estimated that 1,000 mi^2 of such vegetation (mostly pinon-juniper woodland) exists on and adjacent to WSMR. Bednarz predicted the entire WSMR area could support about 30 wolves. The FWS's current estimate of the number of wolves the area could support, based largely on prey availability and computer modelling of deer population dynamics (Green-Hammond 1994), is less: only 20. Neither estimate—30 or 20—represents an independently viable population (Bednarz 1989, Shaffer 1987). Nevertheless, a population in this size range likely could be maintained through supplemental releases or, possibly, by natural immigration of wolves from other nearby populations if other populations were present.

The WSMR is unique among the five candidate areas in that it is closed to public access and livestock grazing, although livestock are grazed on adjacent lands. It is largely isolated, except to the northeast, by 25 to 40 mile-wide desert basins that could inhibit wolf movements. These features, particularly the low likelihood that wolves would prey on livestock, offer advantages as an area to conduct a relatively low-conflict, experimental reintroduction. However, the predicted wolf numbers the WSMR could support fall far short of the Mexican Wolf Recovery Plan's objective of re-establishing at least 100 wolves in an area of 5,000 mi^2 (Mex. Wolf Rec. Team 1982). At least one additional area would be needed to achieve the objective. The WSMR could possibly serve as a "wolf nursery" from which recaptured wild wolves, rather than captive-raised wolves, might be used to stock another recovery area. The use of wild-raised wolves has been an important factor in the success of past reintroductions (Fritts 1992).

The Blue Range of east-central Arizona was the other high-ranking candidate release area (Table 2-1). It also received the highest ranking by the Arizona Game and Fish Department in its analysis of the four Arizona candidate areas (Johnson et al. 1992). This and contiguous parts of the Apache National Forest (ANF) lie adjacent to the larger Gila National Forest (GNF) in New Mexico, which provides similar, forested, mountainous habitat. Together the ANF and GNF comprise more than

Figure 2-1. Five candidate areas for releasing Mexican wolves.




- KEY
-  HISTORIC RANGE
 - 1 BLUE RANGE
 - 2 CHIRICAHUA MOUNTAINS
 - 3 GALILRO AND PIVALENO MOUNTAINS
 - 4 ATASCOSA AND PATAGONIA MOUNTAINS
 - 5 WHITE SANDS MISSILE RANGE

Table 2-1. Suitability rankings of candidate areas for releasing Mexican wolves.

Key:

- APM = Atascosa and Patagonia Mountains, Arizona
- BR = Blue Range, Arizona
- CM = Chiricahua Mountains, Arizona
- GPM = Galiuro and Pinaleno Mountains, Arizona
- WSMR = White Sands Missile Range, New Mexico

Attribute	Area Rank ¹				
	APM	BR	CM	GPM	WSMR
Habitat Area	3	5	2	4	1
Ungulate Density	4	3	1	2	5
Water Availability	5	5	5	1	5
Livestock Density	1	1	1	1	5
T&E ² Sp. Effects	3	5	3	3	4
Human Density	1	4	3	2	5
Road Density	4	4	2	2	5
TOTAL	21	27	17	15	30

¹The highest rank is 5 and the lowest rank is 1. Areas that were substantially equivalent on an attribute received the same rank for that attribute.

²“T&E Sp. Effects” refers to expected effects on other threatened and endangered species in the area

SOURCE: USFWS (1993e)

7,000 mi² of federal land, most of which is suitable for wolves. A wolf population reintroduced into the Blue Range area would likely eventually expand throughout much of the ANF and GNF unless managers prevented this from occurring.

Assuming an average pack territory size to be about 250 mi² (see Mech 1970), and average pack size to be five wolves (Bednarz 1988), the ANF and GNF combined could support 100 or more wolves. This accords roughly with Bailey’s (1931) estimate that 100 wolves occupied the GNF area in 1906. Successful reintroduction into the ANF and GNF area would meet the Mexican Wolf Recovery Plan’s objective. However, unlike the WSMR, the ANF and GNF are open to public use and largely in cattle

grazing allotments. The potential for conflicts with ranching and other uses is higher.

In addition, about 4,000 mi² of similar, contiguous, largely forested, montane habitat lies to the west on the Fort Apache (or White Mountain Apache) and San Carlos Apache Reservations in Arizona. However, the FWS has no agreement with these tribes regarding their future involvement in wolf recovery and both have expressed opposition to wolves on their reservations. The reservations, therefore, have not been considered as potential release or recovery areas. Nevertheless, they could be affected if wolves are released in the Blue Range area and they are addressed as likely wolf dispersal areas

under the full endangered status alternative (Alt. C) in this FEIS.

In sum, the Blue Range and WSMR areas each possess distinct positive and negative features for wolf recovery. This FEIS analyzes reintroduction in both areas. Since issuing the DEIS, the FWS has designated the BRWRA as the preferred reintroduction location, with the WSWRA as a back-up to be used only if necessary and feasible. This focussing of the Preferred Alternative on the BRWRA is fundamentally due to the Interdisciplinary Team and the FWS determining that a strong biological preference exists for the BRWRA. It provides a large, multiple-species, native prey base (white-tailed deer, mule deer, elk, javelina), abundant well-distributed water, and a large area for wolves to colonize following the initial release. It is also known to have been prime wolf habitat historically. Only it is projected to achieve the Mexican Wolf Recovery Plan goal of 100 wild wolves. While evidence exist of wolves having been on the WSWRA, it was probably not prime wolf habitat and could not now support an independently viable population.

Alternatives

Alternative A (Preferred Alternative):
The U.S. Fish and Wildlife Service proposes to reintroduce Mexican wolves, classified as nonessential experimental, into the Blue Range Wolf Recovery Area. Wolves will be released into the primary recovery zone and allowed to disperse into the secondary recovery zone. If feasible and necessary to achieve the recovery objective of 100 wolves, a subsequent reintroduction of wolves into the White Sands Wolf Recovery Area will be conducted.

Actions Associated with Alternative

In 1997, the FWS will begin to reintroduce family groups of captive-raised Mexican wolves into the primary recovery zone of the Blue Range Wolf Recovery Area (BRWRA) (Fig. 2-2; areas defined precisely in Box 2-1, Geographic Boundaries). The FWS will gradually release up to 15 family groups

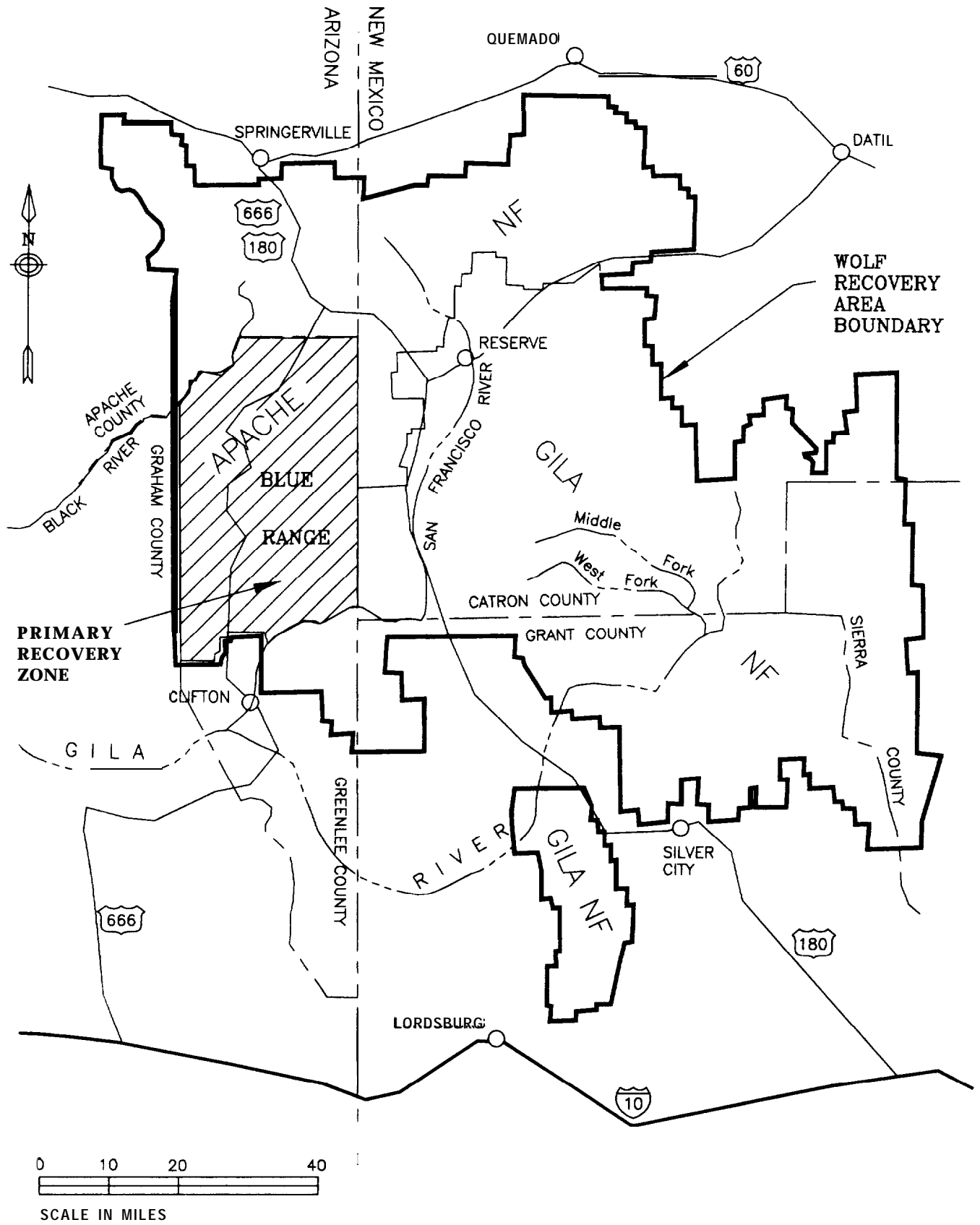
into the BRWRA (Table 2-2) and later, if necessary and feasible, up to five family groups into the back-up WSWRA (Fig. 2-3; Table 2-3). Reproduction in the wild would increase the populations to approximately the recovery area goals under each reintroduction alternative. Wolves will be released into the primary recovery zone and allowed to disperse into the secondary recovery zone. The recovery objective of the alternative is to re-establish 100 wild wolves distributed over more than 5,000 mi² by about the year 2005, consistent with the 1982 Mexican Wolf Recovery Plan. The FWS projects that the population will eventually fluctuate near this level as result of natural processes, such as intra-specific aggression and changes in prey abundance and vulnerability, and management actions, such as problem wolf control and translocation. The FWS and its cooperators will monitor, research, evaluate, and actively manage the wolves, including translocating or removing wolves that disperse outside the wolf recovery areas or that cause significant conflicts.

The FWS will designate the released wolves and their progeny as one “nonessential experimental” population under the Endangered Species Act (ESA), 16 USC sec. 1539(j). Reintroduction will be accomplished through “soft releases” (see the Soft Release Approach section, above). This will be done in cooperation with various agencies. The U.S. Forest Service (for the BRWRA) and the U.S. Army (if the WSWRA is used) will be the primary land managing agencies involved.

The Arizona Game and Fish Department has developed a Cooperative Reintroduction Plan that outlines the Department’s potential involvement as joint managers, with the FWS, of wolves on the Arizona side of the BRWRA (Groebner et al. 1995). The plan is consistent with the FWS’s Preferred Alternative, with some additional ideas that are highlighted herein. It will be considered as a subset of this alternative pertaining just to the Arizona side. (It should be noted that future FWS cooperation with the Arizona Game and Fish Department would not preclude similar cooperation with other state, federal, tribal, and local agencies in Arizona or New Mexico.)

Reintroduction will occur under management plans that allow dispersal by the new wolf populations from the immediate release areas (“primary recovery zones”) into designated adjacent areas

Figure 2-2. Blue Range Wolf Recovery Area.



Box 2- 1. Geographic boundaries for Mexican wolf reintroduction.

Blue Range Wolf Recovery Area (BRWRA): all of the Apache National Forest and all of the Gila National Forest (Fig. 2-2).

BRWRA primary recovery zone: the area within the Apache National Forest bounded on the north by the Apache-Greenlee County line; on the east by the Arizona-New Mexico State line; on the south by the San Francisco River (eastern half) and the southern boundary of the Apache National Forest (western half); and on the west by the Greenlee-Graham County line (San Carlos Apache Reservation boundary) (Fig. 2-2).

BRWRA secondary recovery zone: the remainder of the BRWRA not in the primary recovery zone (Fig. 2-2).

White Sands Wolf Recovery Area (WSWRA): all of the White Sands Missile Range, the White Sands National Monument, and the San Andres National Wildlife Refuge, and the area adjacent and to the west of the Missile Range bounded on the south by the southerly boundary of the U.S. Department of Agriculture Jornada Experimental Range and the northern boundary of the New Mexico State University Animal Science Ranch; on the west by the New Mexico Principal Meridian; on the north by the Pedro Armendaris Grant boundary and the Sierra-Socorro County line; and on the east by the western boundary of the Missile Range (Fig. 2-3).

WSWRA primary recovery zone: the area within the White Sands Missile Range bounded on the north by the road from former Cain Ranch Headquarters co Range Road 16, Range Road 16 to its intersection with Range Road 13, Range Road 13 to its intersection with Range Road 7; on the east by Range Road 7; on the south by U.S. Highway 70; and on the west by the Missile Range boundary (Fig. 2-3).

WSWRA secondary recovery zone: the remainder of the WSWRA not within the primary recovery zone (Fig. 2-3).

Mexican wolf experimental population area: the portion of Arizona lying north of Interstate Highway 10 and south of Interstate Highway 40; the portion of New Mexico lying north of Interstate Highway 10 in the west, north of the New Mexico-Texas boundary in the east, and south of Interstate Highway 40; and that portion of Texas lying north of US Highway 62/180 and south of the Texas-New Mexico boundary (Fig. 2-4).

Table 2-2. Projected wolf population growth to recovery area goal after releases into the Blue Range Wolf Recovery Area under nonessential experimental classification (Alternative A).

Recovery area goal: 100 wolves occupying a total area of 5,000 mi²; based on Mexican Wolf Recovery Team (1982).

	1997	1998	1999	2000	2001	2002	2003	2004	2005
No. released successfully^a	10	10	10	10	4	0	0	0	0
No. surviving (from prev. year)	--	7	14	23	35	45	55	68	83
No. pups born^b	0	5	10	20	30	40	50	60	75
10% control loss	1	2	3	5	7	9	11	13	16
25% other losses^c	2	6	8	13	17	21	26	32	40
Total wolves (end of year)	7	14	23	35	45	55	68	83	102
No. packs^d	1	2	4	7	9	11	13	16	20
No. breeding pairs^e	1	2	4	6	8	10	12	15	18
Area occupied^f (100 mi²)	3	5	10	18	23	28	33	40	50

^a Initially, about 15 captive-raised wolves annually will be released, but five of these are assumed to quickly die, disappear, disperse from the recovery area, or require recapturing for a variety of reasons, and not to contribute to population growth. Fewer wolves will be released in 2001 to minimize overshooting of the population goal.

^b Average of five pups per litter based on McBride (1980)

^c "Other losses" includes wolves that die, leave, disappear, or are removed from the recovery area for any reasons besides control; adapted from rates in Phillips (1992), USFWS (1993a), and Mech (1970).

^d Average pack size of five based on Bednarz (1988).

^e Most packs contain one breeding pair; assumed that 10% of packs do not have a successful breeding pair.

^f Average pack territory size of 250 mi² based on Mexican Wolf Recovery Team (1982) and Mech (1970). Not all land within a territory is suitable year-round habitat.

SOURCE: Adapted from USFWS (1993a).

Figure 2-3. White Sands Wolf Recovery Area.

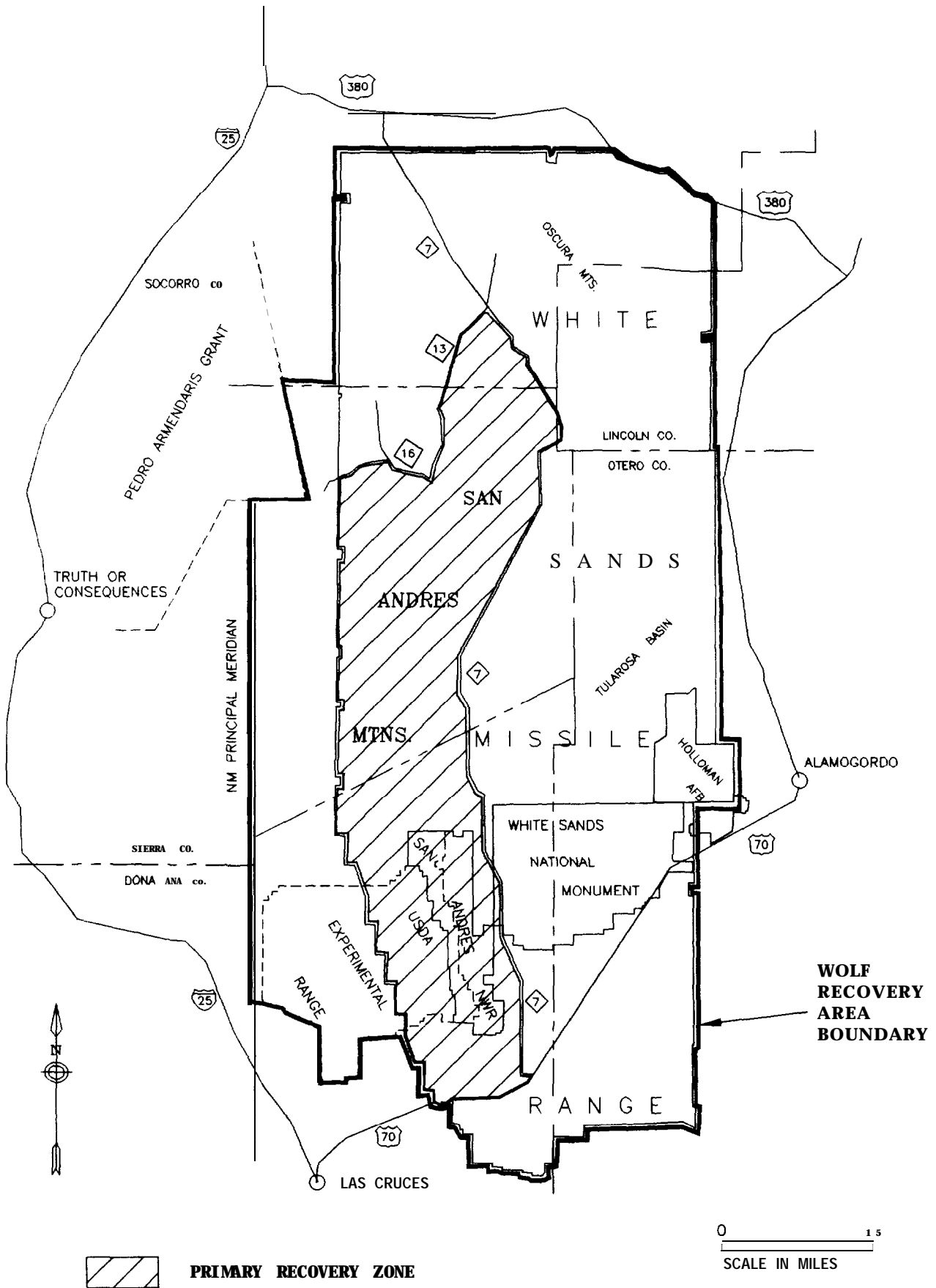


Table 2-3. Projected wolf population growth to recovery area goal after releases into the White Sands Wolf Recovery Area under nonessential experimental classification (Alternative A).

Recovery area goal: **20** wolves occupying the typical habitat area of approximately 1,000 mi², adapted from Bednarz (1989).

	1997	1998	1999
No. released successfully^a	7	7	3
No. surviving (from prev. year)	--	6	13
No. pups born^b	0	5	10
5% control loss	0	1	1
20% other losses^c	1	4	5
Total wolves (end of year)	6	13	20
No. packs^d	1	2	4
No. breeding pairs^e	1	2	4
Area occupied^f (100 mi²)	2.5	5.0	10.0

^a Initially, about 10 captive-raised wolves annually will be released, but three of these are assumed to quickly die, disappear, disperse from the recovery area, or require recapturing for a variety of reasons, and not to contribute to population growth. Fewer wolves will be released in 1999 to minimize overshooting of the population goal.

^b Average of five pups per litter based on McBride (1980)

^c "Other losses" includes wolves that die, leave, disappear, or are removed from the recovery area for any reasons besides control; adapted from rates in Phillips (1992), USFWS (1993a), and Mech (1970).

^d Average pack size of five based on Bednarz (1988).

^e Most packs contain one breeding pair; assumed that 10% of packs do not have a successful breeding pair

^f Average pack territory size of 250 mi² based on Mexican Wolf Recovery Team (1982) and Mech (1970). Not all land within a territory is suitable year round habitat.

SOURCE: Adapted from USFWS (1993a).

(“secondary recovery zones”) (Figs 2-2 and 2-3, above). However, the FWS and cooperating agencies will not allow the wolves to establish territories outside these wolf recovery area boundaries unless this occurs on private or tribal lands and the land manager does not object. The FWS would attempt to enter into cooperative management agreements with such landowners regarding control of the wolves. If the land manager objects to the presence of wolves on private or tribal lands, field personnel would recapture and relocate the wolves.

The FWS and the cooperating agencies will use a flexible “adaptive management” approach based on careful monitoring, research, and evaluation throughout the release phase. This will include adjusting the numbers actually released according to the needs and circumstances at the time. Initially, to reduce the likelihood of wolf dispersal onto the White Mountain Apache and San Carlos Apache reservations to the west, the wolf releases will occur on the eastern side of the BRWRA primary recovery zone, close to the Arizona/New Mexico border. The FWS will encourage and support the formation of a citizen advisory committee, or similar management oversight body, to assist the FWS and cooperating agencies in responding to local concerns.

Initial release stock will be “surplus” Mexican wolves designated by the SSP Management Group from the U.S. captive population. A surplus wolf is one whose loss or removal will not significantly adversely affect the genetic or demographic make-up of the population (Siminski 1994a). Thus, death of one or more surplus wolves would not jeopardize the continued existence of the subspecies. Use of surplus wolves will allow the FWS to designate the wild population as nonessential experimental. This provides greater management flexibility than if released wolves retain their endangered status and associated ESA protections.

Prior to any releases, the FWS will determine whether recolonization has occurred or appears likely to occur within the U.S. portion of the subspecies’ former range. Depending on its extent, natural recolonization could contribute to meeting the recovery objective and could, but would not necessarily, eliminate the need for releases of captive animals into one or both of the designated wolf recovery areas (see USFWS 1994c).

The following future circumstances will be considered in decision-making about using the

WSWRA subsequent to initial releases in the BRWRA:

- whether using the WSWRA, in combination with the BRWRA, is necessary to achieve the recovery objective of re-establishing 100 wolves; that is, it would be used if it appears that the initial introduction in the BRWRA will not achieve a total population of 100 wolves,
- whether, based on future research, it appears that the WSWRA deer herd could support a wolf population that would contribute to meeting the recovery objective, and
- other future circumstances that could affect the feasibility of using the WSWRA, such as the FWS wolf program budget, management concerns, future military uses of the missile range, and so on.

If both areas are eventually used, wolves could be translocated between the two areas as needed to maintain overall population viability and to accomplish other management objectives. If feasible, recaptured wild wolves from one recovery area, rather than captive-raised wolves, could be used to stock the other area to increase the likelihood of success (Fritts 1992).

A key aspect of this proposal is the necessity of adequate funding for monitoring and research to study the impacts of the action and to determine whether the Mexican wolf can survive in the modern Southwest (see Appendix B - Projected Implementation Costs). Progress will be continuously evaluated. The FWS will prepare periodic progress reports, detailed annual reports, and full evaluations after three and five years. The full evaluations will include recommendations regarding continuation or termination of the reintroduction effort and whether, and how, to use the WSWRA. Decision-making criteria that the FWS and cooperating agencies will consider will include those recommended by the Arizona Game and Fish Department in its Cooperative Reintroduction Plan, which also calls for full evaluation of the initial “experimental” phase after three years (Groebner et al. 1995):

- whether the wolves have successfully established home ranges within the designated wolf recovery area,
- whether the reintroduced wolves reproduce successfully in the wild,
- whether the numbers and vulnerability of prey are adequate to support wolves,
- whether the livestock depredation control program is effective,
- whether significant threats to human safety have occurred,
- whether wolf mortality is substantially higher than expected, see Tables 2-2 and 2-3,
- whether effective cooperation with other agencies and the public is occurring, and
- whether combined agency funds and staff are adequate to carry out needed management, monitoring, and research.

Monitoring and research efforts will assist in determining the answers to these questions. The criteria may need to be updated in the light of changes in circumstances after the initial releases (Groebner et al. 1995). For example, concern has been expressed that current forest and woodland health and ecological trends in the BRWRA will result in decreased viability of prey populations needed to support recovery levels of wolves (Hayes 1995). If the initial releases fail, further releases would be inappropriate unless the cause of **failure** is identified and remedied.

Projected Population Growth-In the BRWRA, three family groups will be released in the first year. (Arizona’s Reintroduction Plan calls for releasing only two pairs annually in the BRWRA; the FWS proposes three pairs because dispersal into the New Mexico side of the BRWRA is anticipated.) Each pair is projected to have, on average, three pups surviving at the time of release (or following the first whelping season after release). Thus, the average family group size will be five and the initial releases would amount to an average of 15 individuals.

Supplemental releases of similar numbers of wolves will be conducted, if necessary, for the following four years; thereafter, only reproduction in the wild will drive the population’s growth.

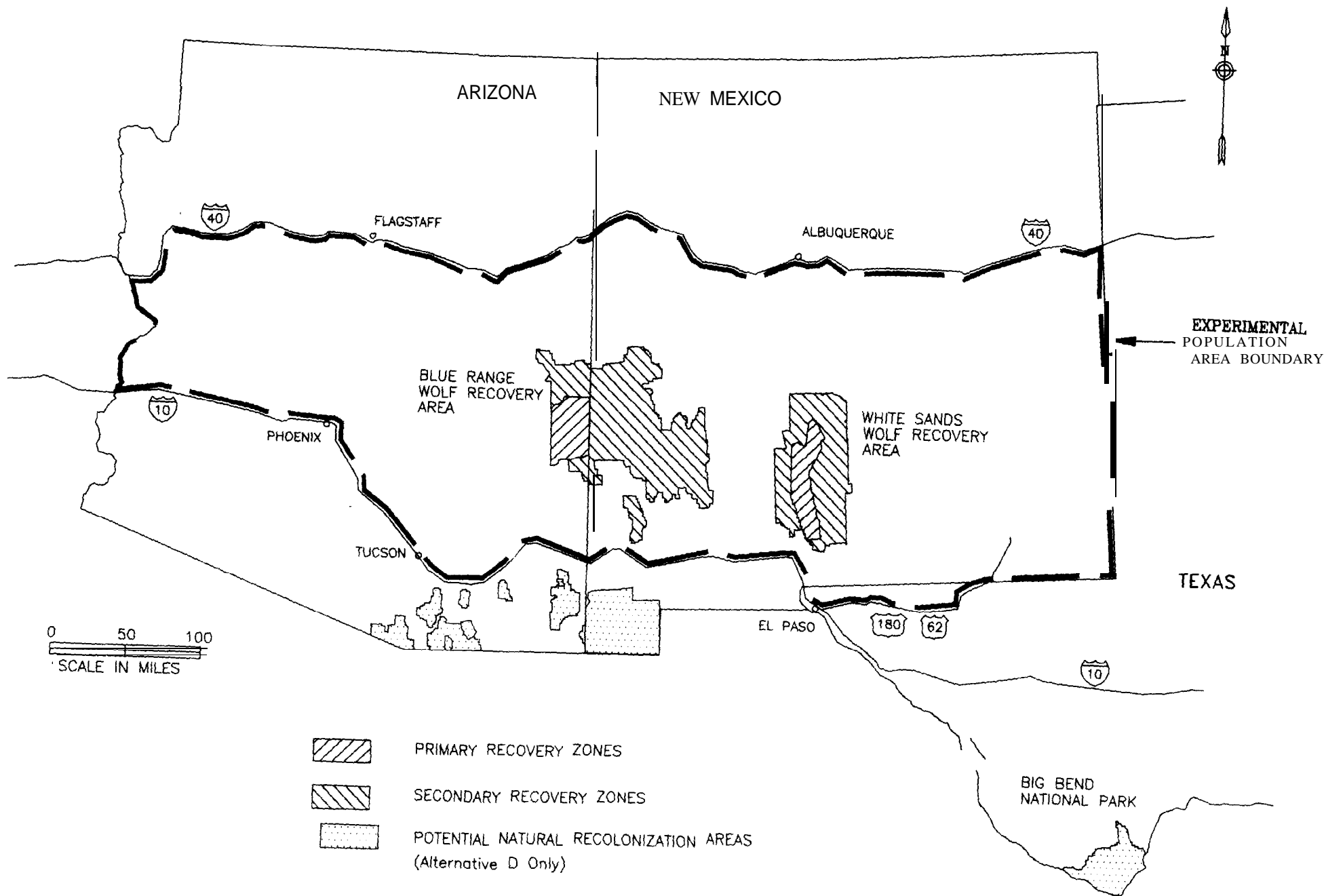
Growth projections are set forth in Tables 2-2 and 2-3 (for the WSWRA, if used), above; these provide guidance but do not predict exact outcomes. The projections assume that about one-third of the wolves released each year quickly die, disappear, disperse from the recovery area, or otherwise require recapturing, and do not contribute to growth of the population (USFWS 1993a, Phillips 1992). Thus, the average number of wolves successfully released annually is initially projected to be ten for the BRWRA (seven for the WSWRA). Fewer wolves may be released in later years to avoid overshooting the recovery objective, depending on actual reproduction and mortality rates.

The Preferred Alternative will be completed when the population reaches the recovery objective of 100 wolves over 5,000 mi²; this is projected to take nine years (Table 2-2). Moderately high annual control losses and other losses-35% total-are expected. The depredation control and other losses are relatively high due to the presence of livestock and the public in the BRWRA.

The FWS or cooperating agencies will monitor the wolves continually. The schedule and numbers of wolves released will be adjusted in accordance with the actual population growth. Upon achievement of the recovery objective, the FWS will develop and implement detailed long-term plans for sustainable management of the re-established wolves. The recovery area goals approximate the expected number of wolves that these areas can reasonably support. The goals may need revision if field evidence shows they are not realistic. The FWS projects that the wolf populations will eventually fluctuate above and below these goals through a combination of natural processes and management actions. The FWS will actively manage against expansion of the population beyond the designated wolf recovery areas.

Geographic Boundaries.-The Preferred Alternative involves the following geographic designations: *wolf recovery area*, *primary recovery zone*, *secondary recovery zone*, and *experimental population area* (Fig. 2-4). Box 2-1 and Appendix C, the proposed Mexican Wolf Experimental Population Rule, give precise

Figure 2-4. Mexican Wolf Geographic Boundaries.



boundaries of these areas and zones. These designations carry no public or private land use restrictions, per se. Also, ESA critical habitat shall not be designated within the experimental population area under the FWS's proposed nonessential experimental classification, 16 USC sec. 1539(j)(2)(C)(ii).

Wolf recovery will be supported only in the designated *wolf* recovery *areas* (i.e., the BRWRA and possibly the WSWRA). Within these recovery areas, wolves will be released only in the *primary recovery* zones, but they will be allowed to disperse into the adjacent secondary recovery zones. The chief significance of the *experimental population area* is to distinguish the legal status of any wolves that might be found there; wolf recovery is not being proposed and will not be supported throughout the area. Any wolf in this large area will be considered to belong to the nonessential experimental population. The flexible management measures in the Mexican Wolf Experimental Population Rule will apply throughout this area. Wolves found within the experimental population area, but outside of a designated wolf recovery area, will be captured and returned for re-release or placement into the captive population. Wolves found outside the experimental population area will be presumed to be of wild origin with full endangered status under the ESA unless evidence such as a radio-collar or identification mark establishes that it is a member of the experimental population. In such a case the wolf would retain its experimental nonessential status pending recapture.

The southern boundary of the experimental area was established to the north of the most suitable areas for possible natural recolonization from Mexico. Thus, if wolves actually did recolonize from Mexico--a very speculative possibility--they would retain their full endangered status unless they travelled north into the experimental population area (see Alt. D).

Release Procedures.—The FWS will select release stock from its captive wolf management facility on the Sevilleta National Wildlife Refuge or other captive management facilities. In the winter of 1996-1997—or later if circumstances compel a delay—the FWS will place the selected pairs in separate

pens constructed within the BRWRA primary recovery zone. These pens will be separated by several miles. Each pen will occupy less than one-half acre; field personnel will have temporary housing nearby.' Land managers will restrict public access and "disturbance-causing land use activities" (defined in the Glossary, Appendix G, including some specific exemptions), up to a one mile radius around the release pens only while wolves are in the pens. Human contact will be further reduced and the wolves' diet will be converted to natural prey items, such as road-killed deer, elk, javelina, jackrabbits, and cottontails. Wolves will remain in the pens for up to six months to acclimate to the area. Then, the field managers will open the pens and allow the wolves to leave and return at will. Managers will place carcasses (e.g., roadkills) of natural prey in the vicinity until they determine that the wolves have the predatory skill to obtain an adequate food supply on their own.

In the event that a wolf selected for release and placed in the acclimation pens becomes unsuitable or dies, it may be replaced by another animal from the captive population. In this case the wolf may be released later, after sufficient acclimation time has elapsed. Releases conducted during subsequent years will follow procedures similar to those described above with refinements based on previous release experiences. If wolves have established a territory in the vicinity of a release pen, then the pen will be moved to a location outside known wolf territories for releases in subsequent years. If the WSWRA is used, release procedures will be similar to those described above.

Monitoring and Research.—Prior to placement in release pens the adult wolves will receive permanent identification marks and radio collars. Pups will receive surgically implanted transmitters prior to release. Field managers will recapture them when they are large enough to be fitted with neck collars. Wild-born wolves will be captured, given a permanent identification mark, and radio-collared for at least the first five years of the project.

The FWS and cooperating agencies will monitor movements, behavior, population status, and well-

***The FWS and the Forest Service, for the BRWRA, and the U.S. Army, for the WSWRA if used, and other cooperating agencies, will jointly designate precise release pen sites within the primary recovery zones. The FWS and these agencies will prepare an environmental assessment under NEPA on potential site-specific impacts associated with these facilities.**

being of released wolves through radio tracking (ground and aerial), field observations, obtaining sighting reports from the public, and other methods. Food habits, kill rates, pack size, litter size, territory size, and other aspects of wild Mexican wolf life will be studied. The FWS and cooperating agencies will bear the costs of this monitoring program at least through five years beyond the achievement of the recovery objective; cooperative research agreements with qualified institutions may be negotiated.

Management.—A federal regulation will designate the population to be released as experimental and nonessential to the continued existence of the subspecies. This Mexican Wolf Experimental Population Rule will delineate the precise geographic boundaries (see Box 2- 1, above) and prescribe the protective measures and management authority that apply. No formal ESA Section 7 consultation would be required regarding potential impacts of land uses on nonessential experimental Mexican wolves. Any harm to wolves resulting solely from habitat modification caused by authorized uses of public lands, that is, not in violation of the closure provisions or other provisions regarding take or harassment, would be a legal take under the Proposed Rule. Any habitat modification occurring on private or tribal lands would not constitute illegal take. Based on evidence from other areas, the FWS does not believe that wolf recovery requires major changes to currently authorized land uses. The main management goals are to protect wolves from disturbance during vulnerable periods, minimize illegal take, and remove individuals from the wild population that deplete or otherwise cause significant problems.

The complete proposed experimental population rule, as published in the Federal Register on May 1, 1996, is in Appendix C. In summary, the Proposed Rule provides:

- No one will be in violation of the ESA for unavoidable and unintentional take of a wolf within the Mexican wolf experimental population area when the take is incidental to a legal activity, such as driving, trapping, and military testing or training activities, and is promptly reported. Anyone may take a wolf in defense of human life.

- No private or tribal land use restrictions will be imposed for wolf recovery without the concurrence of the private owner or tribal government. On public lands, public access and disturbance-causing land use activities (defined in Appendix G) may be temporarily restricted within a one-mile radius around release pens, and around active dens between March 1 and June 30 and around active wolf rendezvous sites (defined in Appendix G) between June 1 and September 30.

- On **public** lands allotted for grazing, livestock owners and their designated agents: (1) may harass wolves for purposes of scaring them away from livestock provided the harassment is promptly reported, and (2) may be allowed to take wolves actually engaged in attacking livestock.

- Permission for private parties to take wolves on public grazing lands must meet all of these conditions: 1) six or more breeding wolf pairs occur in the BRWRA, or three or more breeding wolf pairs occur in the WSWRA (if used); 2) previous livestock loss or injury by wolves has been documented by an authorized FWS, ADC, or state employee and efforts to control the offending wolves have been undertaken but have not succeeded; 3) physical evidence exists that an attack occurred at the time of the take; and 4) the take is promptly reported.

- On **private** or **tribally-owned land**, regardless of location, property owners and livestock owners and their designated agents may harass wolves near livestock, people, buildings, facilities, pets, or other domestic animals at any time and may take wolves attacking livestock under more liberal conditions than those applicable to public grazing lands. That is, such take can occur regardless of the number of recovered wolf pairs in the area and no requirement exists for government agencies to have completed their efforts to take the depredating wolves. However, physical evidence that an attack occurred at the time of the take must be

present and the take must be promptly reported.

- Any FWS-authorized person may capture and remove or translocate reintroduced wolves consistent with a FWS-approved management plan or special management measure. These may include wolves that: (1) prey on livestock, (2) attack domestic animals other than livestock on private land, (3) impact game populations in ways which may inhibit further wolf recovery (impact defined in Appendix G), (4) prey on state-endangered desert bighorn sheep on the White Sands Missile Range (if used), (5) are considered problem wolves (defined in Appendix G), are a nuisance, or endanger themselves by their presence in a military impact area, or (6) are necessary for research.
- The FWS does not intend to change the “nonessential experimental” designation to “essential experimental” or “endangered” and the FWS does not intend to designate critical habitat for the Mexican wolf.
- Any taking of a wolf contrary to the experimental population rule may be referred to the appropriate authorities for prosecution.

The release process involves many uncertainties. Wolves may die, surviving mates may need to be recaptured and paired with another mate or returned to the captive population, or wolves may disperse out of the recovery areas and need to be retrieved (Phillips 1992). Post-release management to address these uncertainties will follow an interagency cooperative management plan. This will include working with the Arizona Game and Fish Department to meet the requirements of its Cooperative Reintroduction Plan and working with the New Mexico Department of Game and Fish. A wolf management team representing the FWS, the Game and Fish agencies, and other cooperating agencies will determine whether particular actions are necessary. The interagency management plan will cover issues such as release pen siting, veterinary management, depredation control, capture and relocation, research, radio tracking, aerial overflights, prey monitoring, and prey habitat management. Field

staff will conduct monitoring and research, trapping, depredation investigation, mortality investigation, control, and other on-the-ground actions. A citizen advisory committee, or similar body, could also participate in management decisions.

Mitigation Measures

Control of Problem Wolves—The experimental population rule provisions, summarized above, are largely measures to mitigate the potential impacts of the proposal by providing the greatest degree of management flexibility and the least impact on private activity consistent with wolf recovery. One mitigation measure is the allowance of non-injurious harassment of wolves and, in limited situations, killing them if they are observed attacking livestock, although the actual number of observed attacks is expected to be small. The FWS or other authorized agencies will respond to all incidents of wolf-caused depredation with concerted efforts to prevent additional depredation. Captured problem or nuisance wolves will be returned to captivity or to a distant location in the wolf recovery area, pursuant to the cooperative management plan. If both recovery areas are in use, wolves from the BRWRA could be translocated to the WSWRA, and vice versa.

The FWS will permanently remove from the wild or, as a last resort, euthanize any wolves exhibiting a consistent pattern of livestock depredation (three or more confirmed kills within one year in primary wolf recovery zones and two or more in other areas). A wolf would be euthanized only after a determination by the FWS that it had no further value to the recovery program; euthanasia would be done in accordance with the guidelines of the American Veterinary Medical Association (AVMA 1993), when feasible. Resolving depredation problems through changes in livestock husbandry will be explored with ranchers.

On private property, after two confirmed incidents within one year of nuisance behavior or the killing or injuring of pets or other domestic animals by wolves, efforts will be undertaken to deter this behavior. The FWS will move captured offending wolves to a distant location. The FWS will permanently remove from the wild or euthanize any wolves exhibiting a consistent pattern of nuisance behavior (three or more incidents per year). This model of active, professional, management of

depredation has proven feasible in Minnesota and in the northern Rockies; it has demonstrably served in both areas to expeditiously resolve wolf/livestock conflicts (Niemeyer et al. 1994; Paul 1995). Active management in conjunction with public education and information improves local tolerance of wolves.

The FWS will attempt to recapture and relocate members of the experimental population that go outside the designated wolf recovery areas. However, the FWS will not routinely recapture and return pack members that make occasional forays outside recovery areas nor will it attempt to do so for reported but unconfirmed lone wolves, except when livestock depredation occurs. Packs that establish territories on public land outside the designated wolf recovery areas will be captured and returned to a recovery area or to captivity. If wolves move onto private or tribal lands outside the recovery areas the FWS will attempt to develop management actions in cooperation with the land manager, including recapture and return if requested by the land owner or tribal government. Field staff will not work on private or tribal land without permission.

Other Mitigation.—As indicated, the FWS will condition the captive wolves prior to release. This will emphasize orienting them to native prey and habitat and may include aversive conditioning to both humans and livestock. The actual releases will occur in remote portions of the recovery areas where the fewest potential conflicts with human uses will occur.

A private depredation compensation fund exists to cover the costs of livestock losses. The Defenders of Wildlife, a national membership non-profit corporation, has over \$112,000 in a fund to be applied to wolf depredation in both the northern Rocky Mountains and the Southwest (Schlickeisen 1993; Defenders of Wildlife 1994). The fund pays **100%** of the market value of livestock lost to confirmed wolf kills as determined by a responsible wolf management official. It **also** pays 50% for unconfirmed losses of livestock when wolves are in the area and evidence exists that a depredation occurred. From 1987 through 1994, a total of about \$15,000—around \$2,000 per year—was paid out of this fund to **17** ranchers in Montana. During this period the wolf population there averaged 44 animals. The FWS does not guarantee the future

existence of this private mitigation fund, but recognizes it has been a very valuable aid to wolf recovery.

The FWS will undertake a cooperative effort to improve public understanding of the biology, ecology, history, management, and status of Mexican wolves. In particular, residents of the primary and secondary recovery zones will receive briefings and regular updates. Participation of a citizen advisory committee will be encouraged and supported. The FWS and cooperating agencies will work with ranchers to assess actual depredation impacts and to develop methods to mitigate potential impacts through changes in livestock husbandry. These could include: use of horned cattle, regular checks of herds, bull management so that calves are born at about the same time, calving in confined pastures, herd concentration methods, herd protection methods, and removal or burial of livestock carcasses (Bjorge and Gunson 1985). Some of the suggested methods likely would be impractical for open range situations. In small pastures, the use of livestock guarding dogs or other guard animals may deter wolf attacks (Coppinger and Coppinger, in press).

The proposed Mexican Wolf Experimental Population Rule also provides for controlling wolves to prevent unacceptable impacts on ungulate herds that might inhibit wolf recovery and to avoid impacts on New Mexico's state-endangered desert bighorn sheep population on the WSWRA (if used). This herd merits special protection due to low population growth caused by long-standing disease problems, although wolves likely will not take many of these steep-terrain animals (Bednarz 1989). Unacceptable impacts on ungulate herds are defined in the Glossary (Appendix G) under "Impact on game populations in ways which may inhibit further wolf recovery."

Summary of Alternative A

In conclusion, the following actions are called for to implement Alternative A:

- expand the captive Mexican wolf population,
- select and acclimate wolves for release,
- adopt the final rule designating the population as experimental nonessential and designating the experimental population area,
- conduct public information and education efforts and support a citizen advisory

- committee,
- develop an interagency cooperative management plan,
- set up release pens in the BRWRA and place wolves in them,
- implement field management, monitoring, research, and problem wolf control,
- conduct annual releases of adequate numbers of family groups of wolves to lead to achievement of the recovery objective of 100 wolves,
- recapture and return wolves that disperse beyond the BRWRA boundary,
- consider the necessity and feasibility of using the WSWRA, and
- at three and five years, fully evaluate whether the reintroduction effort should continue or terminate.

Alternative B: Reintroduction of Mexican wolves, classified as nonessential experimental, into both the Blue Range Wolf Recovery Area and the White Sands Wolf Recovery Area primary recovery zones. Wolves dispersing from the primary recovery zones will be captured and returned to the primary zones or captivity.

Actions Associated With Alternative

In 1997, the FWS will begin to reintroduce family groups of captive-raised Mexican wolves into both the BRWRA and the WSWRA primary recovery zones and actively prevent the populations from expanding beyond these zones (Figs 2-2 and 2-3, above). In the BRWRA primary recovery zone the FWS will release about eight family groups over four years with the goal of reaching a population of 20 wild wolves by 2001 (Table 2-4). In the WSWRA primary recovery zone the FWS will release about four family groups over two years with the goal of reaching a population of 14 wild wolves by 1999 (Table 2-5). The total recovery objective will be 34 wolves. The BRWRA primary recovery zone represents only about one-fifth of the area wolves would occupy in the whole BRWRA under Alt. A. The WSWRA primary recovery zone represents about two-thirds of the area wolves would occupy in the whole WSWRA under Alt. A.

The FWS will designate the population as nonessential experimental under the ESA. The FWS will adopt basically the same Mexican Wolf Experimental Population Rule as under Ah. A (Appendix C), but it would apply to the smaller areas. The FWS and its cooperators will follow the same release, monitoring, and management procedures as under Ah. A, but on a smaller scale due to the smaller areas involved. Control will be accomplished through a combination of aggressive monitoring and management methods to promptly recapture wolves that leave the primary recovery zones. Wolves could be translocated between the two areas as needed.

In the BRWRA primary recovery zone, because of the smaller area involved (1,000 mi²), the FWS will release only two family groups annually, totaling approximately ten wolves (Table 2-4), rather than three family groups released annually under Ah. A. High annual control mortality and other losses of wolves are expected due to the intensive management required to prevent dispersal. Alternative B in the BRWRA will be completed when 20 wolves occupy the 1,000 mi² primary recovery zone. The population and area goals likely would be met after five years, in 2001.

In the WSWRA primary recovery zone, annual mortality and other losses of wolves are expected to be somewhat higher than under Alt. A due to the intensive management required to prevent dispersal. Alternative B in the WSWRA will be completed when 14 wolves occupy the roughly 720 mi² of suitable Mexican wolf habitat in the primary recovery zone (Bednarz 1989). The population and area goals likely would be met after three years, in 1999.

These population projections provide guidance but do not predict exact outcomes. Neither subpopulation would be considered independently viable and neither would alone, nor combined, meet the Mexican Wolf Recovery Plan objective.

Table 2-4. Projected wolf population growth to recovery area goal after releases into the Blue Range Wolf Recovery Area under nonessential experimental classification with restricted dispersal (Alt. B).

Recovery area goal: 20 wolves occupying the primary recovery zone, area of approximately 1,000 mi²; adapted from Mexican Wolf Recovery Team (1982).

	1997	1998	1999	2000	2001
No. released successfully^a	7	7	7	7	0
No. surviving (from prev. year)	--	4	7	11	17
No. pups born^b	0	0	5	10	15
10% control loss	1	1	2	3	3
30% other losses^c	2	3	6	8	9
Total wolves (end of year)	4	7	11	17	20
No. packs^d	--	1	2	3	4
No. breeding pairs^e	--	1	2	3	4
Area occupied^f (100 mi²)	--	3	5	8	10

^a Initially, about ten captive-raised wolves annually will be released, but three of these are assumed to quickly die, disappear, disperse from the recovery area, or require recapturing for a variety of reasons, and not to contribute to population growth.

^b Average of five pups per litter based on McBride (1980)

^c "Other losses" Includes wolves that die, leave, disappear, or are removed from the recovery area for any reasons besides control; adapted from rates in Phillips (1992), USFWS (1993a), and Mech (1970)

^d Average pack size of five based on Bednarz (1788)

^e Most packs contain one breeding pair; assumed that 10% of packs do not have a successful breeding pair.

^f Average pack territory size of 250 mi² based on Mexican Wolf Recovery Team (1782) and Mech (1770). Not all land within a territory is suitable year round habitat.

SOURCE: Adapted from USFWS (1993a).

Table 2-5. Projected wolf population growth to recovery area goal after releases into the White Sands Wolf Recovery Area under nonessential experimental classification with restricted dispersal (Alt. B).

Recovery area goal: 14 wolves occupying the primary recovery zone area of approximately 720 mi²; adapted from Bednarz (1989).

	1997	1998	1999
No. released successfully^a	7	7	0
No. surviving (from prev. year)	--	5	12
No. pups born^b	0	5	10
5% control loss	0	1	1
25% other losses^c	2	4	6
Total wolves (end of year)	5	12	15
No. packs^d	1	2	3
No. breeding pairs^e	1	2	3
Area occupied^f (100 mi²)	2.5	5.0	7.5

^a Initially, about ten captive-raised wolves annually will be released, but three of these are assumed to quickly die, disappear, disperse from the recovery area, or require recapturing for a variety of reasons, and not to contribute to population growth.

^b Average of five pups per litter based on McBride (1980).

^c "Other losses" includes wolves that die, leave, disappear, or are removed from the recovery area for any reasons besides control; adapted from rates in Phillips (1992), USFWS (1993a), and Mech (1970).

^d Average pack size of five based on Bednarz (1988)

^e Most packs contain one breeding pair; assumed that 10% of packs do not have a successful breeding pair.

^f Average pack territory size of 250 mi² based on Mexican Wolf Recovery Team (1982) and Mech (1970). Not all land within a territory is suitable year-round habitat.

SOURCE: Adapted from USFWS (1993a).

Mitigation Measures

Mitigation will be the same as under Alt. A. The scale of the mitigation efforts will be reduced due to the smaller areas involved. However, a high intensity of management will be needed to prevent wolves from dispersing beyond the primary recovery zones into adjacent suitable habitat.

Summary of Alternative B

In conclusion, the following actions are called for to implement Alternative B:

- expand the captive Mexican wolf population, select and acclimate wolves for release,
- adopt the final rule designating the population as experimental nonessential and designating the experimental population area,
- conduct public information and education efforts and support a citizen advisory committee,
- develop an interagency cooperative wolf management plan,
- designate release areas within the BRWRA and WSWRA primary recovery zones, set up release pens, and place wolves in them,
- conduct annual releases in both areas of adequate numbers of family groups to lead to achievement of the total recovery objective, that is, 34 wolves,
- implement intensive field management, monitoring, research, and problem wolf control,
- recapture and return wolves that disperse beyond designated primary recovery zones, and
- after three and five years, fully evaluate whether the reintroduction effort should continue or terminate.

Alternative C: Reintroduction of Mexican wolves, classified as endangered, into the Blue Range Wolf Recovery Area only. Wolves will be released into the primary recovery zone and unlimited dispersal will be allowed.

Wolves will receive full protection under the Endangered Species Act.

Actions Association with Alternative

In 1997, the FWS will begin to reintroduce family groups of captive-raised Mexican wolves under their current full-endangered status into the primary recovery zone of the BRWRA in east-central Arizona, following the same release procedures as under Alts A and B. The FWS will gradually release up to 15 family groups into the BRWRA. No releases will occur in the WSWRA.² The recovery objective of the alternative is to re-establish 100 wild wolves distributed over more than 5,000 mi² by about the year 2002, consistent with the Mexican Wolf Recovery Plan (Table 2-6). The FWS and its cooperators will monitor and conduct research on the wolves, but they will not actively manage them.

The full-endangered status allows unrestricted dispersal; that is, the FWS will neither restrict the population to the designated BRWRA, as under Alt. A, nor to the smaller primary recovery zone, as under Alt. B. No attempts will be made to recapture or return wolves with the possible exception of individual depredators.

The wolves will have the full protection against “take” by humans provided by the ESA. Anyone who would “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct” against a Mexican wolf will be violating the ESA, 16 USC sec.s 1532(19) and 1538. The only exceptions will be takings to protect human life or by special permit “for scientific purposes or to enhance the propagation or survival of the affected species,” 16 USC sec. 1539(a)(1)(A). This is the same “endangered” status that wild Mexican wolves would have if they were to somehow naturally recolonize into the United States from Mexico under Alt. D.

The overall rates of mortality and other losses are projected to be lower than under Alt. A in the BRWRA, at 25% (Table 2-6, above). As a result, the population and area goals will be met after six years, three years sooner than under Alt. A. These popula-

²In the DEIS, Alt. C included reintroduction into the WSWRA as well as into the BRWRA. The Interdisciplinary Team and the FWS decided to drop reintroduction into the WSWRA from Alt. C in this FEIS.

Table 2-6. Projected wolf population growth to recovery area goal after releases into the Blue Range Wolf Recovery Area with full Endangered Species Act protection (Alternative C).

Recovery area goal: 100 wolves occupying a total area of 5,000 mi²; based on Mexican Wolf Recovery Team (1982).

	1997	1998	1999	2000	2001	2002
No. released successfully^a	10	10	10	10	4	0
No. surviving (from prev. year)	--	8	17	31	49	70
No. pups born^b	0	5	15	25	40	65
25% all losses^c	2	6	11	17	23	34
Total wolves (end of year)	8	17	31	43	70	101
No. packs^d	1	3	6	9	14	20
No. breeding pairs^e	1	3	5	8	13	18
Area occupied^f (100 mi²)	3	8	15	23	33	50

^a Initially, about 15 captive-raised wolves annually will be released, but five of these are assumed to quickly die, disappear, disperse from the recovery area, or require recapturing for a variety of reasons, and not to contribute to population growth. Fewer wolves will be released in 2001 to minimize overshooting of the population goal.

^b Average of five pups per litter based on McBride (1980)

^c "Other losses" includes wolves that die, leave, disappear, or are removed from the recovery area for any reasons besides control; adapted from rates in Phillips (1932), USFWS (1993a), and Mech (1970).

^d Average pack size of five based on Bednarz (1988)

^e Most packs contain one breeding pair; assumed that 10% of packs do NOT have a successful breeding pair

^f Average pack territory size of 250 mi² based on Mexican Wolf Recovery Team (1982) and Mech (1970). Not all land within a territory is suitable year-round habitat

SOURCE: Adapted from USFWS (1993a).

tion projections provide guidance but do not predict exact outcomes.

It is more likely under Alternative C than under *Alt.s* A, B, or D that the wolf population could eventually grow to far exceed the projections in the scenarios. The precise numbers and areas where wolves could occur cannot be predicted with confidence, but they most likely would be forested, montane habitats near the BRWRA. Chap. 3 describes the areas into which reintroduced wolves foreseeably would disperse under this alternative. They are the San Carlos Apache and Fort Apache reservations, the Lakeside Ranger District of the Sitgreaves National Forest, and the San Mateo Mountains unit of the Cibola National Forest.

The impacts will be less predictable than under the nonessential experimental classification alternatives (A and B) because the impacts would occur over a broader region when the wolves disperse outside the BRWRA, as they probably eventually would. A greater likelihood of land use restrictions will exist under this alternative. Depending on where the wolves occur, these could include limiting predator control methods that might kill or injure wolves, closing roads, modifying livestock grazing allotments, and imposing other protections to avoid jeopardizing the population's survival. Federal agencies will be required to pursue their ESA Section 7 responsibilities to conserve, and not to harm, the endangered population. This legal mandate could take precedence over other, more discretionary, activities of these land managers. This could include managing lands specifically to maintain and create high-quality habitat for wolf prey. Such management could include extensive vegetation manipulation to favor ungulates, e.g., through timber harvesting, clearing, and prescribed burning if this is determined to be necessary to fully support wolf recovery.

Mitigation Measures

Individual depredating wolves could be controlled only pursuant to a permit so long as the action enhanced the subspecies' survival, 16 USC sec. 1539(a)(1)(A). Management for this fully-protected population will be less flexible than under the experimental population rules for *Alt.s* A and B. There will be no experimental population rule, no boundaries on the wolf recovery area, no provisions

to control wolves that are impacting ungulate herds, and it will be illegal to harm or harass the wolves anywhere except under very narrow circumstances authorized by an ESA permit. Taking by private individuals of wolves that attack livestock will be illegal. Taking wolves in defense of human life will still be allowed, 16 USC sec.s 1540(a)(3) and 1540(b)(3).

The FWS will implement the other mitigation measures listed under *Alt. A*. As indicated, the FWS will condition the captive wolves prior to release. Conditioning will emphasize orienting the wolves to native prey and habitat and may include aversive conditioning to both humans and livestock. The private depredation compensation fund sponsored by the Defenders of Wildlife would apply. Again, the FWS does not guarantee the future existence of this private mitigation fund, but recognizes it has been a valuable aid to wolf recovery in the northern Rockies since 1987.

The FWS will undertake a cooperative effort to improve public understanding of the biology, ecology, history, management, and the full-endangered status of the wolves under this alternative. In particular, residents of all areas where the reintroduced wolves occur will receive briefings and regular updates. The FWS and cooperating agencies will work with ranchers to assess actual depredation impacts and to develop methods to mitigate potential impacts through changes in livestock husbandry (Bjorge and Gunson 1985; Coppinger and Coppinger, in press).

An interagency management plan will be entered into with cooperating state, federal, and tribal agencies. This will cover issues such as release pen siting, veterinary management, depredation control, research, radio tracking, aerial overflights, land use restrictions, wolf and ungulate habitat enhancement, and prey monitoring and management. Mitigation will be necessary over a broader area when the population expands beyond the BRWRA. Even if the reintroduction was going badly it is unlikely that the project could be terminated and all the wolves recaptured consistent with the ESA, as could occur under the nonessential experimental reintroduction alternatives.

Summary of Alternative C

In conclusion, the following actions are called for to implement Alternative C:

- expand the captive Mexican wolf population,
- select and acclimate wolves for release,
- conduct public information and education efforts in the BRWRA and likely dispersal areas,
- develop an interagency cooperative wolf management plan,
- designate release areas in the BRWRA primary recovery zone, set up release pens, and place wolves in them,
- conduct annual releases of adequate numbers of family groups of wolves to lead to achievement of recovery objective of 100 wolves,
- implement field management, monitoring, research, and limited permitted problem wolf control, and
- after three and five years, fully evaluate whether the reintroduction effort should continue.

Alternative D: No Action

Actions Associated with Alternative

Under the No Action alternative, the FWS will take no action other than continuing its present course. It will neither release wolves nor take any other steps to directly ensure Mexican wolf recovery. The FWS will neither adopt an experimental population rule nor designate any wolf recovery areas. The agency will continue to support the captive population objectives established in the SSP Master Plan (Siminski 1994b), but the agency will not support breeding for maximum growth.

Based on its current ESA obligations, the FWS would still encourage protection and expansion of wild wolf populations under this alternative, if any were discovered. Natural recolonization of gray wolves has occurred in recent years in some areas along the northern U.S. border, such as northwestern Montana, northern Wisconsin, and northern Michigan, which are close to Canada or Minnesota where large sources of dispersing wolves exist (Laufer and Jenkins 1989, Ream et al. 1991, Thiel 1988). No evidence exists to indicate a likelihood of natural

recolonization in U.S. portions of the historic Mexican wolf range (Girmendonk 1994a, Whitaker et al. 1995, Wolok 1994), but the FWS will support continued research on this possibility.

Natural recolonization is considered extremely speculative. Based on historical wolf abundance, recent sighting reports alleged to be wolves, proximity to Mexico, and other factors, the most suitable areas for potential natural recolonization by wild wolves probably would be the mountainous parts of southeastern Arizona and southwestern New Mexico (Fig. 2-5), and Big Bend National Park in southern Texas (Fig. 2-6). This alternative analyzes these three areas. No confirmed sighting reports have come from these areas or from Mexico in recent years.

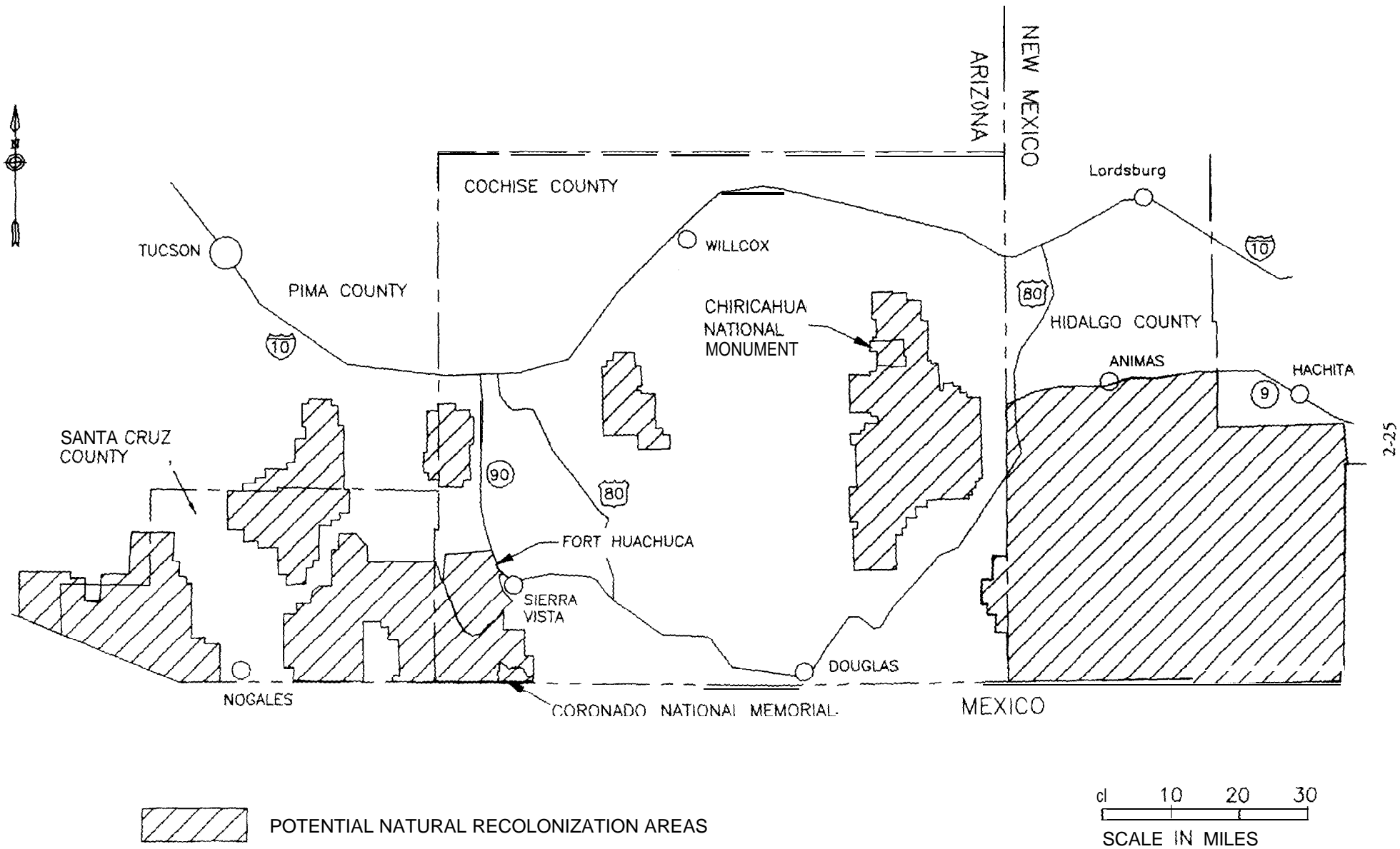
The WSWRA and BRWRA-the most suitable candidate areas for releases of captive-raised wolves-are farther north and less likely to be naturally recolonized from Mexico (see Fig. 2-4, above). They are not analyzed under this alternative. However, if natural recolonization were somehow to occur in the BRWRA and WSWRA, the impacts likely would be comparable to those analyzed under the reintroduction alternatives.

Any wolves that did naturally recolonize would be fully protected as an endangered species in the United States. It would be illegal to harm or harass them except under very narrow circumstances authorized by an ESA permit. Nevertheless, evidence from natural gray wolf recolonization along the U.S./Canada border suggests that, even when adequate source populations exist, lone wolves or breeding pairs may repeatedly appear in an area but then die out or be accidentally or illegally killed without establishing a self-sustaining population (USFWS 1993a).

Assuming for analytical purposes that source populations exist in Mexico, natural recolonization might take on the order of 30 years, if it occurred at all (see USFWS 1993a). Under this time frame, and assuming a 250 mi² average territory size (Mech 1970) for the five-member average pack (Bednarz 1988), speculative population scenarios for the three potential natural recolonization areas analyzed are:

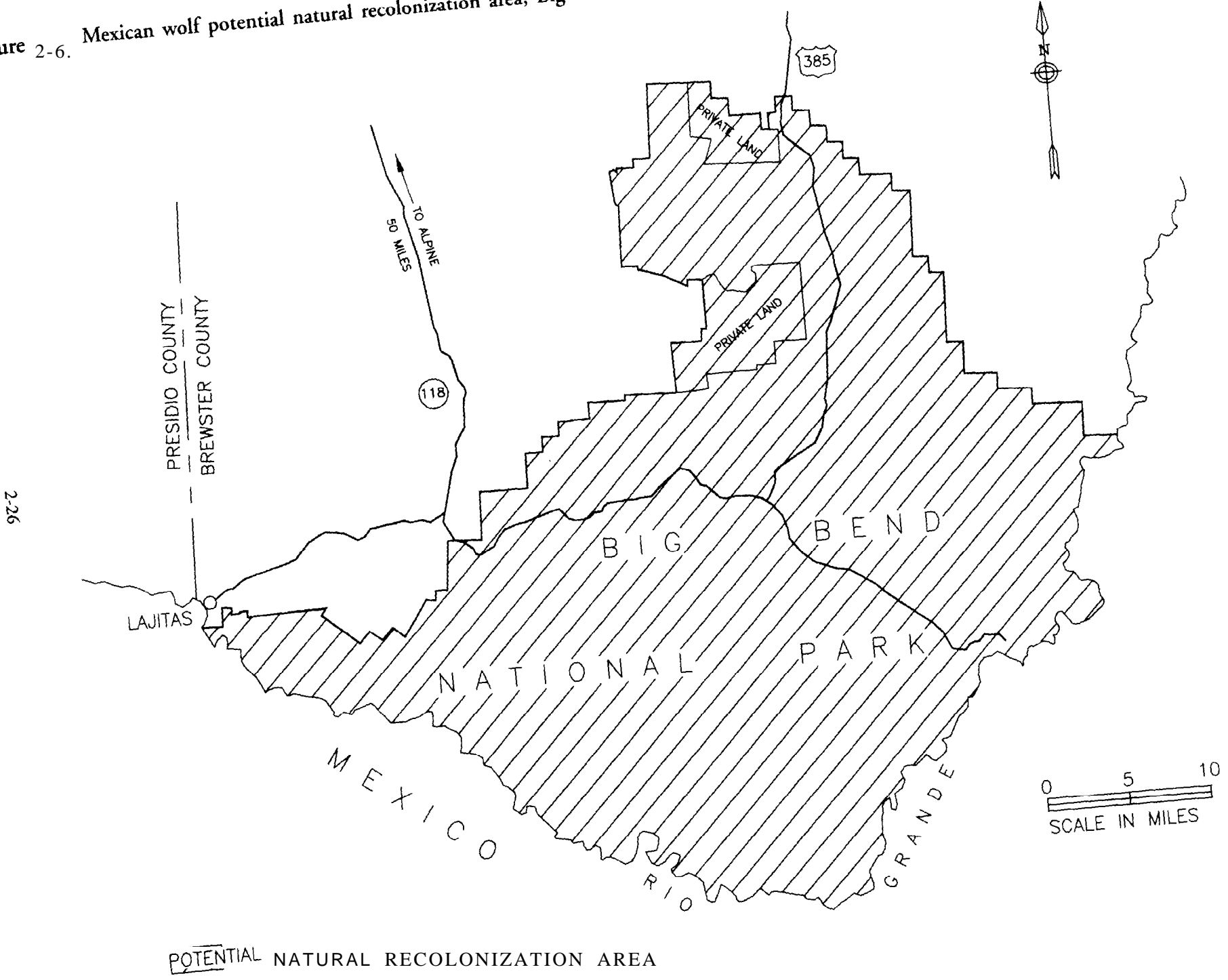
Southeastern Arizona: 30 wolves might recolonize by the year 2023 over approximately 1,500 mi², consisting of the Coronado National Forest units south of Interstate 10, together with the Chiricahua National Monument, the Coronado National

Figure 2-5. Mexican wolf potential natural recolonization areas in southeastern Arizona and southwestern New Mexico.



NOTE: Areas in southeastern Arizona consist of all the Coronado National Forest units south of Interstate 10, together with the separately labelled areas.

Figure 2-6. Mexican wolf potential natural recolonization area, Big Bend National Park, Texas.



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Memorial, and the Fort Huachuca Military Reservation west of State Route 90 (Fig. 2-5, above).

Southwestern New Mexico: 20 wolves might recolonize by the year 2023 over approximately 1,000 mi², consisting of the mountainous areas of Hidalgo County south of State Route 9 (Fig. 2-5, above).

Big Bend National Park: five wolves might recolonize by the year 2023 over approximately 250 mi², consisting of the Chisos Mountains and surrounding land (Fig. 2-6, above).

These speculative scenarios provide guidance but do not predict outcomes. Because of the great uncertainty involved, year-by-year population growth is not projected under this alternative as it is for *Alt.s* A, B, and C. Even if wolf recovery were somehow to occur in these three areas it might take several decades and the most optimistic total population of 55 animals inhabiting 2,750 mi² would not meet the Mexican Wolf Recovery Plan goal.

None of the potential natural recolonization areas alone, nor all of them combined, would meet the objective of the Mexican Wolf Recovery Plan of at least 100 animals distributed over a 5,000 mi² area, unless they were linked with larger source populations in northern Mexico (Mex. Wolf Rec. Team 1982). Due to uncertainties about location and timing, the impacts of natural recolonization, if it occurs, will be less predictable than in the case of reintroduction of captive-raised animals.

Land use restrictions could be imposed under this alternative depending on if, and where, wolves occurred. Restrictions could include limiting the use of predator control methods that might kill or injure wolves, closing roads, modifying livestock grazing, and imposing other protections to limit any jeopardy resulting from human activities. Other federal agencies would be expected to pursue their responsibilities under the ESA to conserve, and not harm, a recolonizing population. This would include managing to maintain and create high quality wolf and ungulate habitat.

Mitigation Measures

Under a natural recolonization scenario the FWS would control only individual depredating wolves so long as the action enhanced the subspecies' survival and a permit to do so was issued, 16 USC sec. 1539(a)(1)(A). Management of a small, fully-protected endangered population would be less flexible than under the experimental population rule in *Alt.s* A and B. Management would be similar to *Alt. C*, the reintroduction of full-endangered wolves.

The other mitigation options under *Alt. A* would be implemented if natural recolonization occurs, including providing public information and developing an interagency cooperative management plan. It is not certain that the current private depredation compensation fund would exist decades into the future to cover possible losses from a speculative natural recolonization.

Summary of Alternative D

In conclusion, the following are called for under Alternative D:

- maintain the captive Mexican wolf population, but take no action toward reintroduction,
- in the event wolves were to recolonize, develop an interagency cooperative wolf management plan,
- in the event wolves were to recolonize, conduct research and public information and education efforts in the recolonization areas, and
- in the event wolves were to recolonize, implement field management, monitoring, and limited problem wolf control.

Comparison of the Alternatives

Table 2-7 summarizes the features of the four alternatives. Appendix **B** provides projected cost **estimates** to complete each alternative. Table 2-8 outlines the projected environmental consequences. See Chapter 4 - Environmental Consequences for the detailed analysis that Table 2-8 summarizes.

Table 2-7. Summary of Mexican wolf re-establishment alternatives.

Key: BR = Blue Range Wolf Recovery Area; WS = White Sands Wolf Recovery Area.

Alternative	Description	Areas Analyzed	Definite Boundaries Around Recovery Areas?	Endangered Species Act Protection Status	Area Wolf Population Goal	Estimated Area to be Occupied by Wolves (square miles)
A (Preferred Alternative)	Nonessential experimental releases allowing dispersal into secondary recovery zones; BR first, WS back-up	BR and WS primary and secondary recovery zones	Yes	Per experimental population rule	BR and WS (if used): Total - 100	BR and WS (if used): Total - 5,000
B	Nonessential experimental releases preventing dispersal from primary zones	BR and WS primary recovery zones only	Yes	Per experimental population rule	WS - 14 RR - 20 Total - 34	WS - 720 BR - 1,000 Total 1,720
C	Releases under full ESA protection	RR only plus likely dispersal areas	No	Endangered	BR - 100+	BR - >5,000
D	No releases; research and support possible natural recolonization	Southeastern Arizona, Southwestern New Mexico, and Big Bend National Park, Texas	No	Endangered (if wolves discovered)	(speculative) SE Ariz. - 30 S W N M - 2 0 Big Bend NP - 5 Total - 55	(speculative) SE Ariz. - 1,500 SW NM - 1,000 Big Bend N P - 250 Total - 2,750

(continued below)

Alternative	Meets 1982 Mexican Wolf Recovery Plan's Population Objective?	Estimated Years to Reach Area Population Goal	Estimated Annual Percentage of Established Population Lost to Control and Other Factors ¹	Major Land Use Restrictions	Intensity of Wolf Management and Control	Total Estimated Implementation Costs ²
A (Preferred Alternative)	BR - Yes WS - No Together - Yes	BR - 9 WS - 3	BR - 35% WS - 25%	None	Medium	\$7,247,000 (over 14 years)
B	WS - No BR - No Together - No	WS - 3 BR - 5	WS - 30% BR - 40%	None	High	\$5,890,000 (over 10 years)
C	BR - Yes	BR - 6	BR - 25%	Some possible	Low	\$5,692,000 (over 10 years)
D	SE Ariz. - No S W N M - No Big Bend NP - No Together - No	Decades (speculative)	No estimates	Some possible (if wolves discovered)	Low	\$150,000 to \$217,000 per year (period indeterminate)

¹ In addition, about one-third of the captive-raised wolves that are released annually are expected to quickly die, disappear, disperse from the recovery area, or to require recapturing for a variety of reasons, and not to become part of the established population.

² See Appendix B for cost accounting.

Table 2-8. Summary of key projected impacts under each alternative.

Votes: Chap. 4 provides background for all information summarized here. All impacts in the back-up White Sands Wolf Recovery Area under Alt. A depend on whether the area is used. This table emphasizes quantifiable adverse impacts and is not a cost-benefit summary. Monetary losses are in 1994 dollars.

Key: BR = Blue Range Wolf Recovery Area; WS = White Sands Wolf Recovery Area.

Alternative	Net impact of wolf recovery on wild prey populations (low to high range) ¹	Impact on annual hunter take in area (low to high range) ¹	Annual lost value of hunting (low to high range)*	Annual lost hunter expenditures in region (low to high range)*	Number of cattle killed annually (low to high range)
A (Preferred Alt.)	BR: 4,800-10,000 fewer deer; 1,200-1,900 fewer elk	BR: 300-560 fewer deer; 120-200 fewer elk	BR: \$716,800- \$1,336,600	HR: \$579,100- \$1,079,100	BR: 1-34
	WS: 1,200-3,000 fewer deer	WS: 10-24 fewer deer	WS: \$3,000-\$7,100	WS: \$2,900-\$7,000	WS: 0.01-0.3
B	HR: 970-1,900 fewer deer; 230-350 fewer elk	BR: 57-110 fewer deer; 24-33 fewer elk	BR: \$123,100- \$214,800	RR: \$58,200- \$101,500	BR: 0.03-1
	WS: 760-2,000 fewer deer	WS: 5-11 fewer deer	WS: \$1,500-\$3,300	WS: \$1,500-\$3,200	WS: 0
C	BR: 3,700-8,800 fewer deer; 870-1,700 fewer elk	BR: 240-480 fewer deer; 90-150 fewer elk	RR: \$582,800- \$1,119,200	BR: \$470,700- \$902,700	BR: 1-34
D³	not modelled	not modelled (none in Big Bend NP)	not modelled (none in Big Bend NP)	not modelled (none in Big Bend NP)	not estimated (none in Big Bend NP)

¹ Figures given compare prey populations under the wolf reintroduction scenario, at a point in time five years after the wolf population goal for the area is achieved, to what the prey populations are projected to be if wolves are not reintroduced.

² These figures likely overstate the actual losses. Hunters may not actually hunt less overall because of fewer deer and elk in the wolf recovery areas, but instead turn their attention to substitute areas or species. Further, deer and elk hunting in Arizona and New Mexico are dominated by resident hunters. Most of the money not spent by residents as hunter expenditures in the region probably will be spent in some other sector of the state economy.

³ All projected impacts in the potential natural recolonization areas are speculative

(continued on next page)

Table 2-8. Continued.

Alternative	Value of cattle killed annually (low to high range) ⁴	Economic benefits	Impacts on ADC activities	Impacts on government policies and plans	Impacts on land use and military activities	Impacts on recreation
A (Preferred Alt.)	HR: \$640-\$21,600	BR: increased recreational use value and expenditures	BR: M-44 and neck snare restrictions; limits on other tools	BR: conflict with local ordinance ⁵	BR: minor access restrictions near pens, dens, and rendezvous sites	BR: increased visitation
	WS: \$10-\$200	WS: little impact	WS: little impact	WS: limited conflict with local ordinance ⁵	WS: very limited access restrictions; inconvenience for security administration	WS: little impact
B	RR: \$20-\$600	BR: limited increased recreational use value and expenditures	RR: limited M-44 and neck snare restrictions; limits on other tools	HR: no conflict	BR: minor access restrictions near pens, dens, and rendezvous sites	BR: limited increased visitation
	WS: \$0	WS: no impact	WS: no impact	WS: no conflict	WS: very limited access restrictions; inconvenience for security administration	WS: no impact
C	BR: \$640-\$21,600	BR: increased recreational use value and expenditures	BR: M-44 and neck snare restrictions; limits on other tools	BR: conflict with local ordinances; potential conflict with San Carlos and White Mountain Apaches' tribal sovereignty	BR: access restrictions near pens, dens, and rendezvous sites; restrictions on grazing and other activities	BR: increased visitation
D³	not estimated (none in Big Bend NP)	All 3 areas: increased recreational use value and expenditures	All 3 areas: M-44 and neck snare restrictions; limits on other tools	All 3 areas: no conflict	All 3 areas: access restrictions near pens, dens, and rendezvous sites; restrictions on grazing and other activities	All 3 areas: increased visitation

⁴ Livestock losses may be compensated by a private depredation compensation fund

Chapter 3

Affected Environments



CHAPTER 3

Affected Environments

Introduction

Chapter 2 designated the areas in the Southwest in which the four alternative actions would take place. Chapter 3 will describe these areas geographically, biologically, and socially. This description will provide the framework for analyzing the potential impacts of each of the alternatives in Chapter 4.

Alternatives A, B and C are the alternatives under which the Fish and Wildlife Service (FWS) would actively reintroduce captive-raised Mexican wolves into the wild. The areas that would foreseeably be affected by these alternatives overlap.

The affected areas under Alternative A could include the entire the Blue Range Wolf Recovery Area (BRWRA) and the White Sands Wolf Recovery Area (WSWRA) (Fig.s 3-1 and 3-2); however, the use of the WSWRA as a back-up area is conditional. The affected areas under Alternative B are just the primary recovery zones within both the BRWRA and WSWRA. Under both Alternatives A and B, the FWS would attempt to recapture and remove any wolves that established territories outside the designated boundaries. Pending recapture, areas outside these boundaries could also be affected, but to a relatively minor degree.

Alternative C is limited initially to reintroduction in the BRWRA (reintroduction into the WSWRA has been dropped since the DEIS). Nevertheless, this alternative potentially affects the largest area of any alternative. Impacts are not limited to the BRWRA. Impacts also may occur wherever the wolves disperse. Dispersal areas under Alternative C cannot be predicted with confidence; however, this chapter provides general descriptions of the most likely, or foreseeable, dispersal areas.

The areas most likely affected if natural wolf recolonization occurred at some point in the future under Alternative D, the “No Action” alternative, are distinct from the areas affected by Alternatives A, B, and C. These “potential natural recolonization areas” are described at the end of this chapter.

Blue Range Wolf Recovery Area (BRWRA)

Geography

The BRWRA includes all of the Apache and Gila National Forests (NF) in east-central Arizona and west-central New Mexico, encompassing 4,386,245 acres, or 6,854 mi² (Fig. 3-3). The BRWRA is located within southern Apache and northern Greenlee counties in Arizona, and southern Catron, northern Grant, and western Sierra Counties in New Mexico. Elevations range from under 4,000 feet in the semi-desert lowlands along the San Francisco River to 11,000 feet on Mount Baldy, Escudilla Mountain, and the Mogollon Mountains. Lower elevations are characterized by rolling hills with moderately steep canyons and sandy washes. Major drainages, such as the Gila and San Francisco Rivers, have carved steep-walled canyons through the lower areas. Higher elevations are characterized by rugged slopes, deep canyons, elevated mesas, and rock cliffs.

Climate

The BRWRA has relatively mild weather with cool summers and moderate to cold winters over most of the higher elevations, and warm year-round temperatures in the lower elevations. Extremes range from -32°F to 101°F (Johnson et al. 1992). At Alpine, Arizona (elevation 8,050 feet), the average minimum temperature is 27.9°F and the average maximum is 58.7°F. At Clifton, Arizona (elevation 3,470 feet), the average minimum temperature is 51.5°F and the average maximum is 79.0°F. Annual precipitation varies from seven to 12 inches in the southern woodlands to 30 to 37 inches in the mixed conifer forests and averages almost 21 inches in the area. Most precipitation falls during thunderstorms between mid-July and September. Snow falls in the higher elevations from December through March (Allen 1993).

Figure 3-2. Affected areas under Alternatives A and B in the White Sands Wolf Recovery Area Region.

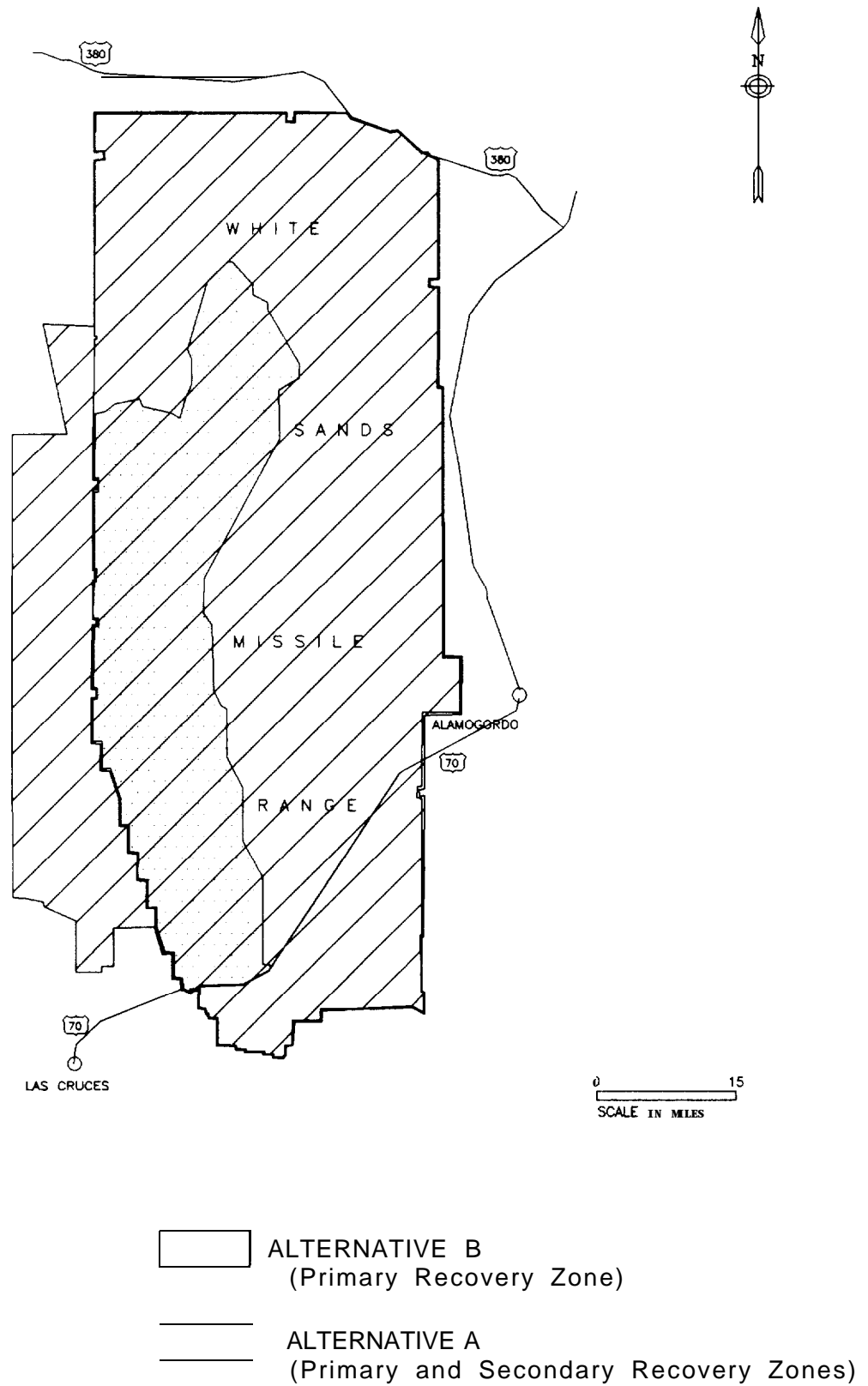
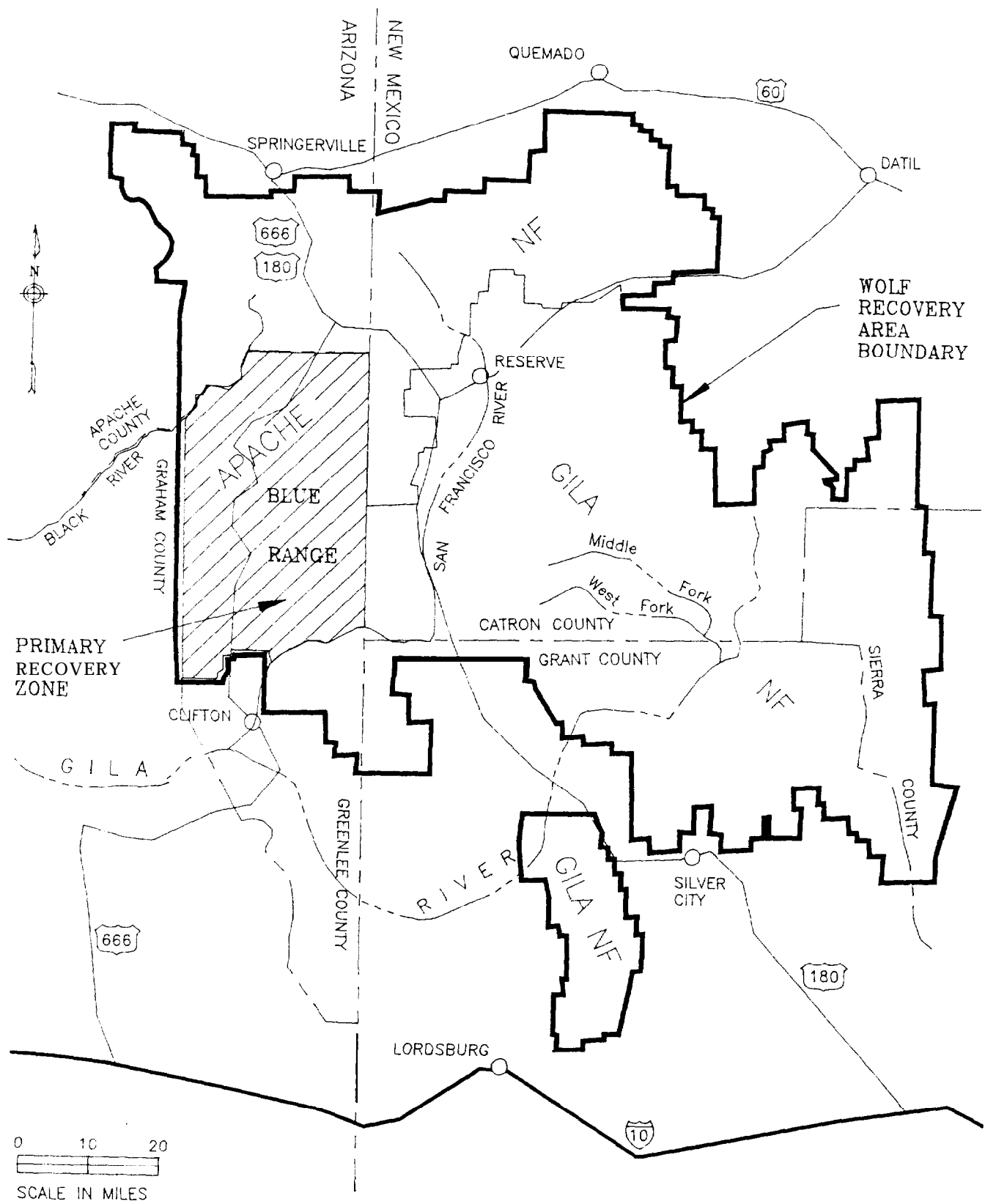


Figure 3-3. Blue Range Wolf Recovery Area.



Water

Natural springs and streams supplemented with sources constructed for livestock and wildlife are widely dispersed (Allen 1993). The BRWRA contains several major drainages, including the Little Colorado, Gila, San Francisco, Blue, and Black Rivers, Eagle Creek, and the North and San Agustin Plains. A total of almost 1,465 miles of permanent streams and about 4,244 acres of lake surface area are present. The Blue Range Primitive Area, in the southern Apache NF, has 22 perennial water sources and 730 developed sources. The Gila NF contains about 2,800 developed water sources for livestock. These are less common in the ungrazed portions of the wilderness areas within the Gila NF (Johnson et al. 1992; SW Region USFS 1987a)

Vegetation

The most prevalent biotic communities in the BRWRA are: petran montane and great basin conifer forests, plains and great basin grasslands, Madrean evergreen woodland, and semidesert grasslands. Petran montane conifer forests, occurring generally from 6,650 feet to 8,050 feet elevation, are characterized by ponderosa pine often interspersed with aspen or fir stands. Great basin conifer forests, at 4,900 feet to 7,550 feet, are dominated by juniper and piñon. Plains and great basin grasslands occur between 4,900 feet and 7,550 feet and are comprised of a variety of grasses; however, fire suppression and overgrazing have altered some of this landscape so that mesquite, juniper, and forbs now are widespread within the BRWRA. In Madrean evergreen woodlands, at 3,950 feet to 7,200 feet, evergreen oaks, juniper and piñon dominate. Occurring at 3,600 feet to 5,600 feet, semidesert grasslands consist of a variety of grass and scrub vegetation (Brown 1982).

Vegetation at the higher elevations of the BRWRA is dominated by mixed conifer stands (437,720 acres). As the terrain slopes toward the Black River, in the upper Blue River watershed, and throughout the Gila NF, ponderosa and white pine forests occur interspersed with understories of oak, piñon, juniper, douglas and white fir, mountain mahogany, and ceanothus (totalling approximately 1,941,230 acres in the BRWRA). Lower elevations support pifion-juniper woodlands and Madrean evergreen woodlands (2,352,430 acres).

Grasslands are interspersed throughout all vegetation types (484,480 acres). The northern portion of the Apache NF includes an extensive high altitude grassland near the summit of the White Mountains. Some areas such as Four Bar Mesa in the southern Apache NF have had extensive control of woody vegetation to preserve the scarce grasslands. Most streams support riparian plant communities, encompassing 46,780 acres in the BRWRA. Fremont cottonwood, sycamore, walnut, boxelder, ash, and hackberry are common at lower elevations; and narrowleaf cottonwood, willows, alders, maples, red osier, and berry bushes are common along higher elevation streams (Allen 1993; SW Region USFS 1987a; SW Region USFS 1986a).

Historically, vegetation in the Apache NF was typified by open-canopied forests and grassland areas interspersed with forested areas. The trend has been and is predicted to continue to be toward expansion of coniferous and woodland vegetation, resulting primarily from decades of fire suppression and secondarily from reduced timber harvesting. The trend in all forest types below the Mogollon Rim follows that experienced above the Rim, especially in the pifion-juniper woodland type, where the shift is from open-canopy stands dominated by mature juniper trees, sparsely scattered pifion, and grey oak to a much denser woodland dominated by pifion (Hayes 1995a). Federally endangered, threatened, proposed, and candidate plant:: are listed in Appendix D.

Animals

History of Wolves

Mexican wolves formerly ranged throughout central and southeastern Arizona and southern New Mexico, including the Mogollon Rim, White Mountains, Black Range, and the Blue and Black River region (Brown 1983; Young and Goldman 1944). Bailey (1931) estimated that 100 wolves occupied the Gila NF area in 1906. Through the 1940s occasional reports of wolves continued from the White Mountain Apache (or Fort Apache) Reservation and the San Carlos Apache Reservation west of the Apache NE. In 1960 the last confirmed wolf in east central Arizona was trapped on the Fort Apache Reservation. No wolves have been confirmed to exist in or near the proposed BRWRA since (Brown 1983, Whitaker et al. 1995). However, **six unconfirmed reports alleged to**

be “wolves” have come from the BRWRA since 1983 (Girmendonk 1994a; Wolok 1994).

Species of **Special Concern**

Endangered species listed by the FWS as presently, or historically, occurring in the BRWRA include the Gila trout, Gila topminnow, American peregrine falcon, whooping crane, northern aplomado falcon, bald eagle, southwestern willow flycatcher, and black-footed ferret. Federally threatened species include the Chihuahua chub, beautiful shiner, spokedace, loach minnow, Apache trout, little Colorado spinedace, and Mexican spotted owl (USFWS 1994a and 1993b). The proposed and candidate species for federal listing also are found in Appendix D. The FWS is investigating the possibility of releasing a population of federally endangered California condors in the Black Range of New Mexico (R. Marshall, USFWS, pers. comm.). The FWS also is proposing to extend protection of the endangered jaguar throughout its range, including the southwestern U.S.

At present, approved critical habitat is associated only with the federally threatened Little Colorado spinedace, in the northern extreme of the Apache NF for approximately five miles along Nutrioso Creek (52 Fed. Reg. 35034, Sept. 16, 1987). Critical habitat has also been designated for the spokedace, loach minnow, and Mexican spotted owl by the FWS, but is in an uncertain legal status.

In addition, the State of Arizona has designated the water shrew and meadow jumping mouse as species of special concern in the BRWRA (AGFD, In prep.), and New Mexico lists as endangered the Gila spring snail, New Mexico hot spring snail, chloride oreohelix, roundtail chub, lowland leopard frog, Gila monster, green rat snake, narrowhead garter snake, Gila woodpecker, Bell's vireo, gray vireo, common black-hawk, southwestern willow flycatcher, spotted bat, Arizona montane vole, and desert bighorn sheep (NM Natural Heritage Program 1994).

Potential Wild Prey of Wolves

Large ungulates include white-tailed and mule deer, elk, and, to lesser extents, javelina, pronghorn, and Rocky Mountain bighorn sheep (Allen 1993). Annual ungulate survivorship and reproduction in the Southwest vary with precipitation levels, grazing quantity and quality, and management practices (Johnson et al.

1992). White-tailed deer in the BRWRA generally inhabit steep-sloped woodlands featuring oak, juniper, and piñon. They also are found in ponderosa pine forests, desert scrub, deciduous forests, and occasionally spruce-fir communities. Mule deer are found usually between 4,000 feet and 7,000 feet elevation in coniferous forests from piñon-juniper to spruce-fir, but they can inhabit chaparral, desert areas, and higher elevations. Mule deer and white-tailed deer ranges frequently overlap. Elk are found in relatively high mountain areas in meadows and coniferous forests. They may move to lower elevations, living in piñon-juniper woodlands, mixed conifer forests, plains grassland, and occasionally in desert scrub. Elk cows, calves, and yearling males often winter in large groups in different areas than adult males. Around the Blue Range Wilderness Area in the Gila NF some elk are becoming year-round residents (E. Holloway, Gila NF, pers. comm.).

Javelina generally inhabit ponderosa pine woodlands, piñon-juniper and oak woodlands interspersed with grasslands, desert scrub, desert grasslands, and chaparral. They also occur on desert mountain ranges and in thickets along creeks and washes. Pronghorn inhabit shortgrass plains and meadows ranging from desert areas to high plateaus. Bighorn sheep are found in mountains, preferring precipitous ranges with broken rock and steep gullies, along washes or creek beds, or near natural water sources. Rocky Mountain bighorn sheep move between higher summer and lower winter ranges in the Apache NF, but remain year-long residents at about 4,000 feet elevation in the Gila NE (Desert bighorn sheep prefer areas between 3,000 and 4,000 feet elevation in jojoba communities where galleta is the dominant grass between shrubs) (AGFD 1994a; Hoffmeister 1986; E. Holloway, Gila NF, pers. comm.).

The BRWRA as a whole contains an estimated 57,170 deer of both species (average density 8.3/mi²). The deer population in the Gila NF generally appears stable (Gonzales 1993), although deer in the Glenwood Ranger District appear to be declining (Baldwin 1995; E. Holloway, Gila NF, pers. comm.). The Apache NF is experiencing a decline in deer likely related to low fawn crops and declining habitat quality resulting from unfavorable vegetation succession largely due to decades of fire suppression. Approximately 15,800 elk (2.3/mi²) are found in the BRWRA (AGFD 1994a; Girmendonk 1994b; Gonzales 1993). This population has increased during recent years

(Allen 1993). Javelina are estimated at 2,380 (0.3/mi²) and are stable on the Gila NF and increasing on the Apache NE Pronghorn number 750 (0.1 /mi²) and are declining, possibly due to consistently low fawn survival, habitat fragmentation, poor habitat quality, and inconsistent land management practices. Rocky Mountain bighorn sheep total about 520-620 (0.08/mi²) in the BRWRA (D. Cagle, AGFD, pers. comm., Gonzales 1993). Herds are declining in the Gila NF and along the San Francisco River in Arizona, while the population in the Apache NF appears to be stable or slightly increasing through recent reintroductions and expansion of some herds.

In the BRWRA primary recovery zone alone (the southern portion of the Apache NF), there are approximately 3,400 white-tailed deer (3.3/mi²), 9,900 mule deer (9.6/mi²), 3,050 elk (3.0/mi²), 600 javelina (0.6/mi²), 380 bighorn sheep (0.3/mi²), and 40 pronghorn (Girmendonk 1994b; D. Cagle, AGFD, pers. comm.).

Jackrabbits are common in open woodlands at lower elevations (less than one-quarter of the whole BRWRA area). Beavers, cottontails, skunks, various tree and ground squirrels, chipmunks, rats, voles, and other small mammals are fairly common in the BRWRA (SW Region USFS 1992a; Hoffmeister 1986). Porcupines occur irregularly. These animals, as well as possibly Merriam's turkeys, may be taken by wolves occasionally. Little trapping occurs in the area; a recent anti-trapping law passed in Arizona has eliminated any commercial and recreational trapping in the primary recovery zone.

Hunting

Arizona and New Mexico's Departments of Game and Fish manage public hunting in their respective portions of the BRWRA. In 1992 in the BRWRA, 19,453 hunters harvested 4,426 deer (22.8% success) and 7,250 hunters took 2,767 elk (38.2% success). Seventy-five hunters took 32 pronghorn (42.7% success). Also in 1992, about 335 hunters harvested 108 javelina (32.1% success), and six hunters took four Rocky Mountain bighorn sheep (66% success) (Girmendonk 1994b; Gonzales 1993). Hunting trends from 1988 through 1992 are presented in Table 3-1. Deer harvests since 1983 have fluctuated slightly. Since 1983, the trend has been toward steadily increasing elk harvests.

In the Arizona portion of the BRWRA hunting seasons for deer occur from late August to mid-September and from October through January, and include general firearm, muzzleloader, and archery seasons (Girmendonk 1994b). Archery, general firearm, and muzzleloader seasons are held for elk hunting. Elk seasons are open during September, October, November, and early December. General firearm and archery seasons for javelina run at various times from January to early March. Pronghorn hunting seasons are concentrated around August and September, and include general firearm, muzzleloader, and archery. For Rocky Mountain and desert bighorn sheep, October and December permits are issued to take any ram by firearm or bow. The black bear hunting season is from August through September and March through April, during which time hunters can take one animal per calendar year. Mountain lion hunters may take one animal per calendar year.

In the New Mexico portion of the BRWRA hunting occurs primarily in the fall and mid-winter. Two archery deer seasons usually are scheduled in September and January, during which one fork-antlered deer can be harvested. Three rifle deer seasons occur in November, allowing one fork-antlered deer to be taken. One archery elk season is scheduled in September. One elk of either sex can be taken. Several limited entry elk hunts are scheduled in September and October, and one limited entry javelina hunt is scheduled in February. One limited entry, mature buck pronghorn season usually is scheduled for two days in late September or early October. Two Rocky Mountain bighorn sheep hunts are scheduled in January (Gonzales 1993). The black bear hunting season occurs September 1 through October 30 and is limited to one bear. Mountain lion hunting can occur from December 1 through March 31 with a bag limit of one lion. Dogs can be used to take bears and lions, but bear baiting is prohibited in New Mexico. About 3% or less of resident New Mexican deer hunters use hunting guides, whereas 12% of deer hunters who come from outside the state use guides (Zia Res. Assoc. 1990).

Existing Livestock Predators

The primary livestock predators are the coyote, lion, and bear (Phillips 1993). Coyotes are common residents of the BRWRA. Black bears are fairly com-

Table 3- 1. Average harvests, numbers of hunters, and success rates in the general BRWRA area, 1988-1992.

	Average Harvest		Average # Hunters		%Hunter Success	
	AZ	NM	AZ	NM	AZ	NM
Deer	1,322	2,874 ²	6,237	11,353 ²	21.2	25.3
Elk	788	1,236	1,676	4,330	47.0	28.5
Javelina	106	71	331	NA	32.0	NA
Pronghorn'	30	2.5	44	15	68.2	16.7
Bighorn sheep	4	6	4	NA	100.0	NA

¹Pronghorn were not hunted in Nhl until 1991

²Figure is for 1989-92

SOUKCES: ADGF 1994a; Girmendonk 1994b; NM DGF 1994; Gonzales 1393.

mon (SW Region USFS 1992a). Predator numbers and densities for the Apache NF are depicted in Table 3-2. For the Gila NF, predator numbers are not available (J. Gonzales, NMDGF, pers. comm.).

From 1987 through 1991, total estimated livestock losses (all cattle) from existing predators averaged about 1% of permitted livestock on the Apache NF (Myers and Baxter 1993). Comparable depredation rates probably occurred on the Gila NF (S. Libby, Gila NF, pers. comm.). The U.S. Department of Agriculture, Animal Damage Control Division (ADC) has depredation control agreements with 53 ranches that graze 170,819 acres in the BRWRA, although no ADC control has occurred in the Gila NF in recent years (A. May, NM ADC, pers. comm.). From 1987 through 1991, permittees on the Apache NF reported that 628 head of livestock were killed by predators, averaging approximately 126 head reported killed each year. Each year the number of depredations confirmed by ADC is much less than the number reported (Phillips 1993). Of the 132 grazing permittees on the Gila NF, 48 responded to a 1993 survey conducted by the New Mexico office of ADC (May 1993). Thirty-seven (77%) reported livestock depredation in 1993, involving 109 cattle and 234 calves. Forty-one permittees believed that coyotes were responsible, 33 said that mountain lions were responsible, and 25 reported that bears were involved. The highest rate of depredation occurs from March through May.

Land Ownership and Management

The U.S. Forest Service manages most of the land within the BRWRA boundaries; on the Arizona side

about 94% is National Forest while on the New Mexico side about 96% is National Forest. The remaining land is primarily private or under state or BLM management. Each National Forest has developed its own land and resource management plan. The Apache and Gila National Forest Management Plans guide federal goals and objectives in the BRWRA. The management emphasis for forested lands in the Apache NF is "a combination of multiple uses including a sustained yield of timber and firewood production, wildlife habitat, livestock grazing, watershed, and dispersed recreation" (SW Region USFS 1987b). For woodland areas in the Apache NF, management emphasizes fuelwood production, wildlife habitat, watershed condition, livestock grazing, and indicator species such as mule deer and elk. The mission of the Gila NF is "to provide multiple use and sustained yield of goods and services in a way that maximizes long-term net public benefits consistent with resource integration, environmental quality, and management considerations" (SW Region USFS 1986b). Emphasis is placed on maintaining or increasing herbaceous forage for wildlife and managing coniferous woodlands to provide high quality habitats.

The Forest Service manages just over one million acres of designated wilderness in the BRWRA. The goals of wilderness management are to minimize human development, to maintain natural biological and physical features, and to provide quality recreation. The areas are the Blue Range Primitive Area (187,410 acres), and the Bear Wallow (11,080 acres), Escudilla (5,200 acres), Mount Baldy (7,097 acres), Gila (558,065 acres), Aldo Leopold (202,016 acres), and Blue Range (29,304 acres) Wilderness Areas. Two Wilderness Study Areas in the Gila NF total another

Table 3-2. Approximate predator densities¹, 1995-94, and total predators taken by ADC², 1987-91, in Arizona portion of Apache National Forest.

	Predators present (animals/mi ²)	Predators taken by ADC
Coyote ³	1,950 (1.03)	68
Black bear	824-1,283 (0.44-0.68)	13
Mountain lion	40-103 (0.02-0.05)	11

¹Assumes an even distribution of populations.

²All ADC activities were conducted in the Alpine and Clifton Ranger Districts

³Numbers reflect an approximation of spring 1994 breeding population only.

SOURCES: USFWS 1993c; AGFD 1994b.

27,660 acres (SW Region USFS 1986b). The only National Park Service unit in the BRWRA is the 533-acre Gila Cliff Dwellings National Monument located within the Gila NE. The monument preserves the homes of Native Americans who lived within this canyon area from the 1280s through the early 1300s.

Agency and Local Government Plans and Policies

U.S. Forest Service

Management in the BRWRA has focused on several human-induced problems such as the loss of habitat diversity and disproportionate levels of key successional habitat stages, resulting from the control of natural disturbance regimes (fire, insects, and disease) and the effects of past timber and livestock grazing practices. Current directions for wildlife management include coordination of wildlife needs with other resource uses, direct habitat improvement work, protection of threatened and endangered species, and cooperative efforts with the Arizona and New Mexico Departments of Game and Fish and the U.S. Fish and Wildlife Service (Hayes 1995b; SW Region USFS 1987a; SW Region USFS 1986a).

The National Forest Plan 1993 amendments for the Southwestern Region call for management of federally threatened and endangered species habitat "to achieve declassifying in a manner consistent with the goals established by the U.S. Fish and Wildlife Service" and by the Arizona and New Mexico Game and Fish Departments (SW Region USFS 1993b). Also, the guidelines and standards for management of Mexican spotted owls and northern goshawks (a

candidate for federal listing) emphasize three activities: surveying to identify the extent and location of populations of the birds; protecting key habitat areas; and managing for long-term maintenance of suitable habitat (SW Region USFS 1993b).

In addition, key elements of the Forest Service reinvention plan are to promote sustainable ecosystems and to provide public service (USDA Forest Service 1994). The Southwestern Region of the Forest Service will continue implementing integrated resource management to guide ecology-based multiple use management (SW Region USFS 1993a). The Forest Plans for both the Apache and Gila NF establish guidelines for integrated management and provide standards to manage for habitat diversity, riparian and stream values, and forest and rangeland health. Under the Forest Plans, old-growth areas will be retained, and moving timber management away from even-aged to uneven-aged management is being emphasized (Hayes 1995b; SW Region USFS 1987b, 1986b).

In addition, the application of prescribed natural fire is expanding over much of the BRWRA. Most of the Gila NF is under revised prescribed fire plans that provide for the use of natural fire both within and outside wilderness areas. Similar plans are in place in the Apache NF within the BRWRA outside of wilderness, but are limited in extent. Analysis is underway to expand the use of prescribed natural fire for the Blue Range and 200,000 acres of the Clifton Ranger District, both in the Apache NF (Hayes 1995b).

The range management emphases on the Apache NF are on high quality forage and improvements. These emphases are shifting through consideration for the following, in order of priority: allotments that have threatened and endangered species; coldwater

fisheries; allotments with no management plans; allotments with management plans that do not comply with the overall Forest Plan; allotments with management plans that have not been implemented; allotments where plan implementation is progressing; and allotments that have reached the objectives of the Forest Plan (SW Region USFS 1987b).

In the Gila NF the emphasis is on increasing grazing capacity to meet current and planned permitted use through intensive management. The range goals of the Gila NF Plan are to provide forage to livestock, cooperate with other agencies and landowners to reduce impacts of grazing, and to manage for threatened and endangered species (SW Region USFS 1986b).

State of Arizona

Arizona does not have a statute specifically protecting endangered species. However, the state legislature granted the Game and Fish Commission broad authority to regulate wildlife (ARS sec. 17-23 1). In response, the Commission created Policy J. 10, amended in 1991 as Policy A2. 11. The policy states that the Department shall administer a nongame and endangered wildlife program, develop lists of state-threatened species, and implement a re-establishment program with the goal of recovering listed species (see Appendix E, Twelve-Step Procedure for Reestablishment of Non-game and Endangered Species (AGFD 1987)). The Department has drafted a "Cooperative Reintroduction Plan for the Mexican Wolf in Arizona" that calls for a reintroduction effort in the Blue Range Area in cooperation with the Fish and Wildlife Service (Groebner et al. 1995).

In 1994 Arizona voters adopted an anti-trapping initiative (amending ARS sec. 17-30 1), which makes the use of several wildlife capture devices illegal, including leghold traps. However, the law does not prohibit "the use of snares, traps not designed to kill, or nets to take wildlife for scientific research projects, falconry, or for relocation of the wildlife as may be defined or regulated by the Arizona Game and Fish Commission and or the Government of the United States."

State of New Mexico

The New Mexico Wildlife Conservation Act (NMSA sec.s 17-2-37 to -46) and regulations (NM State Game Commission Reg. No. 682) list the Mexican wolf as a state-endangered species. The statute prohibits taking, possessing, transporting, exporting, processing, selling, or shipping a state-listed species, and authorizes the New Mexico Department of Game and Fish to establish management programs. State-listed species may, however, be taken to "alleviate or prevent damage to property or to protect human health" (NMSA sec. 17-2-42D).

Counties

Most of the National Forest land in the BRWRA falls in **Greenlee** and **Catron** Counties, with smaller portions in southern Apache, northern Grant, and western Sierra Counties (Fig. 3-3). About 2/3rds of both **Greenlee** and **Catron** Counties are in the BRWRA.

Sierra and **Catron** Counties have land use ordinances establishing the counties' environmental planning and review process. The ordinances seek to identify federal agency legal obligations regarding decisions affecting the environment (Sierra County Ord. No. 92-012; **Catron** County Ord. No. 002-93). These ordinances assert that federal decisions within these counties are subject to a local approval process. They also call for coordinated analyses that address numerous impact areas of local interest. Also, in 1995, Apache and **Greenlee** Counties adopted land use and resource policies with some goals similar to the ordinances described above, although **Greenlee** County's does not appear to assert authority as such (Apache Co. Bd. of Sup. Res. No. 95-28; **Greenlee** Co Bd. of Sup. Res. of June 6, 1995). **Catron** and Sierra Counties also have passed ordinances prohibiting release into the wild of any animal of the genus *Canis* (**Catron** County Ord. No. 002-92; Sierra County Ord. No. 94-00 1).

Land Development

Although there are many proposals in the BRWRA, there are no major land developments in the construction phase or with definite plans to proceed. The Forest Service and other agencies will continue present management, including limited timber harvesting,

grazing improvements, fire management, flood control, and recreational improvements. No ski areas exist in the BRWRA; however, the potential for downhill ski facilities exists at sites in the northern portion of the Apache NF near Alpine (SW Region USFS 1987a), and possibly in the Mogollon Range in the Gila NE Geothermal potential exists on National Forest land near Nutrioso. The Phelps-Dodge copper mines at Morenci in Greenlee County likely will continue to slowly expand in size, as will the other smaller mines around the BRWRA in Grant and Sierra Counties.

Vacation and retirement development in and around the BRWRA is expected to continue at a brisk rate in some areas, particularly in the Silver City area, where construction has been increasing at 5% annually (L.K. Jones, Grant Co. Econ. Dev. Office, pers. comm.), and in the Lakeside-Pinetop area in the southeastern portion of the Sitgreaves NE Additional possible recreational developments include a proposed dude ranch in the Beaverhead area of the Apache NF and expansion of camping and fishing facilities at Joy's Fish Hatchery near Blue on the Blue River (L. Ruger, Greenlee Co. Econ. Dev. Office, pers. comm.).

Livestock Grazing

Before addressing livestock grazing in the BRWRA specifically it is useful to understand the industry in the Southwest. Box 3-1 provides a general description. It should be noted that the numbers below are based on a 1993 compilation and that some reductions in allowable livestock numbers, and changes in grazing period for particular allotments, were required by the Forest Service in 1995. Many, but not all, of these reductions are under appeal, so their ultimate effect on the total number of livestock permitted remains unclear (M. Rising, Apache-Sitgreaves NF, pers. comm.).

Domestic livestock graze on 3,047,960 acres (69%) of the BRWRA. Large areas closed to or deferred from grazing include the 63,620-acre Sandrock Allotment, located in the Apache NF in the southern portion of the primary recovery zone, approximately 394,000 acres of the Gila Wilderness Area surrounding the Mogollon Mountains, and 43,000 acres in the Black Range within the Aldo Leopold Wilderness Area. The Sandrock Allotment, over half of which is located within the Blue Range Primitive Area, has been closed since 1983 to improve

range and watershed conditions. The Forest Service is going through a planning process to determine whether and how future livestock grazing may occur there.

Approximately 82,600 cattle total are permitted to graze in the BRWRA. (This is the cumulative number of permitted bulls, cows, and calves; not all allottees actually graze their full permitted numbers; also, the number should not be confused with AUMs, or Animal Unit Months). There are 208 allotments, averaging 397 cattle per allotment. Roughly 50% of the cattle are on year-round allotments while the rest are seasonal. Numerous grazing allotments have had major reductions in allowable cattle in recent years, largely for range improvement reasons. One flock of 7,000 sheep grazes on one allotment near the northern periphery of the Apache NE Scattered grazing of ranch horses also occurs throughout the area (Allen 1993).

Within just the BRWRA primary recovery zone, 10,494 cattle are permitted to graze. There are 35 allotments, averaging 300 cattle per allotment. Again, 50% of the cattle are on year-round allotments and the rest are seasonal. One dude ranch in the primary recovery zone is authorized to graze 47 horses.

Most of the cattle graze in remote, mountainous areas and are infrequently seen by their owners. Roughly 60% of the calves are born on the open range, away from the ranch headquarters. Because the cattle are neither concentrated nor closely monitored by their owners these calves may be more susceptible to predation than calves of different cattle operations (Allen 1993).

Forestry

Timber harvesting and related activities such as planting and thinning are planned by the Forest Service to sustain forest health, forest products, threatened and endangered species habitats, other wildlife habitat needs, biological diversity, rural community stability, and social values. Approximately 15,000 acres per year are required to sustain an annual harvest of approximately 30 million board feet to regional sawmills. Forest products include sawtimber, pulpwood, salvage material, and fuelwood. The majority of timber lands in the BRWRA are managed for even-aged stands. Future harvests will be from smaller diameter trees to improve forest diversity through creation of small openings in large monotypic

Box 3- 1. General description of southwestern cattle ranching.

Most of the ranches in the areas addressed in this EIS are cow/calf operations, which means the rancher has a base breeding herd of mother cows and bulls. A typical size operation has about 170 mother cows. While the timing of calving varies with the rancher's bull management, most calves are born in late winter and early spring. This is the most critical period for exposure to depredation. The rancher sells the annual calf crop for income at about ten months of age. Marketing can occur throughout the year but is concentrated in the fall. A small number of yearling operations are present in which young cattle are held on a ranch for a period of growth until all are sold at about 18 months of age. Yearlings tend to be less susceptible to predation than calves.

Most of the ranchers in the areas considered here rely on public land grazing allotments (the exception being the southwestern New Mexico potential natural recolonization area with its very large private ranches). Ten-year permits are issued to the owners of private tracts known as "base properties" within the allotments. Grazing seasons can range from year-long to as short as one month. Each allotment has a management plan specifying the number of animals allowed and other measures, such as rest and rotation, to prevent overgrazing and other damage. Public land grazing fees, which vary according to a formula that accounts for beef prices and other factors, are important in this cyclical business of marginal profitability. Fees are subject to an ongoing federal reform process that may lead to future increases. Another important factor in profitability is the rate of predator losses. Indeed, predator loss trends are one of the factors considered in calculating the grazing fee formula.

Economic returns from ranch sales vary with the market for beef, which has been depressed for several years. Typical livestock receipts on a large ranch in Arizona and New Mexico total about \$130,000. A typical year for a large ranch yields a return on total assets of 1.8% to 2.0%. Median net ranch income is around \$17,000 annually. The average rancher spends close to \$50,000 per year locally for goods, services, and employee wages.

Ranch returns may be negative, especially for smaller operations. In other words, many small ranchers exist on depreciation. Many rely on other jobs to supplement their incomes. Because the rates of return do not attract capital into the industry, few young people are attracted to it. Thus, the ranching population averages 55 years of age. Typical ranchers in Arizona and New Mexico have been on the same ranch for a long time, i.e., about 31 years. The employment outlook for ranch foremen and cowboys is negative, with employment losses for New Mexico projected at about 8% between levels in 1988 and the year 2000.

Sources: Allen (1993), Bur. Econ Res. and Analysis (1991), U.S. BLM (1994), Fowler et al. (1993), New Mex. Coop. Exten. Serv. (1992), New Mex. Dep't of Agric. (undated).

stands (Allen 1993; SW Region USFS 1987a; SW Region USFS 1986a).

Of the total National Forest acreage in the BRWRA, 1,242,890 acres (28.3%) are suitable for timber harvesting. Another 958,688 acres (21.9%) are classified as incapable of producing commercial timber; these primarily consist of mixed ponderosa pine-p&on-juniper stands at low elevations. An additional 258,912 acres (5.9%) are physically unsuitable for timber harvesting. Finally, 1,202,019 (27.4%) acres of piñon and juniper are currently classified as unsuitable by the Forest Service because it has inadequate information to determine suitability (SW Region USFS 1987a; SW Region USFS 1986a).

Most future harvesting will use existing roads. Reconstruction of existing roads will be primarily of low standard roads, averaging 30 miles per year. Much

of this reconstruction will involve moving roads away from environmentally sensitive areas such as meadows and riparian areas (Allen 1993). The Forest Service collected \$9,351,449 in timber fees for the BRWRA in 1993 (S. Lee, Apache NF, pers. comm.; M. Boyles, Gila NF, pers. comm.). This amount has decreased substantially due to logging restrictions.

Mining and Other Natural Resources Extraction

Several large open-pit copper mines are worked to the south of the BRWRA, including the South Dodge Tyrone mines southwest of Silver City **and** the Santa Rita/Chino mine east of Bayard in Grant County. Morenci, in Greenlee County, is the site of a 1.8-mile long open-pit copper mine immediately south of the

primary recovery zone. Phelps Dodge owns the mine and nearby smelter. About 450 million pounds of copper are produced each year, making it the nation's largest copper mine. On the Clifton Ranger District in the Apache NF one active mine has produced small amounts of gold (SW Region USFS 1987a).

Public Access and Recreation

Most of the BRWRA is adequately roaded for management activities, recreational access, transport of forest products, and livestock grazing (Allen 1993). Recreation is the fastest growing use of southwestern National Forests. The Forest Service constructs and upgrades campgrounds and other recreational facilities to meet the growing demand. Common activities include hiking, backpacking, horseback riding, hunting, fishing, snowmobiling, and driving for pleasure. The BRWRA contains 52 developed campgrounds and seven picnic areas. Several lakes offer fishing and boating. There are 2,320 miles of trails (Allen 1993).

Use is measured in Recreation Visitor Days (RVDs). Estimated use for 1992 in the BRWRA was 2,190,580 RVDs, including 1,068,620 RVDs for camping, 234,200 RVDs for hunting, 324,560 RVDs for hiking/horseback riding, 229,440 RVDs for fishing, and 336,760 RVDs for nature study (Allen 1993). Approximately 67 guides and outfitters provide service in the BRWRA (SW Center for Res. Analysis 1994), mostly for hunting. Average fees charged range from \$75 for photography to \$2,720 for an elk hunt.

Regional Economy, Employment and Population

The highest median household income in the region, \$28,570, is found around Silver City in Grant County, New Mexico. The lowest, \$18,460, is in Catron County, New Mexico, which also has the BRWRA's highest unemployment rate at 12.9% and the highest poverty rate at 25.6%. The central economic activities in the mostly rural BRWRA region are logging, ranching, mining, tourism/recreation, and farming (Catron County Commission 1992; 1990 U.S. Census).

Apache County

Coal-fired energy plants near St. Johns provide much of the economic base in addition to timber, tourism, government, and agriculture. Southern Apache County has relied heavily on economic activity associated with timber, with some recreational and retirement development "spilling over" from the Lakeside-Pinetop area to the west. Cattle ranching has declined in importance.

A small sawmill operates in Nutrioso, north of Alpine, a larger mill operates in Eager, and other wood processing facilities exist. Apache County recently opened an economic development office and is seeking to attract various businesses, including additional forest products manufacturing and microwave relays. Slow to moderate economic growth is projected (Ariz. Dept. Econ. Sec. 1993).

Greenlee County

Phelps Dodge's Morenci mine employs 2,100 people, about 80% of the county work force. Mine employment is projected to climb slowly (Ariz. Dept. Econ. Sec. 1993). Unlike Apache County to the north, tourism and recreation have not contributed much to the regional economy; however, they represent opportunities for future economic development (Ariz. Dept. of Commerce, n.d.). Timber production has declined in economic importance. Irrigated crop agriculture is important in the southern portion of Greenlee County. About 2/3rds of the cattle grazing in the county occurs in the northern portion in the Apache NF (M. Schneider, Greenlee Co. Agric. Ext. Office, pers. comm.).

Catron County

Ranching is the most important business in Catron County, with 175 mostly small- to medium-sized cattle ranches and 420 employees. Ranching is relatively more important to Catron County than to any other county in the BRWRA; the county cattle industry had more than \$20 million in sales in 1992. Crop agriculture plays a minor role. Government is a large employer, particularly with the county's preponderance of National Forest land.

The timber industry in the county has declined markedly. Reserve, the Catron County seat, formerly relied heavily on a Stone Container Corporation

sawmill for employment, which closed in 1992. The mill closure eliminated 140 to 160 jobs and also had a major negative secondary impact on employment in other businesses in the area (Catron Co. Comm'n 1992). The county has about 35 retail business establishments and no wholesalers (A. Thal, Western NM Univ., pers. comm.). Guiding and outfitting contribute more to Catron County's economy than to the economies of any other county in the BRWRA (SW Center for Res. Analysis 1994).

Grant County

Copper production represents the most important economic sector, followed by livestock. The Phelps Dodge mines at Tyrone and Santa Rita and the smelter in Hurley provide over 1,600 jobs.

More beef cows graze in Grant County than in any other New Mexico county (R. Lamb, Grant Co. Agric. Ext. Office, pers. comm.). Tourism, construction, light industry, and Western New Mexico University are other important economic contributors. Timber has decreased substantially in economic importance, reflected in the closing of area sawmills.

Sierra County

Retail trade (including recreation and tourism) and ranching are the top economic contributors (Sierra Co. Comm'n 1993). Most ranches are small, with fewer than 100 cows. However, two large ranches east of the BRWRA (the Ladder Ranch and the Pedro Armendariz Ranch), now in a single ownership, encompass about 800,000 acres. The owners have removed most cattle from these ranches and replaced them with a smaller number of bison to the economic detriment of the county due to reduced taxes (Sierra Co. Comm'n 1993).

Both the BRWRA as a whole and the primary recovery zone within the BRWRA have low population densities, averaging about one person per mi² (Tables 3-3 and 3-4). Silver City is the largest population center near the BRWRA, at about 11,000. The smaller population centers of Springerville/Eager (population 6,100), Clifton/Morenci (population 4,640), and Central/Bayard (population 4,400) lie just outside the borders of the BRWRA. The latter two population centers are associated with large copper mining operations. Few towns occur within

the BRWRA boundaries; the largest are Alpine (population 600) in Apache County and Reserve (population 310) in Catron County. Alpine is oriented toward tourism and recreation, while Reserve is the center of commercial and government activity in Catron County. A few small, isolated ranching communities exist in the BRWRA. Two within the primary recovery zone are Eagle Creek and Blue. Both communities consist of a dozen or so families, with their own schoolhouse but no commercial establishments within an hour's drive.

Population growth through the year 2000 is projected to be fairly high in the Springerville/Eager area in southern Apache County but low or negative in northern Greenlee County (Johnson et al. 1992). The population of Catron County is projected to be stable or to decrease through the year 2000, Grant County's population is projected to increase by about 4% above 1990 levels, and Sierra County's population is projected to increase about 8% above 1990 levels (Bur. of Bus. and Econ. Res. 1991).

Likely Dispersal Areas Associated with the Blue Range Wolf Recovery Area

The following areas adjacent to the BRWRA are foreseeably affected under Alternative C, which gives full Endangered Species Act protection to the reintroduced wolves (Fig. 3-1, above). The Service would not attempt to prevent the dispersal of the wolves out of the BRWRA under this alternative. The areas discussed are, in order: the San Carlos and White Mountain Apache reservations, the Lakeside Ranger District of the Sitgreaves NF, and the San Mateo Mountains unit of the Cibola NE. The largest areas are the two Indian reservations to the west of the BRWRA; these are addressed in the greatest detail.

San Carlos and White Mountain Apache Reservations

History of Wolves

Mexican wolves historically ranged across both reservations. Wolves were sporadically reported or caught on the reservations until 1960. In 1930, a pack of wolves was reported in the San Carlos Apache Reservation along the Black River. A wolf was taken in

Table 3-3. Summary of regional U.S. Census data for Blue Range wolf recovery area.¹

Total population	10,782
Population density	0.8/mi ²
Number in labor force	4,514
Percent of civilian labor force unemployed	8.3%
Percent of civilian labor force employed in agriculture, forestry or fisheries	16.3%
Median household income	\$21,612
Percent of population below poverty level	17.6%

¹Region covered by census tracts does not correspond exactly with recovery area boundaries; generally, census tracts include some adjacent rural areas around the recovery areas.

SOURCES: 1990 U.S. Census for following census tracts in Arizona: Apache County 390 1 and Greenlee County 9704. In New Mexico: all of Catron Country; Grant County 9841, 9842, and 9849; and Sierra County 7824.

Table 3-4. Summary of regional U.S. Census data for Blue Range wolf recovery area, primary recovery zone only.¹

Total population	1,371
Population density	1.1/mi ²
Number in labor force	519
Percent of civilian labor force unemployed	8.3%
Percent of civilian labor force employed in agriculture, forestry or fisheries	10.1%
Median household income	\$23,355
Percent of population below poverty level	17.2%

¹Region covered by census tracts does not correspond exactly with primary recovery zone boundaries; census tract includes a small adjacent rural area to the southeast of the recovery zone.

SOURCES: 1990 U.S. Census for Greenlee County census tract 9901.

the same area in 1938 and again in 1945. Unconfirmed wolf reports continued to surface on the reservations from 1945 through **1947**. **Two wolves** were caught on each the White Mountain and San Carlos Apache Reservations in **1946**. **The last confirmed wolf kill in Arizona came in 1960 in the** Grasshopper District of the White Mountain Apache Reservation (Brown 1983). An unconfirmed “wolf” sighting was reported on the San Carlos Reservation in 1087 and another was reported in the Apache NF just east of the northeast corner of that reservation in 1992 (Girmendonk 1994a). There continue to be reports of sightings on the White Mountain Apache Reservation. However, none of the sightings have been confirmed (White Mountain Apache Tribe 1995).

San Carlos Apache Reservation

Geography

The 1.8 million-acre San Carlos Apache Reservation occupies a range of elevations and habitats in east-central Arizona. San Carlos Reservation lands form the western boundary of the BRWRA (Fig. 3-1). The southern portion is mostly high desert, with the exception of 8,000-foot Mount Turnbull. To the north, high ridges and plateaus occur with several large prairies interspersed. The northeastern section consists of steep, densely forested terrain. The reservation is bordered to the east and west by National Forests, to the south by state, private, and BLM lands, and to the north by the White Mountain Apache Reservation.

Climate

At the town of San Carlos average low temperatures range from 32°F in January to 63°F in July. Average highs range from 55°F in January to 95°F in July. Annual average precipitation is 15.8 inches with 4.4 inches of snowfall. Moving north and east on the reservation and higher in elevation, average temperatures decrease and precipitation and snowfall increase.

Water

The perennial streams are portions of the Gila, San Carlos, Blue, Black, and Salt Rivers and Willow, **Bonita**, **Bear Wallow**, and Eagle Creeks, totalling **2 15**

miles. There are five main reservoirs, including Talkalai Lake, San Carlos Lake (the largest lake on the reservation), Seneca Lake, Point of Pines Lake, and Dry Lake, totalling 20,800 acres. Three hundred and sixty-two stock tanks have been built on the reservation, but many are in disrepair and have gone dry or are at low levels.

Vegetation

Vegetation types occurring on the reservation include piñon-juniper (470,580 acres), ponderosa pine (175,000 acres), oak (103,380 acres), mesquite (84,260 acres), and riparian (7,350 acres). The condition of the woodlands has never been classified. Overgrazing is causing soil erosion in many areas.

Animals

Species *of Special* Concern.-The Gila topminnow, razorback sucker, bald eagle, southwestern willow flycatcher, and American peregrine falcon are federally endangered species, and the federally threatened loach minnow, Mexican spotted owl, and spikedace may be found. Nongame wildlife species are poorly documented.

A portion of the critical habitat for the endangered razorback sucker is on the reservation. Activities which may adversely **affect** the critical habitat include construction and operation of hydroelectric facilities, irrigation, flood control, bank stabilization, oil and gas drilling, mining, grazing, introduction of nonnative fish, and resort facilities (59 Fed. Reg. 13374, Mar. **21**, 1994).

Potential Wild Prey of Wolves.-Coues white-tailed deer, mule deer, elk, javelina, pronghorn, bighorn sheep, turkeys, **Abert's** squirrels, ground squirrels, cottontails, jackrabbits, and wood rats occur on the reservation. The deer occur in relatively low density, with an estimated 2,410 mule deer and 850 Coues white-tailed deer occupying approximately the eastern one-fifth of the reservation. Migration of mule deer from the Apache-Sitgreaves NF is believed to occur, while the white-tailed deer are believed to be resident and nonmigratory.

The elk herds are dense. The resident Dry Lake herd consists of about 700 elk. The northeastern part of the reservation east of the Black River holds a resident elk herd of 100 to 150 animals and 500 to

1,500 elk that migrate onto the reservation from the north and east during the winter months.

Javelina are common in the southern portion. Pronghorn, possibly the Chihuahuan subspecies, historically have occurred in the Big Prairie area, and they currently number about 120. Pronghorn from Montana recently were introduced to Ash Flats and now number about 160. A population of Rocky Mountain bighorn sheep occupies an area south of the Natanes Mountains. Table 3-5 depicts potential wolf prey numbers and densities. These density figures were calculated over the entire reservation, although much of it is not suitable habitat.

Hunting.—The San Carlos Recreation and Wildlife Department, under the direction of the San Carlos Game and Fish Commission, is responsible for wildlife management. The tribal council is ultimately responsible for wildlife policy decisions. Big game permit fees are paid by non-tribal members. Bag limits for big game species usually are one animal per year, and small game season limits follow the Arizona state regulations. Bear permits are limited to keep hunter success high. Mountain lion harvest has been limited but is now being encouraged. Small game permits are unlimited.

Table 3-6 depicts hunter revenue and harvest for 1993. On the northeastern portion of the San Carlos Apache Reservation an average of 150 deer, 225 elk, and 2 pronghorn are harvested by an average of 450 (33.3% success), 435 (51.7% success), and 2 (100% success) hunters annually, respectively.

Trophy elk hunting by non-members has produced several record animals and non-member hunting represents a major tribal revenue source providing about \$500,000 in hunting revenues annually. Excluding mountain lion and turkey hunt revenues, the total fee income from non-member big game hunting was \$442,075 in 1993. During the 1994-1995 elk season, 18 non-member hunting permits for the Malay Gap herd alone were sold for a total of \$45,000. The tribe charges additional trophy fees of \$1,000 to \$3,000 for each elk that exceeds a certain trophy quality, which amounts to roughly \$5,000 annually. An additional \$25,000-30,000 is brought in annually from small game permits and another \$7,000 from trapping permits. About 35 licensed guides, mostly tribal members, receive varying amounts of revenue from guiding.

About 50% of the tribal member deer hunters hunt in the eastern one-fifth of the reservation. The mountains in the northeastern portion provide the bulk of elk hunting by tribal members, which adds significant protein to their diets.

Existing Livestock Predators.—Coyote numbers range locally between low to very high densities. Black bears number about 475, occurring most densely in the eastern one-fifth of the reservation. Mountain lions total approximately 200. Coyotes are controlled through aerial gunning, traps, and call-and-shoot. A part-time federal ADC employee works on the reservation. Between May and July 1993, the ADC trapped 90 to 100 coyotes in or near the pronghorn range in the eastern portion of the reservation. The tribe has a policy against the use of poisons. Lion control is encouraged to reduce livestock depredation, including a \$500 bounty offered by one livestock association.

Tribal Policies and Plans

The San Carlos Overall Economic Development Plan is being updated. The need for a comprehensive zoning plan has been identified. The primary document governing forest management policy is the tribe's 1982-1991 Forest Management Plan. Multiple use of the forests is a tribal objective, and management practices favor harvesting younger and smaller trees. Other forestry management concerns are the negative impact on pine regeneration caused by cattle concentrations and the deterioration of range conditions due to poor cattle management.

In 1995, the Tribal Council adopted a resolution opposing wolf recovery in the BRWRA. The tribe does not have a comprehensive policy for managing recreational areas or threatened and endangered species. Bear Wallow (2,620 acres) is the only designated primitive area on the reservation. It was established to enhance wilderness recreation, to maintain biological diversity, and to protect threatened and endangered species. Logging is prohibited there.

Land Development

Little industry or business occurs on the reservation. Highway 70 is the major commercial development corridor. A small amount of agricultural land is irrigated. Some high elevation lands are suited for dry land farming but are not used. There are five major

Table 3-5. Game densities on San Carlos Apache Reservation, 1993-94 estimate.

	Number	Density (animal/mi ²)
Coues white-tail deer	2,350	0.8
Mule deer	3,700	1.3
Elk		
Resident + migratory	1,500±	0.5
Resident	700+	0.3
Javelina	3,950	1.4
Pronghorn (historic and introduced)	280	0.1
Desert bighorn sheep	15	0.0
Rocky Mountain bighorn sheep	30	0.0

Table 3-6. San Carlos game permits, harvest, and hunter success, for tribal members and non-members, and fee revenue for non-member permit sales, 1993-94 hunt year.

	Member			Non-member		
	Animals Taken	Estimated Hunters (% success)		Animals Taken	Permits (% success)	Fee Revenue
Mule deer	260	875 (37)		Not permitted		
Coues deer	65	*		35	100 (35)	\$ 99,750
Elk	250	485 (52)		16	21 (76)	179,500
Javelina	80	200 (40)		360	800 (45)	120,000
Pronghorn	2	2 (100)		1	1 (100)	2,500
Black bear	10	20 (50)		46	94 (49)	40,325
Turkey	265	375 (70)		193	225 (70)	39,600

*Member deer tags are not species-specific, but mule deer are preferred.

road projects scheduled, two of which are underway. Approximately 35 miles of roads will be upgraded and over twelve miles will be graded and drained.

Livestock Grazing

Multiple-family and tribal cattle operations exist. The reservation is divided into seven range units (totalling 1,832,040 acres), with grazing controlled under a Bureau of Indian Affairs system. In five of the units grazing permits are issued to privately owned and operated cattle associations; two ranches are tribally owned and operated. Four of the seven grazing areas are in poor range condition, two in fair condition, and one in good condition. Grazing now takes place in the southern portion of the reservation known as the Mineral Strip. The area was previously ungrazed for about 25 years, but the tribe is establishing ranches there.

The five cattle associations, consisting exclusively of tribal members, are managed by boards of directors elected from the association membership. For all the associations and ranches a total of 18,500 animal units (cow and calf) are allotted, but actual numbers are likely higher. Cows and bulls range freely with little active management. Cattle with different family ownership brands mix freely and many cattle are not branded.

Six of the seven livestock operations employ year-round grazing with round-ups occurring largely through trapping in scattered corrals. Cattle carcasses resulting from winter kill are common in the higher country. Moving herds toward calving pastures, limiting the amount of time that cows spend with bulls (to synchronize calving), and rotating cattle to less vulnerable pastures might reduce predation but are currently beyond the means of the cattle associations.

Forestry

Approximately 55,000 acres (3 1%) of the pine forests are suitable for timber harvesting. The annual allowable cut is 2.87 million board feet. One sawmill at Cutter has operated since 1990. Sustained yield principles are followed.

Mining and Other Natural Resource Extraction

Sand and gravel are mined commercially. Gypsum has been mined for many years in the southwest corner of the reservation from a patented mining claim. Mineralized uranium also has been located in a one-half square mile area, and two basins have potential for lithium mining. A 1990 U.S. Geological Survey study found low oil, natural gas, and coal potential on the reservation. Six kinds of decorative stone are mined, collected, or planned for mining including peridot, agate, garnet, calcite, and sapphires.

Public Access and Recreation

The reservation contains 465 miles of roads. Outdoor recreational opportunities for the public and tribal members include fishing, boating, camping, hunting, hiking, and wilderness experiences. Use fees are paid by non-members. Fishing, camping, and water sports contributed \$700,000 to \$800,000 in non-member fees to the tribe in fiscal year 1993. Several water-based recreational facilities exist. They include Seneca, San Carlos, Point of Pines, and Talkalai Lakes and the Black/Salt River area. The Black/Salt River recreation area is jointly managed by the San Carlos and White Mountain Apache Tribes.

Regional Economy, Employment and Population

The major economic contributors are timber, cattle, and recreation revenues. Over 7,000 people live on the reservation. Unemployment on the reservation is high. The reservation has one of the lowest median household incomes and highest percentage of people living below the poverty level in the Southwest (Table 3-7). Most residents live in or near the communities of San Carlos, Peridot, or Bylas.

White Mountain Apache Reservation

Geography

The 1.63-million acre White Mountain Apache (or Fort Apache) Reservation is located immediately west of the BRWRA in the transition between the Colora-

Table 3-7. Summary of regional U.S. Census data for the San Carlos Apache Reservation.

Total population	7,294
Population density	2.7/mi ²
Number in civilian labor force	3,188
Percent of civilian labor force unemployed	30.0%
Percent of civilian labor force employed in agriculture, forestry or fisheries	6.6%
Median household income	\$8,743
Percent of population below poverty level	62.0%

SOURCE: 1990 U.S. Census for the San Carlos Apache reservation.

do Plateau and the Basin and Range physiographic provinces (Fig. 3- 1). Erosion by streams has carved deep canyons into strata underlying the area. The Mogollon Rim runs through the southwestern margin of the Plateau Province on the reservation. Elevations range from 2,600 feet on the extreme western end to the 11,403-foot crest of Mount Baldy in the east. The reservation is bordered on the east and north by the Apache-Sirgreaives NF, on the west by the Tonto NF, and on the south by the San Carlos Apache Reservation.

Climate

Temperature extremes range from a high in the summer of about 110°F at the low elevations of the far western end to about -45°F on Baldy Peak in mid-winter. The average low temperature is 7.4°F in January and the average high is 90.8°F in July. Average annual precipitation ranges from 15 inches in the desert regions on the western end to over 35 inches in the Mount Baldy area.

Water

There are over 300 miles of perennial streams on the reservation. Among the major streams are Canyon, Cibecue, Carrizo, Ord, Big and Little Bonito, Reservation, Tonto, and Pacheta Creeks, and the North Fork and East Fork of the Whiteriver. Numerous springs exist, particularly below the Mogollon Rim. Over 30 artificial trout lakes and 60 stock tanks are located throughout the reservation.

Vegetation

Over 72 1,000 acres, or 44%, of the reservation is forested, mostly ponderosa pine. Vegetation zones include spruce-alpine fir forest (about 27,000 acres in the northeast), montane conifer forest featuring ponderosa pine, with aspen stands intermixed (about 694,000 acres), riparian deciduous forest, juniper-piñon woodland (about 640,000 acres), oak-pine woodland, interior chaparral (about 24,000 acres), plains and desert grassland (about 50,000 acres), Sonoran desert scrub (about 7,000 acres), and mountain meadow grassland (about 7,000 acres).

Animals

Species of Special Concern.-The tribe has a cultural tradition of care and respect for all species of wildlife. There are, however, several species that the tribe or the FWS has identified as endangered or threatened. Federally endangered wildlife which the FWS has identified as occurring on the reservation are the razorback sucker, bald eagle, peregrine falcon, and southwestern willow flycatcher. Federally threatened species that the FWS lists as occurring are the Apache trout, loach minnow, Little Colorado spinedace, spikedace, Mexican spotted owl, and possibly a re-established, nonessential experimental population of Colorado squawfish. (Activities which may adversely modify critical habitat for the razorback sucker on the reservation are described in the San Carlos Apache Reservation section, above.)

Potential Wild Prey of Wolves.—Cougars white-tailed deer, mule deer, elk, javelina, pronghorn, Rocky Mountain bighorn sheep, and desert bighorn sheep are found on the reservation. Table 3-8 shows the estimated population sizes, densities, and habitat areas of these species. Bands of feral horses also occur here. White-tailed deer inhabit oak-pine woodlands, while mule deer are common in the montane conifer forests, interior chaparral, mountain grasslands, and Sonoran desert scrub. Elk were introduced into the White Mountains between 1913 and 1934 and have spread throughout the forested areas. The highest concentration of elk is in the eastern portion of the reservation. These elk move to and from the southeastern part of the reservation, the San Carlos Apache Reservation, and the BRWRA. Introduced pronghorn inhabit the plains and desert grasslands of the Bonito Prairie.

The deer population is low but stable. Elk herds are slowly increasing. However, recent changes in elk hunting regulations both on and off the reservation may slow or stop this increase. Desert and Rocky Mountain bighorn sheep each have a resident herd size of up to 10 animals. Small mammals include Arizona gray squirrels, Abert's squirrels, golden-mantled ground squirrels, cliff chipmunks, ringtails, raccoons, and cottontails.

Hunting.—The tribe holds regular seasons for elk, mountain lion, javelina, and pronghorn. Hunting of deer and bighorn sheep by non-members is not permitted. About \$1 million was generated in non-member hunting revenues in 1995. Three trophy elk hunts are held annually, with a limit of one bull per year per permit. Sixty-four non-member trophy elk permits were available for the 1994-1995 season at \$11,000 each. Special auction and cow elk hunts also are permitted. Table 3-9 depicts non-member hunting revenues for 1994. One hunting season for javelina, pronghorn, and bear are permitted. Mountain lions can be hunted year-round. Guides are required for most non-member hunts. Nine non-member guide licenses were issued in 1994 providing tribal revenue of \$22,500.

Existing Livestock Predators.—Coyotes and mountain lions are common. Black bear are found in montane conifer forests. Badgers and feral dogs also occur on the reservation. A tribal member is employed as the ADC specialist on the reservation working under a year-round cooperative agreement. The primary focus of the program is the prevention of depredation to cattle and horses. The specialist also works with the tribal Game and Fish Department controlling coyotes on antelope fawning grounds and

Table 3-8. Population estimates, densities, and estimated habitat areas of potential wolf prey species on the White Mountain Apache Reservation.*

Species	Estimated Population	Density (animal/mi ²)	Estimated Habitat (mi ²)
White-tailed deer	1,700	0.97	1,750
Mule deer	2,300	1.15	2,000
Elk			
Winter	6,000	13.33	450
Summer	11,500	10.95	1,050
Pronghorn	275	2.60	105
Desert bighorn	5	0.13	75
Rocky Mountain bighorn	8	0.16	50

*Numbers for javelina are not known.

SOURCE: White Mountain Apache Tribe 1995.

Table 3-9. White Mountain Apache Reservation non-member hunting revenues for 1994.

Species	Number Permits Issued	Total Revenues
Bull elk	75	\$ 940,000
Cow elk	100	30,000
Pronghorn	3	10,500
Mountain lion	20	3,000
Black bear (spring and fall)	58 ¹	5,800

Approximate

SOURCE: White Mountain Apache Tribe 1995.

helping to capture bears in campgrounds and populated areas. Over the past three years, ADC has taken an annual average of 47 coyotes, 35 feral dogs, 1.3 lion, and 3.7 bears (Table 3-10). Control tools include leghold traps, M-44s, and calling and shooting for coyotes and feral dogs, and foot snares and hunting with dogs for lions and bears (Phillips 1994).

Tribal Policies and Plans

The tribal economy is guided by the Overall Economic Plan (White Mountain Apache Tribe 1993). Tribal plans include upgrading and expanding timber-related activities such as increasing timber processing capabilities, broadening the tourist base to include passive activities such as the opening of a walk-through historic park, and the development of retail and service businesses. The trend is toward internalizing control over these economic and development ventures (White Mountain Apache Tribe 1993).

The Tribal Council adopted a resolution in 1995 opposing Mexican wolf recovery in the BRWRA (White Mountain Apache Tribe Res. No. 12-95-371). In 1994, the Council adopted a resolution prohibiting most access to the reservation by federal and state agencies for scientific research or data collection without the tribe's express written consent (Res. No. **02-94-060**).

Livestock Grazing

All areas within the reservation except the populated areas and the wildlife area are grazed by livestock. There are nine multiple-family livestock associations

and one tribal herd. The allocated animal units (cow and calf) total 15,230. The reservation is understocked due to low precipitation and few association funds. Grazing is yearlong. Previously, the associations held an annual fall sale of calves; however, because of low calf numbers, a regular sale has not been held for several years. Table 3-10 depicts the reported livestock losses for 1990-92. Approximately 3,500 head of horses also occur on the reservation.

Livestock ownership and grazing is not a major economic base on the reservation. Individuals within the associations own varying numbers of animals, from one cow to over 200 animals. Livestock ownership was established and largely continues to be for subsistence. Cattle are used for ceremonies, wakes, family consumption, etc.

Forestry

Forest management is governed by 10-year harvest plans. Commercial forestry occurs in the montane conifer forest, mostly in the northeast section of the reservation. Up to 721,000 acres are active timber harvesting areas, with annual harvests of 75 to 80 million board feet. Two sawmills exist, one at Cibecue and one at Whiteriver, for a total capacity of about 80 million board feet of lumber.

Mining and Other Natural Resource Extraction

No mineral extraction is occurring on the reservation. Mineral deposits ranging from non-metalliferous building materials to precious metals occur on the

Table 3-10. White Mountain Apache Reservation livestock losses reported to APHIS-ADC, 1990-92.

		Cows	Calves	Horses
1990:	Bear	80	64	0
	Feral dog	57	57	
	Lion	41	30	
	Coyote	71	97	
	Subtotal	249	248	2
1991:	Bear	9	8	
	Feral dog	8	8	
	Lion	12	10	2
	Coyote	3	20	
	Subtotal	32	46	2
1992:	Bear	38	35	1
	Feral dog	18	18	
	Lion	11	9	6
	Coyote	15	69	
	Subtotal	82	131	7
	Total	363	425	11

SOURCE: Phillips 1994.

reservation; however, potential for development is low. Large quantities of gypsum and limestone and small amounts of low-quality coal have been located but not extensively developed.

Public Access and Recreation

About 760 miles of roads exist on the reservation, of which 128 miles are paved. The tribe requires all non-members to purchase outdoor recreation permits for activities on the reservation. The tribe offers hiking, backpacking, fishing, hunting, camping, whitewater rafting, boating, skiing, and gaming. The Sunrise Park

Ski Resort near Mount Baldy offers downhill skiing and related activities. The revenues from fishing, camping, rafting, and picnicking were expected to total nearly \$1.2 million in 1995. Skiing will add nearly \$2 million and gaming nearly \$5 million to tribal revenue. The northeast corner near Mount Baldy is closed to non-tribal members, and special use permits are required for the areas bordering the southern boundary as well as the entire area west of Highway 60.

Regional Economy, Employment and Population

The reservation is economically diverse, particularly near Whiteriver, with an active sawmill, thriving commercial development, and many construction projects underway. Industrial and farming pursuits are limited, although some irrigated farming occurs in the river valleys. The economy is centered on natural resources and recreation (BIA 1978). Five firms within the public administration, service, and manufacturing sectors account for 73.7% of employment. Tourism is a major employer, directly contributing more than 14% of reservation employment. The Sunrise Park Ski Resort and the Fort Apache Timber Company (employing about 220 tribal members) are the largest employers (White Mountain Apache Tribe 1993). According to the U.S. Census, the civilian labor force was 5,820 individuals in 1990 and the unemployment rate was 32.8% (although the U.S. BIA reported a 6.1% unemployment rate for 1990 (Waters 1991)).

The median household income is \$13,020 and 50.8% of the people live below the poverty level (Table 3-1). The reservation is sparsely populated, with approximately 10,390 residents according to the U.S. Census. The BIA estimated the resident population at 11,000 tribal members and about 2,500 non-tribal residents (Waters 1991). The residents are primarily clustered around Whiteriver, McNary, and Cibique. The population has been growing steadily by almost three percent annually since 1980 (White Mountain Apache Tribe 1993).

Lakeside Ranger District, Sitgreaves National Forest

The Lakeside Ranger District, which lies immediately to the north of the White Mountain Apache Reservation and to the northwest of the BRWRA, comprises relatively gentle terrain sloping upward from northwest to southeast. The elevation ranges from 6,500 feet to 8,800 feet. Volcanic cones, generally in the eastern portion, rise 500 to 1,000 feet above the base topography. The ranger district has several wetlands, streams, lakes, and artificial impoundments.

A mixture of piñon-juniper, ponderosa pine, mixed conifer, and aspen forest types occur here. The northwest portion is predominantly piñon-juniper and dry rangeland. Plant cover is low, primarily due to low rainfall and low elevations. Mixed conifer and aspen occur mostly in the eastern portion and are associated with the volcanic cones. Approximately half of the district consists of ponderosa pine.

The district is managed under the Apache-Sitgreaves National Forest Plan (SW Region USFS 1987b). In the short term, management for consumptive uses (which includes recreation such as hunting and fishing) will be emphasized (E.H. Klein, Sitgreaves NF, pers. comm.). However, as the area becomes more urban, the demand for non-consumptive uses increases, and a greater emphasis may be placed on developing nonconsumptive recreational opportunities in the future.

The ranger district permits a total of 2,460 livestock. The entire district is open to grazing,

Table 3- 11. Summary of regional U.S. Census data for the White Mountain Apache Reservation.

Total population	10,394
Population density	4.2/mi ²
Number in civilian labor force	5,820
Percent of civilian labor force unemployed	32.8%
Percent of civilian labor force employed in agriculture, forestry or fisheries	5.7%
Median household income	513,020
Percent of population below poverty level	50.8%

SOURCE: 1990 U.S. Census for the Fort Apache reservation.

although some areas have not been grazed recently. Grazing occurs in the majority of allotments from June to October; a few are year-round.

Recreation includes camping, picnicking, hiking, sight-seeing, cross country skiing, hunting, fishing, and birdwatching, for an average of 409,000 RVDs yearly. The district has three developed campgrounds, three primitive campgrounds, a large number of undeveloped camp sites, and approximately 200 miles of trails used by horses, mountain bikes, and hikers. Most recreational activities occur in the southern and eastern parts of the district where pine vegetation predominates.

Traditionally, this portion of Arizona has been a recreation and vacation area. Forty-thousand acres of private land occur within the district boundaries consisting mostly of unincorporated developments. Two communities, Pinetop-Lakeside and Show Low, are located within the boundaries of the district with a combined population ranging from about 10,000 in the winter to over 50,000 in the summer. The trend is toward more growth as a retirement and second home area, leading to an increase in demand for conversion of National Forest lands to both private lands and areas for dispersed recreation (E.H. Klein, Sitgreaves NF, pers. comm.).

San Mateo Mountains Unit of Cibola National Forest

The San Mateo Mountains encompass approximately 395,000 acres primarily in the southwestern portion of Socorro County northeast of the Black Range in New Mexico. The San Mateos are situated in the Magdalena Ranger District of Cibola NF, to the northeast of the Gila NF portion of the BRWRA. No permanent water sources are found in the San Mateos; only seasonal springs and wildlife watering tanks are located here. Vegetation ranges from spruce-fir woodland at about 10,000 feet elevation to mixed conifer, ponderosa pine and piñon-juniper woodlands, mountain shrub, plains grassland, and Chihuahuan desert at about 6,000 feet elevation on the south end of the mountains. About 66 percent of the land is forested. Less than 4,000 mule deer inhabit this part of the Cibola NE. Approximately 400 elk also occur (B. Stephenson, Cibola NF, pers. comm.).

Most of the mountain range is covered by a management plan; however, about 52,800 acres in the

southern half of the range is not under any current plan. Unit plans covering a ten-year period will be prepared beginning in fiscal year 1996 (B. Stephenson, Cibola NF, pers. comm.).

There are approximately 4,000 head of permitted cattle using the mountain range. Grazing seasons vary from a few months to year-round. The only ungrazed land is in the upper elevations of the Apache Kid and Withington Wilderness Areas. No timber sale program exists on the Magdalena Ranger District with the exception of fuelwood harvesting. No new campgrounds, roads, or major hiking trails are planned. Management emphasis for the mountain range will continue to be grazing, dispersed recreation, and wilderness management.

The primary recreation use is hunting, predominantly for mule deer and elk. During the warmer months, developed camp sites receive steady use. Hiking and sight-seeing by automobile are other important seasonal uses. The San Mateo Mountains account for about 75,000 RVDs.

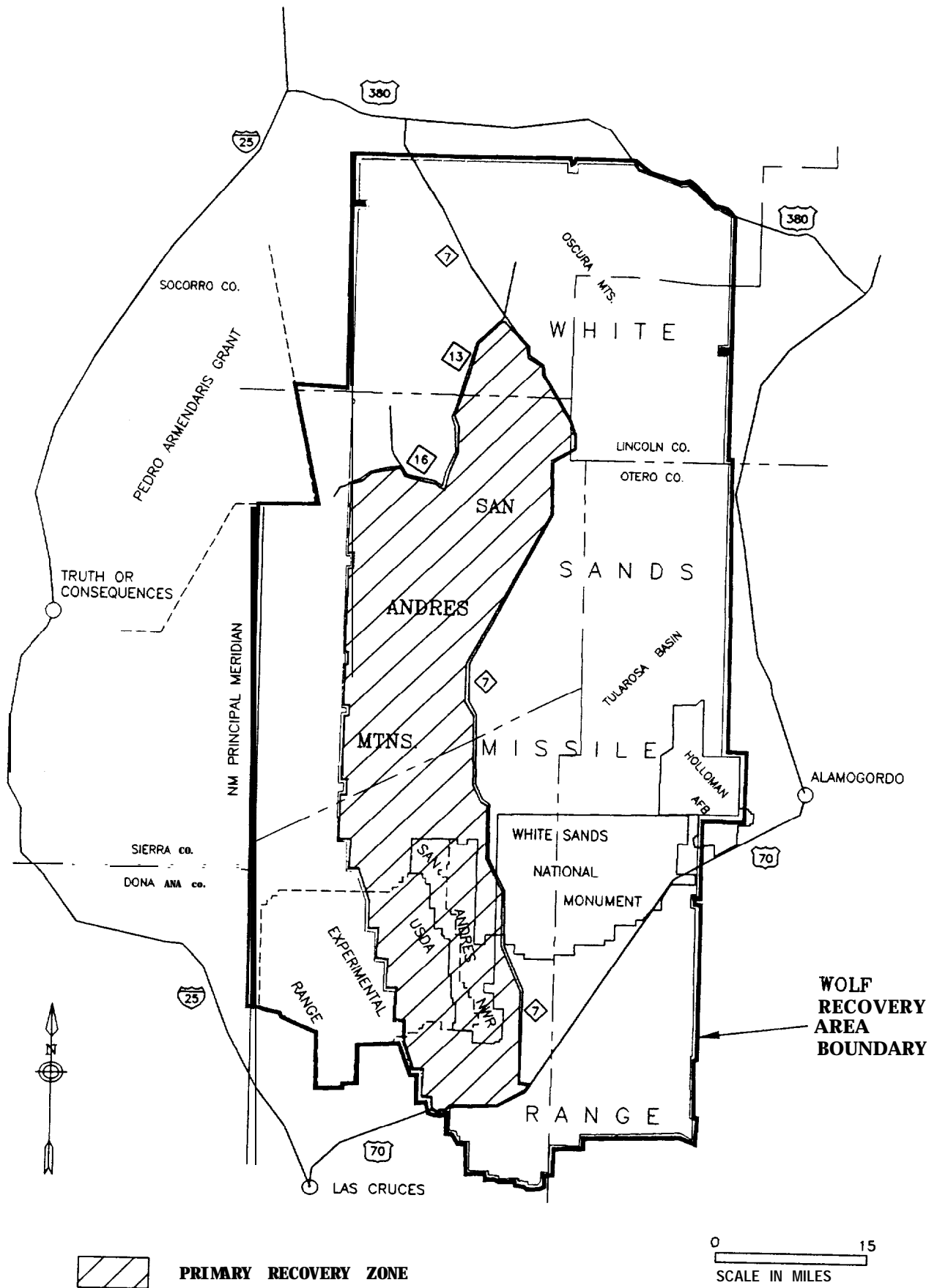
White Sands Wolf Recovery Area (WSWRA)

Geography

The WSWRA encompasses 2,578,026 acres, or 4,028 mi², in south-central New Mexico (Fig. 3-4). This area includes all of White Sands Missile Range and Holloman Air Force Base (2,087,264 acres), White Sands National Monument (142,639 acres), the San Andres National Wildlife Refuge (57,215 acres contained within the missile range boundary), and lands adjoining the western boundary of the missile range (348,123 acres), including the Jornada Experimental Range and San Andres National Wildlife Refuge. The WSWRA encompasses two entire mountain ranges (the San Andres and the Oscura Mountains), portions of two major drainage basins (the Tularosa Basin to the east of the mountains and the Jornada del Muerto to the west of the mountains), two lava flows, and the largest gypsum deposit in the world.

The WSWRA primary recovery zone consists of the San Andres Mountains in the western part of the missile range. (The primary recovery zone and other precise boundaries are delineated in Box 2-1.) The

Figure 3-4. White Sands Wolf Recovery Area.



secondary recovery zone on the west side is the narrow strip of foothills and plains, about 70 miles long and about eight miles wide, lying adjacent to the missile range boundary (Fig. 3-4). The secondary recovery zone makes up 14% of the WSWRA and consists mostly of BLM lands, private lands, and the Jornada Experimental Range (see separate section below). The remainder of the WSWRA secondary recovery zone lies within the White Sands Missile Range boundary, consisting of all lands outside the San Andres mountains.

The WSWRA includes portions of five New Mexico counties: Doña Ana, Sierra, Socorro, Lincoln, and Otero. Highway 70 traverses the southern portion between Las Cruces and Alamogordo forming the southern boundary of the primary recovery zone. The 1,119,771-acre Fort Bliss, an Army artillery and air defense training range, lies to the south of the WSWRA. The Army has evacuation agreements with land owners over four extension areas to the north and west of the missile range that are evacuated periodically for safety reasons during missile tests and other military activities (Fig. 3-5).

White Sands Missile Range is approximately 100 miles long and 37 miles wide. The majority of the range is situated in the Tularosa Basin, which consists mostly of Cenozoic deposits of gypsum and quartz (Bednarz 1389). The basin is notable for its shifting gypsum dunes and extensive alkali flats. The northern part of the basin is covered by a basalt flow called the Carrizozo Malpais. The San Andres Mountains form the western boundary of the Tularosa Basin for approximately 85 miles and are from six to 17 miles wide. The range rises to about 9,000 feet elevation at Salinas Peak. The San Andres are fault-block mountains with tilted sedimentary rock beds dipping westward toward the Jornada del Muerto. The foothills and bajadas in the secondary recovery zone to the west of the San Andres grade into gravelly and sandy plains toward the Rio Grande.

The Oscura Mountains occupy the northeastern section of the WSWRA. These extend 25 miles from north to south in a roughly triangular shape with a maximum width of about 13 miles. The Oscuras are comprised of primarily eastward dipping blocks of Permian sedimentary and Paleozoic rocks (Meinzer and Hare 1915). The western margin is a steep escarpment and the eastern slope descends gradually.

Climate

The climate in the WSWRA is typical of the southwestern deserts, characterized by aridity throughout the year, hot summers, mild winters, low relative humidity, and scant precipitation (Table 3-12). Average high temperatures can be over 100°F in June, and the average low is 21°F in January. Annual precipitation varies from 7 to 11 inches in the lower areas, averaging 10 inches. High mountain locations in the San Andres can receive from 12 to 20 inches, averaging 18 inches. Most precipitation occurs during thunderstorms from June through September. Precipitation from 1993-1995 in the lower Tularosa Basin has been 38% below the 1951-1994 ten year average (Morrow 1996).

Water

Surface water in the WSWRA is almost nonexistent except for the highly gypsumiferous and saline water in Lake Lucero, Salt Creek, Malpais Springs, and Lost River. Malpais Springs is the most significant source of surface water, discharging several cubic feet per second. About 130 small springs, of variable reliability, exist in both the San Andres and Oscura Mountains. Approximately 50 percent of these are perennial (Bednarz 1989). Discharge from most sites usually is less than one gallon per minute (USFWS 1985). As a result of a 1993-1995 drought all natural springs in the San Andres Mountains either dried up or were at their lowest levels in ten years (Logan 1994a). In addition, White Sands Missile Range has more than 50 watering facilities (e.g. windmills and rainwater catchments) that are occasionally serviced for game, wildlife, and feral horses (D. Taylor, WSMR, pers. comm.).

The secondary recovery zone to the west of the missile range has numerous dirt tanks and livestock troughs, many supplied by pipeline systems. A water source occurs roughly every one to two miles (Howard 1993).

Figure 3-5. White Sands Missile Range Extension Areas.

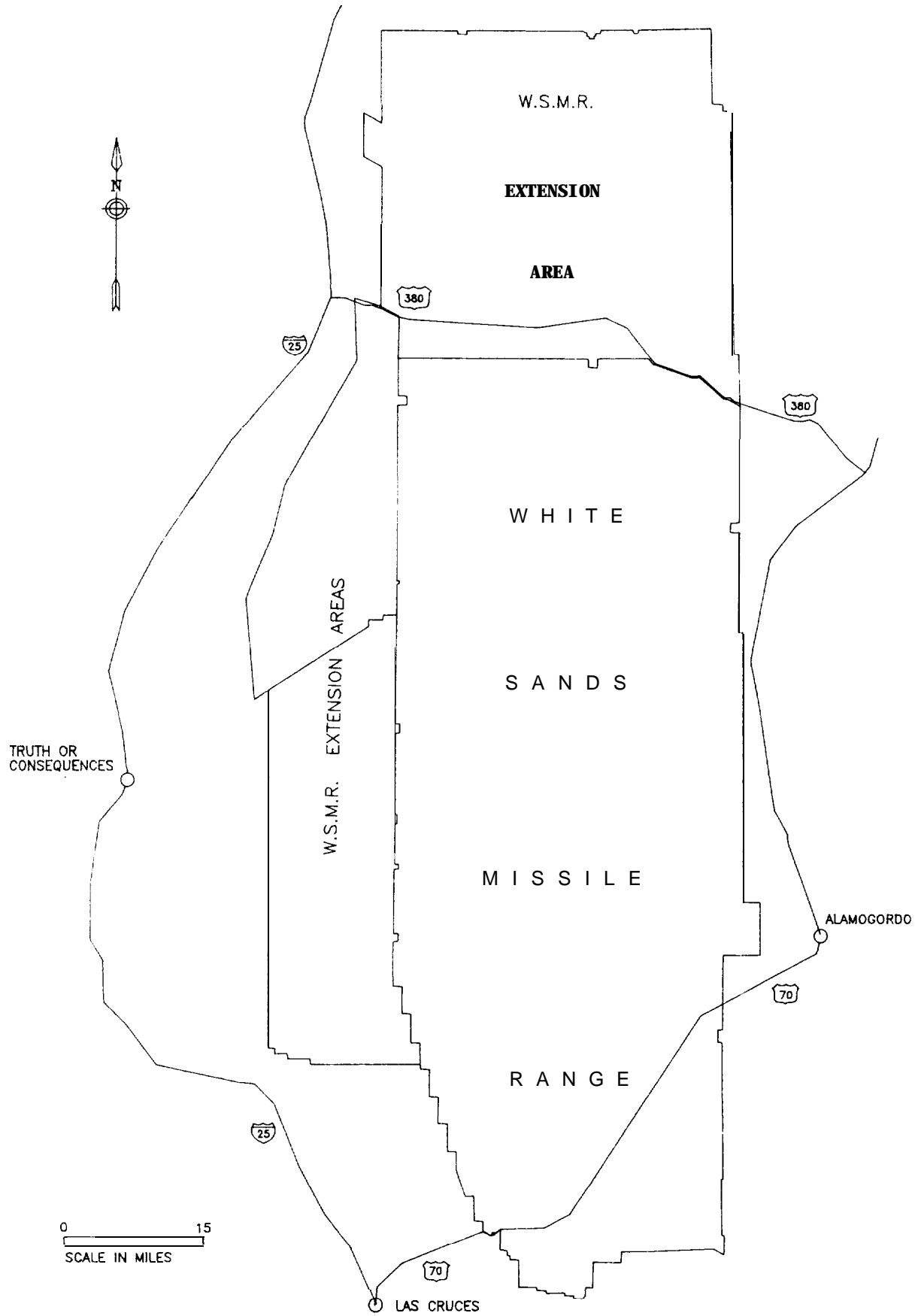


Table 3-12. Average annual temperatures for White Sands Missile Range, New Mexico.

Region	Elevation (feet)	Temperature (°F)		
		High	Mean	Low
Basins	3,900-4,900	77	61	46
Mountains	5,000-9,060	74	53	31

SOURCES: WSMR Meteorological Branch 1994; Eschrich 1992.

Vegetation

The WSWRA supports a mixture of Chihuahuan desert, upper Sonoran desert, and southern Rocky Mountain flora. The major vegetation classes include piñon-juniper woodland, semi-desert shrubs, desert grasslands, gypsum grasslands and dunes, and desert mountains (NMNHP 1992).

A ponderosa pine community occurs at the highest elevations of the San Andres Mountains at Salinas Peak, covering about 7 mi². The coniferous woodlands are found between 6,300 and **8,500** feet elevation and are dominated by piñon and juniper. These woodlands total about 237 mi². Savannas occurring between about 6,000 and 7,000 feet elevation have open juniper canopies with predominately grassy cover. Savannas cover approximately 321 mi² of the missile range.

Scrublands are extensive, covering over 2,000 mi². Scrub types occur from about 4,100 to 8,500 feet elevation. Montane scrub usually occurs in the same elevation zone as woodlands and savannas, but in either more extreme environments or on sites that have been subjected to high frequency disturbance such as repeated fire. The vegetation is dominated by mountain mahogany, oaks, and hardy grasses. Plains-mesa scrub is typified by sand sage, occurring along the edge of the upper Jornada basin. Chihuahuan desert scrub occupies large areas of lower mountain slopes, bajadas, and basin bottoms, and is dominated by drought-resistant shrubs.

Grasslands on the missile range total about 761 mi² and are dominated by plains-mesa and desert grasslands. Plains-mesa grasslands lie between the higher elevation woodlands, savannas, or montane scrub, and the lower elevation desert grasslands or desert scrub. Desert grasslands are characterized by species like black grama. **Desert grasslands range in elevation from 4,000 to 6,000 feet (NMNHP 1992).**

The federally listed plants occurring in the WSWRA are listed in Appendix D.

Animals

History of Wolves

The WSWRA lies within the probable historic range of the Mexican wolf subspecies. Historic documentation of wolves is sparse, consisting of a few verbal accounts from turn-of-the-century residents (Halloran 1946, 1944a, and 1944b; Forsling 1919). Also, **Bertram (1992)** examined canid bones excavated from the northeastern foot of the Organ Mountains within the WSWRA, which he identified as *Canis lupus*. However, he could not determine whether the bones were of local origin or came to the site through trade from elsewhere.

Bailey (1907 and 1931) mentioned reports of wolves in the San Andres and documented their common occurrence in the early twentieth century in neighboring areas such as the Sacramento and Capitan Mountains. Nunley (1977) and Young and Goldman (1944) reported wolves being captured west of the WSWRA near Hatch, New Mexico. No confirmed wolf reports have come from the area in recent years (Wolok 1994). However, one alleged sighting of a lone “wolf” occurred in 1988 at the southern White Sands Missile Range boundary in Otero County (Wolok 1994).

Species of Special Concern

The federally endangered species which the FWS lists as occurring on the missile range include the bald eagle, American peregrine falcon, northern aplomado falcon, southwestern willow flycatcher, whooping crane, and black-footed ferret. **Federally-threatened Mexican spotted owls** are listed by the FWS as

occurring. Peregrine falcons and bald eagles have been documented only as transients. The other animal species are seasonal residents or breeding species.

The potential wolf prey species of special concern is the New Mexico-endangered desert bighorn sheep, which occurs in the San Andres Mountains. The population numbers about 30 individuals (S. Berendzen, San Andres National Wildlife Refuge, pers. comm.) and primarily inhabits steep, rocky areas. The population has had persistent, devastating scabies infections that sharply reduced its numbers in the late 1970s from a high of about 200 animals (Sandoval 1979).

Critical habitat for the federally endangered Todsen's pennyroyal occurs within a 2-km² area of White Sands Missile Range. Activities by the Army which would result in increased trampling or disturbance of the critical habitat may be restricted (46 Fed. Reg. 5730, Jan. 19, 1981).

Potential Wild Prey of Wolves

Mule deer are the most abundant ungulates followed by oryx, pronghorn, and feral horses. Table 3-13 provides population estimates for these potential prey (except horses) on the missile range portion of the WSWRA. Small mammals and ungulates such as javelina, elk, and desert bighorn sheep occur in limited numbers.

Mule deer occupy most habitat types except for the lowest elevations in the Tularosa Basin where vegetation and fresh water are sparse or nonexistent. Approximately 70% (5,300) of the total mule deer population on the missile range can be found in the primary recovery zone in the San Andres Mountains (NMDGF 1993a, 1993b, and 1992). Densities vary widely, from less than one animal per mi² to 10- 12 per

mi² within the mid-elevations of the mountains and along the footslope areas. Pockets of high densities exist at lower elevations as well. About 10% of the total deer population dwells in the lower basins (P. Morrow, WSMR, pers. comm.).

A drought from 1993-1 995 has caused a decline in mule deer numbers in the San Andres Mountains (Morrow 1996). Fawns and reproducing does experienced the greatest reduction. It is anticipated that the mule deer population in the San Andres will recover with the return of normal to above normal precipitation (Logan 1994a).

Approximately 80% of the pronghorn live in the Jornada Basin and the rest occur in the northern and western portions of the Tularosa Basin below 6,000 feet elevation (U.S. Army 1994). Pronghorn move seasonally between the missile range and adjacent private and federal lands, apparently in response to water and forage availability. Overall, pronghorn on the missile range are increasing. The Jornada Basin pronghorn population appears to be stable-to-increasing and the Tularosa Basin population appears to be increasing (I? Morrow, WSMR, pers. comm.).

Non-native oryx are well-distributed below 6,000 feet elevation. Generally, oryx occupy the basin desert shrub and grassland habitats, but they can be found throughout the WSWRA, including most canyons within the San Andres. Single oryx and groups of less than three individuals are frequently observed in piñon-juniper habitats (I? Morrow, WSMR, pers. comm.). The population on the WSWRA is about 1,700 animals. It is increasing at an average annual rate of about 17% (Table 3-14). In the WSWRA, the species has no significant predators other than humans. They have sharp, formidable horns, and they defend their young. Coyotes, mountain lions, and bobcats may take a few, primarily young, oryx. It is

Table 3-13. Population estimates of ungulate prey species for the WSWRA, 1994.

	Species		
	Mule Deer	Pronghorn	Oryx
Primary recovery zone	5,300	70	700
Secondary recovery zone	2,200	280	1,000
Total primary + secondary	7,500	350	1,700

SOURCE: Morrow 1994.

Table 3-14. Oryx population estimates for the WSWRA.

Area	Year			
	1993	1994	1995	1996
Primary recovery zone	700	700	950	1,100
Secondary recovery zone within the missile range	650	825	900	1,070
Secondary recovery zone outside the missile range	150	175	200	230
Total WSWRA	1,500	1,700	2,050	2,400

SOURCE: Morrow 1994.

not known whether wolves will prey on oryx, or whether oryx will harm the wolves through defensive actions. African wild dog packs do not attack oryx in their native Africa (J. Ginsberg, Zoological Society of London, pers. comm.). No evidence exists of disease resulting in significant mortality in the oryx population (D. Taylor, WSMR, pers. comm.).

The oryx population continues to expand beyond original introduction expectations (Saiz 1978). Concern over the impacts of this expansion is increasing. White Sands National Monument personnel are undertaking a roughly half-million dollar project to fence out oryx (D. Ditmanson, White Sands Natl. Mon., pers. comm.). Managers are implementing strategies to reduce the population, particularly within the mountains where the potential to compete with native species may increase and through which oryx may disperse off the missile range (Morrow 1996).

A population of feral horses exists on the missile range entirely within the northern Tularosa Basin. The horses likely represent the progeny of domestic ranch stock left behind after the Army established exclusive military use of the missile range in 1950 (U.S. Army 1991). They are not protected under the Wild and Free-roaming Horses and Burro Act, 16 USC § 1334, because the Act does not apply to federal military lands. Feral horse movements and distribution are directly related to water availability (U.S. Army 1991). During dry periods horse distribution becomes compressed. Following rains horses again disperse (Morrow 1993).

In 1994, the horse population was estimated at 1,200 to 1,400 animals. However, several die-offs had

occurred as a result of extreme dry conditions which limited forage and water availability. Over 120 horses died in the 1994 drought. Severe degradation is evident throughout horse habitat, especially along riparian areas (D. Holdermann, NM Coop. Res. Unit, pers. comm.). Pursuant to a study and Environmental Assessment (EA), the missile range initiated horse reduction activities (capture and removal) in late 1995; the current population is 250-350 animals (Morrow 1996). Current management objectives call for continued reductions in the population in 1996 to achieve the EA recommendation of half the Maximum Target Population of about 375, that is, reducing the population to about 180.

Small prey species include jackrabbits, cottontails, skunks, porcupines, ground squirrels, chipmunks, rats, and other small mammals (Bednarz 1989; Findley 1975).

Hunting

All big game hunts on the missile range are by special permit with limited entry. Permit levels and hunt areas are established cooperatively by White Sands Missile Range and the New Mexico Department of Game and Fish. In recent years, there have been two deer, one pronghorn, and six oryx hunts annually. Deer hunts are conducted annually in either the Salinas Peak or Oscura Mountain Hunt Area on an alternating basis. One male deer with at least one forked antler is the legal limit. Pronghorn are hunted concurrently with oryx in the Stallion Range Center area each fall. The legal harvests are one male pronghorn and either a

male or female oryx. Hunters are limited to one trophy oryx permit for life. Most hunts take place for two days over a weekend. Both rifle and primitive weapons hunts (muzzle-loader and archery) are conducted annually. No hunting is permitted on Holloman Air Force Base except for occasional oryx control hunts.

Table 3- 15 summarizes the average mule deer harvest over the past five years. The average annual permit level for deer hunts is 140, and hunter participation averages 123 (88%). Hunter success rates average 5 1% for all deer hunts combined. Bow hunter success averages 1 1%, while rifle hunter success averages 69%. The success rate for primitive weapon hunts averages 38%. Harvest strategies for the 1996-97 season on WSMR will include the reduction of permit levels by about 50% from the previous year to an expected harvest of 40-55 legal bucks in the northern San Andres and Oscuras.

Pronghorn and oryx harvest statistics for the period 1986 though 1993 are presented in Table 3-16. From 1992-1 994, permit levels increased by an annual average of 1 0%, while the oryx population is estimated to have increased 17% annually. Approximately 200 oryx permits were available in 1994 (U.S. Army 1994; I? Morrow, WSMR, pers. comm.). Permit levels for the 1995-96 season were increased by 50% to 300 permits. Depredation hunts held on and off WSMR were increased by over 100% to approximately 150 permits.

Existing Livestock Predators

Coyotes are present in the mountainous areas in low densities and are more numerous in the secondary

recovery zone in the Jornada del Muerto (K. Havstad, Jornada Experimental Range, pers. comm.).

White Sands Missile Range and the New Mexico Department of Game and Fish have initiated an informal agreement that allows nuisance black bears live-trapped from the Cloudcroft and Ruidoso areas to be released into suitable habitat within the Oscura Mountains on the missile range (NMDGF 1993b). Eight bears have been relocated under this agreement. Relocated bears were not believed to have killed livestock or to have been aggressive toward humans.

The total mountain lion population in the San Andres Mountains is estimated at 75 to 80. Density is approximately one lion per nine mi². This density is among the highest documented in North America (Logan 1994b). An experiment was initiated in 1990 in which two-thirds of the lion population of the southern San Andres were translocated to northern New Mexico. By mid-1993, most of this loss had been replaced by immigration and reproduction, and the population in this portion of the San Andres stood at 26 to 28 animals. Researchers continue to regularly monitor their movements. Despite the high lion density, cases of depredations on livestock on the west side of the missile range have been very rare (K. Logan, Hornocker Wildlife Research Inst., pers. comm.).

No predator control occurs within the missile range boundary. The New Mexico ADC office has control agreements with six ranches in the WSWRA secondary recovery zone. Target animals are coyotes and bobcats, and a full range of control methods are used, Verified losses in 1992 consisted of one calf.

Table 3-15. Average annual mule deer harvest, White Sands Missile Range, 1989-1993.

Area	Weapon	# Permits	# Hunters	Harvest	% Hunter Success
Oscura	Bow	50	43	4	8
Salinas	Bow	50	36	5	14
Oscura	Rifle	93	84	42	49
Salinas	Rifle	75	71	60	88

SOURCE: Morrow 1994.

Table 3- 16. Average annual pronghorn and oryx harvest, White Sands Missile Range, 1986-1993.

	# Permits	# Hunters	Harvest	% Hunter Success
Pronghorn	27	26	25	97
Oryx	148	147	140	96

SOURCE: Morrow 1994.

Land Ownership and Management

The Department of the Army exerts principal control and land management authority over White Sands Missile Range. The Army manages it to support missile and weapons development and test programs for the Army, Navy, Air Force, National Aeronautics and Space Administration (NASA), several other agencies, and non-government agencies. The missile range consists of a complex overlay of federal lands co-used by the Army and various land administrators, particularly in the southern one-third of the installation. Air space over the entire WSWRA is controlled by the military.

The National Park Service administers the 88-mi² White Sands National Monument. The monument is located entirely within the boundaries of White Sands Missile Range (see separate section below on the Monument). The FWS manages the 90-mi² San Andres National Wildlife Refuge that also lies entirely within the missile range. The principal purpose of the refuge is to conserve and develop its wildlife resources. The focus of refuge activities has been on protecting and restoring the remnant population of desert bighorn sheep.

The U.S.D.A. Agriculture Research Service, administers the 293-mi² Jornada Experimental Range located on the western San Andres Mountain piedmont and on the eastern portion of the Jornada Valley (see separate section below on the JER). About half of the JER is located within the missile range, and activities of both the Agriculture Research Service and the Army are subject to a co-use agreement.

NASA manages its White Sands Test Facility on a 88 mi² portion of the missile range to test spacecraft components. The Army has access to the NASA site and may construct roads, power lines, communication lines, and instrumentation sites, as well as conduct missile and Air Force tests at altitudes above 10,000 feet.

A 64-mi² area in the southeastern portion of the missile range is managed by Holloman Air Force Base.

The New Mexico Department of Game and Fish has ultimate management responsibility for most of the wildlife in the area. An interagency cooperative agreement sets forth the specific responsibilities of the Department of Game and Fish, U.S. Fish and Wildlife Service, and the Army.

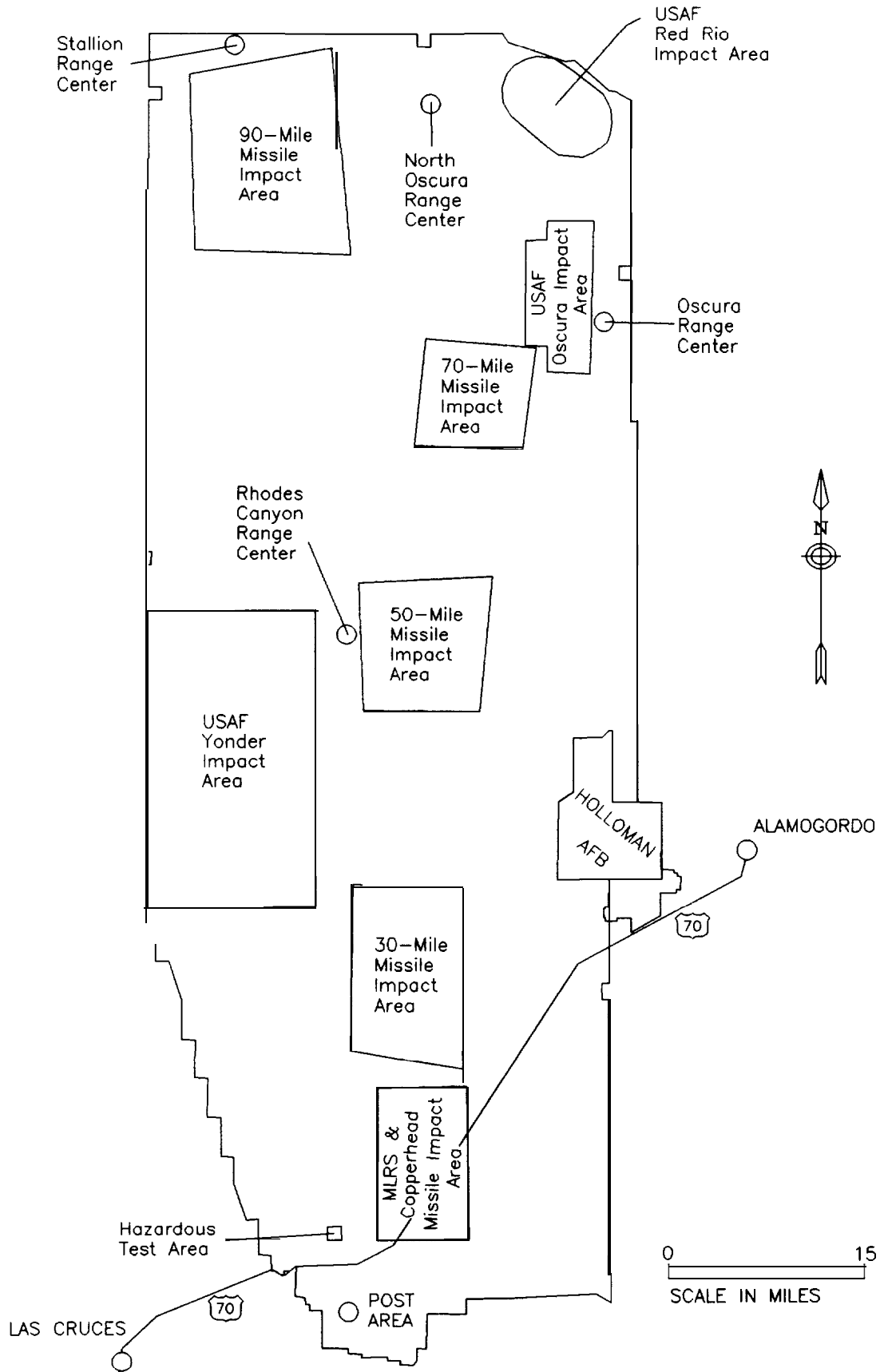
Military use of all co-use lands takes precedence over other activities. Public access generally is prohibited on all co-use lands except on White Sands National Monument (WSMR 1993). The secondary recovery zone to the west of the missile range boundary consists mostly of BLM and private land. About a dozen ranches operate there.

Land Development

Within the missile range are one post headquarters area in the southwestern corner and four range centers (Stallion, Oscura, North Oscura, and Rhodes Canyon Range Centers), two of which are regularly inhabited by government personnel (Fig. 3-6). The post headquarters area consists of 1,900 acres (U.S. Army 1985) and provides living quarters for about 850 families and 65 single people (Anon. 1992). The range centers occupy less than 65 acres each and primarily consist of maintenance, shop, and storage buildings. These sites have temporary housing facilities for 20 to 80 people (U.S. Army 1985). All of the support facilities are located in lowland basin areas.

More than 1,100 instrumentation sites are scattered throughout the missile range (U.S. Army 1985). Many of these consist simply of elevated concrete pads used occasionally to support portable equipment during specific tests. A few sites have structures manned occasionally. Collectively, these sites occupy about 1,480 acres, mostly in basin areas (U.S. Army 1983).

Figure 3-6. Impact areas and range centers in White Sands Missile Range.



Historic homesteads, mostly in dilapidated condition, are scattered throughout the missile range. The **Hardin Ranch** and **Mocking Bird Gap House** are maintained by the Army and used mostly by staff working in remote areas.

Livestock Grazing

The only part of the WSWRA with private livestock grazing is the narrow, sparsely-populated ranching area in the secondary recovery zone to the west of the missile range. Twelve ranchers graze a total of about 2,120 cattle year-round. Some of their BLM allotments are only partially within the secondary recovery zone (Howard 1993). Cattle occasionally trespass onto the missile range, especially where fences do not exist or are not maintained, and a small band (10 to 20) of feral cows reportedly lives in the southern part of the San Andres (D. Taylor, WSMR, pers. comm.).

Mining and Other Natural Resource Extraction

There are no active mines or other natural resource extraction activities occurring within the WSWRA, with the exception of an exploration permit granted for an alleged historic gold cache on **Victorio Peak** in the southern part of the San Andres range. Active mines for precious metals are found in the northwest part of the **Oscura Mountains** just outside the WSWRA boundary near **Bingham**. Portions of the secondary recovery zone to the west have been leased for oil and gas development (Howard 1993). However, the few wells drilled have not produced and the development potential appears low.

Military Activities

White Sands Missile Range is a multi-service test range. Its main function is to support missile development and test programs for the Army, Navy, Air Force, NASA, other government agencies, and private industry. The missile range is under the operational control of the U.S. Army Test and Evaluation Command, Aberdeen Proving Ground, Maryland. The primary purpose is to test new high-technology weapons systems and equipment. In conducting these tests, the missile range uses sophisticated instruments such as radar, fixed and tracking optics, and telemetry.

White Sands Missile Range also operates various Army laboratories and test facilities, including the **Temperature Test Facility**, **Atmospheric Sciences Laboratory**, **Aerial Cable Range**, and **Nuclear Effects Laboratory**. Simulated nuclear explosions are conducted in the northwest area to the west of the **Oscura Mountains**. White Sands Missile Range also provides an alternate landing site for the space shuttle program. In 1992, 91 testing programs were active and 3,468 different tests were completed (Public Affairs Office 1993). Many sites are used as missile or weapons impact areas or for other types of potentially hazardous experiments. Most operations that involve some risk to wildlife and humans are carried out in the **Tularosa Basin**; however, the mountainous areas are subject to occasional impact risk.

Many missile firing programs are underway. Surface-to-surface type missiles, with ranges in excess of twenty miles and requirements for large impact areas, use much of the range area and assets. **Surface-to-air** missiles along with their associated targets use even more range area and assets, often scattering debris over wide areas. The proposed reopening of the **off-range corridor** over White Sands Missile Range, which would enable the firing of target missiles from **Fort Wingate**, New Mexico and **Green River**, Utah, would increase surface-to-air test activity. Several air-to-air missile test programs are ongoing with the attendant problem of debris falling over wide areas. **Air-to-surface** missile tests also are ongoing and have large surface area danger zones as well as specific target areas.

Most of the instruments are mobile and may be operated from any of the more than 1,100 sites distributed throughout the missile range, depending upon the test requirements. There also are a number of autonomous, manned facilities scattered throughout, the operators of which frequently conduct their own operations. Most of those sites, such as **Aerial Cable**, **Large Blast Thermal Simulator**, and **Nuclear Effects facilities**, are located in the basin areas. However, some facilities are located in or adjacent to mountainous areas. **North Oscura Peak** is occupied intermittently by test programs requiring a mountain-top location.

Although a majority of the live firing tests have the potential to impact the mountainous areas of the range, the more routine impacts in the San Andres area will result from Air Force and Air National Guard training missions. Most of these missions occur at altitudes over 10,000 feet. Duds and damaged drone

targets are scattered throughout the mountain range. Targets are not normally shot down over the San Andres because of the difficulty in recovering the debris; however, this area is a safety buffer zone and impacts can occur.

The Red Rio and Oscura impact areas (Figure 3-6, above), managed by Holloman Air Force Base, are mainly used for bomb drop exercises and by tactical fighter aircraft for air-to-ground gunnery and strafing practice. These locations in the relatively dry foothills are contaminated with 20-mm shells, but are policed periodically for duds by the Air Force to the maximum extent possible (U.S. Army 1985). Programs involving the testing of air defense system weapons have been active in the foothill areas east of the Oscura Mountains (U.S. Army, n.d.). The testing programs involve numerous missile firings at fixed-wing and rotary drone aircraft. The Oscura Mountains primarily serve as a “back stop” for launched missiles that miss the targets. Live ordnance has occasionally caused fires in this area (U.S. Army, n.d.).

A hazardous test area in the southwestern portion of the missile range (Fig. 3-6, above) lies adjacent to the San Andres. Contaminants at this site include ordnance, explosives, and propellants that may be potentially toxic to wildlife.

Public Access and Recreation

The entire missile range is closed to the public with the following exceptions: occasional temporary openings of specified areas such as the Trinity Site, which commemorates the first atomic bomb test; big game hunts; and special use permits, such as for research. Additional public access has been proposed for future special events. Holloman Air Force Base is closed to the public with the exceptions of Lakes Holloman and Stinky. The White Sands National Monument is open to the public (see separate section below on the Monument). Highway 70 provides the major public access across the WSWRA.

The secondary recovery zone to the west of White Sands Missile Range is primarily BLM land that is open to public use. However, due to its isolation and lack of developed recreational opportunities, recreational use is low (Howard 1993). The exception is during the deer hunting season when numerous hunters occupy BLM land along the missile range boundary.

Regional Economy, Employment, and Population

The economic activity generated by missile range testing activities and nearby military and space facilities dominate the economy of the WSWRA. The combined civilian and military payrolls of the missile range exceed \$143 million annually. An additional payroll is attributable to the contractors working on the range (Public Affairs Office 1993).

The Post area, where 1,724 personnel live, is the only population concentration within the WSWRA. Most of the rest of the 8,800 missile range employees (military, civilian, and contractors) live in the Las Cruces, El Paso, or Alamogordo areas (Public Affairs Office 1993). The other large employers in the region are Holloman Air Force Base near Alamogordo and New Mexico State University in Las Cruces.

The population of Doña Ana County, which is concentrated in the Las Cruces area, is projected to grow rapidly in the near future, from 136,470 in 1990 to 182,430 in 2000 (Bur. of Bus. and Econ. Res. 199 1). Slower growth rates are projected for Lincoln, Otero, Sierra, and Socorro Counties surrounding the WSWRA. Table 3-1 7 summarizes U.S. census data for the census areas that correspond best to the boundaries of the WSWRA. There are no permanent inhabitants of the WSWRA primary recovery zone, thus no summary table is provided for it.

White Sands National Monument

White Sands National Monument occupies approximately 145,000 acres of the Tularosa Basin and is surrounded by White Sands Missile Range. The Monument was established to preserve the white gypsum sand dunes and crystalline formations that cover about 37% of the area (NPS 1993). The Monument contains no perennial water sources. Lake Lucero, a **playa** lake, contains water about 10% of the time. During periods of heavy rainfall, the lake may contain water for up to three to four months (J. Mangmeli, White Sands Natl. Mon., pers. comm.).

The vegetation is generally representative of the Chihuahuan desert ecosystem. The harsh alkaline soils support little growth, however. No deer, pronghorn, or **javelina** inhabit the Monument (R. Appling, White

Table 3-17. Summary of regional U.S. Census data for White Sands wolf recovery area.¹

Total population	3,868
Population density	0.8/mi ²
Number in civilian labor force	1,870
Percent of civilian labor force unemployed	9.2%
Percent of civilian labor force employed in agriculture, forestry or fisheries	10.0%
Median household income	\$23,393
Percent of population below poverty level	8.4%

¹Region covered by census tracts does not correspond exactly with recovery area boundaries; generally, census tracts include some adjacent rural areas around the recovery areas. Portions of additional census tracts in Dona Ana, Lincoln, Otero and Socorro counties also occur within the WSWRA secondary recovery zone; however, these portions lack permanent resident, and census data from these tracts are not included here. There are no permanent inhabitants of the WSWRA primary recovery zone, thus no summary table is provided for it.

SOURCES: 1990 U.S. Census for Dona Ana County census tract **19** and Sierra County census tract **982 1**.

Sands Natl. Mon., pers. comm.). Oryx number **100** to 200. No mountain lions or black bears are present. Coyotes and kit foxes are common.

The western half of the Monument is administered as a joint-use area with the missile range and is subject to frequent closures during testing periods. Development plans consist of expanding the trail system and continuing construction of an oryx enclosure fence. A total of eight miles of public roads, a one-mile trail, and three picnic areas have been constructed for public use. An average of 600,000 visitors per year visit the Monument, and the one backcountry campsite attracts **1,000** to 1,700 people per year (R. Appling, White Sands Natl. Mon., pers. comm.).

Jornada Experimental Range

The Jornada Experimental Range (JER), administered by the Agricultural Research Service of the U.S.D.A., is located mainly on the Jornada de Muerto Plain between the Rio Grande Valley on the west and the San Andres Mountains on the east (Fig. 3-4, above). Elevations on the 193,394-acre tract range from 4,200 feet on the plains to 8,500 feet in the San Andres. Average annual precipitation is 9.7 inches,

falling mostly from July through September. The average maximum temperature is 97°F in June and 56°F in January. Eighteen permanent water tanks and wells are distributed throughout the plains portion of the JER.

The primarily Chihuahuan desert vegetation types range from grassland to desert scrub. Research has documented the historical conversion of semi-desert grasslands to desert shrubs caused by drought, shrub seed dispersal by animals, and overgrazing. Grasses are interspersed with encroaching snakeweed, honey mesquite, creosotebush, and **tarbush**. On the mountain slopes, honey mesquite, creosotebush, sotol, and mountain mahogany are predominant, although some areas support oneseed juniper and **piñon**.

No federally endangered or threatened mammals occur in the JER. New Mexico state-endangered desert bighorn sheep number about 20, including the overlap area with the San Andres National Wildlife Refuge. Mule deer in the foothills and mountains are estimated at **100** to 300. Pronghorn (70 to **100** animals) roam the Jornada plain. Eighty oryx inhabit the plain and foothills. Coyotes are the most numerous carnivore and are increasing in number. Coyote density is three to four animals per mi². Two to three mountain lions inhabit approximately 55 square miles, all in the San Andres Mountains.

The mission of the JER is to acquire knowledge of ecosystem processes for development of remediation technologies and management of desert rangelands. Research conducted by JER staff is augmented by interagency research programs, including the National Science Foundation's Long-Term Ecological Research Program and the Environmental Protection Agency's Environmental Monitoring and Assessment Program. Over 30 scientists conduct agricultural and ecological studies.

For experimental purposes, the JER maintains approximately **1,100** cattle (640 cows and 400 to 500 calves), 300 sheep (plus 300 to 400 lambs annually), and a small number of horses. No livestock grazing occurs in the San Andres National Wildlife Refuge portion of the JER. Coyotes are the major predator. The JER's experimental predator control program consists of electric fences, guard dogs, and bonding of sheep to cattle. Fifty coyotes were removed in **1989** and none since then. Most of the land is managed for livestock grazing, including 42,720 acres managed jointly with White Sands Missile Range as a missile test safety buffer zone. A total of 4 **1,280** acres of the JER in the San Andres is off-limits to livestock. Unescorted public access and hunting are prohibited (Anon. 1987a; K. Havstad, JER, pers. comm.).

The Potential Natural Recolonization Areas

The following are potentially suitable areas for natural recolonization by wolves that might disperse north from Mexico: southeastern Arizona, southwestern New Mexico (Fig. 3-7), and Big Bend National Park in south Texas (Fig. 3-8). They are not proposed for active releases of captive-raised wolves. These areas are described here for the purpose of assessing speculative, long-term, impacts under Alt. D, the no action alternative (see Chap. 2). No impacts will occur in these areas under the other alternatives, unless reintroduced wolves were to disperse into these areas under Alt. C, the full-endangered reintroduction approach.

Southeastern Arizona Potential Natural Recolonization Area

Coronado National Forest South of Interstate 10

Geography

The potential natural recolonization area within southeastern Arizona is that portion of the Coronado NF south of Interstate Highway 10 together with Coronado National Monument, Chiricahua National Memorial, and Fort Huachuca (see sections below on the latter three areas). The area takes in parts of Cochise, Santa Cruz, and Pima Counties.

The Coronado NF in this area consists of seven separate blocks **totalling 1,531 mi²**, or 979,840 acres, and comprises the Tumacacori (310 mi²), Santa Rita (218 mi²), Huachuca (380 mi²), Whetstone (69 mi²), Dragoon (81 mi²), and Chiricahua (445 mi²) Mountains, and the Arizona portion of the southern Peloncillo Mountains (28 mi²) (Girmendonk 1994b). Landforms are typical of the Basin and Range physiographic province, with isolated mountain ranges rising above desert valleys. Elevations vary from slightly under 4,000 feet in the interspersed desert valleys to more than 9,000 feet at the crests of the Santa Rita, Huachuca, and Chiricahua ranges (Allen 1993).

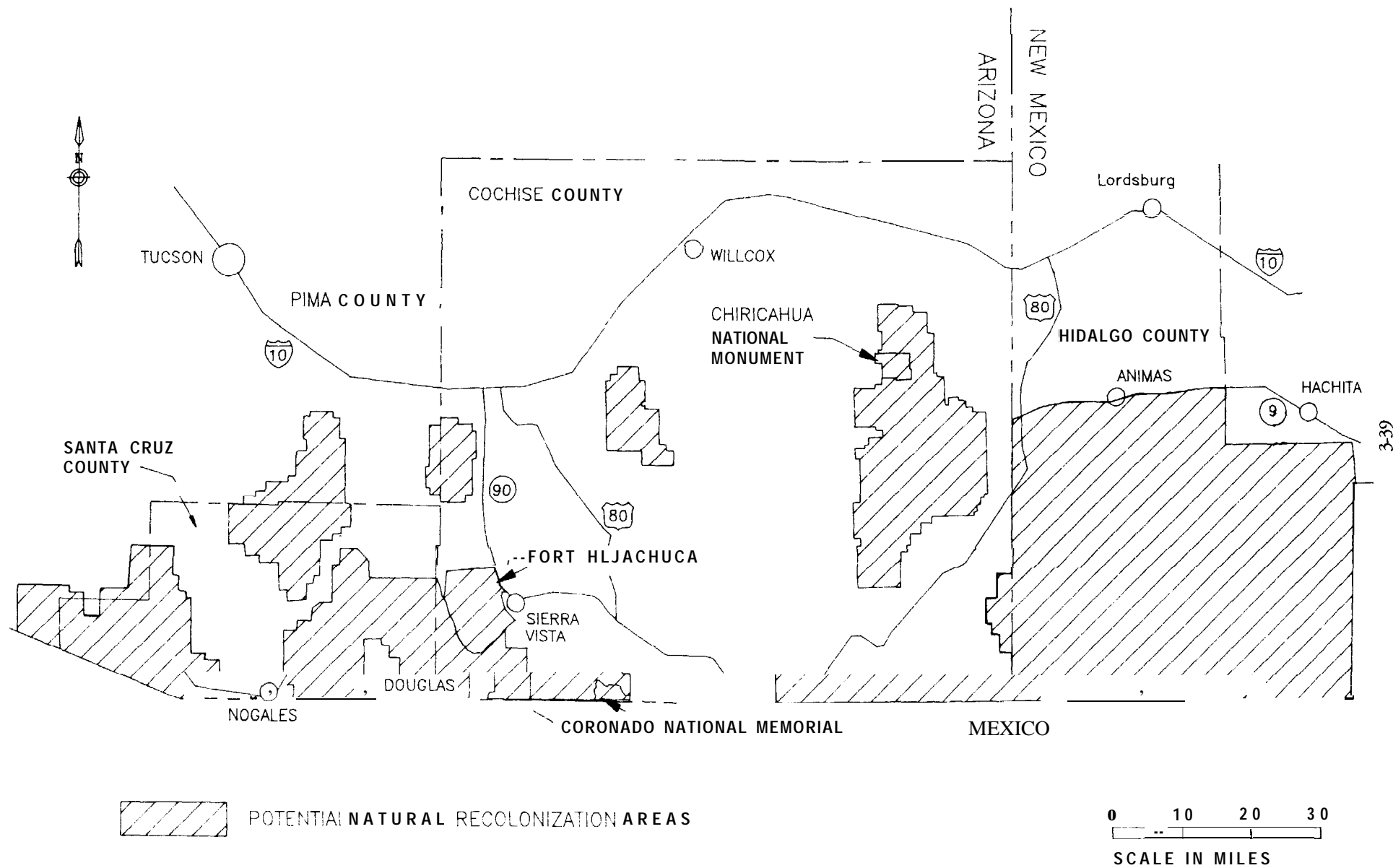
Climate

Climate varies with elevation, with mild winters and hot summers at lower elevations and the opposite extremes in the high mountains (Allen 1993). The Atascosa and Patagonia Mountains average 19.2 inches of rain per year with extreme temperatures ranging from -7°F to 114°F and averaging 62°F. The Chiricahua Mountains receive 16.7 inches of rain annually and temperature extremes are -9°F to 112°F, with an average of 60.8°F (Johnson et al. 1992).

Water

Several thousand water sources have been developed by the Forest Service and its permittees in this area (Allen 1993). Based only on sources registered for livestock or wildlife use, the Arizona Game and Fish Department determined that the Atascosa, Santa Rita,

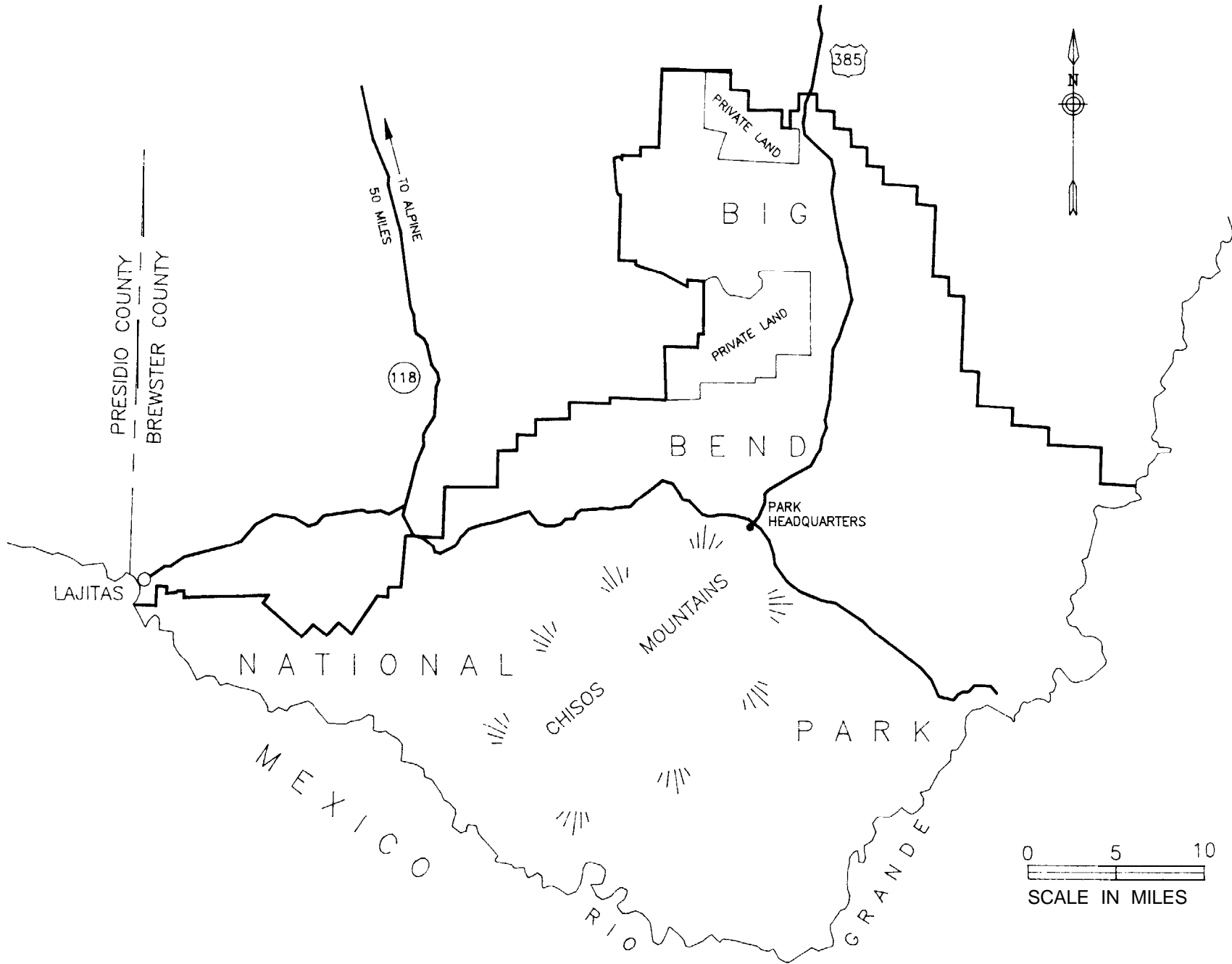
Figure 3-7. Mexican wolf potential natural recolonization areas in southeastern Arizona and southwestern New Mexico.



NOTE: Areas in southeastern Arizona consist of all the Coronado National Forest units south of Interstate 10, together with the separately labelled areas.

Figure 3-8. Mexican wolf potential natural recolonization area in Big Bend National Park.

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Huachuca, Whetstone, and Patagonia Mountains have 2,395 developed sources and the Chiricahua Mountains have 1,576 developed sources. Four perennial waters are present in the Chiricahuas, and 13 perennial water sources are spread throughout the Atascosa/Patagonia area (Johnson et al. 1992).

Vegetation

Because mountains in southeastern Arizona are surrounded by desert vegetation, these isolated ranges have developed unique plant and animal species. Valley floors support desert shrub or semi-desert grassland vegetation. Low elevation areas west of the Whetstone Mountains exhibit flora characteristic of the Sonoran desert, while low elevation areas to the east are part of the Chihuahuan desert. The dominant vegetation on the southern portion of the Coronado NF is Madrean evergreen woodland. This community includes live oaks, piñon, junipers, and a significant cover of grasses and forbs. Density of these woodlands varies with topographical aspect and fire history, and the area is a mosaic of dense to sparse woodlands, savannas, and grasslands. These woodlands are bordered by pine and mixed conifer forests at higher elevations and grasslands at the lower elevations (Allen 1993). The Atascosa and Patagonia Mountains contain the greatest percentage of oak vegetation and Madrean evergreen woodlands. The Dragoon and Whetstone Mountains contain few forested areas (Johnson et al. 1992). Riparian vegetation intergrades from mesquite, willow, and hackberry within the desert grasslands through cottonwood, sycamore, ash, and willow in the woodlands to willow and alder at the upper elevations (Allen 1993). The areas that include conifer forests, Madrean evergreen woodlands, and grasslands total 860 mi² in the Atascosa and Patagonia Mountains and 790 mi² in the Chiricahua Mountains (Parsons 1993).

Animals

History of Wolves.—In southeastern Arizona, Mexican wolves historically were common in the Santa Rita, Tumacacori, Atascosa, Patagonia, Chiricahua, Huachuca, and Pinalaño Mountains, and the Canelo Hills (Brown 1983). The area contained three historical wolf runways (paths regularly used by travelling wolves) (Young and Goldman 1944). **One** originated in Mexico and ran north through the Huachuca

Mountains, west along the Canelo Hills near Patagonia, and back south along the Patagonia Mountains to the border. The second passed north through Ruby along Bear Mountain, west through Altar Valley, and into the Baboquivari Mountains. The third went northwest from Mexico through the Peloncillo Mountains and back into Mexico through the Animas/San Luis Range (Johnson et al. 1992).

Trapping data from Arizona revealed the presence of wolves throughout the region until 1950. In the 1920s and 1930s, about 40 wolves **were** taken by government trappers and private ranchers in Santa Cruz, Pima, and Cochise Counties. Approximately 30 more were trapped in the 1940s in the same area. A few wolves were reportedly captured in 1949, but no successful trapping occurred after that year (Brown 1983). Since 1983, 29 unconfirmed “wolf” observations have been reported in Cochise, Santa Cruz, and Pima Counties, more than half of those reported being lone animals. The greatest concentration of these reports (14) occurred in Santa Cruz County (Girmendonk 1994a). Intensive wolf howling surveys in the area in 1995 found no evidence of wolves (Whitaker et al. 1995).

Species of Special Concern.—Federally endangered wildlife include the Yaqui catfish, Yaqui chub, desert pupfish, Gila topminnow, Yaqui topminnow, bald eagle, peregrine falcon, thick-billed parrot, southwestern willow flycatcher, and lesser long-nosed bat. The federally threatened Sonora chub and Mexican spotted owl also occur here. Chihuahuan pronghorn are a state-threatened species, occurring in the Atascosa and Patagonia Mountain area and the Chiricahua Mountain area (Johnson et al. 1992). Other species listed by Arizona are the Sonora chub, Yaqui chub, Gila topminnow, Yaqui topminnow, and California leaf-nosed bat (L. Allen, Coronado NF, pers. comm.; D. Groebner, AGFD, pers. comm.).

Designated critical habitat associated with the federally threatened Sonora chub occurs in the Coronado NF, which encompasses Sycamore and Peñasco Creeks, an unnamed tributary, Yank’s spring, and a 25-foot wide riparian strip along each side of the creeks. Activities that would deplete or change the natural flow of these waters may be restricted. In addition, excessive groundwater pumping, impoundment, or water diversion, mining, excessive sedimentation, riparian destruction, release of pollutants,

and the introduction of exotic fish species also may adversely impact the Sonora chub's critical habitat.

Potential Wild Prey of Wolves.—Prey species present include white-tailed deer, mule deer, javelina, and Chihuahuan pronghorn (Allen 1993). In southeastern Arizona white-tailed deer are associated with Madrean evergreen woodlands, while mule deer inhabit chaparral, semi-desert grasslands, and desert shrub communities (Johnson et al. 1992). In the Coronado NF south of Interstate 10 white-tailed deer are estimated at 1,640, mule deer at 2,700, javelina at 3,177, and transplanted Chihuahuan pronghorn at 500 animals (Table 3-1 8). In addition, about 100 North American pronghorn inhabit the Lochiel Valley. No elk or Rocky Mountain or desert bighorn sheep are found in southeastern Arizona south of Interstate-10 (Girmendonk 1994b), although the New Mexico Game and Fish Department recently relocated desert bighorns to the New Mexico side of the Peloncillos (L. Allen, Coronado NF, pers. comm.). Southeastern Arizona deer are increasing since a low in 1989, although fawn and buck survival remain relatively low. The Dragoon Mountains have had good mule deer fawn survival recently, while the Whetstone and Chiricahua Mountains have had the poorest mule deer fawn survival. Javelina populations are increasing. The pronghorn fawn and overall survival rates are increasing (AGFD 1994a).

Ungulate density in the **Atascosa/Patagonia** Mountains area is 8.5 per mi², with about 69% deer and 30% javelina (Girmendonk 1994b). The Chiricahua Mountains maintain an ungulate density of 3.2 per mi², with 73% deer and 25% javelina (Parsons 1993). Descriptions of habitat characteristics of the various prey are found in the previous section in this chapter on the BRWRA, with the additional observation that in southeastern Arizona, javelina usually occur at 2,000-6,500 feet near bajadas and canyon mouths, rarely going above the oak forests (Hoffmeister 1986).

Small prey species include jackrabbits, cottontails, skunk, coatimundis, porcupines, various tree and ground squirrels, chipmunks, rats, voles, and other small mammals (Hoffmeister 1986).

Hunting.—White-tailed and mule deer, javelina, black bear, lion, and pronghorn hunting are permitted in the Coronado NF south of I-10. For 1991-1992, the average annual deer, javelina and pronghorn taken

were 7,612 (24.0% hunter success), 1,206 (23.3% hunter success), and 6 (50.0% hunter success), respectively. Buck:doe:fawn deer ratios vary among the different units, although does consistently outnumber bucks and fawns, and fawns outnumber bucks (Girmendonk 1994b). Hunting seasons are comparable, but with some differences, to those for the Arizona side of the BRWRA, described above. Small game hunting is more common.

Existing Livestock Predators.—Coyotes and mountain lions are the primary livestock predators in the area. Coyote, black bear, mountain lion, and bobcat numbers are depicted in Table 3-19. No federal predator control actions were carried out on this part of the Coronado NF during fiscal year 1993. The ADC can respond to requests from livestock permittees when needed; however, because of a lack of funding agreements, work in Santa Cruz and Pima counties has been limited since 1989, and no federal control actions in the Atascosas, Santa Ritas, Patagonias, or Canelo Hills has occurred since 1991 (Phillips 1993). Grazing permittees are allowed to take depredating animals under state regulation.

ADC has two full-time employees stationed in Cochise County. ADC has agreements with 39 ranches, which graze 398,789 acres of private lands, and with Fort Huachuca, covering another 12,304 acres. Livestock losses in the area are low. Between October 1992 and August 1993, a total of four adult cattle, eight calves, 25 lambs, two ostriches and four chickens were verified killed by predators. Control tools used include leghold traps, call and shoot, and foot snares (Phillips 1993).

Land Ownership and Management

The Forest Service administers the Coronado NF. Management emphasizes grazing, forest products, and recreation. The National Forest is surrounded by State of Arizona, BLM, and private lands, including approximately 75,000 acres of private inholdings (about 4% of the land area) (L. Allen, Coronado NF, pers. comm.).

Wilderness areas include Miller Peak Wilderness in the Huachuca Mountains, Pajarito Wilderness in the Pajarito Mountains, Mount Wrightson Wilderness in the Santa Rita Mountains, and Chiricahua Wilderness (totalling 87,150 acres). The Bunk Robinson Wilderness Study Area is in the Peloncillos. The private San

Table 3- 18. Number and density (animals/mi²) of potential wild prey of wolves in Coronado National Forest south of Interstate 10.

Note: Densities are not available for white-tailed deer or pronghorn.

	Mule Deer	White-tailed Deer	Javelina	Pronghorn
Tumacacori Mountains (310 mi ²)	992 (3.2)	>200	1,054 (3.4)	--*
Santa Rita Mountains (218 mi ²)	153 (0.7)	>260	414 (1.9)	0
Huachuca Mountains (380 mi ²)	114 (0.3)	>360	684 (1.8)	<100
Whetstone Mountains (69 mi ²)	200 (2.9)	>200	97 (1.4)	>100
Dragoon Mountains (81 mi ²)	203 (2.5)	>20	65 (0.8)	0
Chiricahua Mountains (445 mi ²)	979 (2.2)	>400	801 (1.8)	>150
AZ Peloncillo Mountains (28 mi ²)	64 (2.3)	>200	62 (2.2)	>150

*This population is the result of recent transplants of Chihuahuan pronghorn. Information on population numbers is not yet available.

SOURCE: Girmendonk (1994b).

Rafael de la Zanja land grant, primarily comprised of one large ranch, lies on the U.S.-Mexican border surrounded by the Huachuca and Patagonia Mountains and the Canelo Hills.

Agency and Local Government Plans and Policies

The Coronado NF operates under its 1986 Forest Plan, as amended each year. This plan identifies major issues facing the National Forest, including: 1) inabil-

ity to meet growing outdoor recreation demands; 2) appropriateness of predator control; 3) identification of critical wildlife habitat; 4) necessity to exclude mining in some sensitive areas; and 5) restricting public access in some areas. Specific goals of the Coronado NF include providing for ecosystem diversity "by at least maintaining viable populations of ... wildlife, fish and plant species through improved habitat management"; meeting the goals of the Endangered Species Act; and restoring rangeland to at

Table 3-19. Predator population estimates and densities (animals/mi²) in Arizona Game and Fish Department management units corresponding to Coronado National Forest south of Interstate 10.

	Coyote	Black Bear	Mountain Lion
Tumacacori Mountains	550 (1.0)	0-1 (0-0.002)	21-47 (0.04-0.08)
Santa Rita Mountains	700 (1.0)	22-56 (0.03-0.08)	21-52 (0.03-0.08)
Huachuca Mountains	1,000 (1.0)	1-5 (0-0.002)	26-68 (0.03-0.08)
Whetstone Mountains	500 (1.0)	0 (0)	12-33 (0.02-0.07)
Dragoon Mountains	1,400 (1.0)	1-3 (0.001-0.002)	24-61 (0.02-0.04)
Chiricabua and AZ Peloncillos	2,700 (1.0)	81-204 (0.02-0.05)	60-123 (0.01-0.03)

SOURCE: AGFD (1994b).

least a moderately high ecological condition (SW Region USFS 1992b).

Land Development

Subdivision of private holdings adjacent to and in between the National Forest units in southeastern Arizona is on the rise. This trend should continue in the foreseeable future. Inholdings tend to be concentrated along stream courses and valleys and have the potential for fragmenting wildlife habitat (L. Allen, Coronado NF, pers. comm.). Approximately 95 miles of trails are in need of construction or reconstruction in the Nogales, Sierra Vista, and Douglas Ranger Districts (SW Region USFS 1986c).

Livestock Grazing

Approximately 37,400 cattle (cows and calves) are permitted to graze the Coronado NF south of Interstate 10. There are 130 allotments, averaging 288 cattle per allotment. Roughly 70% of the cattle are on year-round allotments, while the rest are on the range in winter only. Almost all calves in this area are born on the range. About 50% of the area is grazed (Allen 1993).

Forestry

No commercial timber harvest is planned for the Coronado NF south of Interstate 10. **Fuelwood** harvest for personal use is permitted on three ranger districts. About 900,000 board feet is the anticipated annual harvest. The Forest Service manages the harvest for wildlife habitat improvement, watershed restoration, and range forage improvement. About 1,000 acres per year will be impacted and no new road construction for this purpose is anticipated (Allen 1993).

Mining and Other Natural Resource Extraction

No mines are active in the area. However, copper deposits have been located in the Santa Ritas and Patagonias and may be mined if markets improve (L. Allen, Coronado NF, pers. comm.).

Public Access and Recreation

The densities of roads in the rural areas in the Atascosa-Patagonia Mountains region and the Chiricahua Mountains are 0.10 and 0.24 miles/mi², respectively (Parsons 1993). The Huachuca Mountains are the

most heavily **roaded** region. Private inholdings that have been developed as subdivisions of larger blocks of land pose barriers to public access in some cases. The Forest Service is negotiating rights of way to some parts of the National Forest in southeastern Arizona (L. Allen, Coronado NF, pers. comm.).

Outdoor recreation is the fastest growing use. The Forest Service constructs and upgrades campgrounds and other recreational facilities to meet demand. Primary recreation uses are dispersed activities such as hiking, backcountry camping, hunting, fishing, birdwatching, and pleasure driving. Developed recreation areas include 19 campgrounds and three picnic areas. Many of these facilities have boat ramps, fishing docks, trail heads, nature trails, interpretive talks, and other attractions. The Coronado NF has two developed fishing lakes, Parker Canyon Lake in the Sierra Vista Ranger District and Peña Blanca Lake in the Nogales Ranger District.

Estimated use of the area in 1992 was 921,580 RVDs, including 369,900 RVDs for camping, 61,860 RVDs for hunting, 229,200 RVDs for hiking and horseback riding, 26,400 RVDs for fishing, and 234,220 RVDs for studying nature. These uses can be expected to grow at a moderate rate for the foreseeable future (Allen 1993). The Coronado NF permits 35 guides and outfitters (Coronado NF 1994). These are largely for hunting, but include some guiding for hiking, climbing, jeep tours, horseback rides, and other uses.

Regional Economy, Employment and Population

The portions of southeastern Arizona within the potential natural recolonization area depend economically on the military (Fort Huachuca employs 3,570 people, see separate section below on the Fort), ranching, and tourism/recreation. The metropolitan area of Nogales (population 19,850) is an important border crossing and warehousing area for trade with Mexico, lying between the Atascosa and Patagonia Mountains.

Some residential development north of Nogales extends into the Atascosas. Nevertheless, little or no residential developments occur within likely wolf habitat in the area. The area between Nogales and Patagonia is developing rapidly, particularly in subdivisions for vacation and retirement homes (see section on land development). Table 3-20 provides socioeco-

omic data for the region. Median household incomes are highest in Santa Cruz County and in the Fort Huachuca/Sierra Vista area and lowest in the rural agricultural areas of southwestern and eastern Cochise County.

Coronado National Memorial

Coronado National Memorial, established in 1952 to commemorate the first organized European exploration of the Southwest and administered by the National Park Service, is located in Cochise County. Encompassing 4,800 acres, it lies at the southern end of the Huachuclas. Elevations range from about 4,900 feet at the entrance to 7,676 feet at Montezuma Peak. Several springs and livestock watering tanks occur in the memorial (Anon. 1993; W. Smith, Coronado Natl. Mem., pers. comm.).

Vegetation communities range from desert grasslands at lower elevations to oak and oak-piñon woodlands at higher elevations. Two unconfirmed "wolf" sightings were reported near the Memorial in 1991 (Girmendonk 1994a). Wildlife of special concern include occasional unconfirmed reports of jaguarundis and ocelots. The federally endangered lesser long-nosed bat also occurs. White-tailed deer and javelina are plentiful throughout the Memorial, but mule deer are uncommon. Coatimundis, ringtails, bobcats, and coyotes are residents. Hunting is prohibited.

There are five miles of paved or graded roads and six miles of trails. In 1992, 71,291 visitors came. Recreational opportunities include sightseeing, birdwatching, hiking, picnicking, and spelunking. Camping is prohibited. There are four memorial-owned residences and three private residences. One grazing allotment is active, with 54 cattle permitted (Anon. 1993; W. Smith, Coronado Natl. Mem., pers. comm.).

Chiricahua National Monument

Chiricahua National Monument is located in Cochise County at the northern end of the Chiricahuas. The southern boundary of the 12,900-acre Monument adjoins the Coronado NF and private livestock ranches. Administered by the National Park Service, the Monument was established to protect unique natural formations called "the Pinnacles" (columns and

Table 3-20. Summary of regional U.S. Census data for southeastern Arizona potential natural recolonization area.'

Total population	26,519
Population density	8.3/mi ²
Number in labor force	12,148
Percent of civilian labor force unemployed	8.0%
Percent of civilian labor force employed in agriculture, forestry or fisheries	8.0%
Median household income	622,008
Percent of population below poverty level	18.3%

Region covered by census tracts does not correspond exactly with recovery area boundaries; generally, census tracts include some adjacent rural areas around the recovery areas.

SOURCES: 1990 U.S. Census for Cochise County census tracts 5, 14, and 21 and Santa Cruz County census tracts 9960 and 9961.

spires created from differential erosion of volcanic rock). Elevations vary from approximately 4,800 to 7,400 feet (Anon. 1987b).

The Monument's two canyon drainages contain ephemeral water, and five permanent springs occur. Pine-oak woodland is the characteristic vegetation community, interspersed with desert and riparian vegetation. No recent reports of wolf sightings have come from here. The federally endangered American peregrine falcon and federally threatened Mexican spotted owl occasionally have been sighted. A population of at least 24 Coues white-tailed deer live in the Monument and desert mule deer occur occasionally. Javelina and coatimundi are common. The Apache fox squirrel is endemic to the area. Coyotes are uncommon. At least one mountain lion and four bobcats inhabit the area (S. Clark, Chiricahua NM, pers. comm.).

There are eleven miles of roads. Visitation reached about 78,000 RVDs in 1990. Uses include scenic viewing, hiking, birdwatching, picnicking, and camping. Management is directed toward identifying, protecting, and perpetuating the Pinnacles and the Monument's natural values. The Monument contains **11,120** acres of designated wilderness. No hunting or grazing is allowed. One 2.4-acre parcel of land in the northeastern corner is the only inholding and is part

of a patented mining claim. Expansion of mining operations is not anticipated (Anon. 1987b).

Fort Huachuca

U.S. Army Garrison Fort Huachuca encompasses 12 1,300 acres, mostly in Cochise County. The south and west sides of the fort border the Coronado NF (Fig. 3-7). Elevations range from 4,000 to 8,410 feet. The terrain varies greatly from flat grasslands and desert scrub to steep, rugged mountains. About 26,000 acres is mountainous. Sedimentary rocks underlie the major canyons, and limestone forms the major conduits for springs. The average temperature is 72°F. Average annual rainfall ranges from nine inches at lower elevations to almost 24 inches at higher elevations. At least 35 acres of artificial ponds and four to five miles of natural streams constitute the fort's perennial water sources. In addition, about 80 water catchments and wildlife watering troughs are found around the fort, as well as several ephemeral ponds, springs, and seeps.

Five overlapping habitat types are represented. Lower elevation vegetation consists of desert grassland. Above 5,000 feet elevation are oak-pine, piñon-juniper and mixed conifer woodlands. Riparian habitat comprises the smallest acreage.

No recent wolf reports have come from the fort; however, several unconfirmed reports originated around Parker Canyon Lake south of the fort **and** along its south-southwest border. The federally endangered American peregrine falcon and lesser long-nosed bat, and the federally threatened Mexican spotted owl occur here. Potential wild prey of wolves include **1,100** to 1,500 Coues white-tailed deer and 200 to 300 desert mule deer. **Javelina** number 200 to 300. A population of 30 to 40 North American pronghorn live on the fort, originating from a herd introduced from Wyoming. An additional herd of 10 to **11** Chihuahuan pronghorn reside on the fort from a population translocated from Texas in 1987. The indigenous Gould's turkey has been re-established and numbers 50 to 100.

Hunting is open to military personnel, civil service employees of the fort, and dependents. Between 1987 and 1993, an annual average of about 200 white-tailed deer, 15 mule deer, 20 javelina, and four North American pronghorn were harvested. Every year, 20 to 25 coyotes are taken by hunters to reduce the threat to Chihuahuan pronghorn fawn recruitment or trapped by the ADC. Six to eight mountain lions and a similar number of black bears range on the fort. Lion hunting is open year-round under state regulations, and one lion is harvested about every three years. One spring bear tag is issued annually, but no bear harvest has occurred in recent years.

The fort contains **73,315** acres that are committed to a natural resource management program. Cattle and sheep grazing are prohibited. A horse stabling and rental program on the fort maintains about 50 to 60 horses, a significant reduction in recent years. Mining activity has ceased. Over 50 miles of roads are open to the public. A minimum of 15,000 people visit annually, including 6,000 to 8,000 bird watchers. Visitors can fish, bird watch, hike, picnic, camp, and ride horses. Limited recreational vehicle camping and off-road vehicle recreation also are available. Approximately 45 miles of trails provide public access to 24,450 acres of forested areas in the Huachuca **Moun-**tains.

The fort population is growing and has reached over 15,500, including approximately 7,000 military personnel. No mechanized military activities occur in the mountainous areas (Anon. 1989).

Southwestern New Mexico Potential Natural Recolonization Area

Geography

Southern Hidalgo County, known as New Mexico's "bootheel," is located in extreme southwestern New Mexico south of State Road 9 (Fig. 3-7, above). The bootheel, covering approximately 1,432,044 acres (2,238 mi²), is bordered on the west by Arizona, on the south and east by the Mexican State of Chihuahua, and on the southwestern corner by the Mexican State of Sonora. The Peloncillo Mountains portion of the Coronado NF (65,360 acres on the New Mexico side) straddles the Arizona-New Mexico border. The majority of federal public lands (488,420 acres, or 34.1%) are located in the eastern part of the bootheel, although substantial federal acreage is located along the Peloncillo and Animas Mountain ranges as well. State of New Mexico lands (187,120 acres, or 13.1%) are interspersed among the federal lands, with the largest holdings in the Big Hatchet Mountains (Big Hatchet State Wildlife Refuge) and along the eastern slope of the Animas Mountains. Private lands (691,140 acres, or 48.3%) are scattered throughout the area, but are concentrated along the Playas and lower Animas Valleys and in the southern quarter of the bootheel.

The area is within the Basin and Range **physi-**ographic province. Landforms include rugged, north-south oriented mountains, broad basins and volcanic uplifts (USBLM 1991). The Peloncillo, Animas, Alamo Hueco, Little Hatchet, and Big Hatchet Mountains are found here, separated by the Animas, Playas, and Hachita Valleys. Elevations range from 4,100 to over 8,500 feet.

Climate

The climate is arid to semi-arid and is characterized by mild winters and warm to hot summers. The average low temperature is 26°F in January and the average high is 95°F in July. Annual precipitation averages eight to ten inches below 6,000 feet elevation and 14 to 16 inches at higher elevations (USBLM 1991).

Water

Few perennial surface water sources occur in the bootheel. Playas Lake, located in the Playas Valley, is a shallow basin that occasionally contains water. Cloverdale Creek, which originates in the Coronado NF, flows over most of the year. The Animas, Deer, and Double Adobe Creeks flow only during periods of heavy rainfall. Stock tanks are plentiful, but few natural cienegas or springs occur here (C. Siepel, Hidalgo County Agric. Extension Office, pers. comm.).

Vegetation

The bootheel historically was dominated by semi-desert grasslands. In response to increased livestock production, the dominant vegetation generally has degraded from semi-desert grasslands to desert shrub. The Animas Valley in the southwestern part of the bootheel is an exception, hosting extensive grasslands characterized by tobosa and black grama, and a 44,000-acre prairie of blue grama and buffalograss. Nearly 55% of the privately-owned, 321,700-acre Gray Ranch (in the Animas Mountains area) is grasslands. The Animas, Peloncillo, and Alamo Hueco Mountains contain extensive juniper-oak vegetation between 5,500 and 8,000 feet elevation. The major drainages support sycamore and cottonwood forests. Big Hatchet State Wildlife Refuge contains primarily desert shrub habitat with piñon-juniper communities interspersed (USBLM 199 1; Brown 1990).

Animals

History of Wolves

Historically, Hidalgo County was a Mexican wolf stronghold. Wolves were most common in the Animas Mountains. They dispersed mainly from Mexico into New Mexico along the mountain ranges in the bootheel. By the 1930s, the Animas and Peloncillo Mountains were the last places in New Mexico to which wolves dispersed from Mexico.

Intensive federal eradication efforts began around 19 16. Wolves were systematically trapped, poisoned, and shot as they crossed the border. By the time trappers were employing Compound 1080 and M-44s in the 1950s, the number of wolves was waning. Only

two were trapped in New Mexico in 1950, both in Hidalgo County. Single or no wolves were taken in the county each subsequent year until 1970, when the carcass of the last wild wolf confirmed in New Mexico was discovered in the Peloncillos (Brown 1983). Since 1983, nine “wolf” sightings have been reported in the area, although none have been confirmed. However, the most reliable-appearing report in the last ten years in the Southwest came from this area in 1989 (Wolok 1994). Intensive wolf howling surveys in the area in 1995 found no evidence of wolves (Whitaker et al. 1995).

Species of Special Concern

Federally endangered species in southern Hidalgo County include the northern aplomado falcon, peregrine falcon, lesser long-nosed bat, and Mexican long-nosed bat. The New Mexico ridgenose rattlesnake and Mexican spotted owl are federally threatened species occurring in the bootheel. New Mexico state-endangered desert bighorn sheep, white-sided jackrabbits, southern pocket gophers, Gould’s wild turkeys, and several other species also occur (NMNHP 1993).

Potential Wild Prey of Wolves

Potential prey of Mexican wolves are Coues white-tailed deer, mule deer, javelina, bighorn sheep, jackrabbits, and feral hogs. Fewer than 1,000 Coues white-tailed deer inhabit southern Hidalgo County. This subspecies lives in scattered, small populations at mid to high elevations in oak and oak-piñon woodlands (D. Weywright, NMDGF, pers. comm.). Mule deer in southern Hidalgo County number approximately 10,140 and reside in all mountain ranges in the area. Population trends from 1988 through 1992 have been stable (Gonzales 1993).

An estimated 500 Chihuahuan pronghorn inhabit the grasslands between the Peloncillo, Animas, Alamo Hueco, and Hatchet Mountains, but populations declined from 1988 through 1992. Javelina number about 3,000, primarily in the low grassland and desert scrub communities, and declined from 1988 through 1992. Desert bighorn sheep total 140 individuals. Over five years, the bighorn sheep populations in the Big Hatchet and Peloncillo Mountains were stable and rising, respectively, and the Alamo Hueco Mountain herd was stable from 1988 to 1992 (Hubbard 1994).

Feral hogs total approximately 800. Approximately 50 introduced bison occasionally roam from Mexico onto private ranch lands near the international border.

Hunting

Coues white-tailed deer, mule deer, javelina, and pronghorn are hunted in Hidalgo County. Hunters harvested an average of 297 deer, 67 javelina, and 23 pronghorn per year from 1988 through 1992. Unregulated feral hog hunting occurs. Public hunting on the large Gray Ranch is prohibited, although the adjacent Coronado NF permits hunting. No season has been established for desert bighorn sheep, oryx, or mountain lions because of their low numbers.

Big game hunting seasons primarily are between fall and mid-winter. Two archery deer seasons are scheduled in September and January, during which hunters can take one fork-antlered deer. One muzzle-loader deer season occurs in September, when one fork-antlered deer can be harvested. No muzzle-loader seasons are scheduled for other big game. Three rifle deer seasons usually are scheduled in early November, which allow one fork-antlered deer to be killed. One limited entry javelina hunt is scheduled in February. One limited entry mature buck pronghorn season usually is scheduled for two days in late October (Gonzales 1993).

Existing Livestock Predators

Coyotes and bobcats are common. Roughly 45 breeding adult mountain lions ($0.03/\text{mi}^2$) are found in southern Hidalgo County (K. Logan, Hornocker Wildlife Research Inst., pers. comm.). Coyotes and mountain lions are the major targets for animal damage control. The New Mexico ADC office has agreements with 22 ranches, covering 566,940 acres of private, 11,460 acres of State, and 122,250 acres of BLM lands. In 1992, ADC verified 32 calves killed by coyotes and five calves killed by mountain lions; however, the number of livestock losses verified by ADC is only a fraction of the reported losses (Phillips 1993). Also in 1992, ADC killed 231 coyotes (U.S. Department of Agriculture 1992). No mountain lions were taken by ADC in Hidalgo County in 1993 or 1994 (A. May, NM ADC, pers. comm.). State regulations also allow private livestock operators and federal grazing permittees to take depredating predators.

In the bootheel, ADC has employed M-44s, aerial hunting, leghold traps, and calling and shooting (Phillips 1993). However, ADC has agreed to cease using M-44s, neck snares, and traps (larger than number 2) south of State Route 9 to reduce the likelihood of harming any potential naturally-recolonizing Mexican wolves (Fowler-Propst 1993). Private livestock operators are still permitted by the state to use these devices on their land.

Land Ownership and Management

Southern Hidalgo County contains mostly private land, consisting of about 15 large ranches. The next largest ownership is federal, mostly BLM. The BLM manages three wilderness study areas, the Big Hatchet Mountains, Alamo Hueco Mountains and Cowboy Springs Wilderness Study Areas. Habitat Management Plans (HMPs) have been established on BLM lands for two areas. Under the Big Hatchet/Alamo Hueco and Peloncillo HMPs, priority wildlife are bighorn sheep and deer and management focuses on prescribed burning and fence modification. The BLM's wildlife habitat management goals for the bootheel include maintaining ungulate populations and reaching desired vegetation goals through proper grazing practices, including eliminating grazing on 8,026 acres, and through land treatments such as fire and chemicals (USBLM 199 1).

Agency and Local Government Plans and Policies, and Land Development

Hidalgo County passed an ordinance in 1992 related to wolves, which prohibits the release of non-resident canids (Hidalgo County Ord. No. 92-1). The county operates under a land use plan. None of its provisions relate directly to possible natural wolf recolonization. In addition, Hidalgo County has a Comprehensive Plan for Development that encourages economic and mineral development as well as growth in recreational opportunities and preservation of natural resources such as wildlife.

The BLM's Mimbres Resource Management Plan encompasses all of the bootheel as well as federal public lands in the rest of Hidalgo County and in Doña Ana, Luna, and Grant Counties. The Plan's

primary vegetation management goals are to provide for livestock, wildlife, watershed, aesthetic, and biodiversity values (USBLM 1991).

The Animas Foundation, which owns the 32 1,700-acre Gray Ranch, provided conservation easements to the former owner, The Nature Conservancy, designed to keep the important natural communities intact. However, the ranch has no numeric livestock stocking limits placed upon it under the land purchase agreement (B. Brown, The Nature Conservancy, pers. comm.).

Ranching will continue to be the dominant land use south of State Route 9 (C. Siepel, Hidalgo. Co. Agric. Ext. Office, pers. comm.). No major types of new development activities are foreseen.

Livestock Grazing

In 1992, approximately 23,500 cattle and 50 sheep grazed in southern Hidalgo County (USDA 1992, C. Siepel, Hidalgo. Co. Agric. Ext. Office, pers. comm.). Most grazing areas are used year-round. Cash receipts from livestock in this area totalled about \$11,800,000 in 1991 (Hidalgo Co. Agric. Ext. Office 1993).

Mining and Other Natural Resource Extraction

While some historic mining areas exist, there is little current activity. Phelps Dodge Corporation owns and operates a large copper smelter in the Playas Valley. Copper is mined elsewhere and shipped to the smelter. The company also owns the rights to copper deposits in the Little Hatchet Mountains (C. Siepel, Hidalgo Co. Agric. Ext. Office, pers. comm.). A guano mining operation and paleontological excavations are conducted in U-Bar Cave in the Alamo Hueco Mountains. The intermountain basins hold some undeveloped oil and gas potential.

Public Access and Recreation

Very sparse public transportation routes extend through southern Hidalgo County. Antelope Wells is the only international border crossing to Mexico, but it is closed to commercial traffic. The Coronado NF, the only large area accessible to the public, provides a wide range of recreational opportunities. These include hunting, hiking, camping, picnicking, rock

hounding, fishing, birdwatching, and vehicle recreation. The BLM has designated no special recreation areas in the bootheel; emphasis on BLM lands is placed on dispersed recreation (USBLM 1991). No major guiding, outfitting, or other recreational establishments are based in the area and no significant tourist facilities exist.

Regional Economy, Employment and Population

The regional economy is dominated by the Phelps Dodge copper smelter (535 employees) and by ranching. Small areas of crop farming occur, mostly near Animas. The most important crops are chile and cotton. Median household incomes are high in southern Hidalgo County because of the several hundred residents of Playas with relatively well-paying jobs at the copper smelter and because of the relatively prosperous large-holding ranchers. Unemployment and poverty are low (Table 3-2 1).

The scattered small communities in the area include Rodeo and Hachita (each of approximately 150 people), Animas (population 250), Playas (population 850), and Cotton City (population 150). Slow population growth is projected for the county as a whole through the year 2000 (Bur. of Bus. and Econ. Res. 1991).

Big Bend National Park Potential Natural Recolonization Area

Geography

Big Bend National Park covers 80 1,160 acres in southwest Texas. The park is on the northern side of the Rio Grande and makes up the southern third of Brewster County (Fig. 3-8). Surrounding tracts of land are primarily cattle ranches. Big Bend Ranch State Natural Area, a 265,000-acre tract owned by the state of Texas, is located 30 miles west of the park along the western upswing of the Rio Grande. East of the park is the Black Gap Wildlife Management Area, a 99,920-acre tract owned by Texas and used primarily for recreational hunting. The park lies within the northern extension of the Chihuahuan desert into the United States. The majority of the park consists of an arid to semi-arid basin plain interspersed with uplifts

Table 3-21. Summary of regional U.S. Census data for southwestern New Mexico potential natural recolonization area.¹

Total population	1,291
Population density	0.7/mi ²
Number in labor force	675
Percent of civilian labor force unemployed	3.6%
Percent of civilian labor force employed in agriculture, forestry or fisheries	14.5%
Median household income	\$38,015
Percent of population below poverty level	3.1%

¹Region covered by the census tract analyzed corresponds exactly with the potential natural recolonization area in this case.

SOURCE: 1990 U.S. Census for Hidalgo County census tract 9883.

of primarily igneous formations (Waid 1990). Elevations vary from 1,880 feet along the Rio Grande to 7,822 feet at Emory Peak in the Chisos Mountains. At the center of the park, the Chisos Mountains form a circle of peaks approximately three miles across.

Climate

The area has hot summers and mild winters. Temperatures in the Chisos Mountains are about 15°F cooler than the surrounding basin during the summer and often dip below freezing in the winter (Waid 1990). Rainfall occurs primarily from May through October and the annual average ranges from 11 inches or less in the arid areas to 16 inches in the Chisos Mountains (Leopold 1984).

Water

Over 300 water sources occur in the park. The Rio Grande is the predominant surface water feature. Terlingua Creek is a perennial stream recharged by groundwater north of the park that empties into the Rio Grande at Santa Elena Canyon. Other permanent water sources include wells, stock tanks, watering holes, and approximately 100 springs, which are largely in or near the Chisos Mountains. Creeks, streams, seeps, tinahas (pools in shallow rock depressions that collect rainwater), and approximately 100

springs represent the ephemeral water sources (NPS et al. 1992; R. Skiles, BBNP, pers. comm.).

Vegetation

The park's only woodland communities occur in the Chisos Mountains above 3,700 feet elevation and comprise less than 3% of the total land base (Waid 1990). At the higher elevations, emory and gray oak, three species of juniper, and piñon dominate (Krausman 1976). Between and sometimes overlapping with the piñon-oak-juniper formation and the lower grasslands are the deciduous woodlands, in which black walnut, Texas madrone, and apacheplume are common. Extensive sotol grassland communities (about 49% of the total park area) surround the Chisos basin, with grasses and lechuguilla predominating. Beyond the sotol grasslands and comprising another 49% of the park's land base are desert scrub communities, with creosotebush, prickly pear, and Torrey yucca being common residents (Plumb 1987).

Animals

History of Wolves

Historically, Mexican wolves probably were common in the Big Bend region of Texas (Bailey 1905). Aggressive predator control programs, begun in the late

1800s and supported by local, state, and federal agencies, effectively eliminated packs from the area by 1945. Lone wolves occasionally were seen and sometimes killed by ranchers or hunters until 1970, when two were killed (Brown 1983). Since 1983, occasional reports of “wolves” within park boundaries have occurred; all these are unconfirmed (Wolok 1994).

Species of Special Concern

Federally endangered wildlife includes the Big Bend gambusia, peregrine falcon, southwestern willow flycatcher, black-capped vireo, and Mexican long-nosed bat (NPS 1992). Ocelots are federally endangered and extremely rare in the park (BBNP 1992). Two reports of ocelots have been made in the last 15 years. Jaguarundis are federally endangered and also extremely rare (BBNHA 1989), with ten being reported in the last eight years. Several other species are listed as threatened or endangered by Texas, including the spotted bat, coatimundi, jaguar and black bear (Texas Dep’t of Parks and Wildlife 1994; BBNP 1992).

Potential Wild Prey of Wolves

The parks large herbivores include Sierra del Carmen white-tailed deer, desert mule deer, javelina, and pronghorn. Desert bighorn sheep were extirpated before the establishment of the park.

Mule deer are common below 4,920 feet elevation in the Chisos Mountain foothills, the surrounding grasslands, and the arid shrub communities. Overlap with white-tailed deer occurs in the Chisos foothills between 3,940 and 4,760 feet elevation (Waid 1990). An estimated 1,000 mule deer inhabit the park. White-tailed deer are abundant in the Chisos Mountains primarily above 4,500 feet elevation, although population estimates are not available. They are found exclusively in woodlands.

Javelina are common in all habitats from the Rio Grande floodplain to the Chisos Mountains, although population estimates are not available. Javelina are commonly found in dense vegetation during the hotter seasons and in the arid lowlands from November through February (Bissonette 1982). One pronghorn herd of 11 individuals represents the entire park population. They occur in the northern and north-eastern desert areas at about 2,500 feet elevation (BBNHA 1989).

Black-tailed jackrabbits and desert cottontails are common residents found in the sotol grasslands and scrub desert regions. Eastern cottontails are seen only occasionally and occur above 4,700 feet elevation (BBNHA 1989).

Existing Livestock Predators

Coyotes are common, though rarely occurring above 5,000 feet (BBNHA 1989). Mountain lions are uncommon, occurring mostly in the Chisos Mountains where prey concentrations are highest. Black bears, considered an endangered species by Texas, are making a comeback in the park, with a current estimate of 12 bears, all in the high Chisos Mountains (BBNP 1992; R. Skiles, BBNP, pers. comm.). The park is developing a black bear emergency management plan. Bobcats are uncommon (BBNHA 1989). They may occur throughout the park, but are densest in the Chisos Mountains (R. Skiles, BBNP, pers. comm.).

Hunting, livestock grazing, and predator control are prohibited. Poaching of mule deer has been reported occasionally in the northwestern section of the park near private ranching properties (R. Skiles, BBNP, pers. comm.).

Land Ownership and Management, and Agency Policies

The park, established in 1935, is managed by the National Park Service for recreation and the conservation of scenic, natural, wildlife, and historical resources. It is designated as an International Biosphere Reserve in recognition of its biological, research, and environmental monitoring potential (NPS 1992).

Ranch access roads are permitted in the northern and western parts through written contracts. No wilderness areas have been designated, although 560,900 acres are under consideration by Congress. Until a decision is made the park administration manages the proposed areas so as not to preclude such designation (NPS 1992).

A state statute prohibits the possession, transportation, receipt, or release of live wolves into Texas (Tex. Parks and Wild. Code Ann. § 63.104). Texas law also protects state and federally listed endangered species, including Mexican wolves (Tex. Parks and Wild. Code Ann. 568.00 1).

Land Development

Visitor accommodations include overnight lodging in the Chisos Basin, camping and recreational vehicle facilities at two sites along the Rio Grande, a network of trails and campsites in the Chisos Mountains and along the Rio Grande, and various other trails scattered throughout the park. The park is planning several minor developments including upgrading the trail network in the Chisos Mountains and expanding resident accommodations, if funding permits. The park permits neither forestry nor mining. Residential development and recreational hunting west of the park are on the rise.

Across the Rio Grande in Mexico livestock grazing continues to be the predominant land use. Three minor, low-water border crossings are located in the park, though none are used for commercial travel (NPS 1992).

Livestock Grazing

Livestock grazing is not permitted. Nevertheless, illegal grazing is a recurring problem along the Rio Grande floodplain. Cattle and horses belonging to Mexican ranchers routinely cross over and cause serious habitat degradation (NPS et al. 1992; W. Wright, BBNP, pers. comm.). Park officials have seen dozens and even hundreds of cattle at any given time. Preventative measures such as building fences along the U.S. side of the border are either ineffective or have not been attempted for practical and comity reasons. Park officials are negotiating with Mexican officials to reach a solution.

Private ranching lands constitute most of the acreage bordering the park. An estimated 58,850 head, including 26,700 cows and 24,000 calves, were raised in 1992 in Brewster County (Brewster County Extension Office 1993).

Public Access and Recreation

The park contains 162 miles of paved roads and 257 miles of unpaved roads, all open to the public. In 1990, over 250,000 people visited and in 1992 almost 297,000 people visited. The Chisos Mountains receive the most visitor use, especially during summer months and holidays (NPS 1992).

Regional Economy and Employment

The economy of southern Brewster County is dependent on tourism, government, and ranching (Table 3-22). Less than 9.1% of the total labor force is employed in agricultural occupations. Approximately 80 full time position equivalents are filled by the National Park Service and 45 to 50 people work for the park's concessionaires.

Permanent residents include park personnel and their families, concessions employees, and U.S. Border Patrol agents. Between 250 and 300 people are normally in residence at Panther Junction making it the second largest residential area in Brewster County (R. Skiles, BBNP, pers. comm.).

Table 3-22. Summary of regional U.S. Census data for Big Bend National Park potential natural recolonization area.¹

Total population	1,915
Population density	0.6/mi ²
Number in labor force	1,010
Percent of civilian labor force unemployed	3.8%
Percent of civilian labor force employed in agriculture, forestry or fisheries	9.1%
Median household income	\$20,970
Percent of population below poverty level	28.0%

¹Region covered by census tracts does not correspond exactly with recovery area boundaries; generally, census tracts include some adjacent rural areas around the recovery areas.

SOURCE: 1990 U.S. Census for Brewster County census tract 9502.

Chapter 4

Environmental Consequences



CHAPTER 4

Environmental Consequences

Introduction

This chapter presents the foreseeable consequences of the four alternative approaches to re-establishing Mexican wolves on the natural and physical environment and on related social and economic concerns. Table 2-8 at the end of Chap. 2 summarizes the information presented here.

To avoid repetition, the impact topics are most fully explained the first time they come up; later discussions are more brief. The impact analysis generally attempts to be as quantitative as possible, but most of the projections involve considerable uncertainty. At root, this uncertainty is due to incomplete information about the behavior of wild Mexican wolves multiplied by uncertain future trends in prey populations, hunting management (which is, and will be, done by state and tribal, not federal, managers), hunter numbers, livestock numbers, land uses, and so on. The analysis, therefore, identifies the methods and assumptions involved in the projections, usually in separate text “boxes.” All quantifiable impacts are presented in terms of high and low ranges; the actual impacts generally should be expected to fall between these extremes. For quantifiable impacts, the point in time at which they are quantified is when the wolf population goal for the area is achieved (the exceptions are the impacts on prey and hunting, which are projected at five years after the goal is achieved). Impacts likely will be intermediate in earlier years of the re-establishment efforts, generally related to the wolf population size at the time. Of course, for each of the alternatives, if the wolf populations grow at different rates-faster or slower-than the rates projected in Chap. 2 (Tables 2-2, -3, -4, -5, and -6), then the rates at which the impacts occur would vary accordingly.

The high percentage of captive-raised wolves in the total population in the early years of the reintroduction alternatives makes impacts somewhat less predictable than during later years, when wild-raised

wolves will predominate. During the initial releases of red wolves in North Carolina, the captive-raised animals exhibited behaviors that were more erratic (that is, less predictable) than the animals that, later, were born in the wild (Phillips, M.K., 1992).

The impact analysis here focuses on the areas expected to be primarily impacted by each alternative. The Blue Range Wolf Recovery Area (BRWRA) is treated first, reflecting its increased emphasis in this FEIS compared to the White Sands Wolf Recovery Area (WSWRA). Of course, not all reintroduced wolves will necessarily stay within recovery area boundaries. Recapture and removal of wolves are called for under **Alt.s A and B** to prevent impacts outside the designated wolf recovery areas or outside the primary recovery zones, respectively. However, dispersing wolves could cause some impacts outside these areas until they are recaptured. Most notably, some of the impacts discussed under **Alt. C** could also occur to a lesser degree under **Alt.s A and B** on the San Carlos and White Mountain Apache reservations, which lie immediately to the west of the **BRWRA** and share an 80 mile border with it (see Fig. 3-1: Affected Areas under **Alt.s A, B, and C** in the **BRWRA** Region).

Analysis of each alternative concludes with a summary of the adverse effects of the full alternative followed by a discussion of its short and long-term effects in relationship to the long-term productivity of the environment, any irreversible commitments of resources, and cumulative effects. While this chapter includes economic analysis, the emphasis is on quantifiable adverse impacts. Potential benefits are discussed, but they are less direct and harder to project quantitatively. (Appendix J includes examples of economic benefits resulting from wolf recovery in the northern Rockies and northern Minnesota.) This FEIS is not intended as a cost-benefit analysis. Monetary cost-benefit analysis is not required under National Environmental Policy Act implementing regulations and it is specifically not recommended when, as here, important qualitative considerations exist (40 CFR sec. 1502.23).

Consequences of Alternative A (Preferred Alternative):

Reintroduction of Mexican wolves, classified as nonessential experimental, into the Blue Range Wolf Recovery Area. Wolves will be released into the primary recovery zone and allowed to disperse into the secondary recovery zone. If feasible and necessary to achieve the recovery objective of 100 wolves, a subsequent reintroduction of wolves into the White Sands Wolf Recovery Area will be conducted.

Blue Range Wolf Recovery Area (BRWRA)

Impacts on Wild Prey of Wolves

The projected population in the BRWRA under Alt. A is 100 wolves. They will kill prey totalling approximately 282,300 lbs. (live weight) annually (Parsons 1994). The species composition of the prey killed and the impact of the predation rate on the prey populations are modelled for each of the reintroduction alternatives in this FEIS as described in Box 4-1.

The prey impacts projected are those expected at the point in time *five years after* the wolf population goal for the area is achieved (Green-Hammond 1994). Because of the difficulty and uncertainty involved, the non-static interrelationship among wolf and prey populations that likely would develop was not modelled (Mech 1970). In other words, the model does not address the long-term effects of changes in the prey population on the wolf population, or vice versa.

In the BRWRA under Alt. A, the deer population is projected to be between a high of 64,100 and a low of 35,500 five years after the wolf population reaches the goal of 100. *This is 14 years after the initial BRWRA releases.* The deer population at that point is projected to be 7% lower than it would be without wolves in the high ungulate population scenario and 22% lower than it would be without wolves in the low ungulate population scenario. The net effect will be an estimated 4,800 to 10,000 fewer deer than would occur without wolves.

The elk population is projected to be between a high of 18,000 and a low of 9,300 five years after

the wolf population reaches the goal of 100. The elk population is projected to be 6% lower than it would be without wolves in the high ungulate population scenario and 17% lower than it would be without wolves in the low ungulate population scenario. The net effect will be an estimated 1,200 to 1,900 fewer elk than would occur without wolves.

Notably, under the high ungulate population scenarios these populations still would increase “with wolves” relative to current populations, by 13% for both deer and elk. Of course, they would increase even more without wolves. Put differently, the effect of wolf predation would be to slow the rate of increase in the increasing scenario; wolf predation also would speed up the rate of decrease in the decreasing scenario.

Impacts to bighorn sheep populations were not modelled because sheep make up less than 3% of the available wild ungulate biomass in the BRWRA and scientific information from northern areas where wolves and sheep co-exist does not suggest that wolves would prey heavily on these animals. It appears unlikely that wolves would have a significant impact on the overall bighorn sheep population. But, some sheep herds in the BRWRA are relatively small (e.g., 20 animals) and isolated, so predation of even a few breeding adults could reduce the productivity of these groups. The likelihood of this occurring appears low.

Bighorn sheep in the BRWRA may not have widely available access to rugged escape cover. Where this is lacking, the sheep may be more vulnerable to wolf predation than they would be if escape cover was readily accessible. Ongoing bighorn sheep surveys, coupled with a wolf food habit study, could provide information on actual impacts of wolves on sheep in the BRWRA.

Wolves that did severely impact big game populations could be captured and moved under the Proposed Mexican Wolf Experimental Population Rule (Appendix C; see definition of “Impacts on game populations in ways which may inhibit further wolf recovery” in Appendix G - Glossary). This is not projected to happen in the BRWRA (Green-Hammond 1994). Also, wolves are not likely to exert a major influence on secondary prey populations of small mammals or on any threatened or endangered species in the area (Appendix D - Section 7 Consultation on Preferred Alternative).

Box 4-1. Modelling Mexican wolf impacts on prey populations.

Potential impacts of wolf reintroduction on deer and elk populations were estimated through computer modeling of future populations with and without wolf predation (Green-Hammond 1994). However, uncertainty exists regarding these issues:

- future deer and elk population trends;
- Mexican wolf use of prey other than deer and elk (called *alternate prey use*); and
- the degree of compensation for wolf-caused mortality of deer and elk that will occur through reduction of other mortality factors, for example, when a wolf kills a deer that would have died of another cause around the same time period (called *compensatory mortality*).

The model addressed these uncertainties as follows. Reasonable increasing, *stable*, and *decreasing* deer and elk population trend scenarios *without* wolves (i.e., assuming no wolf reintroduction) were created, using the New Mexico Department of Game and Fish Deer Model for predicting birth and survival rates, state wildlife agency information on current populations, historic population trends, and future agency management plans (Green-Hammond 1994). This model was applied to both the New Mexico and Arizona populations. Using these scenarios and other assumptions about Mexican wolf predation (Parsons 1994), the Green-Hammond model produced corresponding computer simulations *with* wolves (i.e., assuming wolf reintroduction occurred as planned). These initial simulations used a variety of alternate prey use and compensatory mortality values. The output was a plausible range of impacts to deer and elk populations five years after achievement of the recovery area goals.

Then, a survey of recognized wolf experts was conducted to narrow down the expected ranges of alternate prey use and compensatory mortality (Parsons 1994). The initial simulations that had the closest fit with the wolf experts' conclusions regarding these variables were used. For example, for the BRWRA under Alt. A, the experts concluded that alternate prey use would probably fall between 6% and 29%; the closest model simulations of 0% and 25% alternate prey use were used. The experts also concluded that compensatory mortality would probably be between 15% and 47%; the initial model simulations of 17% to 50% were used.

Thus, a range of plausible, expert-assisted, impact scenarios are presented in this EIS. The *high ungulate population scenario* is the one in which the deer or elk population experiences the least reduction due to wolf predation. For the BRWRA under Alt. A, this was the scenario with increasing deer or elk populations, with only 75% of the reintroduced wolves' diet consisting of deer or elk (50% for the WSWRA), and half of the wolf-caused mortality on deer and elk being offset by reductions in other mortality causes. The *Low ungulate population scenario*-the one in which the ungulate population experiences the greatest wolf-caused reduction - for the BRWRA under Alt. A was the scenario with decreasing deer or elk populations, with 100% of the reintroduced wolves' diet consisting of deer or elk (88% for the WSWRA), and only one-sixth of the wolf-caused mortality on deer and elk being offset by reductions in other mortality causes.

This modelling was done for the deer and elk populations under each of the three reintroduction alternatives. But, it was not done for the "no action" alternative (Alt. D) and was not done for potential prey other than deer and elk, due to lack of data and high uncertainty regarding impacts. The actual alternate prey use and compensatory mortality figures that were used in the impact analysis here are given in the notes in the tables that accompany the "Impacts on Hunting" discussion for Alts A, B, and C (Tables 4-1, -5, -9, -12, and -14).

Potential positive impacts of the wolf, a top predator in North American ecosystems, on its prey include: (1) sanitation (removal of diseased animals to prevent epidemics), (2) natural selection (culling of deformed or genetically inferior animals before reproduction), (3) stimulation of prey productivity (acceleration of reproductive rates among prey through higher twinning and fertility), and (4) population control (maintenance of prey populations at levels that can be supported by the habitat, protecting against overgrazing and erosion) (Mech 1970).

Conclusion: Although uncertainty exists, wolves are not expected to severely impact prey populations in the BRWRA under Alt. A, even under the low population ungulate scenario.

Impacts on Hunting

Under Alt. A, a re-established population of 100 wolves in the BRWRA is projected to lead to an overall decline in average legal kills of deer of between 6% and 17% in the high and low ungulate population scenarios, respectively, and a decline in legal kills of elk of between 5% and 13% in the high and low population scenarios, respectively (Green-Hammond 1994, Parsons 1994). That is, 300 to 560 fewer deer and 120 to 200 fewer elk may be killed by hunters annually. Because the projected declines would occur over a many-year period it is not clear that they would be large enough to be detectable or measurable by state game managers.

The total expected reduction in hunter days due to wolf reintroduction in the BRWRA ranges from 12,400 to 23,000 days annually (Table 4-1). Box 4-2 explains the calculation of these projected reductions; associated economic impacts are discussed below under Regional Economic Impacts.

Conclusion: Hunter take may fall, with a maximum projection of 17% for deer in the greatest impact case. Actual reductions in permits issued by state game managers likely would occur only if measurable herd reductions were observed.

Impacts on Livestock

Box 4-3 explains how this FEIS projects likely livestock depredation rates for each alternative (see

also Tables 4-2 and 4-3). For the BRWRA, after the Preferred Alternative is completed and 100 wolves are distributed throughout the area, losses are projected to be between one and 34 cattle per year (average: 17.5), mostly calves (Table 4-4). This represents a range of between 0.001% and 0.04% annual loss of the approximately 82,600 total cattle present in the area. These projections are best estimates; rates could be different. (The EIS prepared for the FWS's proposal to reintroduce wolves into Central Idaho (USFWS 1994b), a primarily National Forest area comparable to the BRWRA, projected similar rates of annual cattle depredation, that is, ranging between a low of one and a high of 19 cattle killed; average: ten. In reality, after one year of experience with 14 wolves reintroduced in Central Idaho, no confirmed depredations have occurred.)

Some cattle likely will be killed but not detected. However, the intensive monitoring and research carried out on the reintroduced population under the Preferred Alternative will also serve to monitor livestock depredation, at least in the initial several years. Another key to mitigating impacts on livestock will be active, professional, management of depredation as has been implemented in Minnesota and in the Northern Rockies (Niemeyer et al. 1994; Paul 1995). Depredation management, in conjunction with public education and information, should, over the long term, improve local tolerance of wolves.

The lost value associated with livestock depredation is calculated as the estimated number of cattle lost multiplied by their market value (Table 4-4). Ranchers may be reimbursed for the lost market value by the private Defenders of Wildlife Depredation Compensation Fund. A very few horses and sheep may also be taken.

From 1987 to 1991, total estimated livestock losses—all cattle—from existing predators averaged about 1% of permitted livestock on the Apache National Forest (Myers and Baxter 1993). Comparable depredation rates occurred on the Gila National Forest (S. Libby, Gila NF, pers. comm.). The projected increase in depredation over these existing rates due to the presence of wolves is quite small. Nevertheless, as described in Box 3-1, above, livestock ranching in this area tends to be economically marginal. If uncompensated wolf depredations occur the results could be further decreases in the attrac-

Table 4-1. Estimated annual reduction in hunting five years after achievement of recovery goals in the BRWRA under Alternative A.

Note: the low estimate is based on the "high population" scenario of increasing ungulate populations with high (25%) alternate prey use and high (50%) compensatory mortality; the high estimate is based on "low population" scenario of decreasing ungulate populations, no alternate prey use, and low (17%) compensatory mortality (Green-Hammond 1994, Parsons 1994). Impacts in Arizona and New Mexico are determined based on the proportion of the ungulate populations existing in each state.

Statistic	Low Estimate	High Estimate
Reduced elk harvest"	Total = 120	Total = 200
	AZ = 40	AZ = 70
	NM = 80	NM = 130
Reduced deer harvest'	Total = 300	Total = 560
	AZ = 95	AZ = 180
	NM = 205	NM = 380
Reduced elk hunting days^b	Total = 2,700	Total = 4,630
	AZ = 950	AZ = 1,620
	NM = 1,750	NM = 3,010
Reduced deer hunting days'	Total = 9,700	Total = 18,400
	AZ = 3,100	AZ = 5,900
	NM = 6,600	NM = 12,500

^a Green-Hammond 1994, Parsons 1994. Figures are rounded.

^b Based on average success rate of .3366 for New Mex. GMU 15, 16, 21, 22, 23, and 24 (1988-1992 statistics for elk; 1989-1992 statistics for deer) and Ariz. GMU 1 and 27 (1988-1992 statistics) and average number of days hunted per big game hunter of 7.787 (average of AZ and NM weighted by number of hunters) (USFWS and Dep't of Commerce 1991a and 1991b).

^c Based on average success rate of .2385 for New Mex. GMU 15, 16, 21, 22, 23, and 24 (1988-1992 statistics for elk; 1989-1992 statistics for deer) and Ariz. GMU 1 and 2 (1988-1992 statistics) and average number of days hunted per big game hunter of 7.787 (average of AZ and NM weighted by number of hunters).

SOURCE: Duffield and Neher (1994).

Box 4-2. Calculating Mexican wolf impacts on hunting and associated economic values.

This EIS calculates the effect of reduced hunter opportunity caused by wolves in two ways:

First, the social cost of the lost enjoyment of hunting is estimated. A straightforward method converts the projected reductions in deer and elk kills into lost hunter days in the field. Reductions in hunter days are calculated based on average success rates and days hunted per hunter (Ariz. Game and Fish Comm. 1993, New Mexico Dep't of Game and Fish 1993, USFWS and Dep't of Commerce 1991 a and 1991 b).

The simplifying assumption is made that the reduction in hunter days equals the reduction in harvest divided by the success rate, multiplied by the average number of days per hunter. The projected declines in deer and elk harvested imply reduced hunting, either through a reduction in available deer and elk permits in the **affected** game management units or through a reduction in hunter success rates in these units. This somewhat simplistic assumption, aimed at projecting impacts that will occur up to 15 years in the future, necessarily does not consider potential complicating factors. Such factors that cannot reasonably be taken into account now could include, for example: a) changes in hunt management strategies by the Arizona and New Mexico Game and Fish Departments, such as moving to trophy hunts; b) positive or negative values that hunters may associate with hunting in an area where wolves are present that may compensate for - or conversely exacerbate - the projected reduction in hunter opportunity; c) the presence of wolves affecting hunter success rates independently of reducing total game availability (e.g., by causing more, or less, clustering of deer and elk); d) changes in the numbers of hunters applying for permits; e) habitat management effects on prey densities and hunter success. State game managers are not expected to reduce permit numbers just because wolves are introduced.

The economic values of the projected reductions in deer and elk hunter days are calculated by multiplying the number of lost hunter days by the average net "willingness-to-pay" for a day of hunting, which is estimated at \$58.00 (all estimates are adjusted to 1994 dollars). Average willingness-to-pay for a hunter day is derived from a survey of 56 big game hunting willingness-to-pay studies in the United States (Walsh et al. 1988).

Second, the reduction in hunting-related expenditures in the region of each wolf recovery area is computed in a similar way, that is, by multiplying the number of lost hunter days by the average hunter expenditure per day. Hunter expenditures per day are obtained from survey information for New Mexico and Arizona (USFWS and Dep't. of Commerce, 1991 a and 1991 b). Also, a reduction in big game license and permit fees collected by the two states is calculated.

The text of Chap. 4 includes caveats about the roughness of the resulting values as far as predicting net economic changes in Arizona and New Mexico. It should be emphasized that the point in time that these levels of annual impacts are projected to occur is five years after full achievement of the recovery area wolf population goals.

SOURCE: Duffield and Neher 1994.

Box 4-3. Projecting rates of Mexican wolf livestock depredation.

Rates of gray wolf depredation on livestock have been studied in Alberta, Minnesota, and Montana (Table 4-2; see Appendix F for background information on the livestock depredation experiences in each of these areas). Estimating future Mexican wolf depredation rates based on these northern areas presents difficulties due to differences in climate, terrain, vegetation, size of operations, livestock husbandry practices, and prey populations. The Minnesota livestock industry, in particular, is quite different from that in the Southwest because pastures are smaller, calving often occurs in barns, and cattle are more easily protected from predators. Also, Mexican wolves are typically smaller than northern wolves, which could lessen the rate at which they depredate.

To estimate depredation in a given Mexican wolf recovery area the equation below is used, which standardizes depredation rates in relation to livestock and wolf numbers in the northern study areas. (Sheep are disregarded in the equation because of the small number of sheep in the Mexican wolf recovery areas.)

The difference in year-round presence of cattle on the range is a key factor. In Alberta, Minnesota, and Montana cattle graze in free-ranging situations (although in Minnesota the pastures they range in are relatively small) for four to six months. In contrast, in many areas of the Southwest cattle are on the range from eight months to year-round. The equation accounts for this difference by multiplying the northern study area rates by a **multiplier** based on the comparative length of the typical grazing season for the allotments in the wolf recovery area being analyzed. For example, if livestock are present year-round in a southwestern area--or twice as long as the northern area--then the *length-of-grazing-season multiplier* is 2.0 (see Appendix F for the actual multipliers used for each southwestern area). This FEIS uses just the length-of-grazing-season multiplier for the area for calculating the low range of likely depredation (Table 4-3). For calculating the **high range** of likely depredation, the length-of grazing-season multiplier is used as a base and 3.0 is added to it. This increase reflects the general feeling of experts that were surveyed on this issue that depredation rates will be higher in the Southwest than in the three northern study areas for a variety of reasons besides differences in the length of the grazing season (the expert survey responses are summarized in Appendix F). Adding 3.0 to the base length-of-grazing-season multiplier represents the high end of the range of specific multipliers proposed by the survey respondents. Thus, the equation used is:

$$\begin{array}{rcl}
 \frac{\text{No. of cattle (recovery area)}}{\text{No. of cattle (northern area)}} & \times & \frac{\text{No. of wolves (recovery area)}}{\text{No. of wolves (northern area)}} \\
 \\
 \mathbf{X} & \times & \text{Mean annual no. depredations (northern area)} \\
 & & \times \text{ multiplier} = \\
 & & \mathbf{Estimated annual no. depredations (recovery area)}
 \end{array}$$

“Plugging in” the numbers from the three northern study areas, and multiplying by the appropriate low range and high range multipliers, produces a range of estimates for the BRWRA and the WSWRA (Appendix F, Tables F-1 and F-2). Table 4-3 presents the lowest low estimate and the highest high estimate from Tables F-1 and F-2 as the “low” and “high” estimates, respectively. Table 4-3 also provides the average of these. (These low, high, and average projections are also provided in the discussion of “Impacts on Livestock” for each of the reintroduction alternatives in this chapter.)

Wolves are expected to prey more on calves than adult cattle. In northern areas calves make up 68 to 95 percent of cattle losses. It is uncertain whether the addition of wolves into an area that already has other predators, such as lions and coyotes, will add to, or redistribute, overall cattle depredation. Mexican wolf depredation will certainly vary from year to year and place to place.

A small fraction of one percent of the total livestock available is expected to be taken in the typical year. (Table 4-3). Most wolves will not depredate even when livestock are present. A small number of livestock

(continued)

Box 4-3. Continued

owners are expected to be affected; however, some could sustain significant losses in a given year. Depredated livestock may be replaced on grazing allotments, thus effects on the overall number of livestock present during a grazing season should be marginal.

Livestock may also suffer non-lethal wounds from wolf attacks that could reduce their market value and compel the rancher to incur veterinary expenses. Ranchers may also be compelled to devote time and expense to investigating possible depredations, to dealing with government officials and others regarding depredations and compensation claims, to replacing stock that has been killed, and to taking steps to prevent depredations. Finally, it should be expected that some wolf depredations will not be found or, even if they are found, will be so old that evidence of wolf involvement may no longer exist. No accepted method exists to project unconfirmed predation losses.

SOURCES: Fowler et al. 1993; Fritts 1992; Mack et al. 1992; W. Paul, ADC, pers. comm.; Thompson 1993; USFWS 1994b.

Table 4-2. Mean livestock depredation rates from northern study areas.

Area	No. Years Studied	No. Wolves	No. Cattle	No. Sheep	Mean Annual Cattle Killed	Mean Annual Sheep Killed
Alberta	17	1,500	257,041	10,000	235 (0.09%)	31 (0.3%)
Minnesota	13	1,460	229,064	23,713	27 (0.01%)	50 (0.2%)
Montana	7	44	75,000	11,000	3 (0.004%)	2 (0.02%)

SOURCE: Mack et al. (1992).

Table 4-3. Number and percentage of cattle available projected to be killed annually by Mexican wolves after achievement of recovery area goals.

Notes: The top number in each box is the number of cattle expected to be killed annually; the bottom number is the percentage of the total cattle available projected to be killed. "Low" and "high" estimates are the lowest low and highest high estimates from background Tables F- 1 and F-2 in Appendix F.

Mexican Wolf Recovery Area	Low Estimate	High Estimate	Average
BRWRA Primary and Secondary Zones combined (Alts. A and B) <i>- 82,617 cattle</i> <i>100 wolves</i>	1.0 (0.001%)	33.9 (0.04%)	17.5 (0.02%)
BRWRA Primary Recovery Zone (Alt. B) <i>- 10,494 cattle</i> <i>- 20 wolves</i>	0.03 (0.0003%)	0.9 (0.009%)	0.5 (0.005%)
WSWRA Primary and Secondary Zones combined (Alts. A and B) <i>- 3,220 cattle</i> <i>- 20 wolves</i>	0.0 (0.0005%)	0.3 (0.015%)	0.16 (0.008%)
WSWRA Primary Recovery Zone (Alt. B) <i>- 0 cattle</i> <i>- 14 wolves</i>	0	0	0

tiveness of affected ranches as businesses to own, invest in, or lend money to (A. Thal, Western NM Univ., pers. comm.).

The impact of wolf depredation on the "custom and culture" of livestock grazing in the BRWRA and other recovery areas defies quantification. Clearly, most ranchers view the wolf as a negative (Biggs 1988, Johnson 1990, Kellert 1985). (However, opinion polling by Duda and Young (1995), indicates about 50% of the public in the most-affected, ranching-oriented, rural New Mexico counties actually support wolf reintroduction, which undercuts the idea that major cultural impacts would occur.) It is unlikely that the small projected increase in livestock losses will have more **than a** marginal impact on the viability of ranching in the BRWRA. A potential positive impact to ranchers

from wolf recovery is the projected reduction in the size of the deer and elk herds that can compete with livestock for forage on grazing allotments. In addition, coyote and lion densities may be reduced by competition with reintroduced wolves, which could reduce livestock depredation losses from coyotes and lions.

Conclusion: Wolves likely will take between one and 34 cattle per year, representing less than **one-twentieth** of one percent of all the cattle present. This should not cause a major impact to ranching as a whole in the area, but some ranchers may experience significant losses.

Table 4-4. Estimated annual livestock depredation costs after achievement of recovery area goals in the BRWRA under Alt. A.

	Low Estimate	High Estimate	Average Estimate
Cattle lost	1	33.9	17.5
Average value per animal ^a	\$638	\$638	\$638
Total lost value/year	\$640	\$21,600	\$11,200

^aValue based on average of the January 1994 average value of cows and calves in Arizona (D. Dewalt, AZ Agric. Statistics Service, pers. comm.) **and** the February 1994 average value of cows and calves in New Mexico (B. Nedom, NM Agric. Statistics Service, pers. comm.). Average values include high value stock, culls, and all others.

SOURCE: Duffield and Neher (1994).

Impacts on Predator Control Programs

The experimental population rule will restrict all use of M-44s and choking-type neck snares in “occupied Mexican wolf range” (see definition in Appendix G - Glossary). Label restrictions on M-44s already limit their use in areas where threatened or endangered species may be adversely affected (USFWS 1994b). The FWS, with USDA Animal Damage Control (ADC) cooperation, will provide private users of these devices with the locations where the EPA label restrictions would apply. Other changes in ADC operations, such as limiting trap sizes and increasing frequency of trap checks, may be agreed to following conferencing between ADC and FWS. The restrictions on control methods likely would reduce ADC’s effectiveness in controlling other predators in the area, unless the agency commits additional resources. However, in Arizona, an anti-trapping law (ARS 17-301 (D)), passed in 1994, already disallows use of traps and snares on public lands for control of other predators. No additional restrictions on control methods for other predators should result from wolf recovery in Arizona.

Wolves may displace other large predators (see Appendix A section on Influence on Other Predators); coyotes and mountain lions could most likely be affected (populations of black bears and wolves apparently co-exist without appreciable impacts on each other). This potential displacement may result

in temporarily higher concentrations of the other predators in surrounding areas, presumably until some equilibrium level is restored. However, because wolf populations will recover gradually, such changes likely would be **difficult** to detect if they occurred. The ultimate impact wolf recovery would have on these predators, and on animal damage control needs for them, cannot be determined now with confidence. In other words, it is unclear whether the presence of wolves in an area would reduce, displace, or perhaps somehow increase the overall private and ADC workloads for other predators.

Impacts on Agency, Tribal, and Local Government Policies and Plans

U.S. Forest Service.—The current management focus on the two national forests in the BRWRA should not change significantly with the presence of wolves. Addressing habitat diversity loss and exotic species invasions should not conflict with management for wolves. Enhancement of native vegetation communities may enhance ungulate populations upon which wolves depend. No formal ESA Section 7 consultation with the FWS would be required regarding potential impacts of Forest Service activities on nonessential experimental Mexican wolves.

The Forest Service may choose to amend the Apache and Gila National Forest Plans to reflect changes related to wolf recovery. No amendments

are required under the Preferred Alternative, however. The most significant topics of possible amendments include Grazing Use, Timber Volume, Vegetation Management Practices (especially fire) and Acres Treated, and management for multiple protected species. Generally, these changes would serve to enhance ungulate prey and harmonize management for wolves with the other “multiple uses” of the forests.

The Forest Service would need to informally “confer,” but a conference would not be required for each individual project, development, or plan amendment in the BRWRA that the agency undertakes. According to the FWS’s Section 7 Process and Policy Handbook: “a conference is required if the action is judged to likely jeopardize” the species involved (USFWS 1993f). This “threshold” is “reached if the likelihood of the species’ survival is appreciably reduced.” Few, if any, Forest Service activities would pose this level of threat to a reintroduced Mexican wolf population. In those few cases where conferences are undertaken, the Service will provide “advisory recommendations for minimizing or avoiding adverse effects.”

It is expected that this informal conferencing will occur on a more programmatic basis under the umbrella of a cooperative wolf management plan that all of the affected agencies will develop. This management plan would include various measures to implement and support wolf recovery and to minimize conflicts with other Forest Service duties on the Apache and Gila National Forests. Such measures would need to avoid conflict with management for other threatened or endangered species with full ESA protection, such as the Mexican spotted owl, that would have a higher degree of legal protection than the nonessential experimental wolves.

State of Arizona.—Although neither Arizona’s Game and Fish Department nor its Commission has taken a final position on wolf reintroduction, the Department has applied its twelve-step procedure for re-establishing endangered species in the state to the Mexican wolf (AGFD 1987; Appendix E describes the complete procedure). The FWS’s Preferred

Alternative includes working cooperatively with the Department. The proposed federal and state recovery efforts are consistent; Arizona’s plan is essentially a subset of the Preferred Alternative that covers only Arizona (Groebner et al. 1995).

State of New Mexico.—The Preferred Alternative is consistent with New Mexico’s Wildlife Conservation Act. The FWS’s Preferred Alternative includes working cooperatively with New Mexico’s Department of Game and Fish.

Tribes.—While no reservations are within the designated BRWRA, dispersing wolves could cause some impacts on the neighboring White Mountain and San Carlos Apache reservations until they were captured. This could compel those tribes to develop wolf management plans that are approved by the FWS or to enter into cooperative wolf management plans directly with the FWS. Both tribes have adopted resolutions opposing wolf recovery in the BRWRA. Further potential impacts on these tribes are discussed under Alt. C.

Counties.—The Catron and Sierra counties land use ordinances that call for equal authority with federal agencies over decisions affecting federal lands within these counties could conflict with the Preferred Alternative. Similar assertions are made in both Apache and Greenlee counties’ Land and Resource Policies. Catron and Sierra counties have expressed concern about wolf recovery and sought to extend local planning jurisdiction over it. The federal ESA and the Mexican Wolf Experimental Population Rule, after adoption as a federal regulation, would preempt any conflicting local mandates.’ Wolf recovery under the Preferred Alternative does not directly conflict with Catron and Sierra counties’ ordinances prohibiting the release of wolves into those counties as no wolves will be released there. Nevertheless, releasing wolves in nearby counties with foreseeable dispersal into Catron and Sierra counties, as proposed here, does appear to conflict with the goals of these ordinances.

¹ The National Environmental Policy Act and implementing regulations require the federal government to attempt to cooperate with local governments when planning federal actions that may affect them. The FWS has pursued cooperation in preparing this EIS through meetings with county officials, inviting county representatives as consultants to the EIS Interdisciplinary Team, making background information available, reviewing and responding to comments and studies prepared by county consultants, and other measures. In addition, the EIS process included holding public comment meetings in each area potentially affected.

Conclusion: Wolf reintroduction as proposed under **Alt. A** will not seriously impact existing federal or state policies or plans. But, wolf reintroduction and the accompanying federally-adopted experimental population rule would conflict with and preempt certain county ordinances.

Impacts on Land Use

Wolf reintroduction under **Alt. A** should not significantly impact four major land uses in the **BRWRA**: forestry, mining, recreation, and grazing (the section above addressed livestock depredation). No formal ESA Section 7 consultation would be required regarding potential impacts of land uses on nonessential experimental Mexican wolves. The **FWS's** management of this experimental population will impose no restrictions on these activities, with some exceptions that apply only within the one-mile radius protected areas on public lands around occupied pens, dens, and rendezvous sites. Commencing operations on a new timber sale, mine, or engaging in other "disturbance-causing land use activities" (see detailed definition, including exemptions, in Appendix G - Glossary) could be temporarily delayed until the pen, den, or rendezvous site is no longer occupied (see Appendix C - Proposed Mexican Wolf Experimental Population Rule). The release pens will not be located near existing or planned timber sales, mines, or developments. No involuntary restrictions will be imposed on any private land use.

Timber harvesting generally benefits wolves by maintaining shade-intolerant vegetation favored by ungulates on which wolves prey (Thiel 1988). Further, wolves in Minnesota are able to tolerate noise and blast effects associated with logging and heavy mining (Mech 1993a). Mech (1993b) has also pointed out that low density development for homes, recreational facilities, power lines, and so on do not deter wolf recovery. No additional wilderness areas or other land designations are called for under the Preferred Alternative.

Grazing strategies could be affected by depredation by wolves and by their establishment of dens and rendezvous sites. However, the proposed Mexican Wolf Experimental Population Rule allows extensive flexibility in the relocation of wolves. They could be relocated if they became habituated to humans or human facilities, preyed on livestock,

caused major ungulate population decreases, and for other reasons.

Conclusion: It is expected that any land use restrictions due to the reintroduction of wolves to the **BRWRA** will be minor. While some activities may be inconvenienced due to temporary access restrictions, this inconvenience is unlikely to result in major economic losses.

Impacts on Recreation

Presence of the wolf may deter some visitors from the **BRWRA**, but it may attract others. The large majority of people surveyed in Arizona (Johnson 1990) and New Mexico (Biggs 1988) indicated they would enjoy seeing or hearing a wolf in the wild (see also Duda and Young 1995). The demand for recreational facilities in the **BRWRA** may increase. (Millions of people recreate annually, in Minnesota, Wisconsin, Alaska, and Canada, within the range of gray wolves.)

Protection of reintroduced wolves from disturbance by visitors may require occasional temporary access restrictions within a one-mile radius of a den site, rendezvous area, or release pen, depending on location and terrain. Wolf pups cannot regulate their own body temperatures during the first several days of life and are vulnerable if disturbance compels the adults to move their pups to more secure areas during this period. However, wolves tend to den in secluded areas in the spring prior to the peak visitation periods, so little impact on hiking, hunting, or other activities should result. Limiting overall rural road density is not required for wolf recovery (Mech 1993b, but see Thiel 1985). In any event, road densities in the **BRWRA** are low and are not expected to increase greatly (USFWS 1993c).

Conclusion: Wolf reintroduction is expected to cause increased visitation to the **BRWRA** as a whole, but also to require minor temporary restrictions on human access to particular areas as necessary to prevent harm to the wolves.

Regional Economic Impacts

As shown in Table 4-5, reduced elk and deer harvest due to wolf reintroduction could result in major lost benefits to hunters in the region, ranging in value

Table 4-5. Estimated annual reduction of hunting-related economic value and expenditures in region five years after achievement of recovery area goals in the BRWRA under Alternative A.

Note: low and high estimates are based on range of impacts on hunting described in Table 4-1

Statistic	Low Estimate	High Estimate
Reduced value of elk and deer hunting ^a	\$716,800	\$1,336,600
Share by State of reduced hunting value	AZ - \$243,700 NM - \$473,100	AZ- \$454,450 NM - \$882,150
Reduced expenditures associated with deer and elk hunting ^b	\$579,100	\$1,079,100
Share by State of reduced hunter expenditures	AZ - \$115,900 NM - \$463,200	AZ - \$215,820 NM - \$863,280
Reduced hunting permit revenue - New Mexico ^c	\$51,200	\$93,400
Reduced hunting permit revenue - Arizona ^a	\$17,500	\$32,100

^a Based on average economic value per day of big game hunting of \$58.00 (Walsh et al. 1988).

^b Based on average AZ and NM trip related expenditures per day of \$46.38 for deer and \$48.60 for elk (weighted by number of hunters)(USFWS and Dep't of Commerce 1991a and 1991b).

^c Based on current AZ and NM license and tag costs for residents and nonresidents and the split between resident and nonresident deer and elk tags sold in AZ and NM.

SOURCE: Duffield and Neher (1994).

from about \$716,800 to \$1,336,600 per year. (Again, this represents hunters' assessments of the lost personal value of the sport, not actual expenditures.) About 34% of these lost benefits would occur in Arizona and 66% in New Mexico. Additionally, an estimated \$579,100 to \$1,079,100 reduction in hunter expenditures could occur. About 20% of this reduction would occur in the Arizona portion of the region and 80% in the New Mexico portion. New Mexico bears a greater share of the expenditure reduction because it has a higher percentage of nonresident hunters than Arizona and thus a higher average hunter expenditure per day.

Hunting-related losses represent the greatest predicted economic impacts of Mexican wolf recovery under the Preferred Alternative. However, they

probably are overstated because hunters probably will not actually hunt less overall because of fewer deer and elk in the BRWRA, but instead turn their attention to substitute areas or species (Duffield and Neher 1994). In other words, the losses are unlikely to reach the amounts shown in Table 4-5. Further, deer and elk hunting in both Arizona and New Mexico are dominated by resident hunters (over 96% of total hunting days by residents in Arizona and over 74% by residents in New Mexico) (USFWS and Dep't of Commerce 1991a and 1991 b). Most of the money not spent by residents on hunting probably will be spent in some other sector of the state economy (Duffield and Neher 1994). However, reductions in Arizona and New Mexico expenditures by the 4% to 26% of hunter

days that are by nonresident hunters would result in reduced overall expenditures in these states. These lost hunter expenditures represent only a small part (0.7 to 1.3%) of the total estimated expenditures (approximately \$80,000,000) by all big and small game hunters in Arizona and New Mexico (USFWS and Dep't of Commerce 1991 a and 1991 b; C. Neher, Bioeconomics, pers. comm.).

Guides and outfitters operate heavily in the area now, particularly in Catron County, primarily for hunting, but some also offer photography trips, trail rides, and other non-hunting trips (SW Center for Res. Analysis 1994). Hunting guides could experience a reduction in business because less game may be available due to wolf predation. However, some guides may add wolf-watching and howling trips to their offerings. The forested regions of northern Minnesota support over 1,500 wolves and a minor "wolf-watching" industry has sprung up around them (Thiel 1988). Educational touring packages and guided "howling" trips have gained popularity and contributed to some regional economies. This could occur in the BRWRA depending on local initiatives. (Appendix J includes examples of economic benefits resulting from wolf recovery in the northern Rockies and northern Minnesota.)

Greenlee County in particular could benefit because it contains the primary recovery zone, it represents the gateway for visitors coming from major population centers to the south and west, and county management has emphasized facilitating tourism and recreation as economic growth sectors (Ariz. Dep't of Commerce, n.d.). Alpine, in Apache County, is already very oriented toward tourism and recreation and wolves could enhance this. Also, expenditures by wolf management field staffs, which may include local residents, represent potential positive economic impacts.

Average annual livestock losses in the BRWRA are projected to total between \$640 to \$2,160. These could impact a few economically marginal ranchers if adequate funds are not available to fully compensate them or if numerous undetected wolf kills occur (A. Thal, Western NM Univ., pers. comm.). Catron County likely would be more affected than any other BRWRA county because it has the largest share of cattle in the recovery area, mostly on small- to medium-sized ranches, which are more likely to be economically marginal than larger ranches. Further, with the lowest median

incomes in the BRWRA, Catron County could be most affected by any negative economic impacts caused by wolves. The tax base and local economy could be negatively impacted if the effects of wolf depredation in Catron or other counties were to lead to ranch failures. Ranch failures are not expected, however. In Minnesota, with about 1,500 wolves inhabiting the cattle range and an average of about 27 cattle depredated per year (i.e., within the range of depredations projected for the BRWRA), no known ranch failures have resulted from such depredation (W. Paul, ADC, pers. comm.). Similarly, no known ranch failures have resulted from natural wolf recolonization in northern Montana.

One final area of potential economic impact is the value (positive or negative) people may place on having a recovered wolf population. Just as the value hunters place on a day of hunting may be economically quantified, potential visitors may place a quantifiable value on a day of hearing or seeing wolves in the BRWRA (Duffield and Neher 1994). Another type of economic value is "passive use" or "existence value." Existence value is the value a person associates with the knowledge that a resource exists, even if that person has no plans or expectations of ever directly using or observing that resource (Krutilla 1967). For example, a wolf enthusiast living in Albuquerque or Phoenix might place a measurable monetary value on the knowledge that a recovered Mexican wolf population exists in the BRWRA even if he or she never anticipates visiting there (Johnson 1990, Duda and Young 1995). Other people may value their absence. Some ranchers or big game hunters, for instance, might value the absence of wolves because they view the wolf as a potential threat.

The potential use and existence values (positive and negative) associated with wolf reintroduction in the BRWRA have not been quantified. However, the FWS projected substantial net economic benefits in the millions of dollars associated with the use and existence values of wolf reintroduction to the Yellowstone and central Idaho areas (USFWS 1994b). In the Southwest, negative economic impacts likely would be offset to some extent by positive economic impacts.

Conclusion: Negative economic effects are projected predominantly in the lost value of hunting and reduced hunter expenditures.

White Sands Wolf Recovery Area

Impacts on Wild Prey of Wolves

The projected population in the White Sands Wolf Recovery Area (WSWRA), assuming it is used, would be 20 wolves. They would kill prey totalling approximately 56,460 lbs. (live weight) annually (Parsons 1994). The deer population is projected to be between a high of 7,360 and a low of 3,550 five years after the wolf population reaches the goal of 20. The deer population is projected to be 14% lower than it would be without wolves in the high population scenario and 46% lower than it would be without wolves in the low population scenario. The net effect will be approximately 1,200 to 3,000 fewer deer than would occur without wolves.

Considerable uncertainty remains over the extent to which wolves will compete with, and thereby reduce, the high (75 to 80) mountain lion population in the San Andres (Logan 1994). Because of their numbers and greater average body weight, these lions likely currently consume more deer than the projected 20 wolves would consume. Thus, wolves' ultimate impacts on the deer population may depend largely on whether they displace lions.

Wolves' impacts on the other potential large prey species--oryx, feral horse, and pronghorn--cannot be predicted with confidence, but are expected to be much less than their impact on deer. Major management reductions in the horse population occurred in 1995 and are continuing (Morrow 1996), which should reduce the likelihood of wolves preying on horses.

Wolves that severely impact big game populations (which excludes feral horses) could be captured and moved, under the proposed experimental population rule (Appendix C). The greatest concerns arise with the projected 46% decline in the deer population under the low population scenario (Green-Hammond 1994), and with the small herd of desert bighorn sheep in the San Andres (Hubbard 1994). Wolves are relatively inefficient predators on all species of mountain sheep due to the cursorial nature of their hunting techniques (Bednarz 1989). However, in other areas gray wolves do occasionally kill bighorn sheep and packs may routinely visit bighorn sheep habitats seeking vulnerable animals (Huggard 1992). If wolves displace mountain lions

(an uncertain effect) and reduce deer populations as predicted, then predation on bighorn sheep by the lions could increase. The scabies-infected desert bighorn sheep may be especially vulnerable to predation and any additional mortality may threaten the viability of this herd of a state-listed endangered species.

Conclusion: While considerable uncertainty exists, wolves are unlikely to severely impact the deer population under the high population scenario, but they are likely to severely impact the deer population under the low population scenario, reducing the population almost in half. Wolves also could negatively impact the desert bighorn sheep herd.

Impacts on Hunting

Under Alt. A, a reintroduced wolf population in the WSWRA--a lightly hunted area--would lead to a decline in average legal kills of deer of between 11% and 34% in the high and low population scenarios, respectively (Green-Hammond 1994, Parsons 1994) (Table 4-6). That is, 10 to 24 fewer deer may be killed by hunters annually.

Conclusion: While a relatively high percentage of lost hunting opportunity could result, the small amount of hunting that occurs in the WSWRA means that actual losses of hunter days will be minor.

Impacts on Livestock

In the WSWRA, after the Preferred Alternative is completed and 20 wolves inhabit the area, losses are projected to be between 0.01 and 0.3 cattle per year (average: 0.16), mostly calves (Table 4-7). (In other words, if 0.3 cattle are taken per year this means that one animal would be taken every three years, on average.) This represents a range of between 0.0005% and 0.015% annual loss of the 3,220 total cattle present in the area. These projections are best estimates; rates could be different. Bednarz (1989) also predicted very low depredation rates. The low rates are largely due to White Sands Missile Range (WSMR) being free of livestock; apart from a few trespassing cattle, the only livestock in the WSWRA are in the secondary recovery zone to the west of WSMR.

Table 4-6. Estimated annual reduction of hunting five years after achievement of recovery area goals in the WSWRA under Alternative A.

Note: the low estimate is based on the "high population" scenario of an increasing deer population with high (50%) alternate prey use and high (50%) compensatory mortality; the high estimate is based on the "low population" scenario of a decreasing deer population, low (12.5%) alternate prey use, and low (17%) compensatory mortality (Green-Hammond 1994, Parsons 1994)

Statistic	Low Estimate	High Estimate
Reduced deer harvest^a	10	24
Reduced deer hunting days^b	51	120

^a Green-Hammond 1994; Parsons 1994.

^b Based on 1992 success rate for GMU 19 of .39 and average number of days per hunter of 2.0 for the limited entry White Sands Missile Range hunts.

SOURCE: Duffield and Neher (1994).

Table 4-7. Estimated annual livestock depredation costs after achievement of recovery area goals in the WSWRA under Alt. A.

	Low Estimate	High Estimate	Average Estimate
Cattle lost	0.01	0.3	0.16
Average value per animal^a	\$665	\$665	\$665
Total lost value/year	\$10	\$200	\$110

^a Value based on the February 1994 average value of all cattle and calves in New Mexico (B. Nedom, NM Agric. Statistics Service pers. comm.).

SOURCE: Duffield and Neher (1994).

The lost value associated with livestock depredation is calculated as the estimated number of cattle lost times the market value of those animals (Table 4-7). Ranchers may be reimbursed by the private Defenders of Wildlife Depredation Compensation Fund. A very few of the livestock present on the Jornada Experimental Range may also be taken. The experimental mission of this area provides an opportunity to conduct research on wolf depredation, should it occur, and ways to mitigate it.

Conclusion: Annual livestock losses in the WSWRA will be minor.

Impacts on Predator Control Programs

Little predator control occurs in the area, thus no significant impacts are anticipated. However, a need might arise for control of mountain lions if, as has been speculated (Bednarz 1989), the wolves do displace some of the large mountain lion population from the missile range into livestock grazing areas, where the lions might depredate (see Appendix A section on Influence on Other Predators).

Impacts on Agency, Tribal, and Local Government Policies and Plans

No formal ESA consultation with the FWS would be required regarding potential impacts of actions by the U.S. Army or other federal agencies on nonessential experimental Mexican wolves (except for actions in the White Sands National Monument and the San Andres National Wildlife Refuge where consultation could be required). The agencies would need to informally “confer,” but a conference would not be required for each individual test or project in the WSWRA. According to the FWS’s Section 7 Process and Policy Handbook: “a conference is required if the action is judged to likely jeopardize” the species involved (USFWS 1993f). This “threshold” is “reached if the likelihood of the species’ survival is appreciably reduced.”

Few, if any, WSMR activities are likely to pose this level of threat to a reintroduced Mexican wolf population. In those few cases where conferences are undertaken, the Service will provide “advisory recommendations for minimizing or avoiding adverse effects.” It is expected that this informal conferencing will occur on a more programmatic

basis under the umbrella of a cooperative wolf management plan that FWS will develop with WSMR and cooperating agencies, which will include various measures to support wolf recovery in the WSWRA while allowing for the normal military use of WSMR.

Most of the area is devoted to military use (discussed in next section). Portions of the WSWRA lie within Sierra and Otero Counties, which have land use ordinances that call for equal authority with federal agencies over decisions affecting federal lands within these counties. These could conflict with the Preferred Alternative. Both counties have expressed concern about wolf recovery and sought to extend local planning jurisdiction over it. Further, Sierra County has an ordinance banning wolf reintroduction in the county. The federal ESA and the experimental population rule, after adoption as a federal regulation, would preempt any conflicting local mandates.

While no Indian reservations are within the designated WSWRA, dispersing wolves could cause some impacts on the nearby Mescalero Apache Reservation until they were captured. This could compel the tribe to develop wolf management plans that are approved by the FWS or to enter into cooperative wolf management plans directly with the FWS.

Conclusion: Impacts on WSMR planning are expected to be minor. Limited potential conflicts with local land use ordinances exist.

Impacts on Military Activities and Land Use

Under the nonessential experimental classification, the Mexican wolf will receive a slightly higher degree of legal protection than other large mammals like the mountain lion and the oryx with which the WSMR test community has co-existed for years. The presence of these animals has never delayed or cancelled a test. (Indeed, no known cases exist of test activities directly killing a large mammal, although such **cases have** not been **actively** looked for and would not necessarily have been recorded if they occurred.)

Except on the San Andres National Wildlife Refuge (SANWR) and the White Sands National Monument (WSNM), the wolf would have the same status as a species “proposed” for ESA listing, such

that only a non-binding conference would be required between the FWS and other federal agencies on proposed activities that might harm the wolves. In the WSWRA sub-areas within the National Wildlife Refuge System, i.e., the SANWR, and within the National Park System, i.e., the WSNM, federal agencies must treat members of the experimental population as a threatened species for purposes of complying with Section 7 of the ESA. No major management conflicts are expected in these areas. The SANWR is already under FWS management. Further, wolves are not expected to inhabit the desert basins and sand dunes of the WSNM.

Gray wolves are able to tolerate noise and blast effects associated with heavy mining in Minnesota, which may be comparable to military testing activities on WSMR (Mech 1993a). Further, wild red wolves live in North Carolina in and adjacent to an Air Force and Navy training area without negative impacts (Phillips 1993). If humans are active in an area the wolves likely will avoid them. However, some test areas in the basins-where wolves are least likely to go-are contaminated with unexploded shells and could be dangerous to both wolves and field personnel (Bednarz 1989).

While limited access restrictions could be imposed under the proposed Mexican Wolf Experimental Population Rule around release sites, dens, and rendezvous sites, the effects will be minimal due to the very limited public access in the WSWRA. Further, the proposed rule allows extensive flexibility in the relocation of wolves. They could be moved if they endangered themselves by remaining in a military impact area, became habituated to humans or human facilities, caused major ungulate population decreases, preyed on livestock, preyed on desert bighorn sheep in the San Andres Mountains, and for other reasons.

Likely the greatest issue related to military activities and land use will be the need for FWS field personnel to coordinate with WSMR headquarters and limit their wolf monitoring and management in the event of potentially dangerous or high-security testing activities. This may inconvenience both WSMR and the field personnel; nevertheless, such coordination was achieved in a comparable project which occurred in the San Andres Mountains in the same areas likely to be used by wolves. A large-scale mountain lion study conducted for several years,

involving radio-telemetry monitoring and recapturing similar to what will take place with the wolf, has caused very little conflict with WSMR's primary mission (K. Logan, Hornocker Wildlife Research Inst., pers. comm.).

Conclusion: Overall, no major impacts on military activities are expected.

Impacts on Recreation

Minimal impacts are anticipated, beyond the potential impact on hunting discussed above, because very little other recreational use occurs within the areas the wolves would likely occupy. Potential impacts would increase if, as has been proposed, more public access to WSMR is allowed in the future. The only backcountry recreation in the area occurs in the single overnight camping area in the sand dunes of the WSNM, which are not considered suitable wolf habitat.

Regional Economic Impacts

As shown in Table 4-8, reduced harvest of deer in the WSWRA due to wolf recovery could result in lost benefits to hunters valued at \$3,000 to \$7,100 per year. Additionally, an estimated \$2,900 to \$7,000 in hunter expenditures could be lost. The estimated reductions in hunter expenditures likely overstate actual reduced expenditures in New Mexico due to the large proportion of resident hunters who will spend that money not spent on hunting in some other sector of the state economy. Hunters probably will not actually hunt less overall because of fewer deer in the WSWRA, but instead turn their attention to substitute areas or species (Duffield and Neher 1994). Livestock losses are projected to have minor economic impacts.

As discussed above under the BRWRA, available survey data indicate a strong level of support for wolf reintroduction in New Mexico (Biggs 1988; Duda and Young 1995), suggesting economic benefits in the form of existence values associated with reintroduction in the WSWRA.

Conclusion: Minor negative economic effects are projected predominantly in the lost value of hunting and reduced hunter expenditures. These could be

Table 4-8. Estimated annual reduction of hunting-related economic value and expenditures in region five years after achievement of recovery area goals in the WSWRA under Alternative A.

Note: low and high estimates are based on range of impacts on hunting described in Table 4-6.

Statistic	Low Estimate	High Estimate
Reduced value of deer hunting ^a	\$3,000	\$7,100
Reduced expenditures associated with deer hunting ^b	\$2,900	\$7,000
Reduced hunting permit revenue - New Mexico ^c	\$ 870	\$ 2,100

^a Based on average economic value per day of big game hunting of \$58.00 (Walsh et al. 1988).

^b Based on NM trip-related expenditures per day of \$56.81 (USFWS & Dept. of Commerce 1991b).

^c Based on current NM license and tag costs for residents and nonresidents and the split between resident and nonresident deer and elk tags sold in NM.

SOURCE: Duffield and Neher (1394).

offset to some extent by positive economic impacts but these have not been quantified.

Summary of Adverse Effects of Alternative A in the BRWRA and the WSWRA

Adverse effects of Alt. A in the BRWRA include projected lost value to hunters as high as \$1,336,600 per year and an associated reduction in hunter expenditures as high as \$1,079,100 per year. Additionally, losses to area ranchers due to livestock predation by wolves are projected to average as high as \$21,600 per year, but these may be privately compensated. Some ranchers may suffer significant losses. Predator control activities will be impacted. Wolves may impact the neighboring White Mountain and San Carlos Apache reservations by dispersing onto the reservations and preying on valuable big game and livestock, until the wolves were controlled. Predation by wolves on elk and deer that migrate from the BRWRA primary recovery zone to the reservations may reduce tribal hunting and sales of tags to non-members.

Adverse effects of Alt. A in the WSWRA include major impacts on the deer population under the low population scenario and potential harm to the desert bighorn sheep population. Lost value to hunters is projected to be as high as \$7,100 per year and the associated reduction in hunter expenditures as high as \$7,000 per year. Additionally, losses to area ranchers due to livestock predation by wolves are projected to average as high as \$200 per year, but these may be privately compensated.

Relationship Between Short-term and Long-term Effects and the Enhancement of Long-term Productivity

Losses of livestock and hunting opportunities, and their associated economic impacts, should be less than predicted in the short-term when wolf numbers are low, then rise to the predicted levels after achievement of the recovery area goals. Full achievement of the recovery objective is projected to take longer—until 2005—under the Preferred Alternative than under the other reintroduction alternatives. This is primarily because of the high population goal for the BRWRA (100 wolves) and the fact that 10%

of the population is expected to be removed annually for depredation control and other management purposes (see Chap. 2, Table 2-2).

In the long term, if wolves are fully recovered and the objectives of the Mexican Wolf Recovery Plan have been met, the wolves may be delisted (removed from ESA protection). If that occurs, the wolves in the BRWRA and the WSWRA (if used) may be managed as a game animal and furbearer by the States of Arizona and New Mexico similar to the way wolves are currently managed in Alaska and Canada. The wolves would represent a potentially valuable resource for both consumptive and non-consumptive use.

The wild Mexican wolf will also be an important natural force in the regulation of prey populations (Mech 1970). Long-term re-establishment of the complex, age-old, highly-evolved relationship between this top predator and its prey is considered beneficial. It may reduce ungulate over-population effects (see Peterson 1977), particularly for elk in the BRWRA, including over-grazing, over-browsing, and competition with livestock. Wolf predation affects deer and elk populations differently than human hunting does (Boyd et al. 1994). Wolves kill a larger proportion of young-of-the-year, males of all ages, and older individuals.

The presence of the wolf will provide opportunities to observe and, through research, to understand the dynamics of natural predator-prey-scavenger relationships in the Southwest, that is, to learn more about ecosystem function and productivity (see, e.g., Murir 1944, Peterson 1977). Returning the wolf, which may go extinct outside of zoos otherwise, will restore a missing component of native biodiversity to the area furthering the goals of the ESA. In conclusion, wolf recovery should enhance the long-term natural productivity of the environment.

Irreversible and Irretrievable Commitments of Resources

From an economic perspective the only irreversible and irretrievable commitments of resources lie with the wolf reintroduction and management costs and the hunter and rancher economic losses as they occur (Duffield and Neher 1994). Reintroduction and management costs will be more than \$500,000 per year until about the year 2010 (Appendix B -

Estimated Costs of Implementing the Alternatives). This includes a five-year monitoring/research phase after full achievement of the recovery area goals. Total reintroduction and management costs are estimated at \$7,247,000 over 14 years.

Wolves could possibly take some livestock that represent key breeding lines that might then be lost to ranchers, but ranchers probably would not put irreplaceable, uninsured, breeding stock out on the open range, where they could be taken by a whole suite of predators besides wolves. The likelihood of key adult breeding stock being taken by wolves appears remote, given the preference wolves show for calves.

Cumulative Effects

Gray wolf recovery, on roughly the same scale proposed here, has occurred in recent years in northern Montana, Wisconsin, and Yellowstone National Park/Central Idaho. In none of those areas has wolf recovery been shown to have acted cumulatively with other federal actions to significantly negatively affect the overall magnitude or nature of any industry, social institution, or other aspect of the environment. (Further, as a general observation, analysis has found that ESA "protections offered to threatened animals and plants do not impose a measurable burden on development activity at the state level... [T]he economic effects of endangered species listings are so highly localized, of such small scale, and short duration that they do not substantially affect state economic performance in the aggregate." (Meyer 1995).) Nevertheless, there are areas of potential concern as far as negative cumulative impacts in the BRWRA region in particular:

Livestock

The effects of wolf depredation on livestock likely will be relatively minor, with a fraction of 1% of the available livestock taken by wolves. But some ranchers could be significantly affected if they suffer multiple uncompensated depredations. The livestock industry is cyclical and it is conceivable that wolf recovery, along with other negative pressures on the industry, could contribute to significant cumulative impacts. Chief among the other pressures are: a) declines in beef prices, which has occurred markedly

since 1994; b) increases in production costs; c) limitations and reductions of public land grazing, some of which have already been proposed in parts of the BRWRA and are mostly under appeal, and increased costs resulting from government management decisions, including protection of other endangered species, e.g., the Mexican spotted owl (USFWS 1995); and d) increases in fees for public land grazing (see U.S. BLM 1994), although these have decreased lately,

Other Predators

Another issue between wolf recovery and ranching is the cumulative effect of adding another predator into what are already multi-predator (primarily bear, lion, and coyote) areas. The restrictions on predator control tools used in occupied wolf range could lead to increased livestock depredation by the other predators. However, considerable uncertainty regarding the effect wolves will have on the other predators, and therefore on the net livestock depredation rates, precludes quantitative analysis. As wolf populations become more dense, coyotes may be reduced (B. Paul, USDA ADC, pers. comm.). Some evidence exists that wolves aggressively compete with mountain lions (Hornocker Wildlife Res. Inst. 1993), but overall effects of gray wolves on lion populations have not been documented to date. Little impact on bear populations is expected.

Wild Prey and Hunting

The uncertainties about the eventual inter-relationships among wolves and other predators relate not only to the cumulative effect on ranchers, but also to the cumulative effect a new multi-predator system will have on deer, elk, and other prey populations. The projected impacts on the value of hunting and hunter expenditures are the highest categories of projected negative economic effects; nevertheless, the cumulative effect on hunting in Arizona and New Mexico are projected to be minor in relation to the overall value of hunting in these states (USFWS and Dep't of Commerce 1991 a and 1991 b; C. Neher, Bioeconomics, pers. comm.). Notably, the deer population within the wolf range in northern Minnesota has reached historically high levels, as has the hunter take, notwithstanding the fact the wolf population has increased steadily at the same time

(M. Nelson, Nat'l Biol. Survey, pers. comm.). The prey populations are more influenced by the harshness of the winters than by wolf predation. Similarly, weather and drought cycles should have greater impacts on the size of ungulate populations in the Southwest than wolf predation (Green-Hammond 1994).

As indicated in the discussion regarding impacts on prey populations, 100 Mexican wolves on the BRWRA would be expected in the low population scenarios to reduce the deer and elk populations compared to what they would be without wolves, by 22% and 17%, respectively. For the WSWRA, 20 wolves would be expected in the low population scenario to reduce the deer population compared to what it would be without wolves by 46%. These low population scenarios considered negative habitat and weather trends (Green-Hammond 1994). Nevertheless, if these scenarios occurred in combination with unexpected trends, such as a prolonged severe drought, then the long-term cumulative impacts could be a serious decline in the prey population. Unless corrective actions were taken, the areas could lose their capacity to achieve the wolf population goals.

Land Management

Deer generally benefit from human management of the land for forest openings with early successional vegetation. Logging and other clearing tends to ultimately benefit wolves by enhancing deer habitat (M. Nelson, Nat'l Biol. Survey, pers. comm.). In the BRWRA the trend has been toward less logging and clearing, largely resulting from reductions imposed to protect the uneven-aged forest habitat favored by the federally-threatened Mexican spotted owl and by the Forest Service "sensitive" northern goshawk (SW Region USFS 1993). This closed canopy forest provides less ungulate forage than more open areas (U.S. BLM 1994). Also, many decades of fire control have contributed to the dominance of formerly open areas by woody species. Approximately 125,000 acres, or about 5% of the Apache NF, would require treatment annually to mimic disturbance to the ecosystem that occurred under a more natural fire occurrence regime (Hayes 1994). This far exceeds the current prescribed burning rate of about 2,000 to 3,000 acres annually (Hayes 1995). The result is a forest with a higher risk of

catastrophic crown fires that kill virtually all trees within a burned area.

Thus, a potential management conflict exists between supporting wolf recovery and preserving Mexican spotted owl and northern goshawk habitat. Wolf recovery would not directly impact owls or goshawks, or any other endangered species in the area such as the spikedace, loach minnow, or Apache trout (see Appendix D - Section 7 Consultation). Further, this alternative imposes no requirements to preserve wolf habitat. Nevertheless, the Forest Service may amend the Apache and Gila National Forest Plans to reflect changes related to wolf recovery. If federal or state managers choose to take such actions to support wolves and their prey through timber harvesting, thinning, chaining, and prescribed burning (or allowing natural fires to burn), these could indirectly affect those species. Owls and goshawks could be affected by direct habitat alteration and the protected fish could be indirectly affected by excessive burning and other land-clearing activities that result in stream degradation. On the other hand, the owl management guidelines in the Mexican spotted owl recovery plan (USFWS 1995) are intended to provide land managers with flexibility to allow most silvicultural practices to occur, apart from even-aged management and harvest of large trees in key habitat areas, and to reduce excessive fuel levels to abate fire risks. This flexibility is most limited within the 100 acres surrounding owl nest sites.

If management conflicts occur, they may be resolved or mitigated through the interagency cooperative wolf management plan that will facilitate implementation of the Preferred Alternative. This plan will be very specific and will be distinct from the Mexican Wolf Recovery Plan, which is a broader guidance document.

The critical habitat designations for the loach minnow and spikedace (which have yet to become applicable due to legal appeals) are expected to cause no economic impacts to private individuals and to cause less than \$20,000 of total local government costs (Souder 1992a and 1992b). The FWS recently released two documents related to the Mexican spotted owl, a Recovery Plan (USFWS 1995) and an economic analysis for the designation of critical habitat (Ekstrand et al. 1995) (the former largely supersedes the economic impact scenarios in the latter). None of the loach minnow, spikedace, or

spotted owl studies identify any conflict or negative inter-relationship between spotted owl recovery and wolf recovery. Indeed, wolf recovery may contribute positively to owl recovery by reducing overgrazing by deer and, particularly, elk in the BRWRA (USFWS 1995). The spotted owl economic analysis indicated that most of the negative impacts from protection have already occurred, brought about by listing of the owl and associated management changes by the Forest Service.

The owl economic analysis does identify Catron County, New Mexico, as one of the counties most likely to suffer a continuing reduction in Forest Service payments due to the timber harvest reductions. Payments to county road and school funds could be at risk (Ekstrand et al. 1995). Catron County also is identified in this FEIS as the county most subject to negative economic effect from Mexican wolf recovery, although the potential also exists for some economic benefits (see Regional Economic Impacts section, above).

On the White Sands Missile Range increased military test activity may occur in the future, particularly as other military bases nationally are closed and more testing is consolidated at White Sands (WSMR 1994). This would result in greater potential for conflict with wolf reintroduction, management, monitoring, and research.

The cumulative public land area that BRWRA and WSWRA managers would actually need to temporarily close to public access to protect wolf release pen sites, den sites, and rendezvous areas should amount to a small fraction of one percent of the designated wolf recovery areas. Access restrictions would not apply to research, management, emergencies, important military needs, and similar cases. It is not expected that the limited restrictions associated with reintroduction of nonessential experimental wolves will act in combination with other current or prospective governmental restrictions so as to cause significant hardship. No planned land uses in the BRWRA or WSWRA, beyond those discussed above, are anticipated to act in combination with Mexican wolf recovery to result in cumulative impacts.

The full potential impact of Alt. A consists of the combined impacts of the BRWRA and the WSWRA, if the latter is used. However, little interaction of effects between the two areas is expected with the possible exception of occasional translocations of wolves.

Consequences of Alternative B

Reintroduction of Mexican wolves, classified as nonessential experimental, into both the Blue Range Wolf Recovery Area and the White Sands Wolf Recovery Area primary recovery zones. Wolves dispersing from the primary recovery zones will be captured and returned to the primary zones or captivity.

Blue Range Wolf Recovery Area Primary Recovery Zone

Impacts on Wild Prey of Wolves

The projected population in the BRWRA primary recovery zone under Alt. B is 20 wolves. They will kill prey totalling approximately 56,460 lbs. (live weight) annually (Parsons 1994). The deer population is projected to be between a high of 15,120 and a low of **10,030** five years after the wolf population reaches the goal of 20. The deer population is projected to be 6% lower than it would be without wolves in the high population scenario and 16% lower than it would be without wolves in the low population scenario. The net effect will be an estimated 970 to 1,900 fewer deer than would occur without wolves.

The elk population is projected to be between a high of 3,580 and a low of 2,340 five years after the wolf population reaches the goal of 20. The elk population is projected to be 6% lower than it would be without wolves in the high population scenario and 13% lower than it would be without wolves in the low population scenario. The net effect will be an estimated 230 to 350 fewer elk than would occur without wolves.

Notably, under the high population scenario deer and elk populations actually increase relative to current populations. Of course, those populations would increase even more without wolves. Wolves that severely impact big game populations could be captured and moved under the experimental population rule. However, this is not projected to happen in the BRWRA primary recovery zone (Green-Hammond 1994).

Conclusion: While uncertainty exists wolves likely will not severely impact prey populations even under the low ungulate population scenario.

Impacts on Hunting

Under Alt. B a re-established population of wolves in the BRWRA primary recovery zone is projected to lead to a decline in average legal kills of deer of between 5% and 12% in the high and low population scenarios, respectively, and a decline in legal kills of elk of between 5% and 9% in the high and low population scenarios, respectively (Green-Hammond 1994, Parsons 1994). This means that 60 to 110 fewer deer and 24 to 33 fewer elk may be killed by hunters annually. All these reductions will occur in Arizona. The total expected reduction in hunter days due to wolf reintroduction in the BRWRA primary recovery zone ranges from 2,140 to 3,700 days (Table 4-9).

Conclusion: Hunter take may fall, with a maximum projection of 12% for deer in the greatest impact case. Actual reductions in permits issued by state game managers likely would occur only if measurable herd reductions were observed.

Impacts on Livestock

After Alt. B is completed in the BRWRA primary recovery zone and 20 wolves are distributed throughout the area, losses are projected to be between 0.03 and one cow per year (average: 0.5), mostly calves (Table 4-10). This represents a range of between 0.0003% and 0.009% annual loss of the 10,490 total cattle present in the primary recovery zone. These projections are best estimates; rates could be different. Ranchers may be reimbursed by the private Defenders of Wildlife Depredation Compensation Fund. A very few horses may also be taken.

From 1987- 1991, total estimated livestock losses (all cattle) from existing predators averaged about 1% of permitted livestock on the Apache NF (Myers and Baxter 1993). The projected increases in depredation over these existing rates are quite small.

Conclusion: Wolves likely will take far less than one-tenth of one percent of the cattle present. This should not cause a measurable impact to ranching as

Table 4-9. Estimated annual reduction of hunting five years after achievement of recovery area goals in the BRWRA primary recovery zone under Alternative B.

Note: the low estimate is based on the "high population" scenario of increasing ungulate populations with high (25%) alternate prey use and high (50%) compensatory mortality; the high estimate is based on the "low population" scenario of decreasing ungulate populations, no alternate prey use, and low (17%) compensatory mortality (Green-Hammond 1994, Parsons 1994).

Statistic	Low Estimate	High Estimate
Reduced elk harvest^a	24	33
Reduced deer harvest^a	60	110
Reduced elk hunting days^b	440	600
Reduced deer hunting days^c	1,700	3,100

^a Green-Hammond 1994, Parsons 1994. Figures are rounded.

^b Based on average success rate of .470 for Ariz. GMU 1 and 27 (1988-1992 statistics) and average number of days hunted per big game hunter of 8.568 (USFWS & Dept. of Commerce 1991a).

^c Based on average success rate of .290 for Ariz. GMU 1 and 27 (1988-1992 statistics) and average number of days hunted per big game hunter of 8.568.

SOURCE: Duffield and Neher (1994).

Table 4-10. Estimated annual livestock depredation costs after achievement of recovery area goals in the BRWRA primary recovery zone under Alternative B.

	Low Estimate	High Estimate	Average Estimate
Cattle lost	0.03	0.9	0.5
Average value per animal^a	\$665	\$665	\$665
Total lost value/year	\$20	\$600	\$330

^aValue based on the January 1994 average value of cows and calves in Arizona (D. Dewalt, AZ Agric. Statistics Service, pers. comm.).

SOURCE: Duffield and Neher (1994).

a whole in the area, but some ranchers will experience losses.

Impacts on Predator Control Programs

In Arizona, an anti-trapping law (ARS 17-301 (D)), passed in 1994, disallows use of traps and snares on all public lands for depredation control. No additional restrictions should result from wolf recovery in the BRWRA primary recovery zone.

Wolves may displace other predators; coyotes and lions would most likely be affected. This potential displacement may result in temporarily higher concentrations of the other predators in surrounding areas. However, the ultimate impact this might have on control needs for these predators cannot be determined with confidence.

Impacts on Agency and Local Government Policies and Plans

The current management focus on the Apache NF in the BRWRA primary recovery zone should not change significantly with the presence of wolves. The State of Arizona's Cooperative Reintroduction Plan resembles Alt. B in the BRWRA closely, except that it includes areas to the north and south of the primary recovery zone (Groebner et al. 1995) (see discussion under Alt. A). The only county with jurisdiction is Greenlee County and it does not have laws in conflict with wolf recovery.

Impacts on Land Use

Wolf reintroduction under Alt. B should not significantly impact four major land uses in the BRWRA primary recovery zone: forestry, mining, recreation, and grazing (the section above addressed livestock depredation). No formal ESA Section 7 consultation would be required regarding potential impacts of land uses on nonessential experimental **Mexican** wolves. The FWS's management of this experimental population will impose no restrictions on these activities, with some exceptions that apply only within the one-mile radius protected areas on public lands around occupied pens, dens, and rendezvous sites. Commencing operations on a new timber sale, mine, or engaging in other "disturbance-causing land use activities" (see detailed definition, including exemptions, in Appendix G - Glossary) could be

temporarily delayed until the pen, den, or rendezvous site is no longer occupied (see Appendix C - Proposed Mexican Wolf Experimental Population Rule). The release pens will not be located near existing or planned timber sales, mines, or developments. No involuntary restrictions will be imposed on any private land use.

Grazing strategies could be affected by depredation by wolves and by their establishment of dens and rendezvous sites. However, the proposed rule allows extensive flexibility in the relocation of wolves. They could be relocated if they became habituated to humans or human facilities, preyed on livestock, caused major ungulate population decreases, and for other reasons.

Conclusion: It is **expected** that any land use restrictions due to the reintroduction of wolves to the BRWRA primary recovery zone will be minor. While some activities may be inconvenienced due to temporary access restrictions this inconvenience is unlikely to result in major economic losses.

Impacts on Recreation

Presence of the wolf may deter some visitors from the BRWRA primary recovery zone, but it may attract others. The large majority of people surveyed in Arizona indicated they would enjoy seeing or hearing a wolf in the wild (Johnson 1990). The demand for developed and dispersed recreational facilities in the Apache NF may increase. Protection of release pens, wolf dens, and rendezvous sites from disturbance may require occasional temporary access restrictions within one-mile of the site, depending on location and terrain.

Regional Economic Impacts

As shown in Table 4- 11, reduced hunter elk and deer harvest in the BRWRA primary recovery zone could result in lost benefits to hunters valued between \$123,100 to \$214,800 per year. Additionally, an estimated \$58,200 to \$101,500 in hunter expenditures could be lost. These projected losses likely overstate the actual losses in Arizona. Hunters probably will not actually hunt less overall because of fewer deer and elk in the BRWRA primary recovery zone, but instead turn their attention to substitute areas or species. Also, deer and elk hunt-

Table 4-1 1. Estimated annual reduction of hunting-related economic value and expenditures in region five years after achievement of recovery area goals in the BRWRA primary recovery zone under Alternative B.

Note: low and high estimates are based on range of impacts on hunting described in Table 4-9.

Statistic	Low Estimate	High Estimate
Reduced value of elk and deer hunting ^a	\$123,100	\$2 14,800
Reduced expenditures associated with deer and elk hunting ^b	\$58,200	\$101,500
Reduced hunting permit revenue - Arizona ^c	\$8,000	\$13,000

^a Based on average economic value per day of big game hunting of \$58.00 (Walsh et al. 1988).

^b Based on average AZ trip related expenditures per day of \$27.41 for deer and elk (USFWS & Dept. of Commerce 1991a).

^c Based on current AZ license and tag costs for residents and nonresidents and the split between resident and nonresident deer and elk tags sold in AZ.

SOURCE: Duffield and Neher (1994).

ing in Arizona is dominated by resident hunters (over 95%). Most of the money not spent by residents on hunting will be spent in some other sector of the Arizona economy. Therefore, reduced resident hunting opportunity should not result in a major reduction in total expenditures in Arizona. However, reduced expenditures by the 5% of nonresident hunters would result in reduced overall expenditures in Arizona.

Hunting guides could experience a reduction in business if fewer game are available due to wolf predation. Some guides may add wolf-watching and howling trips to their offerings. Because of their locations, Clifton, in Greenlee County, and Alpine, in Apache County, are the communities most likely to benefit from possible increases in tourism and recreational visitation.

Average annual livestock losses in the BRWRA primary recovery zone are projected to be between \$20 to \$600. One final area of potential change in economic value associated with wolf reintroduction is the value people may place on having a recovered wolf population. While some people may attach a value to the existence of wolves in the area, others may value their absence. Some ranchers or big game

hunters, for instance, might value the absence of wolves because they view the wolf as a potential threat.

The potential use and existence values (positive and negative) associated with wolf reintroduction in the BRWRA primary recovery zone have not been quantified. However, the FWS found substantial net economic benefits associated with the existence value of wolf reintroduction to the Yellowstone and central Idaho areas (USFWS 1994).

Conclusion: Negative economic effects are projected predominantly in the lost value of hunting and reduced hunter expenditures. These likely would be offset to some extent by positive economic impacts but these have not been quantified.

White Sands Wolf Recovery Area Primary Recovery Zone

Impacts on Wild Prey of Wolves

The projected population in the WSWRA primary recovery zone under Alt. B is 14 wolves. They will kill prey totalling approximately 39,500 lbs. (live weight) annually (Parsons 1994). The deer population in this area is projected to be between a high of 5,070 and a low of 2,600 five years after the wolf population reaches the goal of 14. The deer population is projected to be 13% lower than it would be without wolves in the high population scenario and 43% lower than it would be without wolves in the low population scenario. The net effect will be an estimated 760 to 2,000 fewer deer than would occur without wolves.

Wolves that severely impact big game populations could be captured and moved, under the experimental population rule (Appendix C; see definition of "Impacts on game populations in ways which may inhibit further wolf recovery" in Glossary). The greatest concern exists with the deer population and with the small herd of desert bighorn sheep in the San Andres (Hubbard 1994). Scabies-infected desert bighorns may be vulnerable to predation and any additional mortality may

threaten the viability of this herd of a New Mexico state-listed endangered species.

Conclusion: While uncertainty exists, wolves are unlikely to severely impact the deer population under the high population scenario, but they are likely to severely impact the deer population under the low population scenario, reducing the population almost in half (Green-Hammond 1994). Wolves also could negatively impact the desert bighorn sheep herd. Avoiding these negative impacts could require extensive wolf population management.

Impacts on Hunting

Under Alt. B a re-established population of wolves in the WSWRA primary recovery zone is projected to lead to a decline in average legal kills of deer of between 10% and 30% in the high and low population scenarios, respectively (Green-Hammond 1994, Parsons 1994). In terms of actual numbers of animals, 5 to 11 fewer deer are projected to be killed annually by hunters in this lightly-hunted area. The total expected reduction in hunter days due to wolf recovery in the WSWRA primary recovery zone ranges from 26 to 56 days (Table 4-12).

Table 4-12. Estimated annual reduction of hunting five years after achievement of recovery area goals in the WSWRA primary recovery zone under Alternative B.

Note: the low estimate is based on the "high population" scenario of an increasing deer population with high (50%) alternate prey use and high (50%) compensatory mortality; the high estimate is based on the "low population" scenario of a decreasing deer population, low (12.5%) alternate prey use, and low (17%) compensatory mortality (Green-Hammond 1994, Parsons 1994).

Statistic	Low Estimate	High Estimate
Reduced deer harvest ^a	5	11
Reduced deer hunting days ^b	26	56

^a Green-Hammond 1994, Parsons 1994.

^b Based on 1992 success rate for GMU 19 of .39 and average number of days per hunter of 2.0 for the limited entry White Sands Missile Range hunts.

SOURCE: Duffield and Neher (1994).

Conclusion: While a high percentage of hunting loss could result, the very small amount of hunting that occurs in the WSWRA primary recovery zone means that the actual reduction in hunter days in the area will be minor.

Impacts on Livestock

No livestock are legally present in the WSWRA primary recovery zone; therefore, cattle losses there are projected to be close to zero (Table 4-3, above). However, a very few trespassing cattle could be killed. Also, a small number of cattle could be killed if wolves leave the primary recovery zone until the wolves were controlled.

Impacts on Predator Control Programs

No predator control activities occur within the WSWRA primary recovery zone, thus no impacts will occur. However, wolves could displace other predators resulting in higher concentrations of the other predators in surrounding areas, at least temporarily.

Impacts on Agency and Local Government Policies and Plans

Because the area is predominantly managed by the White Sands Missile Range, impacts are discussed in the following section.

Impacts on Military Activities and Land Use

Potential impacts of Alt. B largely will be limited to the mountainous areas where very little missile testing or other military activity occurs. Parts of the primary recovery zone are overlaid by the Yonder Air Force training impact area (Fig 3-6, above), but it is unlikely that the high altitude training that occurs there will impact wolves, or vice versa (Bednarz 1989). Gray wolves are able to tolerate noise and blast effects associated with heavy mining in Minnesota, which may be comparable to testing activities on WSMR (Mech 1993a). Further, red wolves exist in North Carolina in and adjacent to an Air Force and Navy training area without negative impacts (Phillips 1993). If humans are active in an area, the wolves likely will avoid them. If the wolves are in danger, they can be removed. No major

impacts are expected on the wolves or on the military activities (Bednarz 1989).

Impacts on Recreation

Except for hunting, discussed above, no recreational activities occur within the WSWRA primary recovery zone, thus impacts on recreation are not expected.

Regional Economic Impacts

As shown in Table 4-13, reduced hunter deer harvest in the WSWRA primary recovery zone could result in lost benefits to hunters valued at about \$1,500 to \$3,300 per year, after wolf re-establishment. Additionally, an estimated \$1,500 to \$3,200 in hunter expenditures could be lost. These estimated reductions likely overstate the actual losses in the region. Hunters probably will not actually hunt less overall because of fewer deer in the WSWRA primary recovery zone, but instead turn their attention to substitute areas or species. Most of the money not spent by residents on hunting probably will be spent in some other sector of the state economy, but likely not in the WSWRA region. However, reductions in expenditures by the nonresident hunters would result in reduced overall expenditures in New Mexico.

Annual livestock losses are expected to be near zero in the WSWRA primary recovery zone. Further, no economic impacts (positive or negative) related to changes in hunting guide use or visitor use will occur because neither of these uses occurs within the WSWRA primary recovery zone. Positive or negative economic values may be associated with the existence of wolves in the area. Such values have not been measured.

Summary of Adverse Effects of Alternative B in the BRWRA and WSWRA Primary Recovery Zones

Re-establishment of the Mexican wolf in the BRWRA primary recovery zone under Alt. B is projected to result in a reduction in economic value to hunters as high as \$214,800 per year and an associated reduction in hunter expenditures in the

Table 4-13. Estimated annual reduction of hunting-related economic value and expenditures in region five years after achievement of recovery area goals in the WSWRA primary recovery zone under Alternative B.

Note: low and high estimates are based on range of impacts on hunting described in Table 4-12.

Statistic	Low Estimate	High Estimate
Reduced value of deer hunting ^a	\$1,500	\$3,300
Reduced expenditures associated with deer hunting ^b	\$1,500	\$3,200
Reduced hunting permit revenue - New Mexico ^c	\$440	\$960

^a Based on average economic value per day of big game hunting of \$58.00 (Walsh et al. 1988).

^b Based on NM trip-related expenditures per day of \$56.81 (USFWS & Dept. of Commerce 1991b).

^c Based on current NM license and tag costs for residents and nonresidents and the split between resident and nonresident deer and elk tags sold in NM.

SOURCE: Duffield and Neher (1994).

region as high as \$101,500 per year. Average losses to livestock owners due to wolf predation are projected to be as high as \$600 per year under Alt. B. Predator control activities in the area will be affected. Wolves may impact the neighboring White Mountain and San Carlos Apache reservations by dispersing onto the reservations and preying on valuable big game and livestock, until the wolves were controlled. Predation by wolves on elk and deer that migrate from the BRWRA primary recovery zone to the reservations may reduce tribal hunting and sales of hunting permits to non-members.

The relatively small WSWRA primary recovery zone deer population could be severely impacted, i.e., up to 43% reduction. Reduced hunter deer harvest are projected to result in hunting value losses as high as \$3,300 per year, after wolf re-establishment. Additionally, an estimated \$1,500 to \$3,200 in hunter expenditures could be lost.

Relationship Between Short-term and Long-term Effects and the Enhancement of Long-term Productivity

Losses of livestock and hunting opportunities, and their associated economic impacts, should be less

than predicted in the short-term when wolf numbers are low, then rise to the predicted levels after achievement of the population goals. This is the shortest-term alternative, with completion by 200 1. However, because neither area alone, nor both areas combined, meets the Mexican Wolf Recovery Plan population objective, additional recovery areas would be needed.

The potential positive biological and ecological effects of wolf re-establishment would be limited by the small scale of this alternative. Also, the long-term sustainability of the wolves would be in doubt absent constant supplementation of the population from the captive breeding program. Thus, long term captive population management program costs could be higher than for Alt.s A or C.

Irreversible and Irretrievable Commitments of Resources

From an economic perspective the only irreversible and irretrievable commitments of resources lie with the wolf reintroduction and management costs and the hunter and rancher economic losses as they occur (Duffield and Neher 1994). This alternative also presents the possibility of irretrievable loss of the

wild Mexican wolf type. This would result if the small wolf populations re-established are not genetically, demographically, or otherwise sustainable over the long-term and they are not maintained through constant population management, and no other Mexican wolf reintroduction projects occur.

Reintroduction and management costs will be on the order of \$570,000 to \$610,000 per year for the BRWRA and WSWRA primary recovery zones combined until about 2006 (this includes a five-year monitoring/research phase after full achievement of the recovery area goals) (Appendix B). These annual costs are higher than those under the Preferred Alternative, despite the smaller areas and numbers of wolves involved here, because of the intensity of management and control required under Alt. B and the fact that the two areas would be used simultaneously. The total reintroduction and management costs of Alt. B are estimated at \$5,890,500, which is less than the Alt. A total because Alt. B takes less time to achieve.

Cumulative Effects

Cumulative effects under this alternative would be similar to those discussed under Alt. A, but across a smaller scale, i.e., just the primary recovery zones.

Consequences of Alternative C

Reintroduction of Mexican wolves, classified as endangered, into the Blue Range Wolf Recovery Area only. Wolves will be released into the primary recovery zone and unlimited dispersal will be allowed. Wolves will receive full protection under the Endangered Species Act.

Introduction

Impacts discussed below should be considered the minimum, as wolves would probably eventually expand to a greater area than just the BRWRA. The actual impacts in areas outside the BRWRA are generally identified but cannot be predicted with confidence.

Based on consideration of public and agency comments on the DEIS, the EIS Interdisciplinary Team and the FWS decided to drop reintroduction of full-endangered wolves in the WSWRA from this

FEIS. Thus, the DEIS discussion has been eliminated regarding potential impacts in the WSWRA under Alt. C, as well as potential impacts in associated areas that were identified as likely dispersal areas, i.e., the Organ Mountains, the Chupadera Mesa, the Sacramento Mountains and Capitan Mountains units of the Lincoln NF, and the Mescalero Apache Indian Reservation.

Blue Range Wolf Recovery Area

Impacts on Wild Prey of Wolves

The projected population in the BRWRA under Alt. C is 100 wolves. They will kill prey totalling approximately 282,300 lbs. (live weight) annually (Parsons 1994). The deer population is projected to be between a high of 58,700 and a low of 40,200 five years after the wolf population reaches 100. The deer population is projected to be 6% lower than it would be without wolves in the high population scenario and 18% lower than it would be without wolves in the low population scenario. The net effect will be an estimated 3,700 to 8,800 fewer deer than would occur without wolves.

The elk population is projected to be between a high of 16,400 and a low of 10,300 five years after the wolf population reaches the goal of 100. The elk population is projected to be 5% lower than it would be without wolves in the high population scenario and 14% lower than it would be without wolves in the low population scenario. The net effect will be an estimated 870 to 1,700 fewer elk than would occur without wolves.

Notably, under the high population scenario, deer and elk populations actually increase (relative to current populations) by 3% each. Of course, those populations would increase even more without wolves. Wolves that did severely impact big game populations could not be captured and moved under full ESA protection, but this is not expected to happen in the BRWRA as a whole (Green-Hammond 1994).

Conclusion: While uncertainty exists, wolves likely will not severely impact prey populations even under the low population scenario.

Impacts on Hunting

Under Alt. C a recovered population of wolves in the BRWRA is projected to lead to a decline in average legal kills of deer of between 5% and 13% under the high and low population scenarios, respectively; and a decline in legal kills of elk of between 4% and 9% under the high and low population scenarios, respectively (Green-Hammond 1994, Parsons 1994). In terms of actual numbers of animals, 240 to 480 fewer deer and 90 to 150 fewer elk are projected to be killed by hunters. The total expected reduction in hunter days due to wolf recovery in the BRWRA ranges from 10,100 to 19,300 days (Table 4-14).

Conclusion: Hunter take may fall, with a maximum projection of 13% for deer in the greatest impact case. Actual reductions in permits issued by state game managers likely would occur only if measurable herd reductions were observed.

Impacts on Livestock

After Alt. C is completed in the BRWRA and 100 wolves are distributed throughout the area, losses are projected to be between one and 34 cattle per year (average: 17.5), mostly calves (Table 4- 15). This represents a range of between 0.001% and 0.04% annual loss of the 82,620 total cattle present in the area. These projections are best estimates; rates could be different. Ranchers may be reimbursed by the private Defenders of Wildlife Depredation Compensation Fund. A few horses and sheep may also be taken.

From 1987- 1991, total estimated livestock losses (all cattle) from existing predators averaged about 1% of permitted livestock on the Apache NF (Myers and Baxter 1993). Comparable depredation rates probably occurred on the Gila National Forest (S. Libby, Gila NF, pers. comm.). The projected increases in depredation over these existing rates are quite small.

Because this alternative allows only limited control of wolves that kill livestock, livestock depredation is more likely to fall near the high range of the projections, or even to significantly exceed the projections, than under Alts A or B. This represents a more serious potential impact on ranchers. Further, since ranchers in the BRWRA and likely

dispersal areas will not be permitted to harass wolves in the vicinity of their livestock or to kill them if they are attacking their livestock, rancher tolerance for wolves likely will be very low, possibly resulting in illegal killing of wolves (USFWS 1994b).

Conclusion: Wolves likely will take between one and 34 cattle per year, representing less than one-twentieth of one percent of all the cattle present, but the rate could go higher. This should not seriously impact ranching as a whole in the area, but some ranchers may experience significant losses.

Impacts on Predator Control Programs

Effects on ADC activities will be greater than for the other reintroduction alternatives. Under Section 7 of the ESA, techniques that could jeopardize wolves, such as trapping, snaring, and M-44s, will be limited or prohibited in areas that the full-endangered wolves choose to inhabit both within and outside the designated wolf recovery areas. However, in Arizona, an anti-trapping law (ARS 17-301 (D)), passed in 1994, disallows use of traps and snares on all public lands for depredation control. While no additional restrictions should result from wolf recovery on public lands in Arizona, restrictions of ADC activities on private lands are expected.

Private shooting of coyotes may be restricted if wolves are being mistaken for coyotes and shot. In Wisconsin, where wolves have full-endangered status, some of the many hunters in the field during deer hunting season have mistakenly (presumably) shot wolves. Therefore, managers have closed coyote hunting within occupied wolf range during this season (Wydeven 1992). If a similar trend causes high Mexican wolf mortalities, similar closures could be imposed through cooperative agreements with the state game and fish agencies.

Impacts on Agency, Tribal, and Local Government Policies and Plans

Section 7 of the ESA requires federal agencies to examine their proposed actions and to avoid those that would jeopardize full-endangered wolves. Additional habitat research and more biological assessments likely will be needed to assess potential impacts on wolves and their prey. Vegetation management may be needed to provide improved

Table 4-14. Estimated annual reduction of hunting five years after achievement of recovery area goals in the BRWRA under Alternative C.

Note: the low estimate is based on the "high population" scenario of increasing ungulate populations with high (25%) alternate prey use and high (50%) compensatory mortality; the high estimate is based on the "low population" scenario of decreasing ungulate populations, no alternate prey use, and low (17%) compensatory mortality (Green-Hammond 1994, Parsons 1994).

Statistic	Low Estimate	High Estimate
Reduced elk harvest^a	90	150
Reduced deer harvest^a	240	480
Reduced elk hunting days^b	2,100	3,500
Reduced deer hunting days^c	8,000	15,800

^a Green-Hammond 1994, Parsons 1994. Figures are rounded.

^b Based on average success rate of .3366 for New Mex. GMU 15, 16, 21, 22, 23, and 24 (1988-1992 statistics for elk; 1989-1992 statistics for deer) and Ariz. GMU 1 and 27 (1988-1992 statistics) and average number of days hunted per big game hunter of 7.787 (average of AZ and NM weighted by number of hunter-s) (USFWS and Dep't of Commerce 1991a and 1991b).

^c Based on average success rate of .2385 for New Mex. GMU 15, 16, 21, 22, 23, and 24 (1988-1992 statistics for elk; 1989-1992 statistics for deer) and Ariz. GMU 1 and 2 (1988-1992 statistics) and average number of days hunted per big game hunter of 7.787 (average of AZ and NM weighted by number of hunters).

SOURCE: Duffield and Neher (1994).

Table 4-15. Estimated annual livestock depredation costs after achievement of recovery area goals in the BRWRA under Alternative C.

	Low Estimate	High Estimate	Average Estimate
Cattle lost	1	33.9	17.5
Average value per animal^a	\$638	\$638	\$638
Total lost value/year	\$640	\$21,600	\$11,200

^aValue based on the average of the January 1994 average value of cows and calves in Arizona (D. Dewalt, AZ Agric. Statistics Service, pers. comm.) and the February 1994 average value of cows and calves in New Mexico (R. Nedom, NM Agric. Statistics Service, pers. comm.).

SOURCE: Duffield and Neher (1994).

ungulate habitat if low ungulate availability limits wolf recovery. This could include increasing timber harvesting, prescribed burning, and other steps to provide open habitat with shrubs, grasses, and **forbs** generally favored by deer and elk. The Forest Service likely would be required to amend the Apache and Gila National Forest Plans to reflect changes necessary to accommodate full-endangered wolf recovery. The most significant topics of possible amendments include Grazing Use, Timber Volume, Vegetation Management Practices (especially fire) and Acres Treated, and management for multiple endangered species. Generally, these changes would serve to enhance ungulate prey and to prioritize management for wolves in relation to the other “multiple uses” of the forests.

Federal agency management of livestock grazing may need revision to reduce significant negative impacts on prey populations and to reduce livestock depredation and the associated potential for illegal killings. Also, federal agencies with permitting authority over private actions that could jeopardize wolves could be compelled under Section 7 to disallow such actions under the ESA. (Notably, even for full-endangered status species, such instances have been rare (Barry et al. 1992).)

With respect to state and local governments the same potential conflicts exist as under **Alt. A**. However, under **Alt. C** the FWS would have less flexibility to accommodate state, local, tribal, and other concerns, Direct federal involvement in state-run hunting programs likely would meet with significant agency and hunter opposition. The potential impacts on state, local, and tribal governments will be broader if wolves disperse out of the BRWRA and WSWRA; these are addressed under the discussion of Impacts in Likely Dispersal Areas, below.

Impacts on Land Use

Case-by-case consultations on proposed land use changes that may affect wolves would be needed under Section 7 of the ESA; it is premature to say that the potential impacts under **Alt. C** would be minor. Wolf reintroduction is not expected to significantly impact three of the four major land uses in the BRWRA: forestry, mining, and recreation development. Nevertheless, the FWS’s management of this full-endangered population could impose more restrictions on these activities, including on

private land, than under the nonessential experimental designation. Commencing or continuing operations on a timber sale, mine, or development could be delayed during the spring denning season if wolves **denned** in the immediate area. Timber harvesting generally benefits wolves by maintaining shade-intolerant vegetation favored by ungulates preyed on by wolves (Thiel 1988). Further, wolves in Minnesota are able to tolerate noise and blast effects associated with logging and heavy mining (Mech 1993a). Mech (1993b) has also pointed out that low density development for homes, recreational facilities, power lines, and so on do not deter wolf recovery.

With respect to the fourth major land use in the area, grazing management could be affected by depredation by wolves and by their establishment of dens and rendezvous sites. Unlike under **Alt.s A** and **B**, which allow extensive flexibility in the relocation of wolves, little flexibility would exist under **Alt. C**. If depredations lead to illegal killings of wolves then restrictions on grazing may be imposed. Further, measures imposed under Section 7 consultations to mitigate potential long-term ecological impacts of grazing could be significant. These could include reductions in grazing where it is shown to negatively affect the deer and elk populations necessary for wolf recovery. However, these outcomes have not occurred in other regions where threatened or endangered wolves have recovered.

Conclusion: It is expected that land use restrictions due to the reintroduction of full-endangered wolves to the BRWRA will be relatively minor. But the potential is highest under this alternative for major land use restrictions to protect wolves and their natural prey.

Impacts on Recreation

Presence of the wolf may deter some visitors from the BRWRA, but it may attract others. The large majority of people surveyed in Arizona (Johnson 1990) and New Mexico (Biggs 1988; see Duda and Young 1995) indicated they would enjoy seeing or hearing a wolf in the wild. The demand for developed and dispersed recreational facilities in the BRWRA region may increase.

Protection of release pens, dens, and rendezvous sites from disturbance by visitors may require temporary access restrictions within one-mile of the site, depending on location and terrain. However, wolves tend to den in secluded areas in the spring prior to the peak visitation periods, so little impact on hiking, hunting, or other activities should result.

Conclusion: Wolf reintroduction is expected to cause increased visitation to the BRWRA and to require minor temporary restrictions on human access to particular areas as necessary to prevent harm to the wolves.

Regional Economic Impacts

As shown in Table 4-16, reduced hunter elk and deer harvest in the BRWRA could result in lost benefits to hunters in the region valued from about \$582,800 to \$1,119,200 per year after re-establishment of full-endangered Mexican wolves. Roughly 34% of these lost benefits would occur in Arizona and 64% in New Mexico. Additionally, an estimated \$470,700 to \$902,700 in hunter expenditures could be lost. About 20% of the reductions would occur in the Arizona portion of the region and 80% in the New Mexico portion. (New Mexico bears a greater share of the expenditure reduction because it has a

Table 4-16. Estimated annual reduction of hunting-related economic value and expenditures in region five years after achievement of recovery area goals in the BRWRA under Alternative C.

Note: low and high estimates are based on range of impacts on hunting described in Table 4-14.

Statistic	Low Estimate	High Estimate
Reduced value of elk and deer hunting^a	\$582,800	\$1,119,200
Share by State of reduced hunting value	AZ - \$198,150 NM - \$384,650	AZ - \$380,530 NM - \$738,670
Reduced expenditures associated with deer and elk hunting^b	\$470,700	\$902,700
Share by State of reduced hunter expenditures	AZ - \$94,140 NM - \$376,560	AZ - \$180,540 NM - \$722,160
Reduced hunting permit revenue - New Mexico^c	\$41,100	\$75,900
Reduced hunting permit revenue - Arizona^c	\$14,100	\$26,300

^a B used on average economic value per day of big game hunting of \$58.00 (Walsh et al. 1988).

^b Based on average AL and NM trip related expenditures per day of \$46.38 for deer and \$48.60 for elk (weighted by number of hunters)(USFWS and Dep't of Commerce 1991a and 1991b).

^c B used on current AL and NM license and tag costs for residents and nonresidents and the split between resident and nonresident deer and elk tags sold in AZ and NM.

SOURCE: Duffield and Neher (1994).

higher percentage of nonresident hunters than Arizona and thus a higher average hunter expenditure per day.)

These estimated reductions likely overstate the actual losses in Arizona and New Mexico. Hunters probably will not actually hunt less overall because of fewer deer and elk in the BRWRA, but instead turn their attention to substitute areas or species. Deer and elk hunting is dominated by resident hunters (over 96% in Arizona and 74% in New Mexico). Most of the money not spent by residents on hunting likely would be spent in some other sector of the state economy, but likely not in the BRWRA region. However, reductions in expenditures by the 4% to 26% of nonresident hunters would result in reduced overall expenditures in Arizona and New Mexico. Hunting guides could experience a reduction in business if fewer game are available due to wolf predation. Some guides may add wolf-watching and howling trips to their offerings.

Average annual livestock losses in the BRWRA under Alt. C are projected to be between \$640 to \$2 1,600 after wolf re-establishment. These could have a major impact on a few economically marginal ranchers if adequate funds are not available to compensate them.

The potential use and existence values (positive and negative) associated with wolf reintroduction in the BRWRA have not been quantified. However, the FWS found substantial net economic benefits associated with the existence value of wolf reintroduction to the Yellowstone and central Idaho areas (IJSFWS 1994b).

Conclusion: Negative economic effects are projected predominantly in the lost value of hunting and reduced hunter expenditures. These likely would be offset to some extent by positive economic impacts but these have not been quantified.

Impacts in Likely Dispersal Areas

San Carlos Apache Reservation

The San Carlos reservation contains extensive suitable wolf habitat that, if fully occupied, would likely support 20 to 30 wolves. They could cause adverse impacts on the game populations and

resulting reductions in hunting, although these have not been modelled.

Wolves could take some of the older trophy bull elk for which the tribe received \$57,000 each for three hunting permits in 1994. The larger bull elk will be in a depleted condition during the fall and winter because of the rigors of the rut, frequently isolated from other elk. This makes them vulnerable to predation. Wolves would be less likely to take a bull elk in prime condition. However, wolf depredation on some older trophy animals could adversely impact the number of high-value permits the tribe could issue and the prices the tribe could obtain for them. Also, wolf predation on breeding cow elk and the younger age classes may negatively impact the recruitment of bulls into the trophy class.

If a decrease in elk migrating onto the reservation is detected by the San Carlos game managers, the first adjustment to hunting seasons would be removal of certain non-member elk permits, which amounted to \$45,000 in total revenue to the tribe in 1994-95 (Brown 1995). In addition, a rough wolf predation model for the San Carlos Apache reservation prepared by Brown (1995) examined several scenarios for wolf impacts on deer, elk, and cattle and the resulting costs to the tribe. For the case of 30 wolves eventually inhabiting the reservation (which the FWS considers at the high range), Brown found that costs in lost deer, elk, and cattle would range between approximately \$4,100 and \$17,500 annually. (This modelling effort did not include lost value of hunting to the hunters themselves nor did it consider lost hunting expenditures in the region.)

Big game hunting is one of the major income sources (through permit fees, guide costs, and hunter expenditures) on this reservation. The other major source is livestock grazing. Depredation rates are already considered high and are probably aggravated by the low degree of livestock management. Many cattle die on the open range resulting in large amounts of carrion available for scavenging. The addition of another major predator with full-endangered species status could cause a marked increase in the amount of depredation, particularly if wolves are conditioned to feeding on cattle through scavenging opportunities (Bjorge and Cunson 1985).

If livestock depredation occurred regularly, as appears likely, the nature of the ownership of most of the cattle would make depredation compensation problematic. Many cattle are unbranded and differ-

ent family brands are intermixed so that even if a branded cow was killed by wolves, if the brand was not preserved the owner could not be determined. Unless some general compensation approach to the cattle association on whose land the depredation occurred was agreed to by the tribe and the Defenders of Wildlife, some wolf depredations may simply go uncompensated. The San Carlos Apaches have the lowest median household income and the highest percentage of people living below the poverty level of any area discussed in this FEIS (see Table 3-7, above). The importance of livestock income together with the big game hunting income means that the already economically marginal San Carlos Apaches could be more heavily impacted by Mexican wolf reintroduction than people in any other area. Deer, elk, and turkey hunting also have a high value to the tribe for food as well as recreational value. Potential adverse impacts from wolf dispersal out of the BRWRA would be exacerbated by the fact that up to **90%** of the tribal elk hunting and **50%** of the tribal deer hunting occurs within **10** miles of the BRWRA primary recovery zone.

Other impacts could occur. The action would conflict with the Tribal Council resolution opposing wolf recovery. Some recreational and other land use restrictions may be imposed under Section 7 of the ESA to avoid jeopardizing the full-endangered wolf population and restrictions on depredation control activities may be needed. Implementing and enforcing such restrictions, and preventing illegal killing of wolves, would present potential conflicts with tribal sovereignty unless cooperative agreements on these issues are achieved. Also, dispute exists about the extent to which negative impacts that the tribe may suffer, e.g., loss of trophy bull elk, would require compensation under the federal government's trust responsibility to the tribes. On the other hand, the potential positive impacts of wolf recovery discussed for the BRWRA, i.e., increased tourism, existence value, and long-term ecological balance, could result on the San Carlos Apache reservation as well.

White Mountain Apache Reservation

The reservation contains extensive suitable wolf habitat that, if fully occupied, would likely support 20 to 30 wolves. They could impact the game populations and resulting reductions in hunting, although these have not been modelled.

The impacts on the White Mountain Apache reservation should be qualitatively similar to those discussed on the San Carlos reservation. However, the White Mountain Apaches have higher incomes overall and are less dependent on hunting and livestock revenues than the San Carlos Apaches; therefore the relative significance of negative economic impacts from wolf recovery should be less. More of the tribe's income is derived from timber and recreation, which recovery of full-endangered wolves may impact in the form of temporary closures but should not seriously impact. Big game hunting may be reduced. About twice as much revenue, over **\$1** million, is generated by non-member big game hunts on this reservation as on the San Carlos reservation. Trophy bull elk hunting accounts for the vast majority of the hunting revenue. (The discussion about the vulnerability and potentially lower recruitment of bull elk on the San Carlos Apache Reservation also applies here.) Wolf depredation of trophy animals could impact the number of trophy elk permits issued and the prices charged for these permits.

The cattle associations could be **affected** because calf production already is low; however, few commercial sales of calves occur. Livestock roam year-round over much of the reservation and the ownership of individual livestock is not always determinable. Large amounts of carrion could be available to the wolves. Animal damage control methods to reduce depredations may need to be restricted.

Temporary access restrictions may be needed to protect the wolf dens and rendezvous sites that could be affected by the relatively high rate of use for logging and outdoor recreational activities. The tribe's ski area probably will not be **affected**, as temporary restrictions around denning sites in the spring likely will not overlap with winter recreation. The tribe's economic development plan to expand passive recreation and retail and service businesses would not be impacted by fully-protected wolves. The discussion on potential conflicts with tribal sovereignty in the San Carlos Apache section apply here also.

The action would conflict with the Tribal Council resolution opposing wolf recovery. Additional conflicts may result from the Tribal Council resolution prohibiting most federal and **state** agency access to the reservation for scientific and wildlife management purposes. It is anticipated that a

cooperative management agreement would be needed to avoid conflicts. The potential positive impacts of wolf recovery discussed for the BRWRA, i.e., increased tourism, existence **value, and long-term ecological balance**, could result on the White Mountain Apache reservation as well.

Lakeside Ranger District, Sitgreaves National Forest

Impacts on deer, elk, livestock grazing, and other activities should be comparable here to those in the BRWRA, in proportion to the number of wolves that may occur. Likely the greatest potential conflict would occur in the form of land use restrictions under Section 7 of the ESA because of the high level of recreational and vacation use in the Pinetop-Lakeside and Show Low areas. Closing trails or back-country roads during denning season and, perhaps, limiting conversion of Forest Service land to private land in key wolf-use areas may be necessary to afford the wolves full-endangered protection.

San Mateo Mountains Unit, Cibola National Forest

Impacts on deer, elk, livestock grazing, and other activities should be comparable here to those in the BRWRA, in proportion to the number of wolves that may occur. Recreational use is relatively light so few conflicts should occur.

Summary of Adverse Effects of Alternative C in the BRWRA and Likely Dispersal Areas

Adverse effects of Alt. C after wolf re-establishment in the BRWRA include lost value to hunters as high as \$ 1,119,200 per year and an associated reduction in hunter expenditures as high as \$902,700 per year. Additionally, average losses to area ranchers due to livestock predation by wolves are projected to be as high as \$2,160 per year, but these may be privately compensated. Wolves may impact the neighboring White Mountain and San Carlos Apache reservations by dispersing onto the reservations and preying on valuable big game and livestock. Predation by wolves on elk and deer on and near the reservations

could reduce tribal hunting and sales of hunting permits to non-members.

Restrictions on predator control activities and potentially-disturbing land uses will be imposed. There is generally a greater likelihood of adverse effects and restrictions occurring, exceeding those projected, as a result of the lower management flexibility under Section 7 of the ESA.

Relationship Between Short-term and Long-term Effects and the Enhancement of Long-term Productivity

Losses of livestock and hunting opportunities, and their associated economic impacts, should be less than predicted in the short-term when wolf numbers are low, then rise to the predicted levels or above after achievement of the recovery area goals. Wolf recovery to a population level that meets the **1982** Mexican Wolf Recovery Plan objective in the BRWRA is projected to occur in a shorter term—five years—under this alternative than under any others. Cost savings in the captive breeding program should result. However, although the wolves will be more protected legally, enforcement **difficulties** and local sentiment against the wolves may result in a high rate of illegal killings that could impede wolf recovery. Extensive law enforcement efforts may be necessary to attempt to reduce illegal killings. This would, of course, increase the costs. It is not clear, however, that increased enforcement efforts actually would be able to reduce illegal killing of wolves in remote areas.

If Mexican wolf reintroduction is successful under this alternative the long-term result could be very widespread effects. The recovered population could eventually range over thousands of square miles of suitable habitat outside the designated recovery area such that the negative and positive impacts described above would occur on a larger scale, roughly correlated with the wolf population size. Because much of the land outside the BRWRA is private or tribal land, the potential for conflict with non-federal land management goals would be high.

Irreversible and Irretrievable Commitments of Resources

From an economic perspective the only irreversible and irretrievable commitments of resources lie with the wolf management costs and the hunter and rancher economic losses as they occur (Duffield and Nehtr 1994). Reintroduction and management costs will be on the order of \$550,00 to \$590,000 per year for the BRWRA until about 2006 (this includes a five-year monitoring/research phase after full achievement of the recovery area goal) (Appendix B). The total reintroduction and management costs of Alt. C are estimated at \$5,692,000, which is less than the Alt. A total because Alt. C takes less time to achieve.

The ranchers' losses would be highest under this alternative and some marginal ranching operations might be forced out of business. The likelihood of depletion of the Defenders of Wildlife Depredation Compensation Fund is highest here, although the reversibility of such a situation is unclear.

The reductions that wolves are projected to cause in the prey populations would likely only be reversible if the wolf population was reduced through illegal killing or higher natural wolf mortality due to lack of a prey base (although the wolves could switch their choice of primary prey if it was depleted, e.g., from deer to elk). Due to the lack of flexibility to remove wolves to assist the recovery of potentially severely impacted prey populations, the potential exists for a major decline in those herds, although this is considered unlikely.

Cumulative Effects

Cumulative effects would include those discussed, above, under the Preferred Alternative (Alt. A), which should be referred to. In addition, the full-endangered status of the wolves under Alt. C could create serious management complications. A key vegetation management issue will have to be confronted for the BRWRA in planning for the overall effects of wolf reintroduction on the prey populations and on the ecosystem. That is, at least for the Apache NF, the general long-term vegetation trends appear unfavorable for ungulates and wolves (Hayes 1995). This area historically had far more open, unforested areas than exist today and the trend is

toward an even more heavily forested situation. (Also, local perceptions that this situation was caused by federally-imposed protections for the Mexican spotted owl and other threatened and endangered species has resulted in a "backlash" against them (L. Allen, Coronado NF, pers. comm.).)

Deer generally benefit from forest openings with early successional vegetation; thus, active logging and other clearing ultimately benefit wolves by enhancing deer habitat (M. Nelson, Nat'l Biol. Survey, pers. comm.). In the BRWRA the trend has been toward less logging and clearing, largely resulting from reductions imposed to protect the uneven-aged forest habitat favored by the federally-threatened Mexican spotted owl and by the Forest Service "sensitive" northern goshawk (SW Region USFS 1993). This closed canopy forest provides less ungulate forage than more open areas (U.S. BLM 1994). Also, many decades of fire control have contributed to dominance of woody species in formerly open areas. Approximately 125,000 acres, or about 5% of the Apache NF, would require treatment annually to mimic disturbance to the ecosystem that occurred under a more natural fire occurrence regime (Hayes 1994). This far exceeds the current prescribed burning rate of about 2,000 to 3,000 acres annually (Hayes 1995). The result is a forest with a higher risk of catastrophic crown fires that kill virtually all trees within a burned area.

Thus, a potential management conflict exists between supporting wolf recovery and preserving Mexican spotted owl and northern goshawk habitat. Wolf recovery would not directly impact owls or goshawks, or any other endangered species in the area such as the spinedace, loach minnow, or the Apache trout (see Appendix D - Section 7 Consultation). But indirectly managing to favor wolves and their prey through such actions as silvicultural treatment, tree thinning, chaining, and prescribed burning (or allowing natural fires to burn) could affect those species. Owls and goshawks would be affected by direct habitat alteration and the protected fish could be indirectly affected by excessive burning and other land-clearing activities that result in stream degradation. On the other hand, the owl management guidelines in the Mexican spotted owl recovery plan (USFWS 1995) are intended to provide land managers with flexibility to allow most silvicultural practices to occur, apart from even-aged management and harvest of large trees in key habitat

Consequences of Alternative D:

No action.

Introduction

Under this “no action” alternative, no impacts are expected in the BRWRA or WSWRA as no wolves will be reintroduced. The most likely areas for possible natural wolf recolonization are closer to Mexico, that is, southwestern New Mexico, southeastern Arizona, and Big Bend National Park. However, if Mexican wolves somehow did eventually naturally recolonize the BRWRA or WSWRA, they would have full-endangered status. The consequences would be similar to those described under the Consequences of Alt. C, the reintroduction of wolves with full ESA protection.

Uncertainty exists regarding whether wild Mexican wolves survive in Mexico, whether they will recolonize the U.S. areas under consideration, and, if so, when and in what numbers. It appears likely that “no wolves”-and no impacts-will occur under this alternative. Thus, the value of quantitative modelling of impacts is limited. Impacts are discussed qualitatively only and should be considered highly speculative.

The Potential Natural Recolonization Areas

Southeastern Arizona

Impacts on Wild Prey of Wolves.-Both white-tailed and mule deer occupy the probable typical habitat for Mexican wolves in southeastern Arizona, from Madrean evergreen woodlands to chaparral and semi-desert grasslands. Javelina are abundant and could provide a secondary diet for wolves. If wolf recolonization occurs, the projected maximum population in the southeastern Arizona potential natural recolonization area would be 30 wolves. Given the relatively sparse deer population in the area, this number of wolves could exert a major impact on the deer. Thus, the ultimate carrying capacity of the area for wolves may be less than initially projected. Also, wolves could impact the small population of Chihuahuan pronghorns (listed by Arizona as threatened) in the area. The Fort

areas, and to reduce excessive fuel levels to abate fire risks. This flexibility is most limited within the 100 acres surrounding owl nest sites. Yet, wolf recovery may contribute positively to owl recovery by reducing overgrazing by deer and, particularly, elk in the BRWRA (USFWS 1995).

Consultation between the Forest Service and the FWS would be necessary to avoid actions favoring Mexican wolves that jeopardized the other endangered species. Also, these actions would be managed to minimize potential taking of wolves themselves, e.g., by fire. The ultimate effect likely will be greater need for biological impact assessments of proposed management actions. A carefully-planned management partitioning of the Apache and Gila NF landscape so as to provide the optimum distribution of required habitat to meet the life-history needs of all protected species in the area may be necessary (see Hansen et al. 1993). Site-specific planning efforts would assist the Forest Service in describing desired future conditions necessary to support outputs from the land (Hayes 1995). This would also provide background information for the Apache and Gila Forest Plan amendment process.

Needed studies and planning efforts likely would lead to additional costs and delays initially, but taking a proactive approach may reduce future costs and delays that would result from case-by-case analyses of impacts on a single endangered species basis. Mexican wolf recovery (under any alternative) likely would stimulate more of an ecosystem approach in the management of these multiple endangered species areas. This fits with the recent FWS policy emphasis on cooperative, ecosystem-wide recovery planning (Beattie et al. 1994). Put succinctly, this means (Beattie et al. 1994, citing Clark and Zaunbrecher 1987):

“Management of natural resources using systemwide concepts to ensure that all plants and animals in ecosystems are maintained at viable levels in native habitats and basic ecosystem processes are perpetuated indefinitely.”

Huachuca herd, in particular, is currently heavily impacted by coyote predation on fawns that ADC is attempting to hold in check. The presence of full-endangered wolves might not only result in more fawn predation, but also could limit the tools ADC could use in its control efforts. On the other hand, wolves might reduce the numbers of coyotes.

Impacts on Hunting.—If Mexican wolves did disperse to the area from Mexico, wildlife managers would need to re-examine and possibly adjust hunting and ungulate management to reflect changes in prey mortality caused by wolves.

Impacts on Livestock.—If natural recolonization happens, some losses of the 37,400 cattle in the area would be expected. Ranchers may be reimbursed by the private Defenders of Wildlife Depredation Compensation Fund.

Impacts on Predator Control Programs.—Because federal ADC activities in the Coronado NF south of Interstate 10 have been very limited, the effects of wolves on ADC activities would be minimal. Because naturally recolonizing wolves would be fully protected as endangered the ADC may need to consult with the FWS under Section 7 of the ESA regarding *ad hoc* requests from livestock owners to control predators, as well as from Fort Huachuca. Techniques that could jeopardize wolves, such as trapping, snaring, and M-44s could be limited or prohibited in occupied wolf range. However, in Arizona, a new anti-trapping law passed in 1994 disallows use of traps and snares on all public lands for depredation control. Private taking of wolves would be illegal; private use of traps might be restricted if necessary to reduce the risk of illegally taking a wolf and private shooting of coyotes might be restricted if wolves were being mistaken for coyotes and shot.

Mexican wolves dispersing into the area could compete with coyotes, black bears, mountain lions, and bobcats. This competition could reduce or displace populations of these predators, but the extent of such competition cannot be predicted with confidence.

Impacts on Agency and Local Government Policies and Plans.—The Forest Service goals of enhancing ecosystem diversity and restoring range-

lands would be consistent with management for wolves under this alternative, primarily because they may enhance ungulate populations. However, management to protect full-endangered wolves might impact the management of public land livestock grazing, pursuant to consultations with the FWS under Section 7 of the ESA. Grazing practices might need revision to reduce livestock depredation and the associated potential for illegal killings of wolves. Such steps could include, for example, seasonal removal of livestock from key areas and requiring changes in husbandry to produce a more controlled calving situation such as calving near the ranch headquarters and controlled breeding to produce a more uniform calving period. (However, these outcomes have not occurred in other regions where threatened or endangered wolves have recovered.) The Coronado NF plan likely would need amending to enhance management for ungulate prey and to prioritize management for wolves in relation to the other uses of the forest.

Impacts on Land Use and Military Activities.—Natural wolf recolonization under Ah. D should not affect the major land uses in the Coronado NF area: mining and recreational and vacation development (grazing is discussed above). Restrictions probably would not be imposed on these activities, with one exception. Commencing operations on a mine, development, or other disturbing activity could be delayed during the spring denning season or summer rendezvous season if wolves established a den or rendezvous site in the immediate area. However, wolves in Minnesota are able to tolerate noise and blast effects associated with mining (Mech 1993a). Mech (1993b) also has pointed out that wolf recovery need not conflict with low density development for homes, recreational facilities, power lines, and so on.

Fort Huachuca conducts few military tests or maneuvers in the mountainous areas. Wolf recovery likely would not pose a major conflict with the Fort's activities.

Impacts on Recreation.—Visitor access by trail or road might be limited or temporarily blocked in the vicinity of an active den or rendezvous site. Roads might be closed to reduce illegal killings if they occur. Visitor use might increase. If so, the demand for recreational facilities could increase.

Regional Economic Impacts.—The large sector of the population in southeastern Arizona that relies economically on Fort Huachuca would not be affected by naturally recolonizing wolves, nor would businesses and trade associated with the heavily-used Nogales border crossing. Natural recovery of the Mexican wolf in southeastern Arizona likely would cause some economic losses to livestock owners and lost hunting value and hunter expenditures. Benefits associated with reintroduction might accrue due to the positive value many Arizonans would place on the existence of wolves in the state (Johnson 1990). The tourism industry could benefit if visitors come to the area to view or hear wolves.

Southwestern New Mexico

Impacts on Wild Prey of Wolves.—If natural recolonization occurs, the projected maximum population in southwestern New Mexico would be 20 wolves. Their prey would consist primarily of mule deer and some Coues white-tailed deer, javelina, and pronghorn. Some concern exists regarding wolf predation on Gould's wild turkeys and white-sided jackrabbits, listed as endangered by the State of New Mexico, but major effects on these species are not expected (Hubbard 1994).

Impacts on Hunting.—If Mexican wolves did disperse to the area from Mexico, wildlife managers would need to re-examine and possibly adjust hunting and ungulate management to reflect changes in prey mortality.

Impacts on Livestock.—If natural recolonization happens, some losses of the 23,500 cattle in the area would be expected. Ranchers may be reimbursed by the private Defenders of Wildlife Depredation Compensation Fund.

Impacts on Predator Control Programs.— Because ADC has already agreed to limit its use of techniques that could jeopardize wolves in southwestern New Mexico, such as trapping, snaring, and using M-44s (Fowler-Propst 1993), there should not be additional impacts if wolves do, in fact, recolonize. Private taking of wolves would be illegal; private use of M-44s and traps may be restricted if necessary to reduce the risk of illegally taking a wolf and private

shooting of coyotes might be restricted if wolves were being mistaken for coyotes and shot.

Mexican wolves dispersing into the area might compete with coyotes, black bears, mountain lions, and bobcats. This competition could reduce or displace populations of these predators, but the extent of such competition cannot be predicted with confidence.

Impacts on Agency and Local Government

Policies and Plans.—Management to protect full-endangered wolves might impact the management of public land livestock grazing. Grazing practices might need revision to reduce livestock depredation and the associated potential for illegal killings of wolves. Such steps could include, for example, removal of livestock from key areas and requiring changes in husbandry so as to reduce open-range calving. (However, these outcomes have not occurred in other regions where threatened or endangered wolves have recovered.) The Coronado NF plan likely would need amending to enhance management for ungulate prey and to prioritize management for wolves in relation to the other uses of the forest.

Hidalgo County's ordinance prohibiting the release of non-resident canids would not conflict with wolf management under this alternative because wolves would be naturally recolonizing. The county development plan's emphasis on economic, mineral, and recreational opportunities should not conflict with management of full-protected wolves.

Impacts on Land Use.—Other than potential restrictions on grazing management and some road closures, few land use restrictions are likely. However, the high proportion of private land in the area compared to the other areas addressed in this FEIS means that government managers probably would face greater difficulty in implementing the minor temporary land use restrictions needed to protect wolf dens and rendezvous sites from disturbance than would be the case on public lands.

Impacts on Recreation.—Few developed recreational facilities exist. Visitor use of the Coronado NF lands might increase if wolves attract them. If so, the demand for developed and dispersed recreational facilities may increase.

Regional Economic Impacts.—Wolf recolonization in southwestern New Mexico likely would result in some economic losses to livestock owners and lost hunting value and hunter expenditures. Benefits associated with reintroduction might accrue due to the positive value many New Mexicans place on the existence of wolves in the state (Biggs 1988; Duda and Young 1995) and with increased visitation to the area.

Big Bend National Park

Impacts on Wild Prey of Wolves.—If wolves recolonized Big Bend National Park, some reductions in prey populations, primarily white-tailed deer, mule deer, and javelina, could result. Little **data exists** regarding these populations. Mech (1991) noted that none of the several long-term studies conducted in hunting-free U.S. and Canadian **national** parks have shown wolves to severely impact populations of their prey.

The projected maximum population in the park **under** this alternative would be five wolves. **White-tailed deer** and **javelina** might be more available as prey than mule deer because the Chisos Mountain habitat of white-tailed deer and **javelina** overlaps with the likely preferred wolf habitat.

Impacts on Hunting.—Hunting in the park is prohibited. Hunting might be affected outside the park if wolves dispersed into nearby areas, such as Big Bend State Natural Area and Black Gap Wildlife Management Area, where hunting is the primary management emphasis.

Impacts on Livestock.—No livestock are legally present in the park. However, a very small number of cattle trespassing from Mexico could be killed. Also, wolves might range out into ranch areas outside the park and take a very small number of **cattle** there.

Impacts on Predator Control Programs.—No predator control activities occur within park boundaries. Coyote control does take place on surrounding private ranches. If endangered Mexican wolves recolonize the park, predator control programs on these ranches could be restricted if necessary to reduce the risk of illegally taking a wolf and private shooting of coyotes may be restricted if wolves were

being mistaken for coyotes and shot. Wolves dispersing into the park might compete with coyotes, black bears, mountain lions, and bobcats, especially in the Chisos Mountains, where all four predators occur. This competition could reduce or displace populations of these predators, but the extent of such competition cannot be predicted with confidence.

Impacts on Agency and Local Government

Policies and Plans.—Under Ah. D, Mexican wolves dispersing into the park would receive full protection under the Endangered Species Act. The National Park Service would be required to formally consult with the FWS to determine whether proposed park activities would likely jeopardize the continued existence of the wolves. The park's mission, to manage for recreation and conservation of scenic, natural, wildlife and historical resources, is consistent with wolf recovery. Park plans such as trail upgrading might need to be altered or limited if they affect wolves, but this is unlikely. Interpretive services also might need to accommodate increased visitor demand to see or hear wolves first-hand. Management of the 560,900 acres being considered for wilderness designation would not change, as designation would be consistent with wolf protection.

The Texas statutory prohibition against possessing, transporting, receiving, or releasing live wolves into the state (Tex. Parks and Wild. Code Ann. § 63.104) would not apply to naturally recolonizing wolves. Further, the Texas endangered species statute (Tex. Parks and Wild. Code Ann. § 68.001) supports wolf recovery.

Conclusion: Major impacts on agency policies and plans are not expected, but some changes in park plans might be necessary.

Impacts on Land Development.—If visitor use increases because of the presence of wolves, a greater demand for recreational facilities could ensue. Increased development could result both in the park and in nearby areas.

Impacts on Recreation.—Wolves probably would attract the public. The initiation of a wolf interpretive program could lead to enhanced visitor use. In Algonquin Provincial Park, Ontario, Canada, about 60 public howling sessions have been conducted

since 1963 (except 1966-68), with 74,250 visitors participating through 1992 (averaging about 1,200 per session) (Strickland 1992). Prince Albert, Riding Mountain, and Jasper National Parks in Canada also have successful wolf howling programs, although on a smaller scale than those in Algonquin.

Visitor interactions with wolves in the Chisos Mountains could occur, due to the high concentration of visitor use in this area, especially during the summer months and holidays. Visitor access by trail or road might need to be limited or temporarily blocked to avoid disturbance of wolf dens and rendezvous sites. However, disturbance by visitors in the desert regions of the park is unlikely because of the low concentration of visitors and limited accessibility, and because wolves probably would not prefer these areas.

Conclusion: Wolf recolonization could result in increased visitation to the Big Bend National Park and could require minor temporary restrictions on human access to particular areas as necessary to prevent harm to the wolves.

Regional Economic Impacts.—If wolves attracted more visitors to the park, especially if the park initiates a special interpretive program, demand for concessionaire services such as dining, lodging, and gift items could increase. Such an increase might contribute to Brewster County economically, where the park already is the largest employer, by increasing employment and visitor expenditures.

Summary of Adverse Effects of Alternative D in the Three Potential Natural Recolonization Areas

Deer in southeastern Arizona are the most likely prey group to be impacted by recolonizing wolves. In addition, natural recolonization could result in economic losses to livestock owners in southwestern New Mexico and southeastern Arizona. Losses of hunting value and hunter expenditures could occur. Restrictions on land use and predator control activities could be imposed in recognition of the wolves' full-endangered status.

Natural recolonization in Big Bend National Park would have fewer adverse effects than any of the areas or alternatives discussed in this FEIS. The

very low projected numbers of **wolves, the absence** of livestock and hunting, and park management objectives consistent with wolf recovery would preclude the main impacts that could occur elsewhere.

Relationship Between Short-term and Long-term Effects and the Enhancement of Long-Term Productivity

Under this alternative, no short-term effects would occur except for program costs because no indication exists that Mexican wolves will naturally recover in the foreseeable future. Over the longer term, the same types of potential adverse and beneficial effects could occur that arise under the other full-ESA protection alternative (Ah. C). However, the no action alternative has the highest likelihood that no long-term environmental effects will result at all, if natural wolf recolonization does not happen.

Irreversible and Irretrievable Commitments of Resources

From an economic perspective the only irreversible and irretrievable commitments of resources would lie with the wolf program and management costs and any hunter and rancher economic losses as they occurred (Duffield and Neher 1994). In Appendix B these costs are presented based on two reasonable scenarios: wolves do not recolonize (the status quo) and wolves recolonize one of the areas. In the first case annual costs for the Mexican Wolf Recovery Program would continue at about \$150,000 per year. In the second case, monitoring, management, and other needs would cause annual costs to increase to **about** \$218,000 per year. Due to uncertainty regarding the period of time over which these scenarios might occur, if at all, no total costs are estimated.

This alternative squarely presents the prospect of an irreversible and irretrievable loss of the wild Mexican wolf type. Maintenance of the captive population over several more generations, without natural selection pressures but with domestication pressures, may result in an animal too far removed from the wild type to be suitable for reintroduction. Risks of disease, possible future genetic problems, lack of zoo space, costs, and other factors could lead

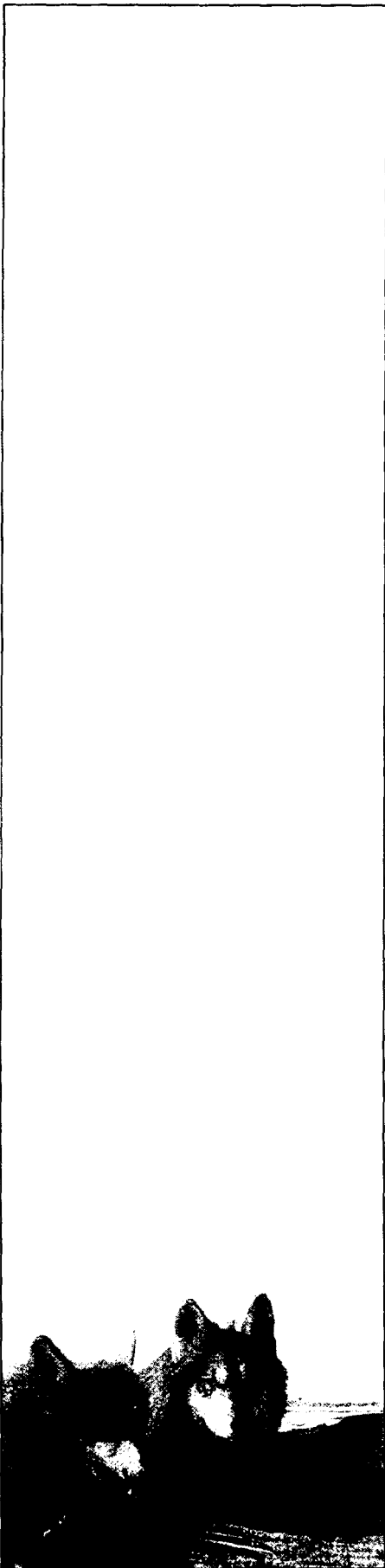
to the permanent loss of the subspecies, if no additional Mexican wolves are discovered in the wild.

Cumulative Effects

Cumulative effects under this alternative are too difficult to predict with any confidence. If wolves do not recolonize, obviously no cumulative effects can be described. If they do recolonize, depending on where and how, the types of cumulative effects described under Alt. C might occur.

Chapter 5

Consultation and Coordination



CHAPTER 5

Consultation and Coordination

Development of the Proposal and the Draft and Final Environmental Impact Statements

The FWS-the lead agency-and cooperating agencies compiled a variety of information in order to systematically analyze the potential impacts of alternative approaches to re-establishing Mexican wolves. Needed information was identified and collected during and after the scoping process. Public scoping occurred in 1991 and 1992. The FWS held four public meetings attended by a total of over 838 people, at which a total of 65 comments were presented. The meetings were followed by a written comment period, during which the FWS received 1,342 written comments. The results of the scoping process are summarized in Chap. 1, Table 1-1.

Qualitative and quantitative data were gathered on Mexican wolf biology, ecology, and history; species of special concern; potential wild prey of wolves, including deer, elk, javelina, pronghorn, bighorn sheep, exotic ungulates, and small mammals; livestock predators such as coyotes, bears, and mountain lions; predator control activities; land ownership, use, and management, including military activities; grazing, forestry, mining, and recreational activities; and regional economies and populations. The information came from many sources, including federal, tribal, state, and local agency files, personal communications, on-site visits, scientific literature, and experts' analyses. Wolf biologists, predator control experts, economists, resource managers, livestock producers, wildlife biologists, and others were consulted.

The FWS contracted with the Center for Wildlife Law at the University of New Mexico School of Law to coordinate the EIS process and to be primarily responsible for drafting the document. The FWS then asked cooperating federal agencies to appoint a representative to an interdisciplinary (ID) team to oversee the writing of the EIS (see List of Preparers). Also, representatives were sought as consultants from the Arizona and New Mexico Departments of Game

and Fish and from the potentially affected tribes. The ID team oversaw the formulation of the Proposed Action (including the proposed Mexican Wolf Experimental Population Rule - Appendix C), the wolf recovery alternatives, and the analysis of their impacts.

The ID team met ten times during the development of this EIS, beginning in April, 1993. Also, FWS and Center for Wildlife Law staff attended many informal meetings with representatives of the potentially affected public, local governments, agencies, and organizations to discuss the EIS process and to obtain background information. A mailing list was compiled that now has over 6,000 individuals and organizations. Regular status reports on the progress of the EIS and Mexican wolf recovery were sent to those on the mailing list.

Consultants were contracted for technical analyses. These were Katherine Green-Hammond of Albuquerque, New Mexico, a prey population modeler, and John Duffield and Chris Neher of Bioeconomics, a natural resources economics consulting firm in Missoula, Montana. Also, two expert surveys were conducted, one on livestock depredation and the other on wild prey impacts.

All of the information was compiled at the Center for Wildlife Law. The FWS, the ID team members and their agencies, the Mexican Wolf Recovery Team, and other potentially affected agencies contributed to, reviewed, and revised the internal EIS drafts prepared at the Center for Wildlife Law. The FWS had final approval authority over the entire draft and final EISs.

Concurrently with preparation of the DEIS by the FWS, the State of Arizona developed a "Cooperative Reintroduction Plan for the Mexican Wolf in Arizona" (Groebner et al. 1995). The FWS cooperated in this effort. The FWS also has attempted to cooperate with the local governments that may be affected. The FWS has requested information relevant to drafting the EIS, held meetings with individual county officials, invited county representatives to ID team meetings as consultants, made background information available, held a joint DEIS public comment meeting with one county that

requested it, and reviewed and responded to comments and studies prepared by county consultants.

The DEIS was released in June, 1995. Review comments on it are responded to at the end of this chapter. The Public Comment Summary document includes a full recounting of hearings and open houses that the FWS held on the DEIS.

Notice

The FWS has final sole responsibility for the contents of this EIS. Participation or review by representatives of other agencies does not imply concurrence, endorsement, or agreement to any recommendations, conclusions, or statements in this document.

Agencies, Organizations, and Persons Sent the DEIS for Review

Copies of the DEIS were provided to federal, state, and local agencies, Native American tribes, businesses, interest groups, and other organizations listed below that could be affected by the final decision, and to all contributors to the writing of this document. These individuals and organization are also being sent the FEIS, as are other individuals and organizations that requested it, as well some others that the FWS determined should receive it. A limited number of additional copies of the FEIS are available, upon request. Also, copies are being provided to public libraries, listed below, in cities and towns throughout the potentially affected areas in Arizona, New Mexico, and Brewster County, Texas.

Federal Agencies

Council on **Environmental Quality**
Director, Information Office

Department of Agriculture

Secretary of Agriculture
APHIS Animal Damage Control
Director, Western Region
State Directors - Arizona, New Mexico, Texas
Forest Service
Regional Forester, Southwest Region
Supervisor, Apache-Sitgreaves National Forest

Supervisor, Cibola National Forest
Supervisor, Coronado National Forest
Supervisor, Gila National Forest
Supervisor, Lincoln National Forest
Director, Jornada Experimental Range

Department of the Army

Commander, Fort Bliss Army Reserve Facility and
Air Defense Artillery Center
Commander, Fort Huachuca Army Garrison
Commander, Holloman Air Force Base
Commander, White Sands Missile Range

Department of the Interior

Secretary of the Interior
Bureau of Indian Affairs
Office of Director
Area Director, Albuquerque
Bureau of Land Management
Office of Director
State Directors - Arizona, New Mexico, Texas
Fish and Wildlife Service
Office of Director
Regional Director, Region 2
Ecological Services Field Offices -
Arizona, New Mexico, Texas
Manager, Bosque del Apache
National Wildlife Refuge
Manager, San Andres National
Wildlife Refuge
Manager, Sevilleta National
Wildlife Refuge
National Biological Survey
Office of Director
National Park Service
Office of Director
Regional Director, Southwest Region
Regional Director, Western Region
Superintendent, Big Bend National Park
Superintendent, Chiricahua National
Monument
Superintendent, Coronado National Memorial
Superintendent, Gila Cliff Dwellings
National Monument
Superintendent, White Sands National
Monument

Environmental Protection Agency

Director, Office of Federal Activities
Regional Director, Region 8, Denver, Colorado

National Aeronautics and Space Administration

Director, White Sands Test Facility

State Department

Ahmed Meer, Science Office,
U.S. Embassy, Mexico City

State Agencies

State of New Mexico

Office of Governor
Commissioner, State Land Office
Director, Department of Agriculture
Director, Department of Game and Fish
New Mexico State House of Representatives
New Mexico State Senate
President, University of New Mexico
President, New Mexico State University
President, Western New Mexico University

State of Arizona

Office of Governor
Arizona State House of Representatives
Arizona State Senate
Director, Department of Agriculture
Director, Department of Game and Fish
President, Arizona State University
President, University of Arizona

Tribal Governments

Chairman, Mescalero Apache Tribe
Chairman, San Carlos Apache Tribe
Chairman, White Mountain Apache Tribe

Government of Mexico

Biol. Javier de la Maza, Dirección
General de Aprovechamiento
Ecologico de los Recursos Naturals,
Instituto Nacional de Ecologia

County Governments

**County Managers, Boards of Supervisors,
and County Commissions**

Apache County, Arizona
Cochise County, Arizona
Gila County, Arizona

Graham County, Arizona
Greenlee County, Arizona
Navajo County, Arizona
Pima County, Arizona
Santa Cruz County, Arizona
Catron County, New Mexico
Doña Ana County, New Mexico
Grant County, New Mexico
Hidalgo County, New Mexico
Lincoln County, New Mexico
Otero County, New Mexico
Sierra County, New Mexico
Socorro County, New Mexico
Brewster County, Texas

Courtesy copies of the DEIS and FEIS were also provided to all members of the United States Congress that represent the potentially affected areas in Arizona, New Mexico, and Texas.

Senator Jon Kyl, Arizona
Senator John McCain, Arizona
Rep. Jim Kolbe, Arizona
Rep. Ed Pastor, Arizona
Senator Jeff Bingaman, New Mexico
Senator Pete Domenici, New Mexico
Rep. Joe Skeen, New Mexico
Senator Phil Gramm, Texas
Senator Kaye Bailey Hutchinson, Texas
Rep. Henry Bonilla, Texas

Businesses and Organizations

AAZPA Conservation Center
Bethesda, MD
Albuquerque Wildlife Federation
Albuquerque, NM
Alpine Chamber of Commerce
Alpine, AZ
Alpine Golf Properties
Alpine, AZ
Animal Defense Council, Inc.
Tucson, AZ
Arizona Wildlife Federation
Mesa, AZ
Arizona Trail Riders
Phoenix, AZ
Arizona Cattle Growers Association
Phoenix, AZ

Arizona Wool Producers Association
Phoenix, AZ

Arizona Nature Conservancy
Tucson, AZ

Arizonans for Wildlife Conservation
Yuma, AZ

Blue River Cowbells
Blue, AZ

Board of Tourism
Springerville, AZ

Coalition of AZ/NM Counties
Catron County, Glenwood, NM

Coalition of AZ/NM Counties
Lincoln County, Carrizozo, NM

Coalition of AZ/NM Counties
Socorro County, Socorro, NM

Coalition of AZ/NM Counties
Apache County, Eager, AZ

Coalitron of AZ/NM Counties
Greenlee County, Clifton, AZ

Coalition of AZ/NM Counties
Sierra County, Truth or
Consequences, NM

Coalition of AZ/NM Counties
For Stable Economic Growth
Glenwood, NM

Cochise-Graham Cattle Growers Ass'n
Pearce, AZ

Committee of Wilderness Supporters Inc.
Las Cruces, NM

Coronado Scenic Trail Association
Clifton, AZ

Davis Mountains Trans-Pecos
Heritage Association
Alpine, TX

Defenders of Wildlife
Northern Rockies Field Office
Missoula, MT

Defenders of Wildlife,
Southwest Field Office
Tucson, AZ

Defenders of Wildlife
Washington, D.C.

Dona Ana County Sportsman
Association
Las Cruces, NM

Eastern Counties Organization
Clifton, AZ

Fundacion Chihuahuense de la Fauna
Chihuahua, Chihuahua, Mexico

Gila Valley Natural Resources
Conservation District
Safford, AZ

Gila Watch
Silver City, NM

Gila Archery Association
Silver City, NM

Greenlee County Cattlegrowers
Clifton, AZ

Hannagan Meadow Lodge
Alpine, AZ

Holistic Management Institute
Albuquerque, NM

Hotchkiss Sawmill & Lumber Co.
Silver City, NM

Instituto de Ecologia, Unidad Durango
Durango, Durango
Mexico

International Wolf Center
Ely, MN

Malpais - Borderlands Project
Douglas, AZ

Maricopa Audubon Society
Phoenix, AZ

Mexican Wolf Coalition of Texas
Spring, TX

Mexican Wolf Coalition
Albuquerque, NM

National Audubon Society
Boulder, CO

National Audubon Society
New Mexico Office
Santa Fe, NM

Native Ecosystems
Tucson, AZ

New Mexico Wool Growers, Inc.
Roswell, NM

New Mexico Wool Growers
Yeso, NM

New Mexico Farm &
Livestock Bureau
Las Cruces, NM

New Mexico Cattle Growers
Association
Albuquerque, NM

New Mexico Land Use Alliance
Silver City, NM

Northern Arizona Audubon Society
Sedona, AZ

People for the West
 Sacramento Mountains Chapter
 Weed, NM

Precision Pine & Timber, Inc.
 Heber, AZ

Preservation of Caballo Mountains
 Truth or Consequences, NM

Preserve Arizona's Wolves
 Phoenix, AZ

Proteccion de la Fauna
 Mexicana A.C.
 Centro Saltillo
 Coahuila, Mexico

Public Lands Action Network
 Santa Fe, NM

Reidhead Brothers Lumber Mill
 Nutrioso, AZ

Region 1 Guide Ass'n
 Alpine, AZ

Round River Conservation Studies
 College of Santa Fe
 Santa Fe, NM

Sierra Club
 Southwest Regional Office
 Phoenix, AZ

Sierra Club Rio Grande Chapter
 Las Cruces, NM

Sky Island Alliance
 Tucson, AZ

Southwest Center for Biodiversity
 Phoenix, AZ

Southwest Regional Director
 Native American Fish and
 Wildlife Society
 Albuquerque, NM

Stone Forest Industries
 Eagar, AZ

Sportsman's Voice
 Springerville, AZ

Texas Sheep and Goat Raisers' Ass'n
 San Angelo, TX

The Nature Conservancy
 Santa Fe, NM

The Wildlife Society
 Bethesda, MD

The Wildlife Society, AZ Chapter
 Phoenix, AZ

The Wildlife Society, NM Chapter
 Las Cruces, NM

The Wildlands Project
 Tucson, AZ

Trail Riders
 Magdalena, NM

Tucson Rod & Gun Club
 Tucson, AZ

Western States Public Land Coalition
 Safford, AZ

Western New Mexico Houndsman Ass'n
 Reserve, NM

White Mountain Chamber of Commerce
 Springerville, AZ

Public Libraries

Benson Public Library
 Benson, AZ

Cochise County Library
 Bisbee, AZ

Copper Queen Library
 Bisbee, AZ

Clifton-Greenlee County Public Library
 Clifton, AZ

Douglas Public Library
 Douglas, AZ

Duncan Public Library
 Duncan, AZ

Globe Public Library
 Globe, AZ

Hayden Public Library
 Hayden, AZ

Holbrook Public Library
 Holbrook, AZ

Huachuca City Public Library
 Huachuca City, AZ

Larson Memorial Public Library
 Lakeside, AZ

Miami Memorial-Gila County Library
 Miami, AZ

Nogales City-Santa Cruz County Library
 Nogales Public Library
 Nogales, AZ

Patagonia Public Library
 Patagonia, AZ

University of Phoenix
 Learning Resources Services Center
 Phoenix, AZ

Pima Public Library-Graham County
 Pima, AZ

Safford City-Graham County Library
Safford, AZ

Apache County Library
Saint Johns, AZ

San Carlos Public Library
San Carlos, AZ

Show Low Public Library
Show Low, AZ

Sierra Vista Public Library
Sierra Vista, AZ

Snowflake Town Library
Snowflake, AZ

Round Valley Public Library
Springerville, AZ

Tempe Public Library
Tempe, AZ

Tombstone Reading Station
Tombstone, AZ

Arizona State Museum Library
University of Arizona
Tucson, AZ

Tucson-Pima Library
Tucson, AZ

University of Arizona Library
Tucson, AZ

Whiteriver Public Library
Whiteriver, AZ

Elsie S. Hogan Community Library
Willcox, AZ

Young Public Library
Young, AZ

Alamogordo Public Library
Alamogordo, NM

New Mexico State University at
Alamogordo Library
Learning Resource Center
Alamogordo, NM

Albuquerque-Bernalillo County Public
Library System
Albuquerque, NM

Hatch Public Library
Hatch, NM

Holloman Air Force Base Library
Holloman AFB, NM

Thomas Branigan Memorial Library
Las Cruces Public Library
Las Cruces, NM

New Mexico State University Library
Las Cruces, NM

Lordsburg-Hidalgo Library
Lordsburg, NM

Village of Reserve Library
Reserve, NM

Ruidoso Public Library
Ruidoso, NM

College of Santa Fe
Fogelson Library Center
Santa Fe, NM

The Public Library
Silver City, NM

Western New Mexico University
Miller Library
Silver City, NM

Socorro Public Library
Socorro, NM

Truth or Consequences Public Library
Truth or Consequences, NM

United States Army Post Library
White Sands Missile Range, NM

Alpine Public Library
Alpine, TX

Sul Ross State University
Bryan Wildenthal Memorial Library
Alpine, TX

List of Preparers

The draft and final EIS were prepared by the Center for Wildlife Law, University of New Mexico, under the supervision of the Mexican Wolf Recovery Program, Fish and Wildlife Service, Region 2. People who contributed substantially are listed below. Others too numerous to list provided information on various subjects.

Mexican Wolf EIS Interdisciplinary Team

Larry &-Regional Mexican Wolf Coordinator, Coronado National Forest. B.S. in Forestry, Stephen F. Austin State University, 1960. Range, Watershed, Timber, and Ecosystems **Staff** Officer, Coronado National Forest, 1979-present. Extensive experience in wildlife, range, watershed, timber, and fire management on seven national forests in New Mexico and Arizona, including assignments as District Ranger and National Forest **Staff** Officer.

Jim Bailey—Assistant Division Chief, Conservation Services, New Mexico Department of Game and Fish. B.S. in Forestry, Michigan Technological University. M.S. and Ph.D. in Wildlife Biology, State University of New York College of Forestry. Past positions include Professor, Colorado State University, Instructor, University of Montana, and Research Biologist, Illinois Natural History Survey.

Cecil Brown—Wildlife Biologist, Recreation and Wildlife Department, San Carlos Apache Tribe. B.S. in Wildlife Management, Colorado State University, 1965. San Carlos Apache Tribe, Wildlife Management Biologist, 1992-present. Idaho Department of Fish and Game, Conservation Officer and Research Biologist, 1969-1991. Range Management Department, Oregon State University, 1968-1969, research on range inventory techniques and analysis of range resources. U.S. Geological Survey, Cartographer, 1958-1963.

John Caid—Assistant Director, Game and Fish Department, White Mountain Apache Tribe. B.A. in Business Administration (1974), B.S. in Biology (1978), and Graduate Studies (1978-1979), University of Arizona. Biologist, White Mountain Apache Tribe Game and Fish Department, 1979-1988. Apache trout recovery team member, 1979-present.

Lindy R. Ford—Electronics Engineer, White Sands Missile Range. B.S. in electrical engineering, Texas A & M University, 1970. Project Engineer, White Sands Missile Range.

Jim Gonzales—Assistant Division Chief, Division of Wildlife, New Mexico Department of Game and Fish. B.S. in Wildlife Management (1974) and M.S. in Biology (1982), Eastern New Mexico University. Southwest Area Wildlife Manager with NMDGF, 1983-1986. Bobcat Research Biologist with NMDGF, 1978-1983. Public Affairs Officer with NMDGF, 1975-1976. NMDGF Wildlife District Officer, 1974-1975 and 1976-1977.

Dan Groebner—Arizona Game and Fish Department, Wolf Biologist. B.S. in Wildlife, Biology and Resource Management, University of Wisconsin-Stevens Point, 1983. M.A. in Biology, Northern Michigan University, 1991 (studied 24-hour movements of Minnesota wolves). Wolf Biologist for the

Arizona Game and Fish Department, 1994 to present. Field Course Instructor for the International Wolf Center, 1987-1993. Educational Coordinator of the International Wolf Center, 1988-1991. Principal Investigator of Earthwatch Wolf Tracking Project in Wisconsin and Minnesota, 1985-1993. Wisconsin Department of Natural Resources Timber Wolf Project, 1982-1984.

Frank Hayes—District Ranger, Clifton Ranger District, Apache-Sitgreaves National Forest. B.S. in Wildlife Science, New Mexico State University, 1973. M.S. in Range Science, University of Idaho, 1978. Wildlife Biologist with Cibola National Forest, 1988-1991. District Range/Wildlife staff on Guadalupe Ranger District, Lincoln National Forest, 1980-1988. Range Conservationist with BLM, 1976-1980. Fire and helicopter management with Apache National Forest, 1974-1976.

Peter Jenkins—Program Manager, Institute of Public Law, University of New Mexico School of Law. Mexican Wolf EIS Coordinator and Principal Author; Interdisciplinary Team Leader, under contract with U.S. Fish and Wildlife Service. B.A., Hampshire College, 1979. J.D. *cum laude*, University of Puget Sound School of Law, 1983. Masters in Environmental Studies, School of Forestry and Environmental Studies, Yale University, 1990. U.S. Congress Office of Technology Assessment, policy analyst, 1990-1992. Private law practice in Seattle, WA, emphasizing environmental and land use law, 1984-1989. Coordinator, Washington Wolf Project, 1985-1989.

Terry Johnson—Chief of Nongame and Endangered Wildlife, Arizona Game and Fish Department. B.S. in Zoology, Central State College, Oklahoma, 1969. M.S. in Ecology, Stephen F. Austin State University, Texas, 1971. Pre-doctoral studies in Ecology and Evolutionary Biology, University of Arizona, 1971-1981. Various positions in biological consulting, 1975-1982. Coordinator of the Arizona Natural Heritage Program for The Nature Conservancy and the State of Arizona (1979-1983). Nongame Chief at Arizona Game and Fish since 1983. Member of, or advisor to, various endangered species recovery or management teams, etc. Fellow, Arizona-Nevada Academy of Sciences.

David R. Parson—Mexican Wolf Recovery Coordinator, U.S. Fish and Wildlife Service, B.S. in Fisheries and Wildlife Biology, Iowa State University, 1969. M.S. in Wildlife Biology, Oregon State University, 1975. Various positions, U.S. Fish and Wildlife Service, 1975-present. Duties included natural resource management coordination, environmental impact analysis and mitigation, research grant administration, and endangered species recovery.

Richard Phillips—State Director, U.S.D.A. Animal Damage Control. Arizona State Director, APHIS-ADC, 1992-present. 25 years experience in animal damage control, first with the U.S. Fish and Wildlife Service and later with U.S.D.A.-APHIS-ADC.

Greg Schmitt—Endangered Species Biologist, New Mexico Department of Game and Fish. B.S. in Wildlife Science, New Mexico State University, 1971; M.S. in Wildlife Science, New Mexico State University, 1973. New Mexico Department of Game and Fish, 1974 to present. Duties have included working with nongame wildlife, with emphasis on endangered species, throughout New Mexico (13 years) and working on waterfowl, sandhill cranes, and upland game species (7 years).

Daisan Taylor—Senior Wildlife Biologist, Environmental Services Division, Directorate of Environment and Safety, U.S. Army White Sands Missile Range. B.S. in Wildlife Management/Biology, University of Wisconsin-Stevens Point, 1976. M.S. in Wildlife Science, Purdue University, 1978. Wildlife Specialist II with Arizona Game and Fish Department, 1980- 1982. Held present position since 1982, with emphasis on threatened and endangered species issues and Endangered Species Act compliance.

Consultants

Wendy Brown—Wildlife Biologist, U.S. Fish and Wildlife Service. Coordinating public information and education program and other facets of the Mexican Wolf Recovery Program.

John **Duffield**—Economist, Bioeconomics, Missoula, MT. Professor of Economics, University of Montana. Analyzed economic impacts.

Steven H. Fritts—Wolf Scientist, U.S. Fish and Wildlife Service. Provided wolf biology and management expertise.

Adele Girmendonk—Wildlife Biologist, Arizona Department of Game and Fish. Conducted research on wolves and Arizona wildlife.

Kathleen Grassel—Graphics Specialist, Institute of Public Law, University of New Mexico. Provided graphics assistance.

Kate Green-Hammond—Consultant in ecosystem modelling. Provided prey base computer modelling analysis.

Ray **Gurule**—Mapping Specialist, U.S. Fish and Wildlife Service. Provided all map figures.

Ma&Johnson—Veterinarian, Yellowstone National Park, WY. Veterinary review.

Patrick Morrow—Biologist, White Sands Missile Range. Provided game data and hunting information.

Chris Neher—Economist, Bioeconomics, Missoula, MT. Analyzed economic impacts.

Dan Pletscher—Associate Professor in Forestry, University of Montana. Provided information on wolves and prey impacts.

Miriam Wolok—Staff Attorney, University of New Mexico School of Law, Institute of Public Law. Research Analyst. Conducted research and wrote portions of the DEIS.

Mexican Wolf Recovery Team

Larry Allen—Regional Wolf Coordinator, Coronado National Forest.

Javier de la Maza—Direccion General, Aprovechamiento Ecologico de los Recursos Naturales, Instituto Nacional de Ecologia, Mexico.

Steven H. Fritts—Wolf Scientist, U.S. Fish and Wildlife Service.

Phil Hedrick-Department of Zoology, Arizona State University.

Terry Johnson—Nongame and Endangered Wildlife Coordinator, Arizona Department of Game and Fish.

David R Parsons-Mexican Wolf Recovery Coordinator, U.S. Fish and Wildlife Service.

Mike Phillips—Yellowstone National Park Wolf Recovery Coordinator, National Park Service.

Greg Schmitt-Endangered Species Biologist, New Mexico Department of Game and Fish.

Peter Siminski--Mexican Wolf Species Survival Plan Coordinator, Arizona-Sonora Desert Museum.

Technical Experts Surveyed

The FWS surveyed various experts on technical issues related to potential wolf impacts on livestock and wild prey. The respondents were:

Livestock Impacts

Larry Allen, U.S. Forest Service, Arizona
Paul Bouche, U.S. Forest Service, New Mexico
Cecil Brown, San Carlos Apache Tribe, Arizona
John Caid, White Mountain Apache Tribe, Arizona
Phil Clifton, Arizona Cattlegrowers Association
Gary Davis, U.S. Forest Service, Arizona
John Fowler, New Mexico State University
Steve Fritts, U.S. Fish and Wildlife Service, Montana
Mike Fusco, New Mexico Cattlegrowers Association
John Gunson, Fish and Wildlife Service,
 Alberta, Canada
Jerry Holocheck, New Mexico State University
Mike Howard, Bureau of Land Management,
 New Mexico
John Mac&, National Park Service, Wyoming
Roy McBride, Ranchers Supply, Inc., Texas
David Mech, National Biological Survey, Minnesota
Curt Mullis, US DA Animal Damage Control,
 New Mexico
Carter Niemeyer, USDA Animal Damage Control,
 Montana
Gary Nunley, USDA Animal Damage Control, Texas

Bill Paul, USDA Animal Damage Control,
 Minnesota

Rick Phillips, USDA Animal Damage Control,
 Arizona

George Ruyle, University of Arizona

Alan Savory, Holistic Management, Inc.,
 New Mexico

Wild Prey Impacts

Warren Ballard, University of New Brunswick,
 Canada

Lou Carbyn, Canadian Wildlife Service,
 Alberta, Canada

Todd Fuller, University of Massachusetts

David Mech, National Biological Survey, Minnesota

Francois Messier, University of Saskatchewan,
 Canada

Mike Nelson, National Biological Survey, Minnesota

Paul Paquet, University of Alberta, Canada

Rolf Peterson, Michigan Tech University

Dan Pletscher, University of Montana

Jon Rachael, Idaho Department of Game and Fish

Participants in DEIS Open Houses and Public Hearings

The following individuals participated in the open houses and public hearings held on the DEIS:

Arizona Game and Fish Department:

Dan Groebner, Terry Johnson

New Mexico Department of Game and Fish:

Jim Bailey, Eddie Bennett, Greg Schmitt

U.S.D.A. Animal Damage Control:

Richard Phillips

U.S. D.A. Forest Service:

Larry Allen, Frank Hayes, Sandy Knight,

Andrea Martinez

U.S.D.I. Fish and Wildlife Service:

Charles Ault, Wendy Brown, Nick Chavez, Dom

Ciconne, George Divine, Yvonne Fernandez, Scott

Heard, Mark Johnson, John Keeler, Ken Kessler, Mike

Lucckino, Susan MacMullin, Colleen McNerney, Doug

McKenna, Kathy Granillo, Bill Myer, Bud Oliveira,

David Parsons, Cindy Schroeder, Steve Spangle Greg

Stover, Hans Stuart

University of New Mexico:

Peter Jenkins, Mimi Wolok

White Sands Missile Range:

Daisan Taylor

Hearing Officer:

Lotario Ortega

Hearing Court Reporters:

Steve Brenner, Caroline Chapman, and

Shannon Stevenson

Comments on the DEIS and FWS Responses

Attached are the letters, with FWS responses, from agency, government, tribal, and legislative commenters on the DEIS. That is followed by a summary of comments on the DEIS received from the public, also with FWS responses.

Responses to Agency, Government, Tribal, and Legislator Comments

Introduction

Below are the reproduced comment letters on the DEIS from federal, state, and tribal agencies, members of the United States Congress, state legislators, and local governments. The FWS responses are given in the right column. Generally, if a comment has already been raised and responded to in the Public Comment Summary, or in response to a previous official's letter, it is not responded to a second time. Issues that are legal or policy based, or are unrelated to the DEIS, are generally not responded to.

Federal Agencies

U.S. Department of Agriculture - Animal Damage Control:



Animal and
Plant Health
Inspection
Service

Animal Damage
Control

ADC Western Regional Office
2nd Floor Suite 204
12345 W Alameda
Lakewood CO 80226

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October 30, 1995

DC
FWS

U.S. Fish and Wildlife Service
Mexican Wolf Environmental Impact Statement Team
Post Office Box 1306
Albuquerque, New Mexico 87103

To Whom It May Concern:

Enclosed are the comments from USDA, Animal Plant and Health Inspection Service, Animal Damage Control program (ADC) concerning the Mexican Wolf Reintroduction Draft Environmental Impact Statement.

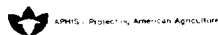
It is apparent in the Draft Environmental Impact Statement (DEIS) that the U.S. Fish and Wildlife Service (FWS) has taken great pains to provide a balanced approach to a highly complex and controversial proposal. As an agency that also deals with controversies on a frequent basis, we can appreciate the difficult position of the FWS and commend you for your efforts to achieve balance. Our interest in providing the following comments is in maintaining our ability to meet our statutory responsibilities to address wildlife damage problems and to assist in resolving potential technical, legal, and procedural questions raised by the DEIS.

1. We noted several items of interest to the ADC Program that were contained in Appendix C - "Draft Proposed Rule." We intend to submit our concerns about these items in the form of written comments, for the record, when the proposed rule is published and public comments are solicited. Nevertheless, some of those comments are contained herein as well, where they are germane to statements made in the body of the DEIS. Some of our program's primary considerations focus on the legal designation of the reintroduced population, the possible change in the designation over time, and the constraints inherent in managing such a population. We recommend that the proposed rule for reintroduction (Appendix C) be formalized as soon as possible and prior to the completion of the DEIS review process. It is difficult for the ADC program to assess the impact of this reintroduction effort until a full accounting of this action is made through the regulatory process.
2. It is not clear in the DEIS whether the recovery plan goals stated in the document are the ones the FWS will ultimately adopt. Page 2-16 refers to the "Mexican Wolf Recovery Plan reestablishment objective of 100 wolves distributed over 5,000 miles." However, the DEIS (p. 1-2 and p. G-7), states that the Plan is currently in the revision process and that population goals for the Mexican wolf are "being formulated." If the goals are going to change, then the analysis of impacts contained in the DEIS may be invalid and may need to be changed to reflect the new population goals. The recovery goals and criteria for delisting should be finalized and made

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1. The FWS has issued the Proposed Mexican Wolf Experimental Population Rule and intends to analyze public and agency comments on it prior to issuing the Record of Decision. It would be inappropriate to issue a final rule prior to the reintroduction decision. If the decision is to not reintroduce wolves or to reintroduce wolves with Full endangered status, then there would be no need to issue a final rule.

2. Population goals for the reintroduction proposal that is set forth and analyzed in this EIS are based on the 1982 Mexican Wolf Recovery Plan and are considered appropriate by the FWS. If additional recovery actions are deemed appropriate based on an approved revision of the Recovery Plan, full compliance with NEPA would be required for any future proposed actions.



clear in the DEIS so interested parties will know just what is being proposed and so they have a chance to review and comment on the appropriate analysis and impacts.

2

The final revised goals of the Recovery Plan are critical to whether any reintroduction program can ever lead to downlisting and delisting the species. This is indicated on page 2-19 of the DEIS ("...and when the revised Mexican Wolf Recovery Plan goals are achieved, the species will be downlisted and then delisted."). It is our understanding that the long term recovery goal is stated in the draft Recovery Plan revision as "two viable Mexican gray wolf populations, each containing 150 animals, in the United States portion of its range." However, it appears from the evaluation of candidate reintroduction areas (p. 2-2 through 2-6, DEIS) that two such areas do not exist in the U.S., which suggests that no reintroduction program in the U.S. can ever be expected to lead to downlisting and delisting of the Mexican wolf if the draft goals are finalized. If this is the case, it should be made clear in the DEIS since the impacts of recovery without eventual delisting are substantially different than if delisting can reasonably be expected to eventually occur.

3

The criteria for designating this population as nonessential experimental are based on the current status of the population. All subsequent designations (threatened, endangered, recovered) will be based on the success of this reintroduction effort and the goals and objectives enumerated in the Mexican Wolf Recovery Plan; therefore, it is important that the revised Plan's recovery goals and objectives be finalized prior to the completion of the DEIS review process. Population status relative to the goals and objectives of the recovery plan will have a major impact on all management actions conducted in the reintroduced areas.

4

There has been general agreement from the beginning of the DEIS process that ADC would be expected to have a leading role in dealing with depredating wolves. In addition other activities may arise that lead to ADC having other roles in dealing with the experimental non-essential transplants. Our position on this issue is that ADC will only cooperate in meeting these needs at a wolf specialist position, selected, hired, and supervised by ADC, is established and 100% funded by the FWS or other source aside from current ADC funds. This was communicated to FWS by ADC representatives during DEIS interdisciplinary team meetings. This understanding should be made clear in the DEIS and the cost should be shown as a line item in Appendix B.

5

It is not clear in the DEIS what actions will constitute termination of the reintroduction effort. If the three or five year evaluations result in the decision to terminate (p. 2-17), will termination constitute just the curtailment of monitoring and management of wolf, it also consist of removal of all reintroduced wolves and their progeny from the wild? What happens if funding for the program is reduced or ended? An additional safeguard to ameliorate concerns of livestock producers might be to remove all protections for the reintroduced wolves should funding for the program be cut or eliminated.

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3. While the Mexican Wolf Recovery Team is revising the Recovery Plan, no approved draft plan exists (as of this writing). It would be inappropriate to conduct NEPA analysis on speculative, unapproved objectives. The goals presented in the ADC letter were merely an early suggestion that has not been approved. It should be noted, too, that a majority of the Mexican wolf's original range is in Mexico and recovery actions implemented there could contribute to overall recovery goals.

4. If a nonessential experimental population of Mexican wolves is established, the FWS foresees no reason to change that classification until the subspecies is removed from ESA protection (i.e., de-listed).

5. We agree. Full support of an ADC wolf specialist position by the FWS is a part of the Preferred Alternative. Appendix B has been revised to more clearly demonstrate this.

6. It is difficult to foresee all the future scenarios and what actions would be appropriate following a hypothetical "termination" of the reintroduction project. We believe this decision should be made by the official management group based upon then current data and information and input from the advisory group and/or the public.

7. This idea probably would not be legal as long as the Mexican wolf remains listed as a threatened or endangered species under the ESA.

8. We agree and intend to revise the final experimental population rule, if issued, as ADC has suggested.

9. We agree that the actual observation of a wolf attack on domestic livestock grazing on public lands will likely be rare. Endangered species conservation is also a legal use of public lands. By law, ESA section 10(j)(2)(a), the FWS must determine that the release of an experimental population will further the conservation of the animal. We believe the limitations imposed in the Proposed Rule on take of Mexican wolves on public lands are appropriate to meet the conservation requirement. Livestock owners are not precluded from protecting their stock on public lands through other, non-lethal, means until the established criteria are reached.

10. A definition of "public lands" has been included in Appendix G - Glossary.

The DEIS, p. 2-21, states that under the proposed action, livestock owners or their agents may harass wolves for purposes of scaring them away from livestock provided the harassment is promptly reported. However, the draft proposed rule (p. C-11) indicates it would be illegal for a livestock producer to "wait for" wolves for the purpose of harassing them away from their livestock. This is counterproductive to the purpose of allowing harassment. If a livestock producer has reason to believe his stock have been attacked or harassed by wolves, it is only reasonable that he or she be vigilant for recurrence. The DEIS needs to clearly state the proposed rule to allow for this "waiting" if harassment is to have a chance at being an effective control method.

8

Throughout the public involvement process, the livestock industry has been repeatedly assured that they would be able to shoot wolves in the act of attacking their stock. However, the DEIS (p. 2-21) and the draft proposed rule (p. C-11) state restrictions that effectively preclude this type of action in public land situations to that: (1) previous depredations must have occurred first; (2) the depredations must have been confirmed by government personnel; (3) the appropriate government agencies must have "completed their efforts to resolve the problem" i.e. attempted and failed; (4) at least 3 WSRCA or 6 BRWRA breeding pairs of wolves must already have been established; and (5) a written permit must be obtained first but will only be allowed after criteria (1) through (4) are met. ADC professional experience indicates that situations in which predators of this nature can be caught in the act of attacking livestock will not likely occur. Thus, take permits with the kind of restrictions described in the DEIS have little or no chance of being a reasonable mitigation measure. In our opinion, if livestock are present on public lands as part of legal multiple use mandates, we see no reason why a different standard should apply for taking depredating wolves than on private lands. It is our contention that a reintroduction effort must assure livestock producers can protect their livestock for the effort to be successful.

9

The phrase "public lands" is not defined in the DEIS or the proposed rule, yet has significant ramifications on the practicality of resolving depredation problems. In Arizona, the recently passed Proposition 201 defines public lands to include all state and even county local government owned property. This needs to be clarified in the DEIS since the impacts will be more far reaching if the definition includes more than just federal lands.

10

The DEIS mentions the recent anti-trapping initiative in Arizona (DEIS p. 3-13) and implies that the use of traps and snares for depredating wolf control would be exempt from the restrictions imposed by that law. An Arizona Attorney General's opinion, dated February 9, however, ruled against the use of these devices to take depredating wolves, stating it bears on public lands, despite the opinions of federal land managers that ADC's use should be exempt. The opinion points to rules of statutory construction which allow the consideration of "explanatory or informative materials" or "writing pamphlets" as relevant history in deciding how laws and initiatives are interpreted. It clearly concludes the intent of the law, based on these pamphlets and materials, was to ban the use, on public lands, of any legal trap or snare for depredating measures which could include their use in capturing depredating wolves.

8

11. The FWS agrees that leghold traps are an essential tool for wolf management. We would place specific provisions for their use in the final experimental population rule which, if promulgated as a federal regulation, should preempt conflicts in state law.

12. The present definition requires that wolf presence be confirmed or corroborated by the FWS. This provides adequate protection against untrained or casual observers' claims of wolf sightings. Specific wolf sighting confirmation criteria will be developed in consultation with ADC and others and will be a part of the interagency management plan for the reintroduced population.

13. The current definition requires evidence of consistent use of an area by wolves for at least one month to establish that an area is "occupied" by wolves, thus triggering restrictions on ADC activities. However, it does not provide criteria for determining when it would be appropriate to resume unrestricted ADC activities following abandonment of the area by wolves. We agree that the rule would be improved by the addition of such wording; and, following consultation with ADC and others, will include clarifying language in the final rule, if necessary

14. The experimental population rule would restrict all use of M-44s and choking-type neck snares in areas occupied by Mexican wolves. The FWS would work to provide private users of these devices with the locations where the EPA label restrictions for M-44s apply and to advise private users of the rule provisions regarding take of wolves, with the goal of avoiding accidental or incidental take of wolves with potentially lethal devices. Clarifying language has been added to the FEIS.

15. Such an assessment would be highly speculative as the plan is to limit wolf recovery to the designated wolf recovery areas and capture and remove wolves that disperse into the larger experimental population area as soon as their presence is known. This management strategy should prevent wolf dispersal outside the experimental population area. We would expect the suggested impacts to be very minor.

16. See response number 12 to the Arizona Game and Fish Commission comments, below.

Although some depredate wolf captures can be accomplished using chemical capture techniques from a helicopter, experience has shown time and again that traps and snares are often the only practical means of capturing wolves. To ultimately determine whether these techniques will indeed be available for wolf capture on Arizona public lands, we strongly suggest a formal state Attorney General's opinion be obtained. This step may well be critical to the ability to manage problem wolves in the Arizona portion of the experimental population area.

The DEIS (p. 4-12) states that ADC use of M-44 devices and choking neck snares should be discontinued in "occupied wolf range" which is defined on p. 6-5. The part of the definition of "occupied wolf range" concerning radio-monitored wolves is reasonable. However, the part of the definition regarding nonradio-monitored wolves needs further refinement to avoid allowing any random but unconfirmable "sighting" by the public to result in undue restrictions on legitimate ADC activities. It is too easy, in our experience, for untrained or inexperienced casual observers to mistake coyotes for larger canids. Confirmation should be defined as visual inspection by personnel experienced in recognizing and interpreting predator signs, which includes many ADC, State Game and Fish, and State Agriculture Department personnel, as well as FWS personnel.

In addition to the above refinement of the definition, there should be wording to allow ADC to resume activities in an area of "occupied range" if evidence of wolf presence ceases. We suggest the restriction state that ADC use of the above devices will only be prevented for 14 days or some other reasonable time period to be negotiated by FWS and ADC. If no further fresh sign of wolf presence is found in the area during or immediately after the specified period of time, ADC activities may be resumed. Without this stipulation, the restriction could be viewed as indefinite which is unreasonable if wolves cease to occupy an area.

The description of impacts on predator control programs of the proposed action (p. 4-12) indicates FWS will restrict the use of M-44s and choking-type neck snares in "occupied Mexican wolf range" through a cooperative agreement with USDA Animal Damage Control (ADC). This implies that private use of these devices would be restricted by such an agreement as well. However, ADC has no authority to restrict private predator management. No discussion is presented on the impacts to private predator control efforts other than mention of the M-44 label restriction concerning threatened or endangered species. The DEIS needs to address the impacts to ADC and private predator control efforts in areas outside the experimental population area if unmarked wolves leave the recovery area and are afforded full managerial species protection.

The DEIS (p. 4-32) indicates backcountry Forest Service roads may be closed to avoid documented aerial killing of a wolf. We recommend the EIS clearly state that ADC, FWS, and State Agency personnel will be exempt from these types of road closure restrictions to avoid possible hindrances to legitimate wolf or other depredate management activities.

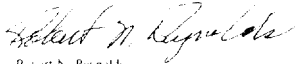
17. Current restrictions of ADC techniques in southwestern New Mexico imposed because of the potential occurrence of Mexican wolves are under review by the FWS.

- 12. The DEIS, p. 4-61, states that ADC has agreed to limit use of techniques that might jeopardize wolves such as traps, snares, and M-44s in southwestern New Mexico. That agreement was made due to previous BLM policy and under the old BLM/ADC MOU. Now that ADC has lead agency authority for NEPA compliance on BLM lands and has initiated section 7 consultation on the Mexican Wolf, we may not agree to the level of restriction we are currently operating under in southwestern New Mexico.
- 13. As worded currently, the definition of "Population of naturally occurring wild wolves" (p. G-6) could include reintroduced wolves or their progeny even in the Experimental Population Area once the reproductive criteria are met. It needs to be made clear that this definition only refers to wolves that have naturally immigrated into the area and that are not present as a result of the reintroduction effort.
- 14. Should a reintroduction program be implemented, we recommend the FWS commit to making frequent contacts with ADC supervisors and/or field employees to inform them of release sites and dates, active den locations, rendezvous sites, and other information necessary to avoid unintentional take of Mexican wolves.

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18. This definition is applicable under the proposed experimental population rule only prior to and no longer than 6 months following the initiation of a reintroduction project. It would be impossible for reintroduced wolves to have reproduced successfully for 2 consecutive years during this time. In addition the definition, in Appendix G, of "Population" has been modified to more clearly apply only to "non-reintroduced wild wolves."

Thank you for your consideration of our concerns and input.
Sincerely,



Robert N. Reynolds
Acting Director, ADC Western Region

cc:
Operational Support Staff
State Directors, AZ, NM, TX

SENT BY: 10-31-95 7:46 AM APACHE@SITGREA.VAS.NM-F +505 248 6788



United States Department of Agriculture
Forest Service
Apache-Sitgreaves NFS
P.O. Box 640
Springerville, AZ 85938
520 333-4301

Reply To: 1950
Date: October 30, 1995

Dave R Parsons
Mexican Wolf Recovery Program
U.S. Fish and Wildlife Service
Mexican Wolf SIS
P.O. Box 1306
Albuquerque, NM 87103

Dear Dave:

The Apache Sitgreaves National Forests appreciate the effort by the Service to incorporate previous comments provided to address concerns from the in service DEIS. Many of these suggested changes were incorporated into the final DEIS and has helped to clarify information on existing land conditions. Several additional points we feel need addressing:

Chapter 3. Affected Environment

The Service has improved language in the DEIS that stresses changes in forest and woodland conditions describing situations not favorable to key ungulate prey species of wolves. However, it appears implications about declining deer herds has been removed, instead of being clarified as requested. The basic question of ecological suitability for wolf recovery, expressible in terms of accurate ungulate population densities and trends and habitat condition and trends, needs addressing. The Forest feels this is the role of the Arizona Game and Fish Department, and feels the Department must provide this essential data, without accurate assessment of ecological conditions and trends, effective analysis of environmental consequences cannot be completed, and will have substantial implications on long-term cumulative effects for Forest management.

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Information was provided the Service on expected levels of disturbance necessary to achieve landscape scale changes in forest and woodland conditions, that mimic possible effects from natural fire. Current social, political and legal court restrictions on Forest practices, coupled with concerns over ungulate grazing, smoke, timber harvest, and water quality, it is likely these conditions are not achievable. We feel this long term effect is predictable and should be adequately addressed in the Cumulative Effects section of Chapter 4.

U.S. Department of Agriculture - Forest Service: Apache National Forest

1. Analyses in the EIS are based upon the best available data on ungulate populations in the BRWRA. While some uncertainty exists in these data, and in predicting future trends, we believe our conclusion is reasonable that the BRWRA will be suitable for wolf recovery for the foreseeable future.

2. The FWS does not agree that it would be necessary to mimic the historical level of effects from natural fire to sustain wolf populations over the long term.



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3. Evidence of an overall decline in ungulate biomass is lacking. While deer appear to have decreased over the past several years, elk populations have increased over the same time period. Wolves will prey on both deer and the larger elk. Current estimates of combined deer and elk biomass levels indicate they are adequate to sustain a population of 100 wolves in the BRWRA.

4. Lack of universal acceptance of wolf recovery and its generally moderate or minor impacts has not precluded it in other areas and we do not expect it to preclude wolf recovery in the Southwest. We have addressed cumulative impacts with as much certainty as possible in the revised Cumulative Impacts section of the FEIS.

5. The FWS position is that wolf recovery can occur with no substantive changes to existing or anticipated future land uses or forest management practices. The Preferred Action does not require changes to Forest Plans. Even habitat modification by the USFS that was detrimental to the wolf would not constitute "take" of the wolf under the nonessential experimental approach. This does not mean the Forest Service could not modify Forest Plans, if deemed appropriate. We have added mention in Chap. 4, under Impacts on Agency, Tribal, and Local Government Policies and Plans, of the specific Plan topics the Forest Service might change.

6. Because reintroduced wolves would be members of a designated nonessential, experimental population, other non-experimental threatened or endangered species would receive management priority over Mexican wolves. Also, see response above regarding Forest Plans. The suggestion goes beyond the scope of the Preferred Alternative because the alternative does not affect management priorities for other species. These issues are addressed in the Cumulative Impacts section of Chap. 4, Alt. C, the full-endangered approach.

7. "Disturbance-causing land use activities" are now defined in Appendix G.

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Dave R. Parsons

2

Chapter 4. Environmental Consequences

Current trends in Forest management will lead to continued decline of ungulate species, generally resulting from a decline in habitat conditions and other social and environmental implications (i.e. elk versus riparian issues). While this current and predictable trend will have little effect on releasing Mexican wolves into the wild (reintroduction), it has significant implications for recovery potential

3

Recovery of the Mexican wolf will require acceptance of environmental and social impacts currently under great scrutiny and stress within the regional area of influence (Graham, Apache, Greenlee, and Catron counties). We feel the cumulative effects section of the FEIS should now address ongoing or related impacts from current activities that might influence acceptance of the wolf upon re-introduction, and that will certainly affect its full recovery in Arizona and New Mexico in the primary and secondary range.

4

To effectively plan for and achieve the needed changes in landscape conditions that will sustain a viable population of wolves, to allow recovery, without assessing the social conflicts with Forest users and especially neighboring Native American peoples, some significant amendments to our Forest Plan will become necessary. Our synopsis of these basic Forest Plan amendments, was provided to the Service. Although the DBIS does include statements that Forest Plan amendments may be necessary, the analysis does not address the context or intensity of these amendments.

5

The DBIS clarifies that recovery of the Mexican wolf will not supersede efforts to recover other federally protected species, or efforts to prevent listing. Recovery of the wolf, however, we feel will involve substantial influences on virtually all occupied, suitable, or capable habitat of many, if not all, federally protected or sensitive wildlife and plants. Given the ever changing directions and needs for managing to recover other federally listed species, or prevent federal listing of other species, existing on Forest lands, it is apparent that major agreement be reached on priority for species management. We feel the Record of Decision to reintroduce the Mexican wolf, supported by the FEIS, should provide clear direction for those Forest amendments and species management priorities.

6

Proposed Experimental Rule

The term "disturbance" has not been clarified or defined in the proposed rule. Currently, the use of the term emphasizes effects related to timber harvest or road construction activities. In previous comments, we felt that since interpretation of the rule would occur through the appropriate Ecological Services unit, it is important that clarification be provided in the rule. Otherwise, there will likely be some mis understanding on the extent of disturbance or types of other activities that might cause disturbance, examples of which were provided in the comments on the in-service DBIS.

7

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Dave R. Parsons

3

Again, the Forest recognizes the effort by the Service within the DBIS to incorporate comments provided for earlier draft documents. Key points about suitability and recovery have remained a concern to the Forest, particularly where it will require the Forest to revise or amend Forest Plan direction. We hope that clarification can be achieved in the final EIS and support for amending Forest plans provided in the Record of Decision.

Frank Hayes will attend the final EIS team meeting in December to review these key points, and look for options to resolve our concerns.

Sincerely,

John C. Bredt
JOHN C. BREDET
Forest Supervisor

CC:
Regional Office
Alpine RD
Clifton RD
Springerville RD

Agency et al. Comments and Responses
U.S. Department of Air Force,
Holloman AFB:



DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 49TH FIGHTER WING (AGC)
HOLLOMAN AIR FORCE BASE, NEW MEXICO

27 October 1995

49 FW CC
461st Street, Suite 1700
Holloman AFB, NM 88330-8277

Mr. David R. Parsons
Mexican Wolf Recovery Program
U.S. Fish and Wildlife Service
P.O. Box 1306
Albuquerque, NM 87103-1306

Dear Mr. Parsons:

The 49th Fighter Wing at Holloman AFB (HAFB) wishes to express concern regarding the proposed reintroduction of the Mexican Wolf on areas of White Sands Missile Range (WSMR).

WSMR is adjacent to HAFB. Our airplanes and helicopters, airplanes of our allies, as well as frequent transient aircraft of other services fly at various altitudes over all parts of WSMR. Our use of WSMR includes low level flights and the potential for sonic booms. Several vital ranges for the dropping of live and simulated ordnance are on WSMR. Significant restrictions on our access to WSMR would adversely affect our training and readiness to go to war.

We have seen significant restrictions on the Air Force's access to other airspace needed for training due to endangered species. One painful local example affecting HAFB is the spotted owl in our National Forests. My concern is a fear that the Mexican Wolf's reintroduction onto WSMR will eventually restrict our access to the airspace over ranges on WSMR in a manner not unlike the restrictions the spotted owl has placed on our access to the airspace over the National Forests.

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Global Power for America

We cannot support the reintroduction of the Mexican Wolf to WSMR unless and until we can be assured that the reintroduction will not now or later impose significant restrictions to the Air Force's access to the airspace at WSMR.

Sincerely,

BRUCE CARLSON
Brig Gen (S), USAF
Commander

49
2 AF-CC

1. Such restrictions would not be imposed under Alts A, B, or D, and are conceivable, but highly unlikely, under Alt. C. The WSWRA has been dropped from Alt. C. It is conceivable, but not clearly foreseeable, that if wolves were reintroduced under Alt. C into the BRWRA and then dispersed to the WSWRA area that restrictions could be imposed to protect the full-endangered wolves. But this would only occur if WSMR or Holloman AFB activities were shown to negatively impact the wolves. Wolves have co-existed with military activities in other areas and apparently are not sensitive to overflights.

Agency et al. Comments and Responses
U.S. Department of the Army:



DEPARTMENT OF THE ARMY
OFFICE OF THE ASSISTANT SECRETARY
INSTALLATIONS, LOGISTICS AND ENVIRONMENT
119 ARMY PENTAGON
WASHINGTON DC 20310-0110



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OCT 31 95
PWE

Mr. David R. Parsons
Mexican Wolf Recovery Coordinator
U.S. Fish and Wildlife Service
Post Office Box 1306
Albuquerque, New Mexico 87102

Dear Mr. Parsons:

Thank you for giving the Army the opportunity to comment on the Draft Environmental Impact Statement - Reintroduction of the Mexican Wolf Within Its Historic Range in the Southwestern United States. The extent to which you considered and limited the impacts of the proposed reintroduction to the accomplishment of the military mission at White Sands Missile Range (WSMR) and your willingness to include WSMR officials as members of the Interdisciplinary Team is greatly appreciated.

As the steward of Army land, the Army conscientiously conserves its natural resources, especially endangered species, while maintaining readiness. The Army endeavors to support listed species in harmony with its mission in a manner that will lead to the recovery of the species. Due to the Army's limited resources and land inventory in the White Sands region, at best the Army will play a restricted role toward the overall recovery of the Mexican Wolf. Army Regulation 200-3, Natural Resources - Land, Forest and Wildlife Management succinctly states the Army's position toward the reintroduction of species on Army land:

"The Army will support the reintroduction of federal and State listed, proposed, and candidate species on Army lands unless reintroduction/introduction will have a significant impact on the present or future ability of the Army to meet its mission requirements. Proposals for reintroduction/introduction on Army lands will not be approved or disapproved without a thorough assessment of the impact of the reintroduction/introduction on the environment and mission requirements and the potential benefits of reintroduction/introduction."

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-2-

White Sands Missile Range provides a unique national asset and the continuation of realistic and timely testing and training at WSMR is critical to military readiness and our national security. I propose the attached changes to the Environmental Impact Statement and the Proposed Rule in order to ensure that the Mexican Wolf's reintroduction will not adversely impact the Army's or other tenant activities' present or future ability to meet mission requirements.

Nothing in this letter should be construed as authorizing reintroduction of any Mexican wolf population at WSMR pending implementation of these changes and entrance into a programmatic agreement that would address the concerns identified here.

My point of contact for this action is Mr. Phil Huber, at (703) 614-9555.

Sincerely,

Raymond J. Fitz
Acting Deputy Assistant Secretary of the Army
(Environment, Safety and Occupational Health)
OASA (I, L&E)

Attached

1. Suggested changes numbered 1 through 8 have been made in the FEIS, except suggested change number 4, which is considered unnecessary because the process and requirements are already set forth under NEPA regulations. Suggested changes 9 through 12 have not been made because they apply to Ah. C and WSMR has been dropped from this alternative in this FEIS.

Recommended Changes to EIS and the Proposed Rule

A. Changes to EIS

1. At p. vi, seven lines from the bottom, and p. 2-21, line 9, add "military testing or training activities."
2. At p. ix, line 18, add "White Sands Missile Range" to employees who may capture and translocate reintroduced wolves.
3. At p. 2-20, at the section entitled "Monitoring and research--" it is unclear as to who will bear the costs of monitoring the wolves and for how long. Suggest inserting the monitoring management proposed in Alternative C at p. 4-51 that the FWS "will be monitoring the wolves' locations at least through 2003 (assuming the reintroduction begins in the WSWRA in 1998)."
4. At p. 2-20, footnote 2, add "The FWS and these agencies will consider and limit to the greatest extent practicable the impact of the release pen sites upon the dominant land use."
5. At p. 3-55, line 3, add "Organ Mountain" to Colorado Chipmunk as only the subspecies is listed as endangered by the state of New Mexico.
6. At p. 3-55, line 7, add "lion."
7. At p. 3-55, line 8, replace "No military developments in the Organ Mountains occur or are expected." with "Fort Bliss extensively uses portions of the Organ Mountains for military training activities. Fort Bliss has approximately 40 square kilometers of currently active impact area within the Organ Mountains. There are six firing ranges within the likely dispersal area, all of these ranges are expected to be upgraded in the near future. These ranges are used by armor, artillery and aviation gunnery units."
8. At p. 4-21, line 13, change "all of the affected agencies will develop, which will include various measures to support wolf recovery in the WSWRA," to read "that FWS will develop with WSMR, which will include various measures to support wolf recovery in the WSWRA while allowing for the normal military use of WSMR."
9. At p. 4-51, line 12, further consider and include the additional impacts from the following information: "In addition to the quantifiable average daily loss derived from the FY 1994 figures, other significant associated costs and harm done to specific test projects cannot be adequately addressed by relying solely upon the average daily loss. For example, the Theater Missile Defense (TMD)

-2-

interceptors, under the Ballistic Missile Defense (BMD) program, estimates losses of between 11 and 30 million dollars per month in the event of delays. The estimate is dependent on the development phase of the project (thus the broad range of estimated losses). For example, the research and development phase is the most crucial, any delay at this stage has numerous collateral effects such as postponing the evaluation period or production phases of the system. The purpose of conducting TMD extended-range tests is to provide realistic test situations for the defenses to operate within a simulated theater of operations which includes defense against threat-representative target missiles. WSMR has been identified as the most effective location for such testing. Also, the TMD program has the attention and interest of Congress (Congress has provided guidance and direction to the Department of Defense in the development of the TMD program by enacting the Missile Defense Act of 1991 which states "It is the goal of the United States to provide highly effective theater missile defenses (TMDs) to forward deployed and expeditionary elements of the Armed Forces of the United States and to friends and allies of the United States.")

It is also necessary to consider the costs and time needed to reschedule a test if it is delayed. Past experience shows that there is a minimum of three days needed to reschedule in the event of a delay. The coordination and preparation efforts include hundreds of employees, not just WSMR personnel but also contractors associated with the project itself. Such a rescheduled test could then impact an other scheduled tests further cascading the losses.

10. At p. 4-51, lines from the bottom, add the following to the beginning of the Conclusion: "A likely impact is that wolf presence will cause delays with the associated costs of delays to testing projects A, the end of the Conclusion add "If WSMR is not a viable project testing site the Kwajalein Missile Range in the south Pacific is probably the only alternative location for missile testing projects. The cost to conduct test projects at this location increases the costs of tests ten-fold. The increased costs reduce available defense dollars for other projects thus adversely affecting the overall readiness of the Armed Forces and impairing national security."

11. At p. 4-53, line 13, change "Recreational use is fairly high" to read "Recreational use of BLM lands is fairly high."

12. At p. 4-53, line 14, replace "No impacts are anticipated on any Fort Bliss military activities in the Organ Mountains with "There are six firing ranges within the likely dispersal area within Fort Bliss all of these ranges are expected to be

upgraded in the near future. These ranges are used by armor, artillery and aviation gunnery units. Approximately 466 square kilometers of firing area can currently be used for firing into the impact area. This includes 9 established firing areas as well as maneuver areas on Dona Ana Range. If a wolf were to move into these live fire areas with the fully protected status, the impediment to training could be significant. Training on these areas is on a light schedule and the training area is used to prepare units for movement to the National Training Center for certification. Because of the importance of the training completed at the National Training Center, failure to complete training on time would seriously impair military readiness.

B. Changes to Proposed Rule.

1. At p. C-10, para. (3)(i), add "military training and testing" to the examples of legal activities.

2. At p. C-10, para. (3)(ii), change "authorized agency action" to read "authorized agency action to include military testing or training activity."

3. At p. C-10, para. (3)(iii), add "In the WSWRA, no legally authorized military test or training will be canceled or delayed due to wolf presence. If wolves are known to be present in a scheduled impact area, authorized WSMR personnel may, but are not required to, harass wolves for purposes of scaring them away from the impact area in a noninjurious manner (no temporary or permanent physical damage may result)."

Reasoning: Failure to incorporate this provision will require inclusion of the environmental consequences for Alternative C, listed at p. 4-50 to 4-51 (Impacts on military activities and land use-- second paragraph through the conclusion) as environmental consequences and impacts on military activities and land use for Alternative A at p. 4-22).

4. At p. C-11, para. (3)(iv), add "In the WSWRA, agency use of lands for safety buffer zones for weapons or missile tests or training are not considered a disturbance-causing land use activity. Therefore, agencies would not need to consult the FWS prior to military tests or training activities which use lands within the national park system and/or national refuge system as safety buffer zones."

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2. We agree with these suggested changes and will incorporate them into the final rule, if one is issued.

3. This requested change would result in a total exemption written into law of all military activities from proposed limited, temporary restrictions near pens, dens, and rendezvous sites. The FWS finds this inconsistent with the ESA requirement that rules established for experimental populations must further the conservation of the animal. Release pens can be sited to avoid the need for use restrictions. We expect that most dens and rendezvous sites will be located in the San Andres Mountains where little military activity occurs. The need for restrictions around dens and rendezvous sites on WSWRA is anticipated to be rare. If restrictions were imposed within a 1-mile radius of all dens and rendezvous sites, less than 1% of the WSWRA land base would be affected for less than 4 months of the year. The management group, which would include a WSMR representative, would consider ways to avoid the need for use restrictions. For these reasons, we anticipate that impacts to military activities resulting from this provision will be negligible.

We disagree with the Army's reasoning. The restrictions in question could be imposed only around release pens, dens, and rendezvous sites; and, under the Preferred Alternative, no formal consultation under Section 7 of the ESA is required for any military actions. Under former Alternative C, from which WSMR has now been dropped, formal consultation resulting in possible restrictions or modifications of proposed military actions, would have been required any time a proposed action could have affected wolves.

4. The use of lands within the national park or national wildlife refuge systems as safety buffer zones for military activities has been included as an exception to the definition of "disturbance-causing land use activity," in Appendix G - Glossary and would be similarly included in the final rule, if issued.

5. The requested revisions have been made in Chapter 2, the Preferred Alternative, and would be made in the final rule, if issued.

-4-

Reasoning There are many missile/weapon tests and training missions that use the national park system and/or the national refuge system for safety areas. The San Andres National Wildlife Refuge and the White Sands National Monument are both located entirely within the boundaries of WSMR. These areas are not intended to be used as any such impact area or target area but in the event of a mishap the safety parameters must include these areas. If these entities must continue to undertake formal consultation whenever these lands are used as safety areas, the consultation relief granted by the experimental/nonessential designation would be negated.

5 At p. C-11, para. (3)(vii) add "authorized WSMR personnel, when applicable in the WSWRA," and at (5) add "or endanger themselves by their presence in a military impact area."

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U.S. Department of the Interior, BIA, Mescalero Indian Agency:



United States Department of the Interior
BUREAU OF INDIAN AFFAIRS
Mescalero Indian Agency
Mescalero, New Mexico 88340

IN REPLY REFER TO

OCT 27 1995

Mr. David R. Parsons
Mexican Wolf Recovery Program
U. S. Fish and Wildlife Service
P.O. Box 1306
Albuquerque, New Mexico 87106-1396

Dear Mr. Parsons:

The Mescalero Apache Tribe does not condone the reintroduction of endangered species, however, they do oppose the reintroduction when such an act may adversely affect the progress already made in the economic development and management of their natural resources.

For many years the Mescalero Apache Tribe has managed these Tribal resources in order to develop the timber, livestock, wildlife and recreation potential to be utilized in a sustainable manner. With the potential introduction of the Mexican Wolf on to the White Sands Recovery Area, approximately 30 miles away from the boundary of the Mescalero Apache reservation, the Tribe stands to be directly impacted by these wandering animals.

Much time and effort has been expended by the Mescalero Apache Cattle Growers in establishing a top notch cattle herd on the reservation. From all of this, they have endured losses from coyotes, wild dogs and other predators. With this proposed reintroduction of the wolf, they now have to contend with another predator.

The development of the big game resources has allowed the Tribe to offer trophy bull elk hunts, cow elk hunts, bear hunts, and turkey hunts for the general public. At the same, this has allowed the Tribe to manage the deer herd strictly for the utilization by Tribal members. Revenues generated from the general public trophy bull elk, cow elk, bear and turkey hunts contributes significantly to the economic well being of the Mescalero Apache Tribe. Potential predation on the fawns and calves of the deer and elk by wolves could significantly limit the overall production of these big game herds.

The Mescalero Apache Tribe has fought and worked hard to maintain its ability to manage their natural resources and will continue to do so into the future. At this time the Tribe sees no practicality in reintroducing the Mexican Wolf on to the proposed White Sands release site. It is therefore determined, that the Mescalero Apache Tribe and the Bureau of Indian Affairs, Mescalero Agency wholeheartedly supports Alternative D, of the Draft Environmental Impact Statement. Under Alternative D, the USFWS will neither release captive-raised wolves nor take any other action to ensure Mexican Wolf recovery through experimental reintroduction. This is to ensure that the USFWS will not designate an experimental population of wolves near the proximity of the Mescalero Apache Reservation.

We appreciated the opportunity to comment on the Draft Environmental Impact Statement on the Reintroduction of the Mexican Wolf within its Historic Range in the Southwestern United States.

Superintendent

1. Under Alternatives A and B, wolves reintroduced into the WSWRA would be recaptured if they dispersed outside the recovery areas. If they entered onto the Mescalero reservation, the FWS would seek permission from the tribe to enter the reservation and recapture the wolves, or cooperative arrangements would be made to assist the tribe in recapturing the wolves. The WSWRA has been dropped from Alt. C. It is conceivable, but not clearly foreseeable, that if wolves were reintroduced under Alt. C into the BRWRA, they could eventually disperse to the Mescalero area. Even with full-endangered status the wolf is unlikely to threaten many land management activities. The main restriction would be that the wolves not be killed.

2. Despite several requests, neither the Mescalero Apache tribe nor BIA provided information on the reservation. Nevertheless, some background information was available and was provided in the DEIS, but detailed impact analysis was not feasible. In the FEIS, the Mescalero reservation has been dropped from full consideration because reintroduction into the WSWRA has been dropped from Alt. C.

Agency et al. Comments and Responses
U.S. Department of the Interior,
National Park Service:



United States Department of the Interior

NATIONAL PARK SERVICE
Southern Arizona Group
202 E. Earl Drive Suite 115
Phoenix, Arizona 85012-2623

IN REPLY REFER TO:

N22

November 2, 1995

RECEIVED
USFWS REG
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PWE

United States Fish and Wildlife Service
Mexican Wolf EIS Team
Post Office Box 1306
Albuquerque, New Mexico 87103

EIS Team.

Having reviewed the Mexican Wolf Draft Environmental Impact Statement this office supports your efforts to reintroduce this species back into the wild. We would favor release under Alternative C into both designated release areas. However, we do not object to release under Alternative A. In addition, we would support releases in southern Arizona as well.

It is a great effort to return this missing link to the southwest ecosystems. The economic benefits far outweigh any projected losses. As has been seen with the Yellowstone wolf reintroduction, we would anticipate an increase in local tourism and related industries.

In closing, this office wishes to thank the U. S. Fish and Wildlife Service for their efforts in this matter. The draft EIS was found to be very professionally produced. It provides a thorough analysis of the alternatives. It was a pleasure to be able to review it.

T. Dwayne Collier
Superintendent

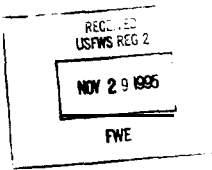
Agency et al. Comments and Responses
U.S. EPA:

1. Thank you for your comment.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS, TX 75202-2733

OCT 31 1995



Mr. David R. Parsons
Coordinator
Mexican Wolf Recovery Program
U.S. Fish and Wildlife Service
P.O. Box 1306
Albuquerque, NM 87103-1306

Dear Mr. Parsons:

In accordance with our responsibilities under Section 309 of the Clean Air Act, the National Environmental Policy Act (NEPA), and the Council on Environmental Quality (CEQ) Regulations for Implementing NEPA, the U.S. Environmental Protection Agency (EPA) Region 6 office in Dallas, Texas, has completed its review of the U.S. Fish and Wildlife Service's (FWS) Draft Environmental Impact Statement (DEIS) for the reintroduction of the Mexican Wolf into its historic range in Arizona and New Mexico. The proposed action (Alternative A) is to reintroduce a nonessential experimental population of Mexican wolves (*Canis lupus baileyi*) and allow for dispersal into the White Sands Wolf Recovery Area in New Mexico, or the Blue Range Wolf Recovery Area in New Mexico and Arizona.

The EPA offers the following comments for your consideration in development of the Final Environmental Impact Statement (FEIS).

Overall, our review of the DEIS found the document to be well written and concise in the information presented about this proposal, particularly in discussions of the project alternatives and their environmental consequences. Most notable is the information and surveys conducted to assess potential effects on military activities, livestock, and hunting within the recovery areas. The EPA concurs with the FWS' selection of Alternative A as the environmentally preferred alternative for this proposed action. We believe that, of the alternatives examined, Alternative A proposes the greatest potential for the successful reintroduction of the Mexican wolf into its historic range while minimizing impacts to the land uses presently utilized in the recovery areas.

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The EPA classifies your DEIS and proposed action as "LO," i.e., EPA has "Lack of Objections." Our classification will be published in the ~~FEDERAL REGISTER~~, according to our responsibility under Section 309 of the Clean Air Act, to inform the public of our views on proposed Federal actions.

I appreciate the opportunity to review the DEIS and request that you send our office two (2) copies of the FEIS at the same time that it is sent to the Office of Federal Activities, EPA, 401 M Street, S.W., Washington, D.C. 20460.

Sincerely yours,

Jane W. Saginaw
Regional Administrator



GAME & FISH DEPARTMENT

2221 West Greenway Road, Phoenix, Arizona 85023-4199

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Commissioner
 File Strategist
 Commissioners
 Chairman, Arthur Porter, Phoenix
 Fred Johnson, Superior
 Michael M. Gougherty, Flagstaff
 Herb Guenther, Tempe
 Fred Belman, Tucson
 Director
 Duane L. Shroufe
 Deputy Director
 Thomas W. Spiller

**Arizona Game and Fish
 Department:**

October 30, 1995

Ms. Nancy Kaufman
 Director, Region 2
 U.S. Fish and Wildlife Service
 Post Office Box 1306
 Albuquerque, New Mexico 87103

Dear Ms. Kaufman:

Enclosed are the Arizona Game and Fish Commission's comments on the Service's Draft Environmental Impact Statement (DEIS) on Mexican Wolf Reintroduction. Our comments include the Department's review of the DEIS.

The Commission has greatly appreciated the Service's cooperation throughout the DEIS process. Despite the significant concerns that we still have, and notwithstanding the revisions that we are now requesting, we congratulate the Service on a considerable accomplishment with this DEIS and offer our support for a modified Alternative A. A copy of the Commission motion adopted for this issue is also attached to this letter.

If you have questions about our comments, please direct them to me or to Director Shroufe. Thank you.

Sincerely,

Arthur Porter, Chairman
 Arizona Game and Fish Commission

AP:tj

Attachments

cc: Commissioners Belman, Golightly, Guenther, and Johnson
 Duane L. Shroufe, Director
 Terry B. Johnson, Endangered Species Coordinator, AGFD
 Sam F. Spiller, Supervisor, Arizona Ecological Services Office

Mexican Wolf:
 Commissioner Mike Golightly's Motion
 on the USFWS DEIS, Approved 3-2
 in Open Session, October 21, 1995

Second: Fred Belman
 Voting yes: Mike Golightly, Fred Belman, Chairman Art Porter
 Voting no: Nonie Johnson, Herb Guenther

The DEIS Alternative

Alternative A (the Proposed Action): Based on specific decision criteria, the U.S. Fish and Wildlife Service proposes to reintroduce Mexican wolves, classified as nonessential experimental, into the White Sands Wolf Recovery Area or the Blue Range Recovery Area, followed by a second reintroduction into the other area if necessary and feasible. Wolves will be released into primary recovery zones and allowed to disperse into secondary recovery zones.

Motion:

I recommend that the Commission vote to support Alternative A of the U.S. Fish and Wildlife Service's Draft Environmental Impact Statement (DEIS), prescribing reintroduction of the Mexican wolf into White Sands National Proving Grounds, contingent upon the following:

- A The Service must satisfactorily address the Commission concerns that will be forwarded following this meeting. These concerns consist of those identified by the Department's review of the DEIS, as modified to appropriately reflect the Commission's guidance this afternoon.
- B The Service must publish a Proposed Nonessential Experimental Population Rule that is determined by the Department to be the same in form and substance as that which was included in the DEIS.
- C The Service must commit in its Final Environmental Impact Statement (EIS) on Mexican Wolf Reintroduction that subsequent reintroductions (if any) in the American Southwest shall be determined through a formal Adaptive Management Program (AMP). The AMP should be facilitated through an Adaptive Management Work Group organized as a Federal Advisory Committee and chaired by a staff designee of the U.S. Fish and Wildlife Service Region 2 Director. The Adaptive Management Work Group must include full participation by the Arizona Game and Fish Department, and other interested or affected parties as appropriate under Federal law guiding such processes.

The AMP must assess the efficacy of the White Sands reintroduction, and the results of that assessment must form the basis of a determination whether (and if so, how) to reintroduce the Mexican wolf at any site or sites other than White

1. The FWS has determined that the BRWRA is the most appropriate location for the initial reintroduction and that the WSWRA would be used as a secondary reintroduction area only if necessary and feasible.
2. The FWS plans to do this.
3. We are not certain what the Commission means by a "formal" Adaptive Management Program; however, the FWS is committed to the adaptive management concept, the establishment of a formal management group (which includes full participation by AGFD), and to the concept of an oversight or advisory group. See Chapter 2, Preferred Alternative, for more discussion on these topics.
4. The management group, using an adaptive management process, will assess the efficacy of the initial reintroduction effort, and use the results of that assessment and other relevant information as the basis of any determination to conduct an additional release or releases on another area.
5. The FWS agrees with all these goals, but does not commit to conducting the initial reintroduction on the WSWRA.

6. The rationale and comments of individual commissioners are acknowledged. Specific issues included in the official comment document are addressed below, beginning with FWS response number 7.

Sands, within the constraints of the Final EIS and Final Nonessential Experimental Population Rule for Mexican Wolf reintroduction. 4

Specific AMP goals must at a minimum include:

- a. Facilitating management responses to monitoring and research information on affected resource conditions, trends, and processes.
- b. Ensuring that the White Sands' project's conservation and management objectives are fulfilled in good faith and in full compliance with the Nonessential Experimental Population Rule, and without abridgement of any Federal, State, Tribal, or other legal obligation. 5
- c. Providing a mechanism for resolving disputes among the affected land and wildlife management agencies and private landowners (if any).
- d. Providing a forum by which to transfer information derived from wolf and prey base monitoring or other pertinent management activities at White Sands to the interested and affected parties, and the general public.

Rationale as stated by Commissioner Goughly

- 1 The Adaptive Management approach recommended within the DEIS necessitates collection of empirical data for development of management guidelines. Information collected in the more controlled setting of the White Sands area should provide knowledge necessary for wolf management in the larger and more complex Blue Range Area.
- 2. Reintroduction into White Sands initially will allow analysis of:
 - a adaptability of captive wolves to a wild existence
 - b. territory fidelity and stability
 - c effectiveness of nonessential experimental management plan
 - d potential for using wild born pups for reintroduction into the Blue Range Area, or elsewhere
 6
- 3 The genetic diversity and size of the captive population will be allowed to increase to more optimum levels. If the two newly certified lines of Mexican wolves are allowed to interbreed with the currently certified population for three to five years, the captive stock will have a higher level of diversity. At present only small numbers of diverse, but genetically surplus, animals exist in the captive population.

This small number of available stock for reintroduction favors using White Sands because fewer animals are needed for that area.

The White Sands wolf population will always need active genetic management through managed dispersal and subsequent releases. This could take place as the captive population is being diversified and allowed to expand. If reintroduction occurs as proposed, wild-caught wolves from White Sands could be used as reintroduction stock for the Blue Range Area or another site, should one be forthcoming (perhaps even in Mexico).

- 4. Effects on Southwest game populations in a multi-predator system could be documented in the more controlled situation in White Sands. Studies on the effects of wolves on their ungulate prey would be more complete in White Sands because more baseline information is available on lions and ungulates. Hunter harvest can be monitored more closely there, making biological data from harvested ungulates more available than in the Blue Range Area.
- 5 Effects on existing predator populations could be documented, to test theories about displacement and competition. A recent study of lions in White Sands provides considerable baseline data on existing predator populations and home ranges that is simply not available for the Blue Range Area. 6
- 6. The results of the truly experimental reintroduction of captive-reared Mexican wolves in the more controllable circumstances that I believe exists in White Sands would allow agencies and the public to better determine whether wolves should and could be reintroduced and effectively managed, in a more isolated and rugged environment such as exists in the Blue Range Area of eastern Arizona and western New Mexico.
- 7 I believe that only through actual, close observation of Mexican wolves in the wild can anyone reasonably predict the behavior of wolves in the wild, and thus predict the true impacts and chances for success, of a reintroduction.
- 8 For these reasons, for the Mexican wolf's sake, as well as for the best interests of the public, I believe that it would be most prudent to carry forward this experiment at White Sands, conduct all the appropriate management and research activities, and use the open public process of Adaptive Management to determine where to go from there. That would provide the best opportunity for sound science to lead to good management

- 9 As a Game and Fish Commissioner representing the interests of the public, I offer this recommendation as a compromise that I believe is truly in everyone's best interests, whether wolf advocate or wolf opponent or neutral party, should any exist.

b

Document MG-MWREC.FNL

Arizona Game and Fish Commission Concerns
 Expressed at the
 October 21, 1995 Commission Meeting
 Regarding the U.S. Fish and Wildlife Service
 Draft Environmental Impact Statement
 On Mexican Wolf Reintroduction

Chairman Porter

- 1 Elk and deer population numbers (minimum, maximum, and average) do not seem to be consistent within the DEIS. The Service must clarify whether these discrepancies arise from errors in mathematics or they reflect comparisons between population estimates at different points in time over the length of the proposed recovery and management effort. See DEIS comments: page 7 lines 21-24.
- 2 The DEIS proposes 1-mile radius temporary closures for acclimation pens, denning sites, and rendezvous sites. The Service needs to affirm that impacts of these closures on big game hunts will be minimized. Scouting often begins in August and actual hunts begin in September. See DEIS comments: page 2 lines 1-4.

 The Service also needs to affirm that ranchers will be allowed to drive cattle through such closures. See DEIS comments: page 2 lines 4-5.
- 3 Back-country road: Please define this term, as opposed to a thoroughfare. Concern: closure of a back-country road may close an area far greater than 1-mile in radius. The Service needs to affirm that temporary closures will not exceed an area 1 mile in radius. See DEIS comments: page 2 lines 7-10.
- 4 The draft nonessential experimental rule in the DEIS states that permission "may" be granted to private property owners to take wolves on public lands after certain conditions are met. The Service needs to provide more definitive wording, that clarifies when a private landowner will or will not be granted such authority. The concern is that at an operational level Service employees may not provide the necessary approval if guidelines are not specific. See DEIS comments: page 2 lines 12-7
- 5 Cooperating agencies must be able to use leghold traps to take wolves, whether for management purposes (including relocation and research), retention in captivity, or euthanasia, and regardless of land ownership. The concern is that if the 10(j) rule is not absolutely explicit and inclusive on this count, State law in Arizona may preclude such use. See DEIS comments: page 2 lines 24-30.
- 6 The DEIS establishes that restrictions may be placed on use of specific depredation control measures (e.g. M44s) through cooperative management agreements with Animal Damage Control and perhaps other agencies. The Service needs to affirm

b

that such agreements will be consistent across public lands and Tribal lands to the maximum extent feasible. See DEIS comments: page 14 lines 30-33

- 7 Page 2-24 "The FWS does not guarantee the future existence of this private mitigation fund." Concern: FWS must guarantee compensation for livestock depredation losses, and not leave this in the hands of a private organization. See DEIS comments: page 6 lines 1-2.
- 8 Page 4-16: The Service must clarify the distinction between economic benefits and expenditures. On what surveys were these conclusions based? FWS surveys may not have included children under age 16. Hunting benefits (values and expenditures) seem very low, but it also seems redundant to include actual (expenditures) and hypothetical (economic values) costs for the same event. See DEIS comments: page 15 lines 35-38.
- 9 Possible wolf depredation impacts to the bighorn sheep population in the Blue Range were not adequately addressed in the DEIS. These sheep are using habitats that differ markedly from those occupied in other parts of the Rocky Mountains. Wolf depredation on bighorns is more likely in these areas of the Blue than in more rugged terrain. See DEIS comments: page 9 lines 16-19.

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Commissioner Belman

- 1 The proposed 10(j) rule should have been published before or with the DEIS, so the public could evaluate and comment on both at the same time See DEIS comments: page 1 lines 35-36.
- 2 The DEIS must affirm more clearly that all wolves reintroduced (including pups whelped in acclimation pens) will be radio tagged for monitoring, and that project biologists will make every reasonable effort to radio implant all pups whelped in the wild for monitoring. See DEIS comments: page 3 lines 32-34.
- 3 The Commission's response must include the Department's DEIS concerns, with modifications as necessary to reflect today's discussions See DEIS comments: all.

Commissioner Johnson

- 1 Tourism should not be used as justification for wolf reintroduction. The people in the Blue do not want additional thousands of visitors. See DEIS comments: page 16 lines 1-2.
- 2. There were inadequate surveys of rural citizens of Arizona. The timing and publicity of the hearings were poor. Given that the surveys were poor she feels the

Fish and Wildlife Service is forcing the reintroduction project on the rural citizens. See DEIS comments: page 1 lines 17-20.

- 3 Adequate funding must be available for the duration of the project. See DEIS comments: page 21 lines 9-10
- 4 The Fish and Wildlife Service needs to look into the extent of increased depredation outside of the primary and secondary recovery zones due to other predators being displaced by reintroduced wolves. See DEIS comments: page 2 lines 32-34
- 5. There is concern for the decrease in revenues to the Department from a decrease in license and tag sales. See DEIS comments: page 15 lines 32-34.

Commissioner Guenther

- 1 There is too much anger between the opposing groups to move forward with wolf reintroduction at this time. We need to look further for middle ground, and create a more friendly environment for wolf reintroduction. It will be difficult, if not impossible, to promote successful reintroduction and recovery in an adversarial environment. See DEIS comments: page 2 lines 36-39.
- 2 The reintroduction of the Mexican wolf, while it may be desirable, is not a necessity for a functional ecosystem See DEIS comments: page 2 lines 39-41.
- 3. It does not appear that local governments have participated in this process as fully as would have been desirable. The Service needs to identify why that happened, if it did, and if possible resolve the problem. Local government participation is essential to decision making. It is unfair to reintroduce the wolf into an area where the majority of the people are against such reintroduction and their lives and livelihood may be impacted by it. See DEIS comments: page 1 lines 15-17.
- 4 The Service needs to find another vehicle for depredation compensation, other than the Defenders of Wildlife program. We need to expand the proposal to make it truly an incentive based program See DEIS comments: page 6 lines 1-2.
- 5 The effects of the recent voter-approved trapping ban need to be clarified. Can agencies use leghold traps or not, and if so under what circumstance and with what limitations. Until we know the effects of the trapping ban on predator-prey relations, it would be imprudent to add another predator to the equation. See DEIS comments: page 2 lines 24-30

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6. We need to reserve the right to revisit the proposal and, if necessary, amend the Commission's position following the completion of the Final Environmental Impact Statement and the publication of the final nonessential/experimental rule in the *Federal Register*. See DEIS comments: page 3 lines 1-3.

Commissioner Golightly (all comments included in the Commission motion)

1. The Adaptive Management approach recommended within the DEIS necessitates collection of empirical data for development of management guidelines. Information collected in the more controlled setting of the White Sands area should provide knowledge necessary for wolf management in the larger and more complex Blue Range Area
2. Reintroduction into White Sands initially will allow analysis of:
 - a. adaptability of captive wolves to a wild existence
 - b. territory fidelity and stability
 - c. effectiveness of nonessential experimental management plan
 - d. potential for using wild born pups for reintroduction into the Blue Range Area, or elsewhere
3. The genetic diversity and size of the captive population will be allowed to increase to more optimum levels. If the two newly certified lines of Mexican wolves are allowed to interbreed with the currently certified population for three to five years, the captive stock will have a higher level of diversity. At present only small numbers of diverse, but genetically surplus, animals exist in the captive population. This small number of available stock for reintroduction favors using White Sands because fewer animals are needed for that area.

The White Sands wolf population will always need active genetic management through managed dispersal and subsequent releases. This could take place as the captive population is being diversified and allowed to expand. If reintroduction occurs as proposed, wild-caught wolves from White Sands could be used as reintroduction stock for the Blue Range Area or another site, should one be forthcoming (perhaps even in Mexico)

4. Effects on Southwest game populations in a multi-predator system could be documented in the more controlled situation in White Sands. Studies on the effects of wolves on their ungulate prey would be more complete in White Sands because more baseline information is available on lions and ungulates. Hunter harvest can be monitored more closely there, making biological data from harvested ungulates more available than in the Blue Range Area.

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5. Effects on existing predator populations could be documented, to test theories about displacement and competition. A recent study of lions in White Sands provides considerable baseline data on existing predator populations and home ranges that is simply not available for the Blue Range Area.
6. The results of the truly experimental reintroduction of captive-reared Mexican wolves in the more controllable circumstances in White Sands would allow agencies and the public to better determine whether wolves should and could be reintroduced and effectively managed, in a more isolated and rugged environment such as exists in the Blue Range Area of eastern Arizona and western New Mexico.
7. Only through actual, close observation of Mexican wolves in the wild can anyone reasonably predict the behavior of wolves in the wild, and thus predict the true impacts and chances for success, of a reintroduction.
8. For these reasons, for the Mexican wolf's sake, as well as for the best interests of the public, it would be most prudent to carry forward this experiment at White Sands, conduct all the appropriate management and research activities, and use the open public process of Adaptive Management to determine where to go from there. That would provide the best opportunity for sound science to lead to good management.

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PROCESS

The U.S. Fish and Wildlife Service (USFWS) has been criticized for the delay in producing the Draft Environmental Impact Statement (DEIS), but the complexity of the issue, and of working with other federal and state agencies, was partly the cause. USFWS used information and process ideas from the Northern Rocky Mountain wolf recovery project very well, and thus avoided making some of the mistakes made in that action. Coordination with and involvement of Arizona Game and Fish Department throughout the process was commendable, as information exchange and receptiveness for input was consistent and professional.

The Department and the public were given ample opportunity to provide input at a variety of formal and informal meetings. Issues raised at scoping sessions were analyzed to the fullest extent possible. USFWS representatives attended most of the AGFD public meetings and Commission discussions, receiving input on Arizona concerns.

It does not appear that local governments have participated in this process as fully as would have been desirable. The Service needs to identify why that happened, if it did, and if possible resolve the problem. Local government participation is essential to decision-making. There were inadequate surveys of rural citizens of Arizona. The timing and publicity of the hearings were poor. Given that the surveys were poor, a Commissioner feels the Fish and Wildlife Service is forcing the reintroduction project on the rural citizens.

SUMMARY

"Net long term effects" should be better defined on page I and throughout the DEIS. It should be clearly stated up front that these impacts are being projected over a period of up to 14 years. The time projected to reach the recovery goal after the initial release should be listed more clearly in a summary table for each alternative. The hunting public will likely be very concerned regarding the projected loss in elk and deer numbers, particularly without having a better indication of the period over which these losses might occur. This information is important enough to be included in the abstract and summary. Concerns within this group might be reduced by also noting that wild ungulate populations could still rise in comparison to current estimates, under the expanding wild ungulate population model scenario, even with wolf reintroduction.

The proposed 10(j) rule should have been published before or with the DEIS, so the public could evaluate and comment on both at the same time.

On page vi, "disturbance-causing land use activities" should be defined, there or in the glossary. The word "active" should be inserted before "rendezvous sites" in the last line of this page and elsewhere.

7. Comments acknowledged. The FWS believes that local governments and rural citizens were adequately involved throughout the NEPA process, which involved 4 scoping meetings, 14 public open house meetings, and 3 formal public hearings in both rural and urban areas. In addition, the FWS attended most public meetings held by AGFD. Chapter 5, Consultation and Coordination, describes the extent to which input from agencies, organizations, and individuals was sought. We disagree that surveys conducted by the Arizona Game and Fish Department, and the timing and publicity of the hearings, were "poor."

8. We have clarified the language in the Abstract.

9. This was our original intent, but the internal FWS review process for the rule took longer than for the DEIS. The public is being given a full opportunity to comment on the Proposed Rule.

10. See Appendix G - Glossary, for a definition of "disturbance-causing land use activities." Also, the word "active," which already was in the draft Proposed Rule, has been inserted in the text as suggested.

11. New language has been adopted that would allow livestock drives through otherwise restricted areas near release pens, dens, and rendezvous sites, if no reasonable alternate route or timing exists. The FWS is committed to the goal of minimizing the effect of temporary closures on hunting-related activities. However, the need to restrict these activities must be considered on a case-by-case basis, with input from established management and advisory groups.

12. All references to the closure of back-country roads have been deleted. Based on public and agency comments, the FWS has determined that this provision would be unlikely to accomplish the intended objective.

13. It is hard to conceive of every possible situation, but we believe that there could be situations where it may not further the conservation of the reestablished wolf population to grant permission for taking a depredating wolf on public lands. While the FWS is committed to providing clarity wherever possible in the rule, a certain degree of management flexibility is desirable. Input from established management and advisory groups would be sought prior to any decision to grant or deny permission.

The DEIS proposes 1-mile radius temporary closures for acclimation pens, denning sites, and rendezvous sites on page vi and within the draft nonessential experimental population rule. The Service needs to affirm that impacts of these closures on big game hunts will be minimized, since scouting often begins in August and actual hunts begin in September. The Service also needs to affirm that ranchers will be allowed to drive cattle through such areas, if necessary.

The DEIS should define a back-country road, as opposed to a thoroughfare on page vii and in the proposed draft nonessential experimental population rule. The Department is concerned that closure of a back-country road may close an area far greater than 1-mile in radius. The Service needs to affirm that these closures will not exceed an area 1 mile in radius.

The draft nonessential experimental rule in the DEIS states that permission "may" be granted to private property owners to take wolves on public lands after certain conditions are met on page ix and in the draft nonessential experimental population rule. The Service needs to provide more definitive wording that clarifies when a private landowner will or will not be granted such authority. Concern at an operational level Service employees may not provide the necessary approval if guidelines are not specific.

On page ix, second bulleted paragraph, it appears that only property and livestock owners would be allowed to take wolves on private or tribally-owned land. We suggest adding "and their agents" to the list of people who could take wolves under these conditions. In the third bulleted paragraph, we suggest adding "or remove" after "translocate" in the first line.

The DEIS states that authorized USFWS, ADC, tribe and State employees may capture and translocate reintroduced wolves consistent with a USFWS-approved management plan or special management procedure on page ix and in the proposed draft nonessential experimental population rule. Cooperating agencies must be able to use leghold traps to take wolves, whether for management purposes (including relocation and research), retention in captivity, or euthanasia, and regardless of land ownership. The concern is that if the 10(j) rule is not absolutely explicit and inclusive on this point, State law in Arizona may preclude such use.

The Fish and Wildlife Service needs to look into the extent of increased depredation outside of the primary and secondary recovery zones due to other predators being displaced by reintroduced wolves.

One Commissioner believes that there is too much anger between the opposing groups to move forward with wolf reintroduction at this time. We need to look further for middle ground, and create a more friendly environment for wolf reintroduction. It will be difficult, if not impossible, to promote successful reintroduction and recovery in an adversarial environment. He also believes that the reintroduction of the Mexican wolf, while it may be desirable, is not a necessity for a functional ecosystem.

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14. The "agents" language already was in the draft Proposed Rule; it has been added to the text. Other suggested revisions have been made.

15. The final rule would be worded to specifically authorize the use of leghold traps by the FWS and any cooperating agencies for all approved management purposes on both public and private lands.

16. The FWS, in cooperation with established management and advisory groups, will identify research priorities and encourage appropriate research. The suggested research topic addresses a commonly expressed concern.

17. Wolves generate strong emotions in humans; no amount of mitigation is likely to eliminate all anger and hostility toward the wolf or between opposing groups. We believe the Preferred Alternative addresses the legitimate concerns of both those who support and oppose this proposal, while Fulfilling the FWS's ESA responsibilities to recover the Mexican wolf.

18. Comment acknowledged.

19. These changes have been made.

20. The FWS is committed to placing radio collars or implants on or in all released wolves and to maintaining enough functioning radios in the re-established population to ensure adequate monitoring of its status. We anticipate that a higher percentage of the population will have radios during the first several years of the reintroduction effort than during later years. It would be impractical to commit to placing a radio transmitter on every wolf in the re-established population.

21. We agree; the road closure provision has been deleted.

1 One Commissioner believes we need to reserve the right to revisit the proposal and, if necessary, amend the Commission's position following the completion of the Final Environmental Impact Statement and the publication of the final nonessential/experimental rule in the *Federal Register*.

2 This section of the DEIS should identify the possibility of contracting universities to conduct pertinent research on all aspects of the proposed reintroduction, including human dimensions

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9 CHAPTER 2. ALTERNATIVES INCLUDING THE PROPOSED ACTION

10 Introduction

11 The "certification" of the Aragon and Ghost Ranch lineages needs to be updated in the Final Environmental Impact Statement (FEIS) Status of the Sevilleta facility should also be updated in the FEIS The AGFD analysis of four candidate areas within Arizona should be cited as Johnson et al (1992) in the first paragraph on page 2-3 and elsewhere The complete citation is correctly listed in the Literature Cited section

19

17 Alternative A

18 The AGFD Mexican Wolf Reintroduction Proposal appears relatively intact in Alternative A Boundaries for the Blue Range Wolf Recovery Area (BRWRA) are different because the USFWS included contiguous lands in western New Mexico in the DEIS. The DEIS proposes to reintroduce three family groups each year for the first couple of years, whereas the AGFD proposal recommended releasing only two family groups AGFD preferred reintroduction of only two family groups to reduce initial management and monitoring costs The DEIS assumes some wolves will quickly disperse into the secondary zones of New Mexico

27 We agree with the nonessential experimental designation outlined in the proposed action and with the specific management protocol in the proposed rule We believe that the nonessential experimental designation will not jeopardize wolf recovery, and will protect wolves that are not causing conflicts, which we expect will be the majority of them

32 The DEIS must affirm more clearly that all wolves reintroduced (including pups whelped in acclimation pens) will be radio tagged for monitoring, and that project biologists will make every reasonable effort to radio implant all pups whelped in the wild for monitoring

20

36 The DEIS recommends road closures if illegal killing of wolves threatens the recovery effort Road closures, although used on a limited basis for other wildlife, may do more overall damage to the wolf project through increased animosity and consequently higher chances of illegal killing of wolves Since wolves usually roam over large areas, any road closure program would need to close off large expanses of National Forest to prevent human-wolf interactions We do not believe this is desirable, necessary, or feasible We recommend that much greater emphasis be placed on education and

21

22. The FWS is cooperating with the AGFD in the establishment of these criteria.

23. We agree.

24. The number of surplus wolves that will be available cannot be accurately stated in the FEIS because it changes with reproduction and mortality in the captive population. Currently 10 surplus wolves are available, and in July 1996 more will be identified. A minimum of 6 surplus wolves would be needed for the initial reintroduction, although we would want some potential replacement surplus wolves in reserve. The FWS would not initiate a reintroduction effort until an adequate initial supply of surplus wolves was available and the captive population was capable of producing a steady supply.

25. Revised budget estimates are presented in Appendix B.

26. Estimates of required personnel are presented in Appendix B.

27. The FWS considers the presence of one animal damage control specialist on the field management staff, with cross-training of other field staff in basic depredation assessment and control techniques, as adequate preparedness for addressing livestock depredation cases. We propose that this position be assigned to the Animal Damage Control Division of the U.S. Department of Agriculture and funded by a transfer of funds from the FWS to USDA-ADC.

28. We agree.

29. We agree that there is uncertainty in projecting population growth rates, but we believe our projections are reasonable. A key difference between the Montana and Wisconsin populations and the population we propose to establish is that the former expanded through natural recolonization mechanisms, whereas this population will be supplemented periodically with additional wolves.

30. This fluctuation idea is stated in the text.

- 4 enforcement to counteract and prevent illegal killings If specific areas are proposed for road closures, we presume that the appropriate land management agency (e.g. U.S. Forest Service) would do so through normal practices that provide for notifying the public, placing appropriate signage, and enforcement | 21
- 6 Specific criteria for determining whether wolves occupy an area before any are released as nonessential experimental need to be defined For example, how many miles of surveys with no wolf sign observed are needed to say with confidence that there are no wolf populations in the area? What other criteria could be used to "clear" an area? | 22
- 10 The Adaptive Management approach, which would include public participation, should be used to evaluate the success or failure of the various elements of this proposal | 23
- 12 Criteria used for deciding where to begin, Blue Range or White Sands, should be quantified in the following areas
- 16 -the number of surplus wolves available
- 17 At present only small numbers of diverse, but genetically surplus, animals exist in the captive population The FEIS should reflect the number of surplus wolves available and the number of wolves needed for reintroduction into each area | 24
- 18
- 19
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- 21 -the amount of funding available
- 22 Currently, the DEIS appears to state that there is no difference in the cost of reintroduction program between the Blue Range Area and the White Sands Area We recommend that site-specific estimated budgets be included in the FEIS | 25
- 23
- 24
- 25
- 26 -the size of field staff available
- 27 The DEIS does not give estimates of the required personnel to manage reintroductions in each area Such estimates should be included in the FEIS for each of the two proposed areas | 26
- 28
- 29
- 30
- 31 -the level of agency preparedness for addressing livestock depredation cases
- 32 This "level of preparedness" needs to be more specifically described For example how many personnel would be needed to be considered "prepared?" | 27
- 33
- 34
- 35 We strongly believe the USFWS and cooperating agencies should be prepared with a depredation control program well in advance of a reintroduction attempt This program including identification of the responsible agency, budget sources, and the number of personnel required should be more clearly described in the FEIS | 28
- 36
- 37
- 38
- 39
- 40 Wolf population growth projections in the DEIS show a growth rate faster than has been documented in other areas, such as Wisconsin and Montana We would expect a slower growth rate, but | 29
- 41

3 1. The text has been revised to acknowledge the role of cooperating agencies.

1 considering the complexity of the variables involved, there is no way to make predictions with any
2 degree of certainty. If wolf populations were to increase at a slower rate, total annual impacts would
3 be less, and it would take longer to reach the recovery goal. Fluctuations in population size once it
4 reaches some type of asymptote should be more clearly presented.

29
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5 All participating agencies should play a role in wolf monitoring, if they choose to enter into a
6 cooperative agreement with USFWS (last paragraph on page 2-18) or participate in the Adaptive
7 Management Program. In addition, long-term management plans should be developed, even if only
8 in draft form, and be made available for management agencies and the public to review during the
9 recovery period rather than waiting to fully achieve recovery objective numbers. This would ensure
10 that there would be some form of long term management strategies in place prior to reaching the
11 target objectives and prevent a time lag in providing management direction for responsible agencies.

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12 Wolf recovery area boundaries are logical, well-thought out, and as biologically sound as they can
13 be considering political realities. The primary and secondary zones follow National Forest boundaries
14 for management purposes and the nonessential experimental zone is delineated by Interstate
15 Highways and state borders. Highways or political boundaries usually have no significance
16 ecologically, but in this case the northern and southern highway boundaries actually closely
17 approximate the limits of apparently suitable wolf habitat in Arizona.

18 All boundaries coincide with those proposed within the AGFD proposal, except that sections of
19 western New Mexico are included in the DEIS Blue Range Area. Since wolves are capable of wide-
20 ranging dispersal, intensive monitoring and management will be needed to confine wolf recovery to
21 the zones described. We expect this will be part of the implementation plan.

22 A citation for the use of the capture collars may be appropriate in the 4th paragraph of page 2-20
23 (Mech. L. D. and E.M. Gese 1992 Field testing the Wildlink capture collar on wolves Wildl. Soc
24 Bull. 20: 221-223).

25 We recommend that "problem wolves" associated with repeated livestock depredation or close
26 association with humans not be translocated from White Sands Wolf Recovery Area to the Blue
27 Range Wolf Recovery Area or vice versa. If wolves are habitually causing problems in one area, they
28 are likely to continue such behavior in the area they are moved to, as studies from Minnesota have
29 suggested. Such wolves should be re-captured, withheld from the captive breeding program, and
30 perhaps be used on educational display in appropriately licensed facilities open to the public.

31 The DEIS should include more emphasis and detail on monitoring and management of released
32 wolves. For example, we would like to see how many staff are going to be assigned to the project,
33 and the proposed budget for telemetry flights. Budget accommodations should also be made for state
34 wildlife agency participation, should such agencies choose to participate.

33

32. We agree.

33. Estimates of staff size are now presented in Appendix B. The proposed staff could be comprised of any combination of federal, state, tribal, or other biologists depending on future management agreements. If reintroduction is authorized, estimated project costs will be included in FWS budget requests. This would include support for agreed-upon state wildlife agency participation.

34. The FWS is willing to consider any plausible proposal for depredation compensation.

35. For these reasons and others, the FWS supports the Preferred Alternative.

1 The Service needs to find another vehicle for depredation compensation, other than the Defenders
2 of Wildlife program.

34

Alternative B

3 This alternative also resembles the AGFD Wolf reintroduction proposal, with the exception of
4 preventing dispersal from the core primary recovery zone into the secondary recovery zone. The
5 AGFD proposal allowed for dispersal from the core area into the surrounding Apache National Forest
6 within Arizona. The goal of establishing 20 wolves within the primary recovery zone appears to be
7 reasonable considering the available habitat. However, this population size is not likely to be self-
8 sustaining and falls far short of the Mexican Wolf Recovery Plan objectives.

Alternative C

9 This alternative calls for reintroduction of a fully protected population of Mexican wolves into the
10 primary wolf recovery zones, with no restrictions on dispersal of wolves outside of this zone. Since
11 there would be no control on where wolves could colonize, wolf management activities could be
12 spread out across the states, increasing project costs and response time to document wolf-caused
13 depredations. Control of depredating wolves would be limited and could only be conducted if the
14 control were to somehow enhance the survival of the species. The Defenders of Wildlife
15 Compensation program would be available to ranchers experiencing documented losses to wolves.

35

16 In our view, conflicts between wolf recovery and the current land uses would be much higher if this
17 alternative were implemented. Since reintroduced wolves would be fully protected and allowed to
18 colonize anywhere, much less control of their impacts would be afforded state and federal wildlife
19 agencies. It could be argued that, by allowing natural dispersal, the wolf population could increase
20 at a faster rate, thus reaching recovery goals in a shorter period of time, reducing overall costs of
21 recovery. However, there is no empirical evidence to support this contention.

22 The potential for additional land use restrictions under this alternative will likely cause unneeded
23 opposition to wolf recovery from livestock producers and the timber industry. Conflicts with
24 management for spotted owls and northern goshawks might complicate Section 7 consultations.

25 Minimal management of dispersal under this alternative also removes flexibility in management of the
26 genetic diversity of the wild population. Reintroduction with the ability to manage genetic diversity
27 through organized translocations would reduce inbreeding concerns.

Alternative D

28 This alternative calls for continuation of the current Mexican wolf recovery activities, which is passive
29 management for natural recolonization and no reintroduction. This alternative would also maintain
30 full protection under the Endangered Species Act for any recolonizing wolves. However, since no

36. All elk and deer population numbers have been rechecked; they accurately present the data provided by the state wildlife management agencies.

37. This has been clarified.

1 wolf populations have been found along the U S -Mexico borderlands in many years, despite surveys
 2 and follow-ups of sighting reports, it is highly unlikely that this alternative would ever accomplish
 3 recovery objectives As stated in the DEIS, natural recolonization occurred very slowly in the
 4 Northwest and the Great Lakes region, even though these areas are near a large, healthy source
 5 population of wolves
 6
 7 Because of the reasons stated above, this alternative does not seem "reasonable" as defined under
 8 NEPA process
 9
 10 In Table 2-9 on page 2-43, the heading labeled "Impacts on Recreation" should be changed to
 11 "Impacts on Non-hunting recreation "
 12
 13 **CHAPTER 3. AFFECTED ENVIRONMENTS**
 14
 15 **Blue Range Wolf Recovery Area**
 16 The citation AGFD (1992) should be replaced with Johnson et al (1992) throughout this chapter
 17 The complete citation is listed in the Literature Cited section already
 18
 19 **Animals**
 20 **Potential wild prey of wolves.**
 21 Elk and deer population numbers (minimum, maximum, and average) do not seem to be consistent
 22 within the DEIS The Service must clarify whether these discrepancies arise from errors in
 23 mathematics or they reflect comparisons between population estimates at different points in time over
 24 the length of the proposed recovery and management effort
 25
 26 **Species of special concern.**
 27 An update on critical habitat designation for the spotted owl is needed in this section
 28
 29 The citation for designating the water shrew and jumping mouse as species of special concern in
 30 Arizona should be "Arizona Game and Fish Department In prep Wildlife of special concern
 31 Arizona Game and Fish Department publication "
 32
 33 **Potential wild prey of wolves.**
 34 "Coues" deer should be "Coues," without the apostrophe, here and throughout the DEIS
 35
 36 **Hunting**
 37 There are no crossbow seasons for elk, except through special permits for disabled hunters Elk
 38 seasons occur in September, October, November, and December
 39
 40
 41

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Agency and local government plans and policies
U.S. Forest Service.

3 The first paragraph on page 3-13 states that "old-growth areas will be retained, and uneven-aged
 4 timber management will be emphasized" However, the current forest plan for the Apache-Sitgreaves
 5 National Forests (ASNF) emphasizes even-aged management and has not been formally amended to
 6 reflect uneven-age management emphasis
 7
 8 On Table 3-21 the source should read AGFD (1994b), not ADGF 1994b
 9
 10 **The Potential Natural Recolonization Areas**
 11 We believe this heading should be bolded and underlined as was done for the White Sands and Blue
 12 Range wolf recovery areas Subsequent section titles should also be changed to address the hierarchy
 13 of organization Immediately after the title "Southeastern Arizona Potential Natural Recolonization
 14 Area," there should be a subheading "Coronado National Forest south of I-10" as indicated in the
 15 table of contents
 16
 17 On page 3-63, 3rd paragraph, there should be a better reference for the source of this data, such as
 18 Girmendonk (1994b)
 19
 20 The **Hunting** section on page 3-65 should mention that black bear and lion hunting, as well as small
 21 game hunting, is also permitted in the Coronado National Forest It could be made more clear that
 22 only areas south of I-10 are being considered here
 23
 24 Hunting seasons are not identical in this area and the BRWRA There are different seasons for the
 25 same species in some cases, and additional seasons for some species In addition, small game hunting
 26 is more common south of I-10 than in the BRWRA
 27
 28 In the **Public access and recreation** section on page 3-67 the citation for road densities should be
 29 the original source, such as the Forest Service report
 30
 31 **CHAPTER 4. ENVIRONMENTAL CONSEQUENCES**
 32
 33 **Alternative A:**
 34
 35 **Impacts on wild prey of wolves**
 36 It should be more clearly stated that projections of changes in the wild ungulate populations are
 37 estimated five years after the recovery goals are met, which is projected to be 14 years after wolves
 38 are initially released into the areas. The current language could lead the reader to believe that a 22
 39 percent reduction in the deer herd could occur in just five years, whereas the intent is to say that this
 40 change is a projected maximum that could occur over 15 years.
 41

38. The experts whose opinions were sought on this topic concluded that compensatory mortality would probably be between 15% and 47%. We used a similar range of values in our prey impact simulation models and predicted a range of estimated prey impact levels, with the high side of the range reflecting low compensatory mortality and the low side reflecting high compensatory mortality.

39. This language has been changed.

40. The discussion of potential impacts on bighorn sheep in the Blue Range has been expanded based on new information received from AGFD.

41. Revised tables provided by AGFD have been included in the FEIS; some figures have been rounded. The tables are not reproduced here to save space.

42. This change has been made.

43. See response number 34. We agree that the research suggested would contribute to estimating the level of undetected livestock depredation by wolves, but cannot guarantee funding for this research.

In the professional opinion of the Department's big game specialists, 41 percent compensatory mortality seemed excessively optimistic. Projections of impacts on the wild ungulate populations should therefore be based on compensatory levels closer to the minimum estimate of 17 percent.

3%

The DEIS states that wolves that severely impact big game populations could be captured and moved under the Mexican Wolf Experimental Population Rule. It would be very difficult to determine which wolf (or wolves) was responsible for severely impacting a big game population. Therefore, USFWS and cooperating agencies need to be prepared and have the authority to trap and move several wolves if not the entire pack, to mitigate the impact on the local big game population if this is necessary.

In Box 4-2 the underlined word "necessarily" should be deleted in the 3rd paragraph. Arizona Game and Fish will definitely not reduce permit numbers just because wolves are introduced. Permit numbers are based on populations and hunt strategies.

39

Possible wolf depredation impacts to the bighorn sheep population in the Blue Range were not adequately addressed in the DEIS. These sheep are using habitats that differ markedly from those occupied in other parts of the Rocky Mountains. Wolf depredation on bighorns is more likely in these areas of the Blue than in more rugged terrain.

40

The Department understands the difficulty and assumptions that are required in attempting to simulate predation rates and impacts. We also realize that the ranges of projected impacts to deer and elk are at best an "educated guess." Therefore, a more appropriate conclusion would be "Although considerable uncertainty exists, wolves are not expected to severely impact prey populations in the BRWRA."

Impacts on hunting

The statement "all estimates are adjusted to 1994 dollars" should be moved to the paragraphs where dollar estimates are given. We assume that Walsh's study, which found the average net value for big game hunting per person per day of \$45.47, was adjusted to \$58.00 in 1994 dollars.

Values in Table 4-1 should be identified as impacts specific to Arizona and to New Mexico. The following table provides estimates of impacts to each state in proportion to the wild ungulate populations in each state, based on the total impacts estimated by Duffield and Neher (1994).

41

We suggest the conclusion be changed to "Hunter take may fall (maximum projection of 17%), but state wildlife agencies would reduce hunter take only if a measurable reduction in the deer herd occurred." This information should be highlighted in the document abstract and summary to provide for those readers who may not carefully read all parts of the document and are concerned about impacts on hunting.

41

Impacts on livestock

The following sentence should be added to the last paragraph on page 4-11: "In addition, coyote and lion densities may be reduced by competition with reintroduced wolves, which could reduce livestock depredation losses from coyotes and lions."

42

The DEIS should include discussion on other possible methods of compensating ranchers for undocumented depredation losses to wolves. Figures could be based on data from research conducted on released wolves in the Southwest which would document the extent of undiscovered wolf kills through intensive monitoring of the wolves' food habits.

43

We agree with the conclusion that wolves will likely take between one and 34 cattle per year and should not cause a major impact to ranching as a whole in the area, but some individual ranchers may experience significant losses. In addition, this conclusion should also be highlighted in the summary and abstract.

Predator control programs

Impacts on predator control programs in Arizona will be insignificant as a result of wolf reintroduction. The trapping ban, approved by voters in 1994, disallows use of traps, snares and poisons on public lands in Arizona. The proposed nonessential experimental rule would not require any trapping or other land use restrictions on private land so the presence of wolves in an area will not change any predator control programs. The use of hounds to control lions is not likely to impact wolf numbers.

The DEIS establishes that restrictions may be placed on use of specific depredation control measures (e.g. M44s) through cooperative management agreements with Animal Damage Control and perhaps other agencies. The Service needs to affirm that such agreements will be consistent across public lands and Tribal lands to the maximum extent feasible.

Effects of wolf colonization on existing lion and coyote populations will be difficult to document. However, evidence from other areas suggests that wolves will reduce the existing predator populations, either through outright killing of lions and coyotes or by territorial exclusions.

The Department believes that many, perhaps most, large predators displaced by wolves through territorial aggression will either be killed by predators already inhabiting the dispersal areas or will die in a relatively short time due to interspecific competition for food and space. Although some

44. This addition has been made.

1 dispersing displaced predators may in turn displace others of the same species, additional predator
2 control should not be necessary in the outlying areas. However, we suggest that USFWS support an
3 investigation into the effects of wolf colonization on existing predator-prey dynamics. The DEIS does
4 not include a summary conclusion for this area

6 **Agency policies and plans**
7 The following phrase should be added in front of the first sentence for the State of Arizona
8 "Although the Department or Commission has not taken an official stand on wolf reintroduction."
9 Wolf recovery as proposed in this alternative will not seriously impact existing AGFD policies or
10 plans

44

12 **Impacts on land use**
13 We agree with the conclusion that Alternative A will result in only minor temporary land use
14 restrictions within a one-mile radius of active dens and active rendezvous sites

16 **Recreation**
17 We agree with the conclusion that Alternative A may cause increased visitation to the wolf recovery
18 area, but may require minor temporary restrictions on access to areas within a one-mile radius of
19 active dens and active rendezvous sites

21 **Regional economics**
22 We disagree with the conclusion that the greatest negative economic effects will be in the lost value
23 of hunting and reduced expenditures associated with hunting. As stated above, the Department will
24 not reduce deer permits in the recovery areas just because wolves are present, if no measurable
25 change in the wild ungulate population is observed. The predicted change in the wild ungulate
26 population could be easily offset by a number of environmental variables, the most important being
27 the amount and timing of annual moisture. Habitat improvements through the use of prescribed fires,
28 for example, could also mitigate effects of wolves on wild ungulate populations. If it is not possible
29 to measure a reduction in wild ungulate numbers, the Department will not recommend reducing
30 hunting permits in the area. If permits are not reduced, or are reduced less than predicted in the DEIS,
31 the economic impact of the lost value of hunting and hunter's expenditure will be much lower than
32 predicted in the DEIS. If permits are reduced, there is concern for the decrease in revenues to the
33 Department from a decrease in license and tag sales

45

35 The Service must clarify the distinction between economic benefits and expenditures. The surveys on
36 which these conclusions were based (USFWS surveys) may not have included children under age 16.
37 Hunting benefits (values and expenditures) seem very low, but it also seems redundant to include
38 actual (expenditures) and hypothetical (economic values) costs for the same event

39
40 The projected negative effects could also be presented as a percentage of total hunting expenditures
41 in the area

46

47. The FWS has never used tourism as justification for wolf reintroduction. However, the potential impacts of wolf recovery on tourism and related industries are qualitatively discussed in Chap. 4 of the FEIS (see also Appendix J.)

2 Tourism should not be used as justification for wolf reintroduction. The people in the Blue do not
3 want additional thousands of visitors

47

5 **Summary of adverse effects of Alternative A**
6 Adverse economic impacts should also be expressed as a percentage of total hunting expenditures
7 or ranching revenues in the reintroduction area to provide perspective on the total impact

8 **Alternative B:**

9 **Impacts on the wild prey of wolves**
10 Wolf population goals are lower under this alternative and thus prey impacts are projected to be less
11 than under Alternative A. However, a single large pack of wolves could exert severe pressure on
12 localized bighorn sheep herds in the wolf recovery area. The flexible management guidelines of the
13 nonessential experimental designation are needed to mitigate this potential impact.

15 **Impacts on hunting**
16 We suggest the conclusion be changed to "Hunter take may fall (maximum projection of 12%), but
17 the Arizona Game and Fish Department would reduce hunter take only if a measurable reduction in
18 the deer herd occurred." The computer model predicted a maximum reduction of the deer population
19 by about 2 percent per year under this alternative. This change is too small to measure using
20 conventional census techniques. This information should be highlighted in the document abstract and
21 summary to provide for those readers who may not carefully read all parts of the document but who
22 are concerned about impacts on hunting

48

24 **Impacts on livestock**
25 We request that the conclusion read "wolves should not cause a measurable impact to ranching as
26 a whole in the area, but some ranchers may experience losses." This conclusion should also be
27 highlighted in the summary and abstract

49

29 **Impacts on predator control programs**
30 ADC personnel have discontinued use of the most common method of predator control in the
31 proposed reintroduction area, the leg-hold trap, to comply with Arizona Revised Statute 17-301(D)
32 (the anti-trapping initiative). M44s can not be used on National Forest lands, which make up more
33 than 94 percent of the BRWRA. Therefore, restrictions on the use of traps or M44s because of the
34 presence of Mexican wolves in an area would not pose any significant additional restrictions on the
35 tools or methods used by ADC to control other predators

37 **Impacts on agency and local government policies and plans**
38 Wolf recovery as proposed in this alternative will not seriously impact existing AGFD policies or
39 plans

48. This change has been made with slight revisions to the suggested language.

49. The phrase "may experience losses" is more conditional than our conclusion statement. We did not make this change.

Impacts on land use

We agree with the conclusion that land use restrictions under this alternative will be minor and any inconveniences will not result in major economic losses

Impacts on recreation

We agree with the analysis of impacts to recreation except for the effect of road closures in response to illegal killing of wolves. The animosity created as a result of road closures will be much more detrimental to the recovery program than the added protection of road closures. Since wolf home ranges are estimated to be about 250 mi², road closures would have to be unreasonably extensive to afford the wolves any significant amount of protection from humans. Access to private inholdings within the forest may be restricted, raising the possibility of private takings litigation. Aggressive enforcement and long-term educational efforts would be more effective methods of discouraging and preventing the illegal take of wolves.

50

Regional economic impacts

We disagree with the conclusion that the greatest negative economic effects will be in the lost value of hunting and reduced expenditures. Reasons for our conclusion have been stated under Alternative A.

Alternative C:

Impacts on wild prey of wolves

We believe it is impossible to predict impacts on the wild prey of wolves under this alternative. Since wolves would be allowed to disperse outside the designated wolf recovery area, due to a lack of specificity associated with potential dispersal areas, impacts to the wild ungulates cannot be accurately modeled. Extrapolation of projections from within the BRWRA to areas outside the recovery zone are not valid due to obvious differences in habitat types and wild ungulate populations within these areas.

51

It could be argued that impacts would be much less because the wolf population would probably be more dispersed and less dense in any particular area. On the other hand, wolf populations would probably grow faster, since mortality due to control measures would be lower. Wolf densities could be much higher than predicted in areas with higher prey densities. Too much uncertainty exists under this alternative to project with any confidence the potential impacts.

Impacts on hunting

Since we believe that accurate projections on the impact to wild ungulates is impossible, it is also impossible then to predict the effect of wolves on hunting. Wolves would probably distribute themselves widely under this alternative, so measuring impacts would be even more difficult to document.

52

50. See response number 12 above. The FWS agrees that enhanced law enforcement and public education would be more effective than road closures.

51. Because of the uncertainties and data deficiencies AGFD has identified, quantitative impact analyses were confined to the BRWRA and WSWRA, for which data were available. Potential impacts in other areas into which wolves would likely disperse generally are addressed qualitatively.

52. Comments acknowledged.

53. We agree.

54. We agree with the approach presented. However, if wolves were mistakenly killed after implementation of these measures, the FWS might request limited coyote hunting season closures through cooperative agreements with the States, under Ah. C.

If wolves were to remain concentrated in their distribution, local deer herds may be impacted enough to measure a decline in the deer herd, necessitating a reduction in hunter permits for that area.

52

Since there would be no provisions under this alternative to move wolves having a significant impact on wild ungulate herds, localized impacts on deer and bighorn sheep could reach very significant levels.

Impacts on livestock

There will be only limited depredation control on wolves taking livestock under this alternative, because of the fully-endangered status. In addition, ranchers and their agents will not be allowed to harass wolves near livestock and ADC will have additional restrictions placed on their control activities. Therefore, livestock depredation will be higher than under Alternatives A & B. We believe actual livestock depredation levels will be higher than projected in the DEIS because livestock killing wolves will not be removed in all cases, and these wolves may train their offspring to kill cattle instead of wild prey. We agree that this level of depredation is not likely to seriously impact ranching as a whole, but some ranchers could experience significant losses.

53

Impacts on predator control programs

We agree that existence of a fully protected wolf population could inhibit activities of ADC. With the adoption of the anti-trapping initiative which already prohibits trapping on public lands in Arizona, this impact would occur on private lands only. However, additional restrictions on predator control activities, especially on private lands, would meet significant local opposition.

Sport shooting of coyotes has been closed in Wisconsin during the deer season without overwhelming opposition. However, this coyote hunting in Wisconsin is primarily for sport, as predator control to eliminate depredation pressure is not a priority with the low level of cattle grazing in the region. In the Southwest, the purpose of coyote hunting includes depredation control in addition to the sport motives. Therefore, opposition to any coyote closure would surely be significant, and could distract managers from other aspects of wolf management. Arizona Game and Fish Commission would also have to approve this closure. Coyote hunting could be allowed, but an intensive educational campaign to make hunters aware that an endangered wolf population existed in the area might be the best way to protect the recovering wolf population. People mistakenly shooting a wolf would be prosecuted if circumstances warrant.

54

Impacts on agency, tribal and local government policies and plans

Impacts to Department policies and plans could be significant under this alternative. If low wild ungulate populations were suspected of affecting wolf recovery, the DEIS states that habitat management could be required to improve forage for the wild ungulates. The USFWS could also recommend changes in hunter harvest strategy for the area to increase wild ungulate populations. Direct USFWS involvement in state-coordinated hunting programs would meet with significant opposition, not only from private hunters, but also from the Department and Commission. We

understand that USFWS involvement in the state's hunt strategy is not likely, but under this alternative it appears to be more than just a remote possibility

4 We agree that a fully-protected wolf population could pose a potential management conflict between wolf recovery and habitat preservation for spotted owls and goshawks. Habitat management for wolves, if required to ensure its recovery, would encourage early successional stage forests, which is higher quality habitat for the wolves primary prey animals. Spotted owls and goshawks appear to require older forests with a more closed canopy

8
 9
 10 An ecosystem management approach may prove successful in dealing with this potential conflict. However, no such approach is operational at this time, and the complexity of the multi-agency coordination that would be required would take considerable time to develop and implement. We believe this ecosystem management approach needs to be operational before implementation of this alternative.

15 **Impacts on land use**

16 Considering the fact that wolves can withstand considerably more human land use disturbance than previously thought, it is not likely that current and planned activities in the wolf reintroduction zone would harm the wolves in any significant way. Nevertheless, the fully-protected status of the wolves would require the USFWS to consult under Section 7 on activities that may affect the wolves. Consultations could require an inordinate amount of time and resources. In certain cases involving management of old growth habitat of spotted owls, management conflicts could arise over setting priorities for one endangered species over another. In addition, restrictions on grazing could be significant if the USFWS determined that livestock depredations by wolves led to illegal killings of wolves.

26 We believe that significant or permanent land use restrictions would be counterproductive to Mexican wolf recovery. Under this alternative, it is unlikely that major land use restrictions would be needed, but since the authority and possibility exists, we do not believe this is an appropriate alternative from the land use perspective.

31 **Impacts on recreation**

32 We agree that wolf reintroduction might cause a slight increase in visitation to the wolf recovery area. Minor, temporary restrictions in access to areas within a one-mile radius of active dens and active rendezvous sites to protect wolves should not cause major impacts to recreationists. However, large-scale closures could cause significant impacts, would be difficult to enforce, and may not be helpful to the wolves. Given the levels of outdoor recreation participation in other areas of the United States that are occupied by much greater numbers of wolves (e.g. Minnesota, Wisconsin), it seems very unlikely that concern for personal safety would of itself significantly diminish human recreational use of the proposed wolf recovery areas.

Regional economic impact

4 Considering the difficulty in estimating impacts to wild ungulate herds, it will be next to impossible to make projections of the economic impacts to hunting. Wolves could conceivably kill enough deer or bighorn sheep to necessitate reductions in hunter permits under this alternative. Although it would be difficult to predict an accurate estimate of the economic impact to hunting resulting from this alternative, we believe that this alternative would impose the most significant economic impacts of all alternatives proposed.

8
 9 As stated previously under impacts on livestock, wolf depredations could become widespread without the ability to control each and every depredating wolf. This alternative would cause the greatest economic impacts to the rancher, and could conceivably exceed even the high estimates within the DEIS.

13 We disagree that the negative economic impacts of this alternative would be predominantly in the lost value of hunting and reduced hunter expenditures. Although impacts to wild ungulates may necessitate reductions in hunter permits, we believe the value of livestock lost to wolves could be as significant, if not more.

18 **Alternative D:**

19 We agree that the likelihood of natural recolonization occurring from suspected, but unproven, population reservoirs in Mexico is extremely remote. In addition, if natural recolonization were to occur, it would probably take place slowly and impacts would not be measurable in the foreseeable future (30-50 years). Even though Mexican wolves have been listed as an endangered species since 1976, this status has not allowed them to recolonize in the nearly 20 years they have been fully-protected. This alternative does not describe any specific methods that would ensure recolonization. In addition, the expected carrying capacities of the natural recolonization areas would not meet the Mexican Wolf recovery Plan population goals.

28 Projected impacts on hunting, livestock, government policies and plans, recreation, and the local economy under this alternative are too vague to discuss.

32 **CONSULTATION AND COORDINATION**

33 This section is complete and well organized.

35 **APPENDICES**

36 We suggest consecutive lettering of the appendices to avoid the appearance that Appendixes H, I, J, K, etc are missing or were omitted.

55. It does and that has now been made more clear.

Appendix A:

3 Complete

Appendix B:

6 Projection of costs are not detailed enough to make specific comments. However, it appears that field staff and administrative costs could be reduced considerably. It is not clear if the amount for field staff salaries includes a full-time ADC agent assigned specifically to this project. Adequate funding must be available for the duration of the project.

11 Monitoring and research functions could be conducted through a cooperative agreement with a private contractor or University, making outside sources of funding available

Appendix C:

15 Complete, although just a draft

Appendix D:

21 Listed species included in "III Pertinent Species and Habitats" should be defined as those species officially listed by USFWS for the area, many of which do not actually exist in the area. Otherwise, this Appendix appears complete

Appendix E:

26 Accurate

Appendix F:

31 Complete and accurate

Appendix G:

35 As stated above, "disturbance-causing land use activities" should be defined in detail

Appendix L:

39 Literature should be cited in ascending chronological order for references by the same author

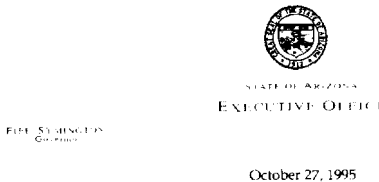
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Arizona Office of the Governor:

1. We have reviewed Dr. Johnson's comment letter and we strongly disagree. See Appendix A on Mexican Gray Wolf Life History and Ecology, section on Pathogens and Parasites for a discussion of rabies. Some key points: the small numbers of wolves are very unlikely to affect the overall incidence of rabies in the Southwest since rabies is already found in other numerous animals, such as bats and skunks; under the Proposed Action wolves will not be allowed to travel to Mexico, rather they would be recaptured; and cases of wild wolves transmitting rabies to people are exceedingly rare in recorded North American history (only reported case in the Lower 48 was in 1833). Of course, if anyone was bitten by a wild wolf, which is very unlikely, they should be examined for possible rabies infection, as they would be if bitten by other wild mammals. Treatment to prevent rabies is commonplace and very successful.

2. We are unaware of any data that other predator populations have increased due to the trapping ban; detection of a broad one-year increase would be extremely difficult. In any event, the trapping ban would not apply to federal efforts pursuant to the experimental population rule which, if adopted as a final rule, will specifically allow for wolf trapping for control, research, and other needs. It would preempt conflicting state law.



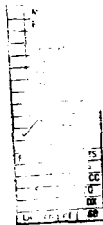
October 27, 1995

Mr David R Parson
Mexican Wolf Recovery Program
U S Fish and Wildlife Service
Mexican Wolf EIS
P O Box 1306
Albuquerque, New Mexico 87103-1306

Dear Mr. Parson

Thank you for the chance to comment on the Fish and Wildlife Service's draft Environmental Impact Statement (DEIS) on the proposed reintroduction of the Mexican wolf into the Southwest. I oppose the various alternatives for reintroduction outlined in the DEIS. Indeed, I do not think reintroduction in any form would now serve the interests of the people of Arizona. My opposition stems mainly from concerns about the health and welfare of the people of my state. In addition, I have questions about the viability of the proposed reintroduction and problems with the way it would be administered under the Endangered Species Act.

A leading medical expert in Arizona recently pointed out to me a significant human health risk likely to arise from the reintroduction of wolves into the Southwest. Dr. Peter Johnson, Chairman of the Division of Neuropathology at the Barrow Neurological Institute in Phoenix, warned that rabies, an almost universally fatal disease, would probably make a comeback in the United States after years of expensive control efforts. He explained that wolves introduced in Arizona or New Mexico would almost certainly roam to Mexico, where rabies is much more common, and carry the disease back to the United States. Rabid wolves, which become aggressive and erratic, would then spread the disease to humans either through direct attacks or indirect transmission from large game animals that have survived wolf attacks. Last year's statewide ban on the trapping of large predators has already appeared to spark an increase in the population of bears, coyotes, and mountain lions. This prohibition likewise would make it difficult to control the wolf population, which may become urgently necessary in the case of a widespread rabies outbreak.



Mr. David R. Parson
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The DEIS lists several potential costs of reintroduction that concern me at a time when many communities in rural Arizona are under a great deal of economic pressure. Under alternative A, for example, the negative economic impact from reduced hunting activity would total more than \$2 million per year. The DEIS also cites possible losses to cattle ranchers from wolf kills. Although the report generally downplays the impact on ranchers, annual losses of up to 34 cattle -- considered a possibility under several of the alternatives -- would have a meaningful impact on the cattle industry, in particular because such kills almost certainly would be concentrated in such a way that a small number of ranchers would have to cope with the losses. The DEIS and the Defenders of Wildlife have also been reluctant to guarantee by contract depredation fund monies to be available on a long term and continuing basis.

3

While the risks and costs stemming from wolf reintroduction seem clear, the long term prospects for the success of the proposal appear dim. The captive population to be released comes from a single female and just two males. Such a narrow genetic base makes this population vulnerable to elimination if it is hit with disease. As a result, there is a strong consensus in the scientific community that this population is not suitable for reintroduction aimed at establishing a thriving, wild population.

4

I also have a number of concerns about the proposed reintroduction that stem from the history and requirements of Endangered Species Act (ESA).

The FWS according to the DEIS, intends to establish a population of only 120 wolves in the Southwest, with 100 in Arizona and 20 in New Mexico. However, this population target could rise substantially, bringing additional risks and costs, if environmentalists and judges conspire to determine that the FWS was not sufficiently ambitious, as happened recently with the wolf reintroduction program the FWS had launched in Minnesota.

5

Similarly, the courts could change the reintroduction from the "nonessential experimental" status deemed appropriate by the FWS to "essential experimental" or "endangered". Such changes would greatly impair land use in the Southwest.

3. The \$2 million per year "high scenario" figure applies to the whole BRWRA, about 2/3rds of which is in New Mexico. More than 50% of the figure is not actual lost expenditures, rather it is a lost intangible "value of hunting." In other words, it represents the lost "willingness-to-pay" of hunters who would not be able to hunt (most of whom would not be from the BRWRA region). Thus, actual lost expenditures in the Arizona portion of the BRWRA region are projected to be far less than the figure quoted. Most of those lost expenditures would be spent elsewhere in Arizona on hunting or other activities.

4. We strongly disagree that there is any scientific consensus against the suitability of the captive population; see Appendix K - Response to Mr. Dennis Parker, for evidence that the overwhelming weight of expert opinion supports the suitability of the captive population.

5. There has never been a wolf reintroduction program in Minnesota and no determination by a judge that we are aware of that the Eastern Timber Wolf Recovery Plan is "not sufficiently ambitious."

6. We believe we have used the best available scientific and commercial data relevant to wolf recovery. Appendix C does contain proposed findings that the reintroduced population would be considered "nonessential." A Federal regulation containing these findings and the special rule establishing the nonessential, experimental population will be issued prior to any releases.


Mr. David R. Parson
October 27, 1995
Page Three

Finally, the proposed reintroduction appears to be in conflict with provisions of the ESA, including Section 4 (b) (1) (A) which requires that all decisions be made on the basis of the best available scientific and commercial data and Section 10 (2) (A) which calls on the Secretary of the Interior to determine prior to a release whether a population to be reintroduced is essential to the survival of a species.

6

I again urge you not to reintroduce the Mexican wolf into the Southwest. There are many better uses for \$7 million of taxpayers' money than this dubious experiment.

Sincerely,


Fife Symington
GOVERNOR

FS.cp

Agency et al. Comments and Responses
New Mexico Department of
Agriculture:

NEW MEXICO DEPARTMENT OF AGRICULTURE
OFFICE OF THE DIRECTOR/SECRETARY
Box 30005, Dept. 3189
Las Cruces, New Mexico 88003-0005
Telephone (505) 646-3007



October 31, 1995

Mr. David R. Parsons
Mexican Wolf Recovery Program
U. S. Fish and Wildlife Service
P. O. Box 1306
Albuquerque, New Mexico 87103-1306

Dear Mr. Parsons:

This letter is to provide comments on the Draft Environmental Impact Statement (DEIS) regarding the Reintroduction of the Mexican Wolf Within Its Historic Range in the Southwestern United States.

1. Release of the Mexican wolf (*Canis lupus baileyi*) into the White Sands Missile Range (WSMR) area of New Mexico, may be an *introduction* rather than a *reintroduction* as proposed. The New Mexico Department of Agriculture (NMDA) maintains that no documentation exists verifying Mexican wolves ever inhabited or were indigenous to the WSMR area. Please address this issue providing conclusive proof and literature references substantiating the U. S. Fish and Wildlife Service's (FWS) contention that Mexican wolves actually were past residents of the WSMR. The DEIS states historic documentation is sparse, yet reintroduction efforts are being pursued based on a few unverified verbal accounts and suppositions on excavated bones identified as *Canis lupus* that might have been brought into the Organ Mountains, "... through trade from elsewhere." These bones may well have been from another subspecies of wolf as easily as they may be from the Mexican wolf. These are poor reasons to insist on making a reintroduction into this area. Unless the FWS can definitely prove Mexican wolves formerly occupied the WSMR, the wolves should not be released into this area.

2. The DEIS states (page 1-7), "Two males and one pregnant female...founded the certified captive population of Mexican wolves." The DEIS does not define the term "certified" captive population. What is meant by the term "certified" in this context? This should be clarified for adequate public review and comment. Does documentation exist to prove these wolves are not hybrids? Please provide for public scrutiny all data and related information regarding DNA and blood testing of the captive population as well as verification that 18 years of inbreeding have not diminished the genetic integrity of the captive population. These documents should be provided for public review and comment prior to the continuation of reintroduction efforts.

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OCT 31 1995

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We understand two new lines of Mexican wolves, the Aragon and Ghost Ranch lineages, have recently been evaluated as suitable to supply genetic diversity to the reintroduction effort as reported in the Mexican Wolf Project Update Newsletter, October 1995, issue. These new lineages have not been discussed in the DEIS. Why not? What is the origin of these two separate lines of wolves? Please provide all DNA and blood testing results and associated information, and pairing data for these wolves for public review and comment prior to the continuation of reintroduction efforts.

3. The preferred alternative recommends the use of Mexican wolves (wolf), designated as nonessential experimental, to be used as a foundation population. When wolves leave the recovery area, they are to be recaptured and returned to the wolf recovery area. However, in the case of repeated depredations, if a particular wolf can be proven to be the culprit of depredations, its elimination from the population, either by death or relocation to a captive environment, results. How will the FWS substantiate that a particular wolf is a repeat offender subject to permanent removal? We also understand any wolves establishing territories outside the designated wolf recovery areas will be captured and returned to a recovery area, or to captivity. Will the progeny of marked wolves be marked and subsequently monitored after each wolf recovery area meets the goals of the wolf recovery plan?

If wolves expand beyond the proposed recovery areas, what will be the effect on the existing cooperative Animal Damage Control program (ADC) between NMDA and the U.S. Department of Agriculture-Animal and Plant Health Inspection Service-Animal Damage Control program outside the recovery area? Please provide an evaluation of the potential impacts to the program's ability to respond in a timely manner, with appropriate methods, to requests for assistance in controlling any animal causing problems.

4. The DEIS projects livestock losses for the Blue Range Wolf Recovery Area (BRWRA) to be "... between one and 34 cattle per year (average: 17.5), mostly calves." Bailey (1931) reported the 1916 estimated cost of livestock damage attributed per wolf was at least \$1,000 per year. The average value of cattle in 1916 was \$41 per head (USDA National Agricultural Statistics Service). Thus, each wolf apparently killed 24 head per year. The average value per head in 1995 is \$650. If wolves were to kill livestock in 1995 at the same rate wolves killed in 1916 (24 head per year), the loss attributable per wolf, per year, in 1995 dollars would be \$15,600, after wolves are fully established. What will be the compensation for livestock animals maimed but not killed? The DEIS reports the annual net median ranch income is approximately \$17,000. Few ranching operations can withstand this degree of loss from predators.

¹Bailey, V. 1931. Mammals of New Mexico. U.S. Department of Agriculture, Bureau of Biological Survey, Washington, D.C. North Americana Fauna No. 53:303-313.

1. New information has been provided about these lineages, in Chap. 2 and Appendix K - Response to Mr. Dennis Parker, which addresses many of the same issues raised.

2. See response to USDA ADC, above.

3. No, these 3 and 5 year evaluations are not tied together. As far as program termination, see response to USDA ADC comment number 6, above.

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Page 3

Although livestock owners may be compensated for verified wolf kills by a private compensation deprecation fund, how will compensation be provided if the private fund is depleted? We request the FWS to commit to compensation for livestock losses due to wolf depredations, as mitigation for the impacts, per regulations (40 CFR §1508.2(e)) implementing the National Environmental Policy Act (NEPA). We encourage the FWS to permanently fund a wolf specialist position to be hired by ADC to coordinate wolf ADC efforts in New Mexico. That person should be an experienced ADC professional able to provide wolf damage claim verifications in a timely manner.

Livestock damages in the form of actual losses, time spent looking for, gathering, and providing veterinary care for injured livestock not killed could prove to be costly to the agriculture unitist where the maiming occurs. Most livestock operators raise their replacement heifers in order to have their cattle acclimated to their particular ranching environment and terrain. Loss of a homegrown replacement heifer due to wolf depredations causes a financial loss taking at least two years to overcome by using a replacement heifer purchased from outside the ranch. A pregnant cow purchased to replace the lost heifer is more expensive to buy, and may or may not make the adjustment to the particular ranching operation. Is the FWS, or the private fund, prepared to reimburse the ranching community for these types of losses? If not, why not?

5. The DEIS creates confusion and mistrust when it states (page G-7), "Population goals are being formulated in the revision of the Mexican Wolf Recovery Plan." Should population goals indeed change, the subsequent analysis of impacts in the DEIS will be affected and may be invalidated, requiring new data analysis to reflect revised population goals. The DEIS should clearly state recovery plan goals and the criteria for delisting. Thus, the public knows what is being proposed, and has an opportunity to review the proposal and to provide comments. Without containing clearly articulated population goals, the DEIS is inherently flawed and should be prepared again after population goals are established.

6. The DEIS is unclear in its discussions pertaining to what actions will cause termination of the reintroduction effort if the three or five-year full evaluation indicates to the FWS a decision to terminate. If the three-year evaluation demonstrates a termination is warranted, will the FWS continue for two more years hoping the full five-year evaluation will be more conducive to what is desired? If so, why? Will termination of the reintroduction effort be just the curtailment of monitoring and management, or will the termination consist of removal of all released wolves and their offspring from the primary and secondary recovery areas, and any place wolves may have strayed? Will termination efforts include removal of any wolf-dog hybrids resulting from the reintroduction efforts?

7. The DEIS lacks specific terminology and direction when it declares, "...if and when the revised Mexican Wolf Recovery Plan goals are achieved, the subspecies will be down listed and then delisted." This statement is open-ended and leaves considerable doubt this wolf

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Mexican Wolf Recovery Program
Page 4

reintroduction effort will ever end. The FWS should finalize its reintroduction criteria goals before reintroduction efforts are initiated. The DEIS states, "A key aspect of the Proposed Action is the necessity of adequate funding for monitoring and research to study the impacts of the action and to determine whether the Mexican wolf can survive in the modern Southwest." If "adequate funding" is unavailable, does the reintroduction cease and the status of "nonessential experimental" revert to "essential experimental" or "endangered"? Will critical habitat be designated if the wolf is not recovered sufficiently to warrant eventual delisting, and thus become a fully protected species?

8. The DEIS goes to great length to analyze aspects of the affected environment, except for the impacts reintroduction will have on New Mexico's economy. As of January 1, 1994, there were approximately 1.41 million head of cattle in the state (USDA National Agricultural Statistics Service). New Mexico ranked 24th in cattle production in the nation, and 34th in the nation for all agricultural cash receipts. The DEIS lists Grant, Catron, and Sierra counties as the primary governmental boundaries for the BRWRA in New Mexico. Grant County ranks third in the state in total beef cow numbers; Catron County ranks sixth in beef cow numbers, and Sierra County is tied for 14th in beef cow numbers.² A ranch profile for the three counties named in the BRWRA of New Mexico indicates the combined impact on the economy is worth \$24.9 million to that area of New Mexico.³

With the reintroduction of the wolf, livestock operators may decide to reduce or eliminate grazing activities in these counties because of anticipated or experienced wolf impacts. Any loss of tax base revenues are detrimental to a counties' infrastructure and its ability to provide services to its citizens. The FWS has not conducted an economic assessment with the state of New Mexico to determine the cost associated with managing the wolves once the Recovery Plan's goals are met, the wolves are delisted, and they are returned to the state for management. We request an appropriate economic assessment, per the regulations implementing NEPA.

9. The DEIS precludes the use of M-44 devices or choking neck snares in "occupied wolf range." This is applicable for radio monitored wolves. However, there may be unconfirmed sightings, or reports of nonmonitored wolves by the general public. The FWS should not deny ADC the use of legitimate methods for predator control as a result of these unconfirmed reports or sightings. Confirmed sightings should be defined as the inspection and interpretation of visual and/or tangible predator sign by experienced personnel from ADC, the New Mexico Department of Game and Fish, and/or the FWS. Furthermore, in addition to the above mentioned change, the

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4. The reintroduction goals are clear: 100 wolves distributed over at least 5,000 mi². Meeting this goal alone would not allow de-listing; other populations would need to be reestablished elsewhere in accordance with criteria being developed in the revision of the Mexican Wolf Recovery Plan. There is no plan to ever change the designation of the reintroduced experimental population or to designate critical habitat.

5. See response #1 to New Mexico Governor Johnson, below. We have done the required assessments under NEPA and we do not project any significant impact on New Mexico's livestock industry.

²Gore, C.E. 1993. New Mexico Agricultural Statistics 1993. USDA

³Hal, A. 1992. Cattle Ranching Information for Southwestern New Mexico. Western New Mexico University

New Mexico Department of Game and Fish:



STATE OF NEW MEXICO DEPARTMENT OF GAME & FISH

Vilagra Building
P.O. Box 25112
Santa Fe, NM 87504

STATE GAME COMMISSION
Walter H. B... Pool, Chairman
Jim Chalmers...
Gus Edge...
Sally...
J.W. ...
Albuquerque, NM
Silver...
Albuquerque, NM
Charles...
Albuquerque, NM
New Mexico

CL#10-127

October 27, 1995

CL#10-127
Kaufman

Ms. Nancy M. Kaufman
Regional Director, Region 2
U.S. Fish and Wildlife Service
Post Office Box 1906
Albuquerque, New Mexico 87103

Dear Nancy:

I would like to take this opportunity to comment on the Draft Environmental Impact Statement (DEIS) concerning reintroduction of the Mexican wolf within its historic range in the Southwestern United States. As you know, several personnel from the New Mexico Department of Game and Fish (Department) have assisted in developing the DEIS. Thus, the Department has been knowledgeable and aware of the intent and content of the DEIS throughout its development.

1 The Department currently sees no potential Mexican wolf release site that provides both the biological and societal elements necessary: valid tests of wild wolf behavior and local residents' support. For that reason and others detailed below, the Department does not consider wolf reintroduction to be practicable and does not support or recommend wolf reintroduction at this time. Should reintroduction occur, we recommend a cautious, incremental approach that is also outlined below.

2 Although the Department's formalized position on reintroduction of Mexican wolves in New Mexico is contrary to the recommendation contained in the DEIS, we feel the DEIS reflects a careful examination of relevant literature and is based on the best available information. We recognize that reintroduction of Mexican wolves is a controversial issue and that the DEIS will not likely be satisfactory to all people. However, we also feel that the DEIS has addressed major issues expressed by the public at large. Furthermore, we

Mr. Tolson	
Mr. DeLoach	
Mr. Mohr	
Mr. Bishop	
Mr. Casper	
Mr. Callahan	
Mr. Conrad	
Mr. Felt	
Mr. Gale	
Mr. Rosen	
Mr. Sullivan	
Mr. Tavel	
Mr. Trotter	
Tele. Room	
Miss Holmes	
Miss Gandy	

31 OCT 1995

Ms. Nancy Kaufman -2- October 30, 1995

feel that the U.S. Fish and Wildlife Service has done a good job in addressing issues of public concern in conducting 14 public open house meetings (six in New Mexico) and three formal public hearings (one in New Mexico) concerning the DEIS and reintroduction of Mexican wolves.

3 If Mexican wolves are reintroduced into the wild, the following comments should be considered: Techniques for managing a viable population of wolves and for controlling interactions with livestock have yet to be tested for use in the modern Southwest. Therefore, if wolves are reintroduced, the Department urges a cautious, incremental, and experimental approach in reestablishing Mexican wolves.

Advantages of this approach would be: 1) limited resources for studying wolf ecology, and for testing methods for introducing and managing wolves, would be used most effectively in an incremental program; 2) each step of the program would be based upon knowledge developed from previous efforts. This may avoid possible errors that could jeopardize the ultimate success of the program, particularly in a politically sensitive environment; 3) individual animals would be released with greater chances of survival; 4) public awareness, concern, and confidence in the reintroduction program may develop as each new step of the program would evolve, be analyzed, and be presented for public comment. Recognizing these advantages of an incremental, experimental reestablishment program, if wolves are released in New Mexico, the Department suggests:

4 1. At the initial stage of any wolf recovery, the primary objectives should be to develop effective reintroduction and management techniques, enhance understanding of wolf biology, and develop a pool of wild-adapted wolves. Recognizing these primary objectives, resources should be available for adequate research at the onset of the program. Designation of released wolves should be as experimental non-essential under the Endangered Species Act (Section 10(j)), which is consistent with these primary objectives.

2. Wolves should not be released concurrently in two potential recovery areas to begin any program. Release and study of wolves in one area would minimize potential mistakes and concentrate research efforts to produce more reliable knowledge about Mexican wolves.

3. The Department does not agree that White Sands Missile Range (WSMR) is a suitable release site as recommended in the DEIS. It is not the typical woody, mountainous terrain historically preferred by wolves. Since livestock are not permitted to graze on WSMR, release there would provide no test of wolves' effect on livestock production. There also

3. We agree and have proposed in the Preferred Alternative a cautious approach to wolf reintroduction with periodic reviews of success and opportunities for mid-course corrections and project termination, if appropriate, through an adaptive management process.

4. The FWS generally agrees with these comments. The issues raised would be fully addressed prior to wolf reintroductions by established management and advisory groups.

DEIS should be amended to allow ADC to resume control activities within two weeks in the occupied range once wolf presence is no longer detected.

10. The DEIS states back country Forest Service roads may be closed following documented illegal killing of a wolf. The final EIS should clearly exempt ADC personnel from these road closures to continue animal damage abatement activities.

11. The DEIS states (page 2-22): "The FWS does not intend to change the 'nonessential, experimental' designation to 'essential experimental' or 'endangered' and the FWS does not intend to designate critical habitat for the Mexican wolf. If such changes were compelled by legal action, the reintroduction program would be terminated and the wolves removed." Can the FWS legally remove reintroduced wolves if legal action has caused their nonessential experimental status to be changed to endangered? At this point, can the FWS designate critical habitat for a wolf reintroduction effort without a completely new DEIS because of legal action changing their protective status?

12. The DEIS, on page 5-1, states, "Neither Arizona nor New Mexico has taken a formal position for or against Mexican wolf reintroduction and both are represented on the ID team and on the Mexican Wolf Recovery Team. No agency represented on the ID team has formally expressed opposition to the Proposed Action." NMDA was not invited nor allowed to participate on the Interdisciplinary (ID) team to represent agricultural interests in New Mexico. It appears that only persons from agencies who actively support wolf reintroduction have been recruited to be on the ID team, or those who may not officially voice opposition to the reintroduction efforts.

New Mexico law directs NMDA to conduct a predator control program. NMDA partially accomplishes its mission through cooperative efforts with the ADC program. On April 7, 1994, NMDA personnel requested permission to attend a Mexican Wolf ID team meeting to be held May 12 and 13, 1994. Our intent for the request to attend this meeting was to become more knowledgeable about Mexican wolves and the FWS reintroduction efforts regarding the wolf, and to provide input that would affect New Mexico agriculture. We were denied the opportunity to attend. Why?

Regarding the *Purpose and Need for Action* on page 1-14, the DEIS states, "The FWS would need to promulgate an experimental population rule describing protection and management of the proposed nonessential experimental population, 16 USC sec. 1539 (j). Pursuant to 50 CFR sec. 17.81 (d), this rule should be developed and implemented in consultation with appropriate state fish and wildlife agencies, local government entities, and affected [emphasis added] agencies and landowners. This EIS process has provided and will continue to provide the opportunity for such consultations to occur." Notwithstanding the fact that NMDA requested to be in attendance at a Mexican Wolf ID team meeting in 1994 and was denied, we now request that NMDA be included in promulgating the above mentioned experimental population rule.

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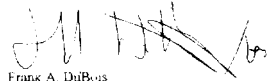
6. The quoted statement has been deleted in the FEIS. There was no requirement that ID team members be supportive of wolf recovery. To keep the team to a manageable size not every state or other agency with a potential interest was invited to be a team member. Due to fairness, manageability, and legal considerations, ID team meetings were generally not open to non-members, except for invited consultants and officials.

7. We will hold consultation meetings on the proposed rule when it is published and your Department will be invited.

In conclusion, the New Mexico Department of Agriculture is adamantly opposed to the reintroduction of the Mexican wolf in New Mexico.

Thank you for the opportunity to comment.

Sincerely,



Frank A. DuBois
Director/Secretary

are no resident elk on WSMR, again providing no valid test of wolves' predatory effects on elk populations. WSMR does contain a small and currently unstable population of desert bighorn sheep (*Ovis Canadensis mexicanus*), listed as endangered by the Department. Wolf release on WSMR would require a commitment to monitor for possible effects of wolves on this desert bighorn sheep herd, and a commitment to remedy any detrimental impacts, including the removal of wolves, if necessary.

4. Any recovery program should include an education program for livestock operators. Topics in this program should include techniques for managing livestock in areas inhabited by wolves, care and disposal of sick and dead animals, and identification and preservation of evidence of wolf activities.

5. If wolves ever are reintroduced, the Department would require sufficient funding, from sources other than hunting and fishing license fees, to cooperate with the Fish and Wildlife Service, grazing permittees, and landowners in responding to all incidents of wolf-caused livestock depredation and in preventing additional depredation.

6. The Department supports having an intensive and continuing public-involvement program on this controversial proposal for several years following any release. The Department is developing tools for use in education programs for students, teachers, and the general public. These tools include a Mexican wolf teacher's guide and a "teaching trunk" with wolf materials for classroom use. The Department will conduct workshops on predators, including Mexican wolves.

The Mexican wolf is currently listed as an extirpated endangered species on the State's list of threatened and endangered wildlife, as provided for in the State's Wildlife Conservation Act (WCA). The WCA provides, "to the extent practicable," for recovery of species listed as threatened or endangered under the Act. The Department does not consider it to be practicable to reintroduce Mexican wolves into New Mexico and does not support or recommend their reintroduction at this time.

--Although there may be broad-based support for wolf reintroduction in New Mexico from many urban residents, local support in those counties with the best potential wolf habitat is practically non-existent. Without local support and participation, successful reintroduction would be in jeopardy.

--As you are aware, 95 percent of the Department's state revenues are generated by our sportsmen license buyers. One of their principle concerns is a desire to have a larger deer herd providing higher hunter success and

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opportunity. Our research over more than two decades clearly indicates a low deer fawn survival rate, the main proximate cause of which is fawn mortality resulting from wild canid predation. Adding the largest member of the canid family, a highly efficient pack hunter, to the ecosystem at this point would likely jeopardize our efforts to increase deer populations or sustain current elk populations.

--We also have a concern over the potential large increase in manpower and time the Department could incur to investigate any real or suspected livestock predation caused by wolves.

For those reasons, and especially because the Department currently sees no potential Mexican wolf release sites that will either provide for valid biological tests of wild wolf behavior, or that would be socially acceptable to local residents of counties that do have suitable wolf habitat, we cannot support release of wolves into the wild at this time.

Thank you for the opportunity to comment on the DEIS on the reintroduction of Mexican wolves. Please feel free to contact me or member of my staff if you have any questions concerning our comments.

Sincerely,

Jerry Maracchini
 Jerry Maracchini
 Director

JAM/GS/1a

xc: Gary Johnson, Governor
 NM State Game Commission
 Jim Vaught, NMDGF
 Dan Sutcliffe, NMDGF
 Andrew Sandoval, NMDGF
 Area Operations Chiefs, NMDGF

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5. Comment acknowledged.

6. See response number 1. We agree that increased local support and participation would enhance the success of reintroduction efforts.

7. Ungulate population ecology, predator-prey relationships, predator-predator relationships, and other ecological factors relevant to wolf recovery are extremely complex and incompletely understood. The FWS believes it is an over-simplification to view wolf reintroduction as just an addition of another source of ungulate mortality. We believe the statement is not well supported by data from areas where wolf populations are recovering nor by expert opinion.

8. We acknowledge NMDGF's concern; however, our impact analyses and the experience in other states where wolf populations are recovering suggest that the added burden of livestock depredation cases should be manageable.

New Mexico Office of the Governor:

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OFFICE OF THE GOVERNOR

RECEIVED NOV 13 1995

GARY E. JOHNSON

November 7, 1995

501-827-3600

Mr. David R. Parsons Mexican Wolf Recovery Program U.S. Fish and Wildlife Service P.O. Box 1306 Albuquerque, N.M. 87503

Dear Mr. Parsons:

Please accept this letter as a comment to the U.S. Fish and Wildlife Service (FWS) proposal concerning Mexican Wolves as detailed in the Draft Environmental Impact Statement (DEIS).

As Governor of the State of New Mexico, my first obligation is to the people. Consequently, a decision made by my office regarding the Mexican Wolf Proposal must be made against the backdrop of the administration's fundamental goals. In this instance, the goal is quite simple: "Unite private and public sector interests in such a manner that opportunities for a robust economy will not be jeopardized."

I see my office as being ultimately responsible for the economic well being of the people of this state. It is this sense of responsibility, combined with the absence of credible information that has led me to conclude that the FWS Mexican Wolf proposal should not be endorsed by this office.

I mention a lack of information for a reason. At my request, the Lieutenant Governor's office has reviewed volumes of information pertaining to this issue, yet none of it provides us with the economic impact analysis that is required by state law. Meanwhile, opponents of the Wolf Proposal have flooded my office with information suggesting that approval of the plan will devastate local economies. Equally troubling is the fact that no one seems to be certain that this subspecies actually inhabited the proposed recovery areas (FWS Endangered Species Report 18, page 11). The net result of these inadequacies is a proposal so devoid of crucial data that no responsible public official can reasonably support it.

Recognizing that my position will likely prompt a torrent of input from supporters of the proposal I would like to ask the question: Why were National Environmental Policy Act guidelines that direct federal and state agencies to cooperate with each other ignored?

As the Governor of this state it would be foolish for me to hastily give my blessing to a plan that was crafted without input from my office. Unlike the authors of the DEIS, I am unwilling to leverage individual financial security against a "mixture of folklore, anecdotes, and impressions." Hence, I am opposed to the FWS Mexican Wolf Proposal.

Sincerely,

Gary E. Johnson Governor

1. We have been unable to identify any requirement under New Mexico law that this federal proposal is subject to an economic impact analysis. Still, we believe the FEIS provides the most detailed economic impact projections that can reasonably be done. We did contract with an expert economics consultant. We are unaware of any credible information that wolf recovery will "devastate local economies." As far as lack of information, see the previous comment from the Department of Game and Fish that the DEIS is based on the "best available information."

2. NEPA guidelines were followed; see the previous comment from the New Mexico Department of Game and Fish, which participated in the EIS process, that commends the cooperative process used in preparing the EIS.

Texas Parks and Wildlife Department:

1. Thank you for your comment.



TEXAS PARKS AND WILDLIFE DEPARTMENT 4200 Smith School Road • Austin, Texas 78744 • 512-389-6800

COMMISSIONERS

JEE M. BASS, Chairman P. Wynn, Vice Chairman, Atty.

NOLAN RYAN, Vice Chairman, Atty.

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WALTER JIMENEZ, Brownsville

PERRY BASS, Brownsville

Handwritten routing slip table with columns for various departments and names.

October 24, 1995

Ms. Nancy M. Kaufman Regional Director U. S. Fish and Wildlife Service P. O. Box 1306 Albuquerque, NM 87103

Dear Nancy:

This is in response to the U. S. Fish and Wildlife Service Draft Environmental Impact Statement on its proposal to reintroduce the Mexican wolf within its historic range in the southwestern United States.

The Texas Parks and Wildlife Department has no comment on the Service's proposed action (Alternative A) or other reintroduction proposals (Alternative B and C) since none of these, either directly or indirectly, affect Texas. Moreover, we understand that the Service has not proposed a reintroduction to any area in Texas and that reintroduced wolves from other states will not be allowed to disperse into Texas. This we support.

We agree the potential for natural recolonization of Mexican wolves in Texas (Alternative D) is highly problematic and unlikely. However, given what is known at this time, it is the only acceptable alternative for Texas that the Department can support.

In conclusion, the Texas Parks and Wildlife Department requests that the Service take no action to reintroduce the Mexican wolf to Texas.

Sincerely,

Andrew Sanson Executive Director

AS:JC:frh

ANDREW SANSON Executive Director

Handwritten notes: CC 10-112, In CC system, at least, BK

RECEIVED stamp

27 OCT 1995

NICK PERRY, Commissioner



TEXAS DEPARTMENT OF AGRICULTURE

Making Texas the nation's leader in agriculture while providing efficient and extraordinary service.

October 31, 1995

Ms Nancy Kaufman
Regional Director
U S Fish and Wildlife Service
P.O. Box 1306
Albuquerque, New Mexico 87103

Dear Ms. Kaufman

Recent events surrounding the proposed reintroduction of wolves into the Southwest compel me to share the following concerns with you

My first concern is the U.S. Fish and Wildlife Service's (USFWS) treatment of those most likely to be affected by this decision. Although an "open house" on the reintroduction of wolves was held in Alpine, Texas, it provided no opportunity for potentially affected landowners to comment in an official public forum. Potentially affected ranchers and property owners had to travel at least 400 miles to Austin in order to participate in such a hearing. Of course, since Austin is the headquarters for most of the organizations supporting reintroduction, those folks had merely to travel a few blocks to stack the hearing with emotional appeals for the rights of wolves.

Of greater concern is the lack of scientific basis for the proposal. For decades, West Texas ranchers have been cooperating with Texas wildlife officials and biologists to restore pronghorn, elk, and the rare and valuable desert bighorn to the mountain and plains of the Big Bend. Predation has been a key obstacle. To introduce another large predator into the Southwest flies directly in the face of these efforts. Further, if an area does not have a prey base large enough to support large predators, they will find food where they can. The most readily available food source then becomes domestic livestock. Therefore, by introducing wolves into an area without ensuring an adequate food supply, the stage is set for immediate conflict. Did the Service consult with any of these conservation-minded ranchers or dedicated state agency biologists before devising this plan?

The most serious problem surrounding this proposal stems from the implementation of the Endangered Species Act (ESA) and the property rights concerns it raises. Who is really helped by the successful introduction of wolves into the southwest? Local landowners? Hardly. Even desirable species such as the warbler are *fama non grata* because of the land control implications federally listed species bring along as baggage.

P. O. Box 12847, Austin, TX 78711 • (512) 463-7470
For the hearing impaired: Relay Texas (1-800-735-2988 (voice) or 1-800-735-2999 (TDD))

Nancy Kaufman
page 2

Are other species in the Big Bend region helped more by wolves or by concerned ranchers using modern wildlife management techniques and a carefully controlled harvest which helps sustain open space habitat and fuel healthy rural communities?

It is indeed unfortunate that Congress has not been able to effect meaningful reform to the ESA so far this session. Tragically, the trust that has been eroded between landowners and wildlife officials can only be restored when the ESA and USFWS's top-down implementation are both amended. In the meantime, legitimate wildlife conservation is the big loser.

Texasans care deeply about their land and are very supportive of wildlife conservation. But the implementation of the ESA has shown them a wolf in sheep's clothing. Landowners will not cooperate while there is a federal foot on their neck, but remove that foot and you may be surprised what can happen, however, it won't be automatic. There must be better communication, better data, and more commonsense, if trust is to be restored.

The Texas Department of Agriculture has been deeply involved in Texas endangered species issues for some time. We offer our help in resolving these conflicts when the USFWS is ready to consider the people part of the wildlife equation. Until there are needed changes made to the ESA, I oppose any attempt to pursue wolf reintroduction efforts.

Sincerely,

Rick Perry
Commissioner

RP/S/mcm



MESCALERO *Apache* TRIBE
Wendell Chino, President Mescalero, New Mexico 88340

October 30, 1995

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USFWS REG #

OCT 31 '95

FWE

Mr. David R. Parsons
Mexican Wolf Recovery Program
U.S. Fish & Wildlife Service
P.O. Box 1306
Albuquerque, New Mexico 87103-1306

Dear Mr. Parsons

The Mescalero Apache Tribe supports the comments submitted by the Bureau of Indian Affairs, Mescalero Agency, concerning the reintroduction of the Mexican grey wolf, and in particular the proposed White Sands release site. Indeed, the Tribe is very concerned for the protection of all its precious resources. Proponents for the reintroduction of the wolf have maintained that such actions are necessary to restore balance to the ecosystem. To presume that nature is a static entity requiring man's intervention is contrary to the basic concepts of ecosystem management, and is truly arrogant. Reintroduction plans do not adequately address the extent to which the balance of vegetative and animal species composition in the Southwestern region has shifted since the wolf freely roamed these areas. For persons who spend very little time in the natural environment, it can be difficult to comprehend the speed with which nature begins healing itself. At this point, reintroduction of the wolves could be likened to the introduction of an exotic species with numerous untold ramifications. In the event that the animals do not find a niche in the changed habitat, they would face needless suffering and certain death.

The Mescalero Apache Tribe cannot condone the reintroduction of this endangered species into the Southwest. From a cultural perspective, the wolf moved away from this area for a reason. The void left by the wolf has since been filled by other predators such as coyotes, mountain lions, and bobcats. Change has occurred, and nature has compensated. To attempt to play 'God' and interfere at this point will wreak havoc with a system that has already equalized.

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Mescalero Apache Tribe:

I. We acknowledge that some vegetation and animal composition shifts have occurred since wolf eradication. However, we do not believe that these shifts would limit wolf reintroduction in the areas proposed. On the WSWRA, the removal of grazing since the 1940s has likely enhanced the natural vegetation and plant communities of the San Andres and Oscuras. Similarly, in the BRWRA, the natural flora and fauna may be in better condition overall now than at the time wolves were exterminated, when severe overstocking of livestock and overharvesting of the native ungulates was occurring (see Ligon 1927).

2. We disagree that the wolf is equivalent to an exotic. The wolf has successfully returned in the northern Rockies and elsewhere after long absences. The wolf did not "move away"; it was deliberately exterminated.

For these reasons, the Mescalero Apache Tribe supports Alternative D of the Draft EIS, under which wolves raised in captivity would not be released. We appreciate the opportunity to comment on the Draft Environmental Impact Statement on the Reintroduction of the Mexican Wolf to its Historic Range in the Southwestern United States.

Sincerely

Thora Walsh-Padilla
Director, Office of
Environmental Protection

Concur:

Wendell Chino
President, Mescalero
Apache Tribe

Agency et al. Comments and Responses
San Carlos Apache Tribe - Monette

THE SAN CARLOS APACHE TRIBE

San Carlos Avenue
P.O. Box 0
San Carlos, Arizona 85510
(520) 475-2361
Fax (520) 475-2561



Raymond Stanek
Tribal Chairman

Marvin Mui Jr.
Tribal Vice-Chairman

1. If a wolf reintroduction project is approved, the FWS would enter into an agreement with the San Carlos Apache Tribe for wolf management, if the Tribe desired.

October 31, 1995

To: Dave Parsons, Ecological Services USFWS
Mexican Wolf Recovery Program
PO Box 1306
Albuquerque, New Mexico 87103 1306

From: Darrell J. Monette, Wildlife Habitat Specialist
San Carlos Apache Tribe
Recreation and Wildlife Department
PO Box 97
San Carlos, Arizona 85510

Subject: Comments on the Draft Environmental Impact Statement for the Reintroduction of the Mexican Wolf within its Historic Range in the Southwest United States.

The question that comes to my mind and certainly others is "Why does the Federal Government put themselves in situations such as the reintroduction of the Mexican Wolf?" Answer: For several decades the Federal Government has made some serious erroneous mistakes in terms of wildlife management in the United States. The mistakes and some decisions that were made in the early 1900s put this subspecies (Mexican wolf) on the list in the first place. Now the Government wants to reintroduce this so called "burden" from the past and essentially telling the public that they made a big mistake and want to fix it. Wildlife certainly can not make these mistakes in order to survive and reproduce for the next generation to take its place. The next question: "Should we let Mother nature take its course and hope that everything will be all right?" Answer: "Why not, haven't we done enough damage already?" Eu seems have altered this landscape so much since their arrival to the New World. I am a Native American and I think that the people of the United States should start "living in harmony" with nature and respect the land as it is and not how they would like to see it become. Sure you can manage landscapes or wildlife populations for economic reasons, but you do not have to clear out 150,000 acres of timber because it is a renewable resource, or eradicate a subspecies because it was a nuisance to society or managers.

I share the same concern as Cecil Brown, Wildlife Biologist for the San Carlos Apache Tribe so I won't be to repetitive. Since the introduction to cattle to the New World, the Apache People have adopted cattle ranching into their culture. The Cattle Associations on the San Carlos Apache Indian Reservation strongly oppose the reintroduction of the Mexican wolf and would only except Alternative D. No action/natural recolonization. From my standpoint as the Tribal Wildlife Habitat Specialist, I think that if and when the final decision were made to release captive-raised Mexican wolves under Alternatives A, or B in the BRWA, then there needs to be some kind of inter-Governmental agreement developed between the San Carlos Apache Tribe and the USFWS. However, I strongly oppose Alternative C. the wolves would receive full protection under the Endangered Species Act.

Sincerely yours,

Darrell J. Monette, Wildlife Habitat Specialist

Paul Novek Jr., Director of the Recreation and Wildlife Department, San Carlos Apache Tribe

Agency et al. Comments and Responses
San Carlos Apache Tribe - Brown

U. S. Fish and Wildlife Service
Mexican Wolf EIS
P. O. Box 1306
Albuquerque, New Mexico 87105

October 18, 1995

I have worked with the Mexican Wolf Reintroduction Environmental Impact Statement team as a member over the past 2 + years and I have reviewed the EIS draft. I have four areas of major concern with the proposed reintroduction in the Blue Range Recovery Area and several of a minor nature. Both of the proposed alternatives, A and B, will release wolves into primary release areas located directly adjacent to the San Carlos Reservation in habitats with close similarity to habitats on San Carlos. Wolves will fresh cross this artificial boundary onto the Reservation. My major areas of concern are expressed below.

1. The EIS does not directly address the potential impacts of the wolf in these adjacent similar habitats and on the resources located on the Reservation. The livestock depredation scenario and the impacts of the wolf on game resources are based on information from the states of Arizona and New Mexico with no input from tribal representatives. Impacts on tribal resources are in a separate section of the EIS, with little depth.

2. There are three tribal ranches abutting the primary release area: Point of Pines, IDT, and Slaughter Mountain. Cattle management practices are not the greatest with tribal cattle and I would expect that depredation on reservation cattle would exceed that suggested in the EIS draft. There is no guarantee that livestock killed or injured by wolves on the reservation will be compensated for by the Defenders of Wildlife as will be the case for non-reservation livestock depredations although this issue was greatly reduced by Craig Miller's presentation at the Tribal meeting on October 16, 1995.

Livestock losses by IDT should be compensated directly to the Tribe through the Tribal Council. Livestock lost by Point of Pines and Slaughter Mountain should be compensated directly to the owner where identifiable or to the Cattle Association when the owners are not identifiable. If the wolves should depredate on livestock of other associations compensation should follow the above guidelines. If the Defenders of Wildlife do not guarantee this compensation then the U.S. Fish and Wildlife should assume the liability.

Better management of the cattle would reduce the vulnerability of the cattle to wolves but the Associations are financially unable to impose better management. This would include a common breeding season, seasonal rotation of livestock to less vulnerable pastures, round up of all weanlings, and less cannon on the landscape. The Fish and Wildlife Service should provide the necessary funds and training to improve the cattle management by the affected Associations.

3. An intergovernmental agreement needs to be developed between the U.S. Fish and Wildlife Service and the San Carlos Apache Tribe on management of the wolf on Tribal lands. This must include support from the Federal Government to train, equip, and fund tribal participation in monitoring wolf activities and their impacts on Tribal resources.

4. Impacts of wolves on tribal wildlife can be expected but the degree is unknown. Under the Trust responsibilities the Federal Government is responsible to compensate the tribe for wildlife losses, both resident and those migratory onto the reservation, resulting from their introduction of the wolf into the ecosystem. The wolf will reduce the elk migrating onto the reservation from the Apache-Sitgreaves National Forest, estimated at 500-750 annually. These together with approximately the same number

1. Wolf recovery has not been proposed for the San Carlos Apache Reservation, and wolves that disperse there could be captured and removed, with the Tribe's permission and cooperation. Because the Tribe has stated its opposition to wolf recovery, we assume the Tribe would take advantage of this provision of the proposed experimental population rule. Because wolves would not be allowed to recolonize the reservation under the Preferred Alternative, impacts to reservation resources are predicted to be minor. Input from the San Carlos Apache Tribe has been sought throughout the development of the EIS through the Tribe's representative on the Interdisciplinary Team.

2. The suggestion that livestock depredation would be higher than predicted on the reservation is speculative. Wolves would only occupy the reservation temporarily until they could be captured and removed. Wolves seen in the act of attacking livestock could be killed under the management provisions. It is our understanding that the Defenders of Wildlife compensation program would pay for livestock killed by wolves on the reservation.

3. The FWS lacks legislative authority to compensate for livestock or other animals killed by wolves.

4. The FWS believes that Tribal livestock associations will not be significantly affected by implementation of the Preferred Alternative. Nevertheless, we anticipate that one of the duties of project personnel, especially the animal damage control specialist, will be to help livestock owners improve management practices to reduce the potential for losses to predation.

5. The FWS supports the establishment of an agreement with the Tribe and has initiated efforts at the staff level to develop draft language for such an agreement.

6. The FWS considers implementation of the ESA to be consistent with its trust responsibilities to the Tribe. We do not believe the law supports the suggestion that the FWS's trust responsibilities includes an obligation to reimburse the Tribe for wildlife losses attributable to wolf predation.

7. See response number 6 above. Because of the number of variables and uncertainties involved, it would be extremely difficult to isolate the effects of a reintroduced wolf population on the populations of deer and elk that migrate between the Reservation and the BRWRA.

8. We agree that wolves might prey on wild turkeys. We lack clear information or data to suggest how much. Where wolves are recolonizing in wild turkey range in Wisconsin, little predation on turkeys has been observed (R Thiel, Wisconsin DNR, pers. comm.).

9. Suggested changes have been made in the FEIS, except for part of the suggestion for p. 4-23. We have incorporated some of that information in Chap. 3 and Chap. 4, under Alt. C. We have pointed out in the Introduction of Chap. 4 that the impacts of Alts A and B could affect the adjacent reservations if the wolves are not promptly controlled, referencing the types of impacts discussed under Alt. C. Information regarding migration on and off the reservation appears incomplete and the implications as far as hunting on the reservation are uncertain.

migrators from the White Mountain Reservation provide hunting for over 400 tribal members and \$45,000 in annual license fees from non-tribal members. Additional income is derived from fees to tribal member guides. An unknown number of mule deer also migrate from the Apache-Sitgreaves National Forest onto tribal lands into an area which provides over 50% of the tribal member deer hunting. The wolves will also have some impact on the resident deer, elk, and antelope in this area. Some of these elk are extremely valuable, over \$40,000 each in tag fees to non-members, and are also highly desirable to members.

The Tribe's Wildlife Management Program is financially unable to document the current numbers of deer and elk migrating onto the reservation accurately, let alone investigate the potential impacts of wolves on the wildlife and on these migrations. This is an area that will fall under the Federal Governments trust responsibilities to the Tribe and the resources necessary to achieve this data should be provided to the Tribe by the U.S. Fish and Wildlife Service.

The above completes my general comments on the Draft FEIS. I will support the reintroduction of the Mexican Wolf into The Blue Range area if the above concerns are adequately covered. Alternatives A or B. I support the reintroduction of the Mexican Wolf into the White Sands area. Alternatives A or B. I oppose the Alternative C reintroduction under full endangered species status.

The following concerns some specific points in the draft FEIS which I believe need some clearing up or errors:

pg 3-8 Merriams turkeys are potential prey species, ranging from 12-25 lb., and are common to numerous in the BRWRA. I would predict some significant predation on turkeys on the San Carlos Reservation. I estimate a population of 1500-2500 turkeys on San Carlos within 10-15 miles of the primary release area.

pg 3-22 There have been 461 stock tanks built on the reservation.

pg 3-23 The Mexican Spotted Owl and The Southwestern Willow Flycatcher are also found on the Reservation.

pg 3-26 change the # to-- Six of the seven. change sentence 3 & 4 to the following: Moving herds toward calving pastures, limiting the amount of time that cows spend with bulls (to synchronize calving), and rotating cattle to less vulnerable pastures could be expected to reduce predation but are currently beyond the means of the Associations.

pg 4-23 add-- San Carlos-- Five hundred - 800 elk migrate annually from the Apache-Sitgreaves National Forest onto the Reservation. These elk, together with a similar number migrating from the White Mountain Reservation, provide the majority (85-95%) of the elk hunting for members on the reservation. These elk also provide \$45,000 non-member tag fees. Most (50%) of tribal deer hunting occurs on deer in this area with an unknown migration from the Apache-Sitgreaves. Alternatives A and B will impact these migrators annually.

pg 4-40 delete the sentence: The ongoing improvements in livestock management may mitigate this.

A-3 add turkeys as occasional prey.

Cecil Brown
Wildlife Biologist

HENRY BONILLA
23rd District TEXAS
427 LIVINGSTON DRIVE, BEACON
WILMINGTON, DE 19815
302-238-4441

Congress of the United States
House of Representatives
Washington, DC 20515-4323

October 6, 1995

COMMITTEE ON APPROPRIATIONS
SUBCOMMITTEE ON LABOR, HEALTH AND
HUMAN SERVICES AND EDUCATION
SUBCOMMITTEE ON NATIONAL SECURITY
SUBCOMMITTEE ON DISTRICT OF COLUMBIA

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SENATE REG 2
OCT 11 95
FWS

Mr. David Parsons
United States Fish and Wildlife Service
Ecological Services
Post Office Box 1306
Albuquerque, NM 87103

Dear Mr. Parsons:

I am pleased that the U.S. Fish and Wildlife Service (USFWS) is holding public hearings on its proposal to reintroduce Mexican wolves to the Southwest region of the United States. I hope the USFWS will listen to the concerns I and my constituents have about this proposal.

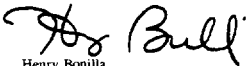
I am concerned that the reintroduction of this predator will have a severe impact on two of the most important industries for this region, ranching and tourism.

As the federal representative for the Big Bend and Guadalupe Mountains National Parks, as well as thousands of square miles of West Texas ranch land, I believe the USFWS must reconsider this plan before jeopardizing the livelihood of my constituents.

The Southwest is well known for its natural beauty. In particular, the Big Bend and Guadalupe Mountains National Parks attract hikers, campers and nature lovers from around the country. This tourism supports many communities in the region. Many will fear encountering this predator in these popular vacation spots resulting in a possible decline in tourism.

Ranchers have every reason to fear the introduction of a new predator. The likelihood of range animal losses will increase leaving ranchers to bare an even greater financial burden. This region depends on the ranching industry for survival and to deliberately impose a risk such as reintroducing the wolf is not wise.

Many thanks for your interest and attention to this important matter.

Sincerely,

Henry Bonilla
Member of Congress

HB 101

PLEASE RECYCLE
1320 ALBUQUERQUE, SUITE 300
N.W. ANTONIO, TX 78208
214-891-8655
300 METAMORPHOSIS, SUITE 1138
DALLAS, TX 75260
214-726-4662
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DALLAS, TX 75202
214-774-8847
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DALLAS, TX 75210
972-488-8823
PRINTED ON RECYCLED PAPER

JACK A. BROWN
STATE REPRESENTATIVE
DISTRICT 4

STATE CAPITOL, HOUSE WING
1100 WEST WASHINGTON
PHOENIX, ARIZONA 85007
800-342-3444



Arizona House of Representatives
Phoenix, Arizona 85007

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JOINT LEGISLATIVE TAX COMMITTEE

HOUSE ETHICS COMMITTEE

LEGISLATIVE COUNCIL

October 20, 1995

U.S. Fish and Wildlife Service
Mexican Wolf EIS
P.O. Box 1306
Albuquerque, NM 87103

Gentlemen:

I am writing to recommend that the Mexican wolf not be reintroduced in the southwestern U.S. I think there are many reasons why this is not a good idea. I think it would be dangerous not only for humans but also for many species of animals, some of which are already endangered. I think we need to make a better environment for the Mexican wolf in a controlled situation, such as a large area in a zoo that would give them natural habitat but from which they could not escape. I just do not think we need to turn the clock backward.

Thank you.

Sincerely,

JACK A. BROWN
State Representative

JAB/jb

Agency et al. Comments and Responses

State Legislators:

Brown:

1. The wolf does not pose a significant danger to humans or to the survival of any other species.

State of New Mexico
House of Representatives
Santa Fe

E. SHIRLEY BACA
Dona Ana-Dist. 35

1501 East Blvd.
Las Cruces, NM 88001

Home Phone: (505) 522-7335

VICE-CHAIRPERSON
Consumer & Public Affairs

COMMITTEES:
Judiciary
Printing & Supplies

October 18, 1995

U.S. Fish & Wildlife Service
P.O. Box 1306
Albuquerque, NM 87103-1306

TO THE U.S. FISH & WILDLIFE SERVICE

New Mexico is a state that has historically been a reflection of diversity and differences. Our geography is varied and expansive; our people differ in ethnicity, cultures, and spiritual beliefs; and our economy expands from agriculture, ranching, and technology, to small manufacturing, retail and services. In almost **ALL** ways, New Mexico's population prides itself for their individuality, love of freedom, and diversity.

My father and his ancestors have a long history of being ranchers -- he's from Adelino (near Tome, NM), and they had a lot of acreage up near the Manzano Mountains, and for generations after generations; they were ranchers -- cattle and sheep -- and they supported themselves and their families with this way of living off the land. When we were little, my Dad loved to tell us stories of his "trail runs" up to Colorado and Wyoming to deliver the cattle, and of the hardship and adventures they encountered along the way.

Also, guess what? My father is a **LONG TIME** - family generations - of being a Republican -- and he won't change his political affiliation, not even for me. **BUT HE SAYS HE VOTES FOR ME**, and he often votes for Democrats, and as he likes to say, "He votes for the person and what they stand for -- **NOT** their political affiliation".

Anyway, in discussing this issue about the "Lobo" with him, I asked him as a former rancher what did he think about reintroducing it to New Mexico again. And he said to me, "If God hadn't wanted the Lobo [Mexican wolf] in this

Baca:

1. Thank you for your comment.

U.S. Fish & Wildlife
Page Two
October 18, 1005

world he wouldn't have created them." He also remembered a time when the
Iboran wild in this area and provided a very necessary function to the land,
and he remembered that in the 1930's, 40's, and the 1950's, the government
gave a lot of money to the ranchers to get rid of them. He said to me very
distinctly "The lobos came first, not the cattle, therefore **THEY** are the natives
to this land and play a very important function in the diversity of this land"

I'm NOT a rancher by any means, and I don't know a lot about all of the
issues in question here, BUT I do understand that if it IS an issue of economics
and that if the Mexican wolf kills off a rancher's livestock, that there **ARE** means
of compensating the rancher for the loss of the livestock that can be demonstrated
to be due to wolf predation.

The U.S. Fish & Wildlife Service describes the Mexican wolf as "one of the
rarest land mammals in the world". Well, New Mexico is rare; our population
is diverse, our land is diverse, and we pride ourselves to be people who are good
stewards of the land. I believe that part of that stewardship is to respect and protect
ALL of the creatures and natural resources that God has gifted us with.

As a native New Mexican, with a family lineage tracing back to the original New
Mexico colonizers; as a daughter of a former rancher/Tome Land Grant member;
and as an individual who respects and takes pride in our lands in New Mexico,
I **DO** support an experimental reintroduction of the Mexican Gray Wolf in a way
that will minimize the impact on established livestock operations, and which will
provide full protection for wild wolves under the Endangered Species Act.

Sincerely,


E. SHIRLEY BACA

Vaughan:

1. The Alamogordo Zoo wolf exhibit is only a small part of the captive breeding program, which includes an additional 23 zoos and wildlife sanctuaries throughout the United States. One important purpose of the Mexican wolf exhibit at the Alamogordo Zoo is to educate people about the native species of New Mexico.

State of New Mexico
House of Representatives
Santa Fe

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COMMITTEES
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Voices & Elections
Enrolling & Engineering (B)

GLORIA C. VAUGHN
R-Ours-Dist 51
503 East 16th Street
Alamogordo, NM 88310-6406
Home Phone: (505) 434-2819

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USFWS REG 2
NOV 2 95

OCTOBER 21, 1995

THE UNITED STATES FISH AND WILDLIFE AGENCY
P. O. Box 1306
Albuquerque, New Mexico 87103

REGARDING: MEXICAN GREY WOLF RE-ENTRY

Dear Sirs:

Although I attended your HEARING at Socorro recently on the plan to re-introduce the MEXICAN GREY WOLF into the range area of our state, I feel that I also must have my letter in your file regarding this serious matter.

I am opposed to putting the wolf back into the wilds of our state, or for that matter, any of the areas of our Southwestern United States.


These animals live from eating meat...and that meat can come from our farmers, ranchers and rural people's animals upon which wolves prey. Their packs can spread about our area and do real damage to our people who wish to live peaceful lives.

The Alamogordo Zoo where some of these animals have been bred and raised is in my legislative district. I have been receiving a lot of opposition to your plan from people in my district 51 who both oppose the wolf re-entry program and feel that our city should not have allowed the breeding of these animals in our zoo if such would cause the controversy that it has created among our people in this area.

For the money that your agency has been squandering about the cost of this unwanted program, we would be much better to spend that money on our children's education or health programs, as well as for others in need in our society. As I said in Socorro: "Our human species needs this care and financial attention before we use the wolf to create controversy and problems in our society."

I hope that you will take my comments into consideration. May I hear from you in this matter.

MOST SINCERELY YOURS,


Gloria C. Vaughn
Representative, District 51
(505) 434-2819

Williams:

1. We disagree that the wolf disappeared naturally; it was deliberately exterminated.

State of New Mexico
House of Representatives
 Santa Fe

W.C. "DUB" WILLIAMS
 R4 Laves, Lincoln & Otero Dist. 56
 HC56, Box 18
 Glencoe, NM 88324
 Home Phone: (505) 778-4116

COMMITTEES
 Agriculture & Water Resources
 Education
 Enrolling & Engrossing (B)

September 20, 1995

U. S. Fish and Wildlife
 Mexican Wolf BIS
 P. O. Box 1306
 Albuquerque, New Mexico 87103-1306

Re: Mexican Wolf


Dear Sir:

Farmers, ranchers and folks that make their living off the land have many things to deal with in their lives. Lack of rain and water, predators, unpredictable markets for their products, paying bills, taxes and maintaining a family are but a few.

On the range in southern New Mexico, the wild horses are dying from lack of food and water due to prolonged drought. It does not make sense to impose another predator on the lives of these people. The more common sense approach would be to help the people function better in their environment.

Man was not on earth when the dinosaur disappeared. Through the natural processes of nature, life forms (plant and animal) disappear. I would encourage us all to accept that fact and go on with our lives.

I stand in opposition to the introduction of the Mexican Wolf into the southern part of New Mexico or any place else for that matter.

Sincerely,

 W.C. "Dub" Williams
 State Representative
 District 56

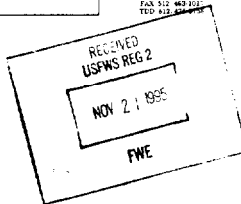


Frank Madla
 Texas State Senate
 District 19

1911 E. McLean Dr. Suite 150
 San Antonio, Texas 78216-2296
 717-546-1000
 FAX 717-546-1001
 P.O. Box 12068
 Austin, Texas 78712
 512-463-0110
 FAX 512-463-0111
 TED 512-463-0112

November 13, 1995

Ms. Nancy M. Kaufman
 Regional Director
 U.S. Fish and Wildlife Service
 P. O. Box 1306
 Albuquerque, New Mexico 87103-1306



RE: Reintroduction of the Mexican Wolf within its Historic Range in the Southwestern United States

Dear Ms. Kaufman:

I am writing on behalf of the constituents that I represent in west Texas, most of whom earn a living by raising sheep and goats. The issue of the release of and specifically the potential recolonization of the Mexican Wolf in the Big Bend National Park Area has created some concern. Questions have been raised concerning the hazards that the Mexican wolf may expose to the livestock, agriculture, and tourist in the Big Bend Park and the surrounding areas. If these Mexican wolves are released, it will not take long for their effect to be felt by the ranchers. Additionally, it is preposterous to believe that a privately funded reimbursement program, which would reimburse ranchers for their losses if they could prove that their livestock had been killed by a wolf, would work.

The proponents of this plan obviously do not understand necessities of modern ranching. Profitable ranching is not done on five acre tracts, but rather on five hundred and five thousand acre tracts. Conceivably a rancher may not discover a lost sheep or goat for several days. Then you ask this rancher to provide evidence that this sheep or goat was killed by a wolf. This is downright absurd.

With all this in mind I must express to you that the ranchers and business people that I represent in Big Bend National Park area do not support the release, recolonization, nor any action to directly ensure that the Mexican wolf establish the Big Bend National Park Area as its domain. These feelings have been shared with me and members of my staff, and therefore, I must formally request that the U. S. Fish and Wildlife Service do not release, recolonize, nor provide any incentive to attract the Mexican wolf into the Big Bend National Park Area.

Madla:

1. See response to Rep. Bonilla, above. Wolves are not proposed for release in Big Bend NP.
2. The FWS does not propose to "attract" wolves to Big Bend, but would take steps to protect any wolves that naturally recolonized that area to enhance their survival. In that sense, the FWS would "encourage" wolf recovery.

Letter to Nancy Kaufman, Regional Director
U.S. Fish and Wildlife
November 13, 1995
page 2

I must also express my dissatisfaction in the location of the October 12, public meeting. While Austin, Texas may be the state capitol and home to some supporters of the wolf release, it was miles away from those people who are directly affected by the proposed wolf release.

3

If you have any questions, please do not hesitate to contact me or my Legislative Assistant, Harold Oliver, if you should have any questions.

Yours truly,

Frank Madla

FM ho

cc: Lt. Governor Bob Bullock
Congressman Henry Bonilla
Nancy Kaufman, Regional Director, US FWS
Texas Parks and Wildlife Commissioners
Andrew Sansom, Executive Director, Texas Parks and Wildlife
Senator Bill Sims
Representative Layton Black

LAYTON BLACK
State Representative
District: 54

The State of Texas
House of Representatives

October 26, 1995

P.O. Box 2910
Austin, Texas 78768-2910
512-463-0684

Ms. Nancy M. Kaufman
Regional Director
U.S. Fish and Wildlife Service
P.O. Box 1306
Albuquerque, NM 87103

Dear Ms. Kaufman:

I am a member of the Texas House of Representatives whose district encompasses an area of the state where many families earn their living raising sheep and goats. I tell you this so that you will understand my particular concerns regarding the reintroduction of the Mexican wolf into New Mexico and Arizona, and the eventual reintroduction of that animal into the Big Bend area of Texas.

1

Once released, it will not take long for the wolves to range into ranching country in search of food. Ranchers will begin to experience additional losses of their valuable livestock from this reintroduced predator. Proponents of the reintroduction plan tout the success of a privately-funded reimbursement program. Ranchers, they say, would be compensated for their losses if they could prove their livestock had been killed by a wolf.

Texas is a big state, Ms. Kaufman. People who raise sheep and goats and even cattle in far West Texas do so on very large tracts of land. What will it cost those ranchers in time and manpower to monitor their herds? Whatever compensation they receive is unlikely to offset what they will expend in order to produce evidence sufficient to prove which predator was the killer.

I attended the public hearing held by your agency on October 12, in Austin. That your agency would schedule a formal public hearing in a location so far from the people who will be affected was a shameful abuse of power. The few landowners who could attend, did so at great personal expense.

On the other hand, I noted that the people who make their living from research grants or from the sale of wolf merchandise were well represented. Your choice of locations was disappointing, but not surprising. It was obvious you really didn't want to hear from those who have the most to lose.

The reintroduction of the Mexican wolf is a bad idea. I cannot conceive of how the public as a whole will benefit from placing this additional burden upon Texas ranchers. Our agency has

OCT 28 1995
FWL

Black:

1. **Wolf reintroduction into Big Bend is not planned. No one in Texas would be affected by the proposed wolf releases.**

Ms. Nancy Kaufman
October 26, 1995
Page 2

certainly earned its reputation for coming up with ideas that hurt working people. Furthermore, by scheduling an important public hearing hundreds of miles from the people who must pay the price for your decision, you have only compounded a serious public relations problem.

I believe that Texas landowners would be much more amenable to the presence of the wolf if they were given the right to manage the animal in the same way as they manage the other resources on their land. However, so long as your agency insists on fostering an adversarial relationship with the people who own the property on which these creatures could flourish, your plans will meet with little success.

2

For what it is worth, I ask that you file this letter among the other official comments upon this ill-advised proposal. If you should have any questions, please do not hesitate to contact me.

Sincerely,

Byron Black
State Representative

FB:jb

cc:

- Governor George W. Bush
- Lt. Governor Bob Bullock
- Speaker James E. "Pete" Laney
- Senator Teel Bivins
- Senator Bill Sims
- Senator Frank Madla
- Commissioner Rick Perry
- Texas Parks and Wildlife Commissioners
- Andrew Sansom
- David K. Langford

2. This right to manage wolves could come to landowners if the Mexican wolf is ever de-listed. But now, under the ESA, the FWS is required to work for recovery of the wolf. This duty would not be served by granting unlimited private management authority. Nevertheless, the experimental population rule does represent the FWS's granting of limited management flexibility to private landowners, including permission to harass wolves and, under certain circumstances, to kill them.

State of Texas
House of Representatives



Pete P. Gallego
District 74
P.O. Box 2919
Austin, Texas 78768-2919
(512) 465-0000

P.O. Box 177
Austin, Texas 78651-0177
(512) 827-1742

P.O. Box 420665
Dallas, Texas 75242-0665
(214) 774-0800

October 10, 1995

Ms. Nancy Kaufman, Regional Director
United States Fish and Wildlife Service
P.O. Box 1306
Albuquerque, NM 87103

Dear Ms. Kaufman:

It has come to my attention that a formal public hearing regarding the re-introduction of the Mexican Brown Wolf to West Texas is planned for October 12. This hearing is scheduled to be held at the Joe C. Thompson Conference Center on the University of Texas Campus in Austin from 4 P.M. to 9 P.M.

I represent District 74, which comprises a great deal of West Texas. One of the most important components of our economy here is ranching. The re-introduction of the Mexican Brown Wolf would be detrimental to ranchers throughout West Texas. Existing West Texas predators account for a great loss of livestock. It is difficult for people out here to understand the justification for re-introducing another threat to the livelihood of so many people.

I strongly urge the abandonment of this plan. It will be detrimental to the animals that are released to the area as sure as will be bad for West Texas. The wolves will be in constant danger of being shot because they hunt on ranchland.

Thank you for your consideration of this issue crucial to West Texas.

Sincerely,

Pete P. Gallego

PKG:jww

Gallego:

1. Thank you for your comment. See responses to previous legislator comments.

Agency et al. Comments and Responses
Local Governments

JOE STIRLEY, JR.
MEMBER OF THE BOARD
DISTRICT 1
P.O. BOX 1001, TULSA, AZ 85001
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DISTRICT 2
P.O. BOX 1002, TULSA, AZ 85001
ARTHUR A. LEE
MEMBER OF THE BOARD
DISTRICT 3
P.O. BOX 1003, TULSA, AZ 85001

**BOARD OF SUPERVISORS
OF APACHE COUNTY**

P.O. BOX 438
ST. PIERRE, ARIZONA 85939
TELEPHONE: (520) 337-4344
FACSIMILE: (520) 337-2003



CLARENCE L. WILSON, MANAGER/CLERK
100 SOUTH 4TH STREET, AZ 85901

TRANSMITTED BY FACSIMILE ON OCTOBER 30, 1995. PLEASE CALL TO CONFIRM
RECEIPT OF FAX. ORIGINAL TO FOLLOW BY U.P.S. OVERNIGHT DELIVERY.

October 30, 1995

Attn: Regional Director
U.S. Fish and Wildlife Service
Mexican Wolf EIS
P.O. Box 1356
Albuquerque, NM 87103

Dear Director:

Apache County has reviewed the Draft Environmental Impact Statement for reintroduction of the Mexican Wolf (*Canis Lupus Baileii*), laws and regulations surrounding reintroduction of species, independent scientific reports on potential wolf survivability, and articles from a number of independent, peer-reviewed works discussing scientific viability of unbreeding closely related wolves, and the genetic purity of captive populations.

After careful consideration of this information, Apache County supports Alternative D, the "no action" alternative. As part of our comments, we attach and adopt as our own comments made by Applied Ecosystem Management, Inc. and the Eastern Arizona Counties Organization to Arizona Game and Fish. We also incorporate either in total or by reference the following:

- The Arizona/New Mexico Coalition of Counties comments
- Conservation Genetics of the Endangered Isl Royale Gray Wolf (1991)
- Mitochondrial DNA Variability of the Gray Wolf: Genetic Consequences of Population Decline and Habitat Fragmentation (1992)
- Inbreeding Depression in a Captive Wolf (*Canis lupus*) Population
- "The Mexican Wolf Recovery Program" (USFWS, 1986)

- Summary--"International Studbook for the Mexican Wolf, 1987"
- USDA Forest Service--letter on Mexican Gray Wolf Sighting, 1992
- 1994 Annual Report from Dr. Julio Carrera, "Mexican Wolf Recovery Program"
- "Reintroduction of the Mexican Wolf: Instrument of Recovery or Instrument of Denial?"

In addition to information from above named sources, we support alternative D, and oppose Alternatives A, B, and C on the following grounds:

1. Reintroduction imposes a regulatory burden on a single class of citizen, and as such is a violation of 5th and 14th Amendment due process rights and further violates the Federal Administrative Procedures Act (APA) and ranchers' civil rights (e.g. *Forester v. Consumer Product Safety Comm'n* [559 F.2d 774, 787, 1977] and *Valdez v. Applegate* [616 F.2d 570, 572, 1980]).
2. Monitoring of wolves in the proposed reintroduction areas would require permanent easement across permitted, leased, and private land which violates case law as found in *Nollan v. California Coastal Commission* [483 U.S. 825, 1987] and *Lucas v. South Carolina Coastal Council* [505 U.S., 1992].
3. Wolf depredation would affect a regulatory takings under the 5th and 14th amendments of the U.S. Constitution (see *Florida Rock Industries v. U.S.* [18 F.3d 1560, 1994], *Nollan v. California Coastal Commission* [483 U.S. 825, 1987] and *Lucas v. South Carolina Coastal Council* [505 U.S., 1992]).
4. Potential wolf attacks (rabid or otherwise) on humans would subject the U.S. Fish and Wildlife Service to tort liability (e.g. the case of a California Mountain Lion attacking a girl, and a subsequent suit being brought seeking monetary relief for the attack).
5. Because there is no agency compensation program for livestock, horse, other domestic animal, or potential human depredation in the proposed plan, the U.S. Fish and Wildlife Service and State Game and Fish Departments subject themselves to takings and tort liability litigation.
6. The proposed reintroduction plan would, if approved, be part of an illegal, programmatic Environmental Impact Statement (see *Natural Resource Defense Council v. Morton*, 388 F. Supp. 829, 834, DDC, 1974; aff'd 527 F.2d 1386, DC Cir., 1975; cert. denied 427 U.S. 913, 1976); *State of California v. Block*, 690 F.2d 753, 1982).
7. Several of the reintroduction plan's scientific analyses are substantively flawed (see attachments), and others are missing.

Apache County:

1. These are primarily legal issues that are not the subject of the EIS process. The FWS disagrees with all of the assertions.

- 8. The proposed reintroduction plan currently before the Commission fails to adequately identify, through best available information, potential adverse economic, social, cultural, and community stability impacts. | 2
- 9. The wolves proposed to be reintroduced, according to peer reviewed analysis and Fish and Wildlife Service documentation, are in two of three instances of questionable genetic purity (see attached). | 3
- 10. The ability of captive grey wolves to survive in the wild, according to peer reviewed analysis, is seriously questioned (see attached).
- 11. The public opinion surveys used to justify wolf reintroduction are dated. Phase one surveys are 6 years old, and phase two are 4 years old. | 4
- 12. Ranchers and hunters Apache County has interviewed indicate that wolves have both been seen and heard in the Blue area, contrary to Game and Fish findings, thus violating one of the criteria necessary for reintroduction, which is that no Wolves can exist in the area of proposed reintroduction. | 5
- 13. Potential existence of other classifications of wolves would present the possibility of cross breeding, thus destroying the alleged genetic purity of the Mexican Grey Wolf.
- 14. There is no scientific evidence that the Mexican Grey Wolf existed in the Blue area before the demise of the Mogollon and/or Texas Wolves, thus violating the second criteria for wolf reintroduction. | 6
- 15. By the plan's admission, there is no assurance that Mexican Wolves would stay within proposed recovery zones. Further, in severe winters, it is entirely conceivable that they would seek out cattle, sheep, domestic animals, and domestic garbage (see page 35 of the U.S. Fish and Wildlife Service Proposed Reintroduction Plan for a documented sighting of wolves next to a garbage dump). | 7
- 16. The plan would bar ranchers from protecting their property from wolf attack. This, in combination with an inability of the plan and its implementation to accurately identify wolf kills in a timely manner, and a lack of official compensation, constitutes a 5th and 14th amendment takings. | 8
- 17. The potential of suits or U.S. Fish and Wildlife Service directives ordering full protection of the wolf under the Endangered Species Act would destroy the ranching economy and culture of Southeastern Apache County, and Northern Greenlee County, violating provisions of the National Environmental Policy Act, as well as the Apache and Greenlee County Policy Plans. | 9
- 18. There is no attempt in the Draft Environmental Impact Statement to account for, or mitigate for the provisions of the Apache or Greenlee County Land Use and Resource Policies as incorporated in County plans. | 10

2. The EIS process is not required to fully address all of the topics mentioned, although the economic issues are covered. Where a clear inference as far as the sociocultural topics can be made from the environmental impact analysis, then it is made. There is no evidence that recovery of endangered wolves elsewhere has had significant sociocultural impacts.

3. We disagree, see Appendix K - Response to Mr. Dennis Parker's Comment on the DEIS.

4. The New Mexico opinion survey was conducted last year (Duda and Young 1995).

5. Reported wolf sightings from the Blue area have been followed up, but none have been confirmed. Even if the occasional lone wolf existed in the area, the reintroduction effort could proceed so long as there was not a "population" (i.e., at least two successful breeding pairs for at least two years). If in fact a wild Mexican wolf existed in the area and interbred with the reintroduced Mexican wolf population, it would not destroy the genetic purity of the reintroduced wolves, but it could enhance their genetic diversity.

6. See rewritten Taxonomy and Historic Distribution sections of Chap. 1.

7. Wolves may be attracted to garbage the same way many other scavenging animals are. The EIS does discuss what will occur if wolves leave the recovery areas and does disclose potential impacts on domestic animals.

8. The Proposed Action allows ranchers to protect livestock on their land if wolves attack it and to harass wolves in the vicinity of their property.

9. We disagree; even under the full protection of Alt. C, the likelihood of such severe consequences occurring is very low.

10. Investigation has produced new information that is cited in Chap. 3.

11. See response to Arizona Game and Fish Department on this issue.

12. We disagree; see Appendix K - Response to Mr. Dennis Parker's Comment on the DEIS.

19 Apache County is currently developing an Initial Assessment Report, similar to an Environmental Assessment under its plan, which should be considered in the development of a final preferred alternative and record of decision.

20 The potential impacts of Proposition 201, passed in November, 1994, on this reintroduction plan raise serious doubts as to the workability of the plan. Thus, Mexican Wolf reintroduction should be tabled until impacts of Proposition 201 have been properly analyzed.

21 Key scientific information is omitted from the development of the Draft Environmental Impact Statement. These include the following articles and reports:
- Wayne, R.K., et. al. "Conservation Genetics of the Endangered Isle Royale Gray Wolf." *Conservation Biology*, 5(1), 1991
- Laikre, Linda and N. Ryman. "Inbreeding Depression in a Captive Wolf (Canis lupus) population." *Conservation Biology*, 5(1), 1991.
- Woody, Jack B., U.S. Fish and Wildlife Service, "The Mexican Wolf Recovery Program." Albuquerque, NM, March 1986
- *International Studbook for the Mexican Wolf*, 1987.
- Parker, Dennis. *Reintroduction of the Mexican Wolf: Instrument of Recovery or Instrument of Denuse?*. Applied Ecosystem Management, Inc.
- Carrera, Julio. *Mexican Wolf Recovery Program: Annual Report 1994*.

22. In an annual project, Dr. Julio Carrera identifies naturally existing Mexican Wolves populations in Mexico, and possibly extreme Southern Arizona. Therefore, the logical step to take is perpetuation of naturally occurring populations, and not reintroduction of genetically suspect populations.

In summary, if this project is approved and implemented, both wolves and people will suffer, leaving the U.S. Fish and Wildlife Service with an expensive project which is scientifically, legally, economically, socially, and logically flawed. With these arguments in mind, we strongly recommend that the U.S. Fish and Wildlife Service adopt Alternative D the "no action" alternative as its preferred alternative in the Draft Environmental Impact Statement, or withdraw the Draft Environmental Impact Statement altogether.

I thank you for this opportunity to comment

Sincerely

Arthur N. Lee, Chairman
Board of Supervisors of Apache County

Board of Supervisors

Leslie E. Thompson
Chairman
District 3
Tony Saracino
District 1
Mike Palmer
District 2



Jody N. Klein
County Administrator
Madeline Parkhurst
Clerk

October 24, 1995

U.S. Fish and Wildlife Service
Mexican Wolf Environmental Impact Statement
P.O. Box 1206
Albuquerque, New Mexico 87193-1206

Dear Sir:

These comments are being submitted by two of the three members of the Board of Supervisors in Cochise County, representing the areas in which the wolf is most likely to appear. We are also supporting the stand taken by the Coalition of Arizona/New Mexico Counties for stable economic growth.

We have a very deep concern for the private citizens using federal lands for recreation. It is their safety and that of their children, pets and property that we submit these comments

INTRODUCTION

Chapter 5 makes the statement that "opposition or strong concern" was expressed by our organization and some of our member counties. As stated in our earliest meetings and correspondence, we neither oppose nor support the introduction of Mexican wolves. The objective of an environmental document is to disclose to decision makers and the public what the environmental consequences can be expected from major federal actions.

History has produced many examples of people blindly carrying out agendas that have devastated entire nations because they believed in what they were doing, got paid enough or were "simply following orders." The FWS has taken a series of actions in the last ten years which are cumulatively destroying our rural counties' abilities to meet our fiscal responsibilities. Even when the FWS has the opportunity to disclose this information outside the confines of the ESA, they fail to do it.

We realize that the Endangered Species Act precludes consideration of economic impacts if it hinders the protection and recovery of threatened or endangered species. However, the Draft Environmental Impact Statement (DEIS) for the Mexican wolf reintroduction is governed by the NEPA and therefore the analysis must include an analysis of the social and economic impacts. In

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Cochise County:

1. That statement has been deleted from Chap. 5 of the FEIS.

an extension of that, the analysis must include the cumulative impacts as well. The DEIS fails on both requirements

SPECIFIC COMMENTS

- The geographic areas, from which the data the FWS is using to derive the impacts on domestic and wild ungulates, bear little comparison to the southwest conditions. Therefore, the estimates of the wolf's take of these prey is flawed. Also, the modeling does not take into account the fact that wild ungulates will be able to flee the boundaries of the primary and secondary zones and leave the domestic livestock secured and vulnerable inside of the pasture fences. | 2
- The stated objective to minimize adverse impacts on the income potential and current lifestyles should also contain the words "avoid-or" preceding the word "minimize." | 3
- NEPA and Judge Muecke's recent ruling on protection for the Mexican spotted owl require that an extensive region-wide cumulative Impact analysis be done on the human environment which includes the social and economic impacts. | 4
- The object of an Environmental Impact Statement (EIS) is to provide sufficient information upon which to make an informed decision. The DEIS has a lot of information, but most of it is speculation and exaggerated positive benefits. | 5
- The information on prey base is only confined to the primary and secondary zones. We request a short-term and long-term cumulative impact analysis for the entire experimental population area. | 6
- Leg hold traps have been banned in Arizona. Animal Damage Control (ADC) will have a more than difficult time attempting to capture problem wolves. The DEIS does not address this issue. | 7
- The presence of protected wolves will stop much of the efforts by ADC to control other predators because of the potential risk of harming the wolves. The DEIS makes this clear but fails to indicate to what extent this will impact the ability of livestock owners to protect their animals. | 8
- While there is proposed a depredation compensation fund, there is no mention of damaged or maimed animals. The DEIS Should point out the difficulty in identifying kills or even locating the evidence of a kill. The DEIS should have also contained the actual payments made in Montana and Minnesota and the fact that there have been numerous complaints about getting paid and being paid timely. It should pointed out that the Minnesota fund has twice run out of funds before further appropriation could be made from the state legislature.
- It is not unreasonable to ask when the non-essential experimental designation will end and what will the status of the wolf be at that point.
- The DEIS does not include the certainty of citizen suits altering the recovery plan and

2. We surveyed numerous experts before drawing the comparison between the northern wolf recovery areas and the Southwest as far as impacts on livestock (see Box 4-3 and Appendix F). No northern areas were directly considered to calculate wild ungulate impacts; these were estimated through a modelling effort with expert input. It is unlikely that the ability of wild ungulates to leap fences will allow them to escape pursuing wolves (who can also leap or go through fences) and extremely unlikely that wild ungulates would flee the huge designated wolf recovery areas.

3. We have added more discussion of the spotted owl in the "Cumulative Impacts" section.

4. We agree that uncertainty exists about the impacts; identifying this uncertainty is appropriate under NEPA. We disagree that positive impacts were exaggerated; in fact, the potential negative impacts are easier to quantify than the benefits. More discussion of benefits from wolf recovery in the Northern Rockies and the Great Lakes region is provided in Appendix J.

5. We do not foresee significant cumulative impacts on the prey base outside the areas where wolf recovery is proposed.

6. See responses to USDA ADC, Arizona Game and Fish Dep't and Arizona Gov. Symington, above, on the trapping ban issue. ADC would still be able to use leg-hold traps.

7. Box 4-3 does discuss wounding and difficult-to-find losses. Defenders of Wildlife may pay for wounding and has paid a percentage in the Northern Rockies in some cases where wolves were in the area but could not be confirmed as the depredator. The Defenders' compensation fund has paid out roughly \$2,000 per year on average since 1987 in the Northern Rockies; the Minnesota state fund has paid between roughly \$23,000 and \$43,000 per year in the last 10 years in an area with approximately 1,500 to 2,000 wolves. During a few years, claims against the Minnesota fund exceeded the amount appropriated by the Legislature and claimants had to wait up to six months for payment, but all approved claims have been paid (B. Paul, USDA ADC, pers. comm.).

introduction scheme. Given the FWS's proclivity to settling these citizen suits through generous agreements, their cumulative impacts should be included in the analysis.

There is a total omission of discussions of state, local or tribal government plans, policies or laws. In conjunction with that omission is an omission of any discussion of any consistencies or inconsistencies with those plans, policies or laws or what the FWS will do to alleviate those inconsistencies.

9

Both sites proposed for release are outside of the known historic range of the Mexican wolf. We understand that the preferred sites were located in close proximity to high population and recreational densities. If there is such an economic benefit to be derived from viewing these animals, why not put them closer to those who have such a great desire to see and hear them?

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This decision is a significant regulatory action subject to the review of the Office of Management and Budget pursuant to Executive Order 12866. Additionally, this decision has a significant impact on a substantial number of small entities which makes it subject to the Regulatory Flexibility Act (RFA) (5 U.S.C. 605 et seq.).

11

We can't locate any reference in the DEIS to a regulatory impact analysis having been completed pursuant to Executive Order (EO) 12866 or the Regulatory Flexibility Act. We hereby request that you include this information in the EIS and forward a copy of the information set forth in EO 12866 in subsections (a)(3)(B) and (C) and pursuant to § 6(a) (E) (1) (ii) & (iii) of the same EO, an identification for the public of these changes in the regulatory action that were made at the suggestion or recommendation of OIRA.

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We have attached and hereby incorporate the comments of Dennis Parker, Biologist.

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CONCLUSION

Our entire effort, for several years, has been to provide you data and information about the potential for direct, indirect and cumulative impacts on our economic, social, cultural, physical and biological environments. Because we live here, we will suffer the losses or enjoy the benefits from your proposed action. For this same reason, our counties have a special expertise in the above environments and should have been accorded, at a minimum, cooperating agency status.

We may have pointed out some impacts that you differ with us in opinion. Subjecting information, theories and test results to multiple trials for signs of repeated outcomes is the heart of science. The National Environmental Policy Act (NEPA) and its implementing regulations demand high quality information and science be employed in the creation of an EIS.

You have approached working with our member counties with the prejudice that all of our information and data is somehow tainted. A true scientific analysis cannot exist where certain individuals are barred from the research effort merely because they have differing opinions. The dynamics of debate yield the better results because they elevate the standards for information either side must produce to prevail.

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You have approached this effort contrary to scientific principles. You have arbitrarily dismissed information and data simply because it did not fit your desired outcome. It certainly would not be good public relations to admit in an official environmental document that the U.S. Fish and Wildlife Service (FWS) was systematically destroying the rural economies and cultures of our region.

13

By employing committed proponents of wolf introduction to gather information and draft with EIS, with no check on their bias, you have guaranteed that they would only select that data and information to show minimal impacts and exaggerate the benefits.

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For this reason the analysis was doomed from the start and has now produced a flawed DEIS. Because of this critical flaw, the document has not produced the necessary information upon which to make an informed decision, nor can it be said to be disclosing the environmental consequences of the proposed action to the public. Based on this alone, the only alternative we can favor is the No Action.

Sincerely,

Leslie E. Thompson
Chairman

Tony Sardo
Supervisor, District 1

Attached: Reintroduction of the Mexican Wolf: Instrument of Recovery or Instrument of Demise?
By Dennis Parker, Biologist, Applied Ecosystem Management, Inc.

cc: Governors Fife Symington and Gary Johnson, the Arizona and New Mexico Congressional Delegations, the State House and Senate Leadership of Arizona and New Mexico and the Arizona and New Mexico Game Commissions

8. The plan is that the designation will end when the Mexican wolves are fully recovered and removed from the endangered species list, which will likely take several decades; this project is one part of the recovery effort. When recovery is achieved, and federal protection no longer necessary, the designation will be determined by state wildlife laws at the time.

9. Chap.s 3 and 4 include descriptions of relevant state, tribal, and local laws and impacts on them.

10. The sites were chosen because they are in the probable historic range and possess favorable characteristics for wolf recovery, as described in Chap. 2 - Selection of Potential Areas for Releasing Mexican Wolves. They were not chosen for wolf viewing.

11. No decision or regulatory action has been taken yet. Appendix C contains the Proposed Mexican wolf experimental population rule, the preamble of which contains a Required Determinations section addressing the points raised.

12. See Appendix K - Response to Mr. Parker's Comments.

13. We have been and remain open to considering any information relevant to Mexican wolf recovery, no matter what the source. We did state we would not contribute FWS funding to support research by an individual we did not agree was an appropriate researcher, but we never have barred anyone from conducting research on behalf of the counties, or independently. We have not indicated that information provided by counties is tainted.

14. See response to similar comments in Public Comment Summary, under General Comments on the DEIS.

Graham County:

RESOLUTION 1995-17
October 16, 1995

A RESOLUTION BY THE BOARD OF SUPERVISORS OF THE COUNTY OF GRAHAM, ARIZONA RELATING TO THE DRAFT ENVIRONMENTAL IMPACT STATEMENT- PROPOSAL FOR REINTRODUCTION OF THE MEXICAN WOLF WITHIN ITS HISTORIC RANGE IN THE SOUTHWESTERN UNITED STATES

WHEREAS, the Board of Supervisors of the County of Graham Arizona have genuine concerns with the proposed Alternative A and Alternatives B and C outlined in the above referenced document

WHEREAS Graham County as a member of the Coalition of Arizona/New Mexico Counties for Stable Economic Growth and the Eastern Arizona Counties Organization, supports the goals and objectives of these organizations and thus support the desires, needs, concerns and overall goals and objectives of other member counties both in Arizona and New Mexico which represent some 845,000 citizens, and

WHEREAS, Arizona law and Graham County's Land Use and Resource Policy Plan grant the governing body of the county the authority to plan for the protector of the health, safety, convenience and general welfare of the residents of Graham County and

WHEREAS, Graham County being directly adjacent to the geographic areas proposed and potentially included in the proposal itself are directly interrelated in terms of economic health and stability preservation of traditional customs and cultural heritage and outdoor recreational and sporting opportunities, and

WHEREAS, Section 1500 2(f) of National Environmental Policy Act (NEPA) states that the Federal Government in cooperation with State and local governments and other concerned and private organizations shall use all practicable means consistent with the requirement of the Act and other essential considerations of national policy to restore and enhance the quality of the human environment and avoid or minimize any possible adverse effects whether they be aesthetic, historic, cultural, economic, social or health, whether direct or indirect and the cumulative effects of their actions upon the quality of life, and

WHEREAS Graham County finds this "Draft" Environmental Impact Statement to be inadequate under the conditions identified in NEPA case law which define the criteria of an adequate and thorough document. Further, the County considers this document to be internally contradictory and highly speculative in terms of data presented, scientifically indefensible, unsupported and contradictory in direct conflict with R.S. 2477 (rights-of-way to and through public lands), lacking a sufficient scientific data base for the Southwestern United States, and fails to analyze and disclose the impacts quantitatively and qualitatively, directly and indirectly, specifically and cumulatively.

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THEREFORE BE IT RESOLVED, that in order to insure minimal impacts on the county's direct relationship to adjoining Arizona and New Mexico counties in terms of custom, culture, economic well being, social welfare, the surrounding environment and wildlife species, the Board of Supervisors of Graham County, Arizona support and encourage Alternative "D", the no introduction alternative, as the only reasonable option when considering preservation of the species, the serious deficiencies within the document and its direct conflict with not only Graham County's Land Use and Resource Policy Plan but also the goals and objectives of the other twenty-two (22) counties that are members of the Coalition of Arizona/New Mexico Counties for Stable Economic Growth.

BE IT FURTHER RESOLVED, that the United States Fish and Wildlife Service in developing its final Environmental Impact Statement in accordance with the National Environmental Policy Act must consider and analyze both the direct and cumulative impacts of its decision upon the social custom and culture, and economic well being of the citizens of the southwestern region as well as Graham County. That analyses must include but not be limited to other published and recognized scientific data, the effect (s) of each alternative on the existing wilderness designations, multiple uses of public lands habitats of various endangered and threatened species, whether listed or being considered for listing and other considerations required by law to be evaluated and weighed before reintroduction of Mexican wolves occur in the region which includes Graham County and its neighboring counties

2

PASSED AND ADOPTED this 16th day of October 1995

APPROVED AT TO FORM


Jack Williams, County Attorney

GRAHAM COUNTY BOARD OF SUPERVISORS


Delbert Householder, Chairman

ATTEST


Barbara Felix, Clerk


Hayes Moore, Member


Terry Lee Bingham, Member



October 30, 1995

Attn: David R. Parsons
Mexican Wolf Recovery Program
U.S. Fish and Wildlife Service
P.O. Box 1306
Albuquerque, NM 87103-1306

RE: COMMENTS ON DRAFT EIS - MEXICAN WOLF REINTRODUCTION.

Dear Mr. Parsons:

These comments are submitted on behalf of Greenlee County, Arizona, the exact county where the Blue Range primary recovery area is located. Greenlee County appreciates the opportunity to address the Fish and Wildlife Service on this issue; however, Greenlee County believes that it was inappropriate to hold the Service's formal public meetings in metropolitan areas far removed from the site where the reintroduction will actually take place. Such logistics place an unreasonable burden on the local residents who will actually have their lives affected by this decision and as such unfairly influences the decision making process by not allowing for adequate input of the directly affected population.

There are several concerns with the EIS which the county would like to address briefly. Because of these concerns, Greenlee County urges Fish and Wildlife to pursue Alternative D, the no action alternative. As a second choice, the county supports Alternative B because of its less intrusive nature as opposed to the proposed action.

page 2 of 7

The first concern is that the environmental consequences regarding impact on cattle are grossly understated. Although the county employs no wolf scientists, Greenlee County does believe that some common sense should be applied to the question. The Service's analysis, that wolves will not kill many cows, simply doesn't pass the test of common sense.

It appears from the EIS that since there is little or no scientific information on habits and lifestyles of Mexican wolves that science gathered on Northern Grey Wolves would be substituted for unavailable science, rather than starting by asking common sense questions.

For example, the EIS accepts as a given that wolf's demise is the result of its reputation as a livestock killer. So pervasive was this notion, that at one time the Federal Government established eradication programs. Clearly, the wolf has a propensity to eat cattle. That's why they were killed! Everyone admits that cattle depredation will occur. If the problem were as small as the EIS estimates, it is unlikely that the Government would have tried to hunt wolves to extinction.

Another common sense point to consider. The terrain in Montana and other Northern Grey Wolf territories is not nearly so rugged as the Blue Primitive area. Furthermore, cattle cannot jump fences like elk and deer. What does this mean in terms of ungulate depredation? It means that the faster-moving, higher-jumping elk and deer will be more likely to escape a wolf as opposed to slower-moving, non-jumping cattle. Greenlee County believes that any decisions in this EIS based upon the faulty presumptions that wolves will eat deer and elk in preference to cattle should be reexamined and reintroduction should not go forward until this problem is adequately understood and addressed.

1. We have added discussion in Chap. 1 regarding historical accounts of wolf depredation. The wolf was also eradicated from the Northern Rockies because it depredated on livestock. Since its return in northern Montana, very little depredation has occurred, i.e., a fraction of 1% of the livestock available, and the wolves do prefer wild prey. Much of that region also is quite rugged. See response to the fence-jumping issue also raised (#2) by Cochise County.

II

Another grave concern, which the Fish and Wildlife Service believes isn't important is the cost-benefit aspect of reintroduction. The DEIS states that "[m]onetary cost-benefit analysis is not required under NEPA implementing regulations and it is specifically not recommended when, as here, important qualitative considerations exist." Clearly, F&W doesn't believe its own statement since the DEIS includes some very poor estimates as to the monetary value of cattle loss, hunting impacts and project implementation costs. Furthermore, the DEIS discusses the impacts on recreation and discusses economic benefits. In reality, by saying that monetary cost-benefit analysis isn't appropriate in this decision, the F&W is merely excusing the lousy job it has done in conducting such analysis.

This is illustrated by the fact that the DEIS actually suggests that the overall economics of this situation is will be a positive. How the F&W comes to the conclusion that recreational visits will compensate for cattle depredation or in some cases, loss of entire ranching operations, once again defies the confines of common sense. The only way into the Blue Range area is by foot, horseback, or helicopter. Therefore, having wolves in the area will not likely cause a significant increase in recreational visits. Furthermore, since the recreational infrastructure necessary to capitalize on recreational wolf visits does not exist nor could it be justified by wolf visitors alone, the Service's guess that wolf reintroduction will have a positive economic impact simply cannot and will not happen.

Another issue of economics that is quite troubling is that it is unclear whether the projected implementation costs include the expected losses in the value of elk and deer

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hunting. It is patently clear however, that the multiplier effect of lost revenue in a local economy has not been adequately considered. The proposed action has a projected price tag of over \$7.2 million. It seems that the true cost in terms of ripple effects in the local economy will be significantly higher. Moreover, who really believes that any federal bureaucracy can really keep costs anywhere near original projections. In short, this is a very expensive experiment and it is immoral in a time of decreasing budgets and increasing needs to waste such large amounts of money on such folly.

III

The county's applauds the DEIS's recognition that wolf reintroduction combined with other pressures on livestock producers may have a fatal cumulative effect on individual ranchers. However, this concern is unquestionably undervalued. Although, wolf reintroduction alone will not kill the ranching industry, when combined with other pressures it may have that effect. It has been suggested that a compensation program funded by private voluntary donations would be available for compensation. Unfortunately, such a program would not be effective. In the first instance, it can be very hard in the Blue Recovery Area to even find downed cattle let alone determine the cause of death. Secondly, wolf depredation as opposed to depredation by other predators is extremely difficult, if not impossible, to distinguish. Furthermore, market value compensation at the price of the carcass does not necessary compensate for the loss of capital investment and production capabilities that established herds represent. Lastly, there would be no compensation for maimed animals, which although not dead, are nevertheless non-productive.

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2. The FEIS does not say there will be an overall economic benefit; indeed, we do not provide a cost benefit ratio. We do say that the negative economic effects projected likely would be offset by economic benefits, but to an uncertain extent. The benefits are more problematic to quantify than the costs.

3. The hunting-related losses are entirely separate from the government's Project Implementation Costs, as set out, and modified since the DEIS, in Appendix B of the FEIS. Much of the latter might be spent in ways that benefit local communities, e.g., living expenses paid into local economies by wolf management field staff, hiring local trapping assistants, local purchases, etc. We have not considered multiplier effects for either increases or losses of expenditures in the region for the reasons stated in response to the comment on indirect and multiplier effects in the Public Comment Summary, under Impacts on Regional Economies.

4. We actually state, in Chap. 4 - Impacts on Regional Economies, and under Cumulative Impacts, that ranch failures are conceivable but not expected. There is no evidence that cattle ranchers have been put out of business by wolf recovery in the Northern Rockies or Great Lakes regions. On the other issues, see the responses given in the Public Comment Summary sections on Impacts on the Livestock Industry, and Compensation for Livestock Depredation.

IV

Another issue regarding compensation is the fact that no government body appears to have any intention of compensating for cattle losses. If even a single privately owned animal is lost to wolf reintroduction, it can certainly be argued that such loss is the taking of private property for public use without just compensation. Obviously this runs afoul of the takings clause of the fifth amendment to the U.S. Constitution which requires compensation not only for conscripted real property but applies to personal property as well.

Throughout the DEIS, the concept of controlling the wolf population is discussed. In both alternatives A and B, F&W expects to be able to control where these wolves will go or at least return them to the primary or secondary recovery areas in the event that one or more wolves should wander. Arizona, now has a law that disallows the use of traditional trapping methods on public lands. This impediment to wolf dispersal control has not been adequately addressed in the DEIS.

VI

Yet another concern which hasn't been adequately evaluated is the fact that some of these wolves will die. Some will die at the hands of mother nature, and it is conceivable that some will die at the hands of human takings. There will be legitimate hunters who may take some animals by accident and there will surely be some illegitimate human activities aimed at intentionally taking wolves. If wolves wander out of the primary recovery areas there will

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also be some wolves lost by the mere interaction with the human environment. Such losses to wolves present a real threat to the legitimacy and efficacy of the reintroduction process. And unfortunately, the remote nature of the reintroduction area may prevent officials from ever conclusively determining who or what did the taking. Although the county doubts that cattle losses will be investigated with the same vigor as wolf losses, of greater concern is whether releasing wolves into the wild with such a limited captive breeding stock is really the wisest decision at this time. Perhaps Alternative D, the no action alternative is at this time, from a common sense point of view, the best alternative for the wolf in spite of the selfish agendas of some overzealous groups.

VII

The last concern Greenlee County wishes to address is the DEIS's lack of regard for local customs, culture and economies. If wolves are released into the Blue recovery area, it will undoubtedly severely impact the residents of the Blue Community. This a community of approximately 75 persons which relies almost exclusively on grazing as its life blood. In just the last three years, Blue has experienced devastating impacts due to endangered species management, threatened grazing reductions, timber and wildlife mismanagement. Flood repair to restore basic health and safety service on the only access road into Blue has been repeatedly slowed or stopped in favor of endangered fish. Over-burgeoning elk populations now threaten to destroy the pastures and land improvements that the ranchers have developed which directly benefit wildlife. Most recently the Forest Service has announced up to 84% reduction in cattle grazing permits on the Blue. The issues that threaten these hard working

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5. The Projected Wolf Population Growth tables in Chap. 2 do include reasonable mortality projections for wolves from both legal and illegal causes.


6. We have visited the Blue area and do mention it in Chap. 3 of the FEIS. Wolf recovery is not projected to cause severe impacts to Blue residents. Wolves are projected to help reduce the large elk population.

people are coming so fast and so frequently that they spend so much time writing letters and submitting comments that they get behind on their jobs of raising cattle to earn a living. In other words, simply fighting so many adverse federal regulatory decisions will eventually drain all of the resources of time, talent, money and effort from these people such that they will eventually loose the battle for lack of ammunition. Although by itself, wolf reintroduction seems innocuous, when considering the cumulative effects of this decision, wolf reintroduction places such a grossly unfair burden on these people, that to continue the reintroduction effort is unconscionable.

Conclusion

In the end, Greenlee County believes that the best alternative for all parties is Alternative D. It preserves precious resources, mitigates impacts on local customs, culture and economics and in the end, provides the greatest protection for current captive wolf populations. It is the best alternative for our pocket books, our people, and the wolf.

Sincerely,


Derek D. Rapier
Resources Management Coordinator
Greenlee County Board of Supervisors

- cc: Greenlee County Board of Supervisors
- Members of Arizona's U.S. Congressional Delegation
- Gov. Fife Symington
- Arizona Senate Pres. John Greene
- Arizona House of Representatives, Speaker of the House, Mark Killion

SHARON ARMIG
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LILLIE LANEY
PROPERTY JUDGE

STATE OF NEW MEXICO
CATRON COUNTY
RESERVE, NEW MEXICO 87830

October 18, 1995

COMMISSIONER DISTRICT NO. 1
CARL B. LIVINGSTON
COMMISSIONER DISTRICT NO. 2
KIM S. MCKEN
COMMISSIONER DISTRICT NO. 3
COMMISSION OFFICE
P. O. BOX 607 - (100) 833-6433
FAX (505) 833-6432

Mr. David R. Parsons
Mexican Wolf Recovery Program
U.S. Fish and Wildlife Service
P.O. Box 1306
Albuquerque, NM 87103-1306

Dear Mr. Parsons:

These comments are to provide input by Catron County on the Reintroduction of the Mexican Wolf within its historic range in the southwestern United States - Draft Environmental Impact Statement (DEIS). The comments are divided into two categories: Legal/Procedural Considerations, and Technical Aspects.

Legal/Procedural Considerations

I. National Environmental Policy Act

The DEIS is not in compliance with the National Environmental Policy Act (NEPA), nor with the regulations for implementing its procedural provisions promulgated by the Council on Environment Quality (CEQ). Significant departures from NEPA and the CEQ-NEPA regulations are discussed below after first setting forth pertinent parts of the law and regulations to place these comments in context.

NEPA is the basic national charter requiring federal protection of the environment. It established policies, sets goals, and provides the means for carrying out policies and attaining goals. NEPA is extremely important to county governments and local communities. As the umbrella environmental law, NEPA (42 USC§4331) declares:

... that it is the continuing policy of the Federal Government, in cooperation with State and local governments, ... to use all practicable means, consistent with other essential considerations of national policy, to improve and coordinate Federal plans, functions, programs, and resources to the end that the Nation may... assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings; and ... preserve



Page 2
October 18, 1995
Parsons

important historic, cultural, and natural aspects of our national heritage, and maintain, wherever possible, and environment which supports diversity and variety of individual choice.

NEPA not only requires the federal government to consider the impacts of its actions on the biological environment, but it also requires federal agencies to preserve culture and heritage. Significantly, Congress' policy regarding NEPA states that cooperation and coordination will occur with "local governments," and that the culturally pleasing surroundings and cultural aspects of community will be preserved so as to support diversity and variety of individual choice. Clearly, this policy can only be carried out at the county level -- through county government that encompasses multiple communities all possessing a common heritage and culture, and similar pleasing surroundings that require protection.

NEPA (42 USC §4332) further states:

... all agencies of the Federal government shall... include in every recommendation or report on proposals for legislation and other major Federal actions significantly affecting the quality of the human environment, a detailed statement....

In this case, the "detailed statement" referred to in NEPA is the environment impact statement (EIS). When the U.S. Fish and Wildlife Service (FWS) personnel made the decision to prepare an EIS, they determined that the intended action to reintroduce the Mexican Wolf (wolf) constituted a "major Federal action significantly affecting the quality of the human environment." We agree, the proposed wolf reintroduction is a major federal action significantly affecting individuals, the locality, and the heritage, customs, culture, and economy of Catron County.

Catron County has passed various ordinances to ensure that the county has and opportunity to interact with federal agencies to protect its heritage, customs, culture, and economy. The DEIS refers to these ordinances, but incorrectly interprets their purpose as follows:

These ordinances seek to subject federal decisions regarding federal property within these counties [Catron and Sierra] to a local approval process (DEIS, p. 2-14).

The Catron County and Sierra County land use ordinances that call for equal authority with federal agencies over decisions affecting federal lands within these counties could conflict with the Proposed Actions (DEIS, p. 4-13).

Catron County's ordinances do not "seek to subject federal decisions ... to a local approved process" and they do not "call for equal authority with federal agencies over decision" as stated in the DEIS. They do require the federal agencies to involve and coordinate pertinent federal land planning and program implementation activities with Catron County per NEPA, as quoted above, and in accordance with the following CEQ-NEPA regulations (40 CFR §1506.2).

- (b) Agencies shall cooperate with State and local agencies to the fullest extent possible to reduce duplication between NEPA and State and local requirements, unless the agencies are specifically barred from doing so by some other law. Except for cases covered by paragraph (a) of this section such cooperation shall to the fullest extent possible include:
 - (1) Joint planning processes.
 - (2) Joint environmental research and studies
 - (3) Joint public hearings (expect where otherwise provided by statute).
 - (4) Joint environmental assessments
- (c) Agencies shall cooperate with State and local agencies to the fullest extent possible to reduce duplication between NEPA and comparable State and local requirements, unless the agencies are specifically barred from doing so by some other law. Except for cases covered by paragraph (a) of this section such cooperation shall to the fullest extent possible include joint environmental impact statements. In such cases one or more Federal agencies and one or more State or local agencies shall be joint lead agencies. Where State laws or local ordinances have environmental impact statement requirements in addition to, but not in conflict with, those in NEPA, Federal agencies shall cooperate in fulfilling these requirements, as well as, those of Federal laws so that one document will comply with all applicable laws.
- (d) To better integrate environmental impact statements into State or local planning processes, statements shall discuss any inconsistency of a proposed action with any approved State or local plan and laws (whether or not federally sanctioned). Where an inconsistency exists, the statement should describe the extent to which the agency would reconcile its proposed action with the plan or law.

Clearly, the law and regulations expressed, require federal agencies to include and coordinate environmental planning and program implementation activities with county governments when the county has an appropriate mechanism (ordinance) in place. This coordination involves more than the mere opportunity to provide input

during the "public comment process." Under the law and regulations, Catron County is accorded more status than the general public. Catron County is to be involved as a government, not just as an interested public. Under the definition of "coordinate," the county is to be treated as an equal -- government to government -- in the decision making process.

Catron County does have "local requirements and procedures" pertinent to environmental planning and program implementation including a Catron County Comprehensive Land Use and Policy Plan and an Environmental Planning and Review Process. Further, this county has informed the Fish and Wildlife Service of the existence of these ordinances/documents and requested the Fish and Wildlife Service to include Catron County accordingly. These ordinances assert our legal right to be involved in relevant federal decision making processes in Catron County. Catron County recognizes the federal agency involved makes the final decisions, but the county insists on it's legitimate participation in the process leading to the decision, per the law and regulations.

The CEQ-NEPA regulations (40 CFR §1502) clearly articulate specific requirements to be met in the preparation of an EIS. Regarding the alternatives, section of an EIS, §1502.14 states in pertinent part:

This section is the heart of the environmental impact statement...it should present the environmental impacts of the proposal and the alternatives in comparative form...In this section agencies shall:

- (a) Rigorously explore and objectively evaluate all reasonable alternatives...
- (b) Devote substantial treatment to each alternative considered in detail...
- (c) Include appropriate mitigation measures not already included in the proposed action or alternative.

Environmental consequences are discussed in 40 CFR 1502.16 which states:

This section forms the scientific and analytic base for the comparisons under §1502.14. The discussion will include the environmental impacts of the alternatives. It shall include discussions of:

- (a) Direct effects and their significant (§1508.8).
- (b) Indirect effects and their significance (§1508.8)...
- (c) Means to mitigate adverse environmental impacts (if not fully covered under §1502.14(f)).

Significantly, the term "effects" is defined in §1508.8 as follows:

1. This is a legal interpretation issue. Our basic interpretation, as stated in Chap. 4 - Impacts on Agency, Tribal and Local Government Policies and Plans, is that, to the extent inconsistencies or conflicts exist between local ordinances and the federal ESA, together with the Mexican Wolf Experimental Population Rule (if it is adopted as a federal regulation), the local ordinances would be preempted. We have pointed out where we saw areas of inconsistency or conflict, particularly for those counties with ordinances that attempt to ban wolf reintroduction outright. We agree that the NEPA CEQ regulations define federal requirements as far as cooperation in planning with local governments and we have complied with those regulations. While we have attempted to cooperate with the counties, we have not agreed to submit to county approval processes under their various planning ordinances. We have stated to Catron and other counties in several letters that we believe we retain some discretion in deciding what constitutes cooperation to the "fullest extent possible," given budget, staffing, and time constraints. We have offered to cooperate with counties in their own environmental analyses on wolf recovery; offered to make background information available; attempted to conduct joint research and studies; considered research and studies provided to us by county officials and others; had several meetings about preparation of the DEIS with county officials and representatives; held open house meetings in virtually all of the counties affected; and held a joint public comment meeting on the DEIS with one county that requested to do so. Because of the large area involved in the DEIS analysis (3 states, 3 tribes, 17 counties, and the jurisdictions of numerous state and federal agencies), it was not practically possible to involve all the local governments as joint or co-lead agencies or for the FWS to participate in many detailed local planning processes (which require numerous formal meetings) on top of the NEPA requirements. We believe this FEIS fully addresses local impacts to the extent the transitory impacts of wolf recovery can be identified to a particular county; we have discussed potential impacts in Catron County in several parts of Chap. 4. When we have received information from the counties that was appropriate to include in the FEIS, we have included it. We have offered to assist in local planning efforts and remain open to that as well as to other avenues of cooperation.

"Effects" include:

- (a) Direct effects, which are caused by the action and occur at the same time and place.
- (b) Indirect effects, which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems.

Effects and impacts as used in these regulations are synonymous. **Effects includes ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative....**

The term "cumulative impact" is defined in 40 CFR §1508.7:

"Cumulative impact" is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor, but collectively significant actions taking place over a period of time.

The pertinent regulations cited above require detailed analyses of the listed factors for each alternative. The DEIS does not meet regulatory requirements in this regard as evidenced by the following comments.

The Catron County Comprehensive Land Use and Policy Plan (plan) was developed with full public input. The plan reveals that the overwhelming reason many citizens struggle to live here is because they appreciate the natural resources and beauty of the area. If Mexican wolves occur in Catron County, because of reintroduction by the Fish and Wildlife Service, the County wants to be involved in preservation efforts in this county. However, in contrast to the DEIS, Catron County wants planning and reintroduction efforts to be conducted in a manner that maintains free enterprise and a market economy, and protects and preserves the county's heritage, customs, culture, and economy. Unfortunately, Catron County had been denied its legal right and full joint participatory opportunities under NEPA and the CEQ-NEPA regulations

2

The DEIS leaves no doubt that Catron County stands to be directly affected by reintroduction of the wolf into the Blue Range Wolf Recovery Area (BRWRA). As a matter of record, Catron County has repeatedly requested, in writing, the Fish and Wildlife Service to meet its obligations under the law by involving the county appropriately, as described above. The Fish and Wildlife Service has steadfastly refused our requests. Accordingly, Catron County must now demand the Fish and Wildlife Service meet its legal mandate under NEPA and the CEQ-NEPA regulations and jointly prepare a new DEIS with Catron County, if the Fish and Wildlife Service continues pursuing the intention of wolf reintroduction in an area that will affect this county.

The present DEIS is deficient in evaluating many effects as they apply to Catron County, including but not necessarily limited to the following list. Further, NEPA, and the pertinent CEQ-NEPA regulations cited near the beginning of these comments, require that direct, indirect, and cumulative effects (hereinafter referred to as "effects" or "impacts") on the heritage, economy, and the customs and culture of the county be analyzed in detail for each alternative in the draft EIS. All appropriate mitigation measures should also be considered for each alternative. At a minimum, a new jointly developed EIS will therefore consider mitigation measures and analyze the effects of at least the following criteria, for each alternative, that were not addressed in the DEIS:

1. The effects on the heritage, customs, culture, and the economy of Catron County to include at least the effects on:
 - a. Tax revenues
 - b. Property values
 - c. Bonding capacities
 - d. Impacts on livestock/ranching associated businesses
 - e. Impacts on other businesses
 - f. Impacts on schools
 - g. Impacts on roads
 - h. Impacts on the counties ability to fund safety, public works, and emergency services infrastructure
 - i. Impacts on jobs and associated employment
 - j. Social and cultural impacts caused by the above effects.
2. The impacts to Catron County in number 1 above should be analyzed under the scenarios of various percentages of ranchers going out of business;
3. The impacts to Catron County in number 2 above should analyzed when considered in conjunction with other impacts; i.e., cumulative effects to include at least:

3

2. We have identified all of the effects of the alternatives that are reasonably foreseeable and required under NEPA. No clear information has been provided to us that impacts—direct, indirect, or cumulative—will occur beyond those we have described in the FEIS. The cumulative impacts discussion in the FEIS is more detailed than the DEIS. Gray wolf recovery in recent years in other parts of the country has not had significant negative effects, beyond the type of effects we have described, on "free enterprise and a market economy," on local "heritage, customs, culture, and economy," or on the other criteria listed later in the comment.

3. We do not project that any ranchers will go out of business because of Mexican wolf te-introduction. Therefore, it would be inappropriate to do the suggested analysis.

- a. Impacts of livestock predator losses on other ranching enterprises- both federal land users and those exclusively on deeded land;
- b. Cumulative impacts, on all items listed in number 1 above, of wolf reintroduction when combined with the impacts of other major federal actions associated with threatened, endangered, and sensitive species management strategies (such as reduced timber harvest, impacts on property values, impacts on businesses associated with private lands including recreation opportunities lost, and farming enterprises lost, etc., because of the impacts associated with the Mexican spotted owl, northern goshawk, southwest willow flycatcher, spokedace, loach runnow, and introduced Rocky Mountain elk.);

Mitigation measures have not been adequately developed in the DEIS per the requirement of the CEQ-NEPA regulations. Although the DEIS offers various mitigation measures such as catching and removing offending wolves under specified circumstance, orient wolves to native prey, improve public understanding, and develop mitigation livestock husbandry techniques (pps. 2-22 to 2-24), the document is conspicuously silent on the following aspect as required by the regulations (40 CFR. §1508.2:

"Mitigation" included"

- (e) compensation for the impact by replacing or providing substitute resources or environments.

A private depredation compensation funds is described in the DEIS that exists "to cover the costs of livestock losses," however, the Fish and Wildlife Service does not guarantee the future existence of this mitigation fund (pps. 2-23 and 2-24).

Catron County requests specific means for the Fish and Wildlife Service to mitigate the county's portion of the following impacts to the BRWRA that are presented in the DEIS. Further, Catron County intends to include these impacts and the means for the Fish and Wildlife Service to mitigate them in a jointly developed DEIS to protect the county's heritage, customs, culture, and economy:

- 1. Confirmed livestock predator losses are estimated in the DEIS to be as high as \$21,600 per year.
 - a. This does not include unconfirmed predator losses. What is the estimated loss and value for unconfirmed predition losses?

4

- 2. What is the estimated loss and value of livestock that is maimed, but not killed per year? What is the estimated loss and value of associated veterinarian and medicine costs? What is the value of lost time searching for missing livestock and trying to protect livestock from wolf depredation?
- 3. Projected lost benefits to hunters is up to \$1,336,600 per year, plus reduced hunter expenditures as high as \$1,079,100 per year.
- 4. Predator control activities may be restricted.
- 5. Commencing operations on a new timber sale, mine, or development on "public land" could be delayed during wolf denning season.

Again, at the risk of being redundant, but in the interest of ensuring that no question remains as to Catron County's concerns, how will the Fish and Wildlife mitigate the impacts listed directly above, and those listed on page 5 and 6 of these comments?

I. Nonessential Experimental/Endangered Status

The DEIS has been prepared under the premise that the wolves will be reintroduced under the status of a nonessential experimental population. What will happen if, for any reason, the status is changed to "endangered" prior to release of any wolves? If this situation occurs, Catron County wants a new DEIS, prepared jointly with the county assessing the alternative, impacts, mitigation, etc., under the premise the reintroduction will be evaluated with the wolves to be released under the endangered status. Further, what happens if the nonessential experimental status changes, for any reason, to endangered status after wolves have been released? If this situation occurs, Catron County wants all released wolves and their offspring removed from the wild by the Fish and Wildlife Service in a timely manner.

III Critical Habitat

Do any circumstances exist under which critical habitat could, or would, be designated? If yes, please explain in specific detail what they are and what could, or would, cause critical habitat to be implemented.

5

Technical Aspects

- 1. Considerable doubts has existed regarding the genetic purity of the wolves to be released. Please provide the data from the DNA and/or other tests the Fish and Wildlife Service is using to confirm the wolves have not hybridized

4. The Proposed Action includes the full extent of mitigation measures that the FWS believes appropriate and consistent with achieving wolf recovery. The private compensation fund has worked very well to mitigate for wolf depredation in the Northern Rockies. It is not clear that an additional federal fund at this time would provide an additional measure of mitigation, because it would be subject to the uncertainty of the federal appropriation process. The livestock losses in the BRWRA would, of course, not all occur in Catron County. We lack a reasonable way to estimate unconfirmed predation losses (see Box 4-3).

5. Under the ESA, critical habitat cannot be designated for an experimental population, 16 USC sec. 1539(j)(2)(C)(ii). Critical habitat has never been designated for wolves and would make little sense for these wide-ranging habitat generalists.

Page 9
October 18, 1995
Parsons

- in the past. Also, provide the name of the laboratory and its credentials that conducted the tests.
- II. It is recognized the wolf-dog hybrids are often aggressive, vicious animals. Many feral dogs occur in and around the primary/secondary recovery areas. If the wolves hybridize with dogs and maim or kill one or more people, who is legally liable for damages? Catron County contends the Fish and Wildlife is liable for damages.
- III. Confirmation of livestock depredation by wolves is time-consuming and requires a special expertise. Catron County contends the Fish and Wildlife should provide all funding for the APHIS/ADC program to hire a "wolf specialist" and pay all associated expenses for the specialist to handle the ADC aspects of wolf reintroduction.
- IV. Predator control of wolves or wolf-dog hybrids is expensive. Who will pay for necessary predator control efforts in Catron County? We believe the Fish and Wildlife should provide such funds.
- V. The DEIS is nebulous about the constitutes "recovery" of the species in order to downlist the wolf from endangered to threatened, or to delist it entirely. Catron County contends it is imperative to set a number, or a population trend, to be achieved for downlisting or delisting before wolves are released and after the public and jointly participating counties have had input. In order to provide meaningful input, the target number, population trend, must be known. For example, the impacts of 200 wolves are different than the impacts of 500 wolves. If wolves can be classified as game animals, or fur bearers, after reaching 200 animals in number the problems and impacts are different than if the number must first reach 500 animals.

Sincerely,

Hugh B. McKeen
Commission Chairman

De Baca County:

1. Thank you for your comment. Wolf recovery is not proposed for De Baca County.

De Baca County Commissioners

514 AVENUE C, P.O. BOX 347
505-355-2601 FAX (505) 355-2441
FORT SUMNER, NEW MEXICO 88119

October 11, 1995

Honorable Gary Johnson, Governor
State of New Mexico
State Capitol, Room 400
Santa Fe, NM 87501

Dear Governor Johnson:

We, the De Baca Board of County Commissioners, are writing this letter in regards to the possible release of the Mexican wolf into the State of New Mexico. We are opposed to this action.

Our area is a rural area dependent on livestock and farming. Despite many studies that have been made, wolves and coyotes are not a good match with livestock, sheep, cattle, etc., not even with small domestic animals such as dogs, cats, etc.

We do not need wolves in our area in the future nor do the urban areas need them either. If urban area had lived and been exposed to coyotes, and perhaps wolves, I cannot believe the majority of the people would want the introduction of wolves into the State of New Mexico.

We trust that you will consider the thoughts of people that depend on the raising of sheep and cattle as their livelihood on this very important matter.

Sincerely,

DE BACA BOARD OF COUNTY COMMISSIONERS

Frank McRee, Commission Chairman

Edward A. Sena, Commission Member

Raymond E. Drake, Commission Member

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FWB

Eddy County
Board of Commissioners

MIRANDA DARGY
REE T. ALVAHEZ
JAY MOBLEY, CHAIRMAN
NANCY BRANTLEY
ALEX CAMP



STEVE MASSEY, Eddy County Manager
(505) 887-9511

Fax (505) 887-1035
Post Office Box 1139
CARLSBAD, NEW MEXICO 88221

October 11, 1995

U.S. Fish & Wildlife
Dave Parsons
Mexican Wolf EIS
P. O. Box 1306
Albuquerque, N.M. 87103

Dear Mr. Parsons:

The Eddy County Board of Commissioners would like to take this opportunity to comment on the Draft Environmental Impact Statement on the re-introduction of the Mexican Wolf. The Commission recommends Alternative D-No Action/natural recolonization for the following reasons:

1. The cost is prohibitive and with the current situation of budget deficit in our nation, there are projects and issues with higher priority.
2. Protection of private livestock will be almost impossible to enforce. Proposed alternatives A and B prohibit the taking of animals that are killing until a certain number in population has been achieved. Alternative C provides full protection against "takings" under the ESA. A rancher cannot survive for the projected two-three years it will take to build up the packs to desired numbers. Historically, wolves roam many miles and can kill great numbers in a short period of time.

It is also hard to prove that a kill was made by a wolf. U.S. Fish & Wildlife employees do not have the time to verify every kill in the field and during the hot summer days we have in New Mexico, the remains of animals killed do not last long enough to determine how they are killed.

1. No road closures were anticipated in or near Eddy County under the former Proposed Action. However, now the back-country road closure provision has been removed entirely.

While there is a proposed depredation fund, compensation funds are not guaranteed. There is no mention of animals that are maimed or injured and how their owners will be compensated.

3. If an illegal killing of a wolf occurs, the Service has the option of closing roads currently open to the public should this proposal be adopted. This could be a conflict with other Federal road laws and NM State road laws. State law defines *all roads and highways, dedicated to public use, declared to be public highways*. Long continued use of a road by the public is sufficient to constitute it a public highway. (Atty. General op.)

4. Finally, there has not been an economic impact study done on the surrounding areas to the proposed sites. The studies done have been inclusive to the proposed sites without considering the certainty of the wolves escaping the recovery zones. The Commission would like to request that an extensive region-wide cumulative impact analysis be done on the social and economic impacts.

In summary, the proposed reintroduction of the Mexican wolf would be costly, protection of private property would be impossible, conflict with existing road laws and possible restrictions on the public to free access, and the economic impacts would be too great to support the reintroduction of the wolf.

Thank you for the opportunity to comment on this. Please address any questions you may have to our County Manager, Stephen Massey at (505)887-9511.

Sincerely,

EDDY COUNTY BOARD OF COMMISSIONERS

Jay Mobley
Jay Mobley
Chairman

cc: DOI file

Agency et al. Comments and Responses
Grant County:



Ms. Jennifer Fowler-Probst
U.S. Fish and Wildlife Service
2105 Osuna, N.E.
Albuquerque, New Mexico 87113

RE: Grant County's comments concerning U.S. Fish and Wildlife Service's proposed reintroduction of the Mexican wolf.

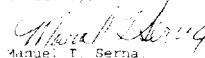
Dear Ms. Fowler-Probst:

This letter is to formally advise the U.S. Fish and Wildlife Service and U.S. Department of Interior of Grant County's opposition of the wolf's reintroduction in our region.

A part of the wolf's designated habitat is in the Gila National Forest, an economically important area to Grant County. A reintroduction of the wolf in areas within Grant County, such as the Gila National Forest, will likely cause economic harm to Grant County, as farmers, ranchers, hunters and fishermen will find their economic and recreational activities threatened. Domestic livestock and wild game are particularly threatened. It is expected that a reintroduced wolf population would inevitably take livestock and game especially during peak population periods. It is the belief of the Grant County Commission that the potential for killing game and livestock has been seriously underestimated. Additionally, the Commission believes that the areas chosen for the reintroduction of the wolf would ultimately be unsuitable for the wolf's recolonization, a conclusion supported by the studies of wildlife biologists.

Therefore, the Grant County Commission strongly opposes the planned reintroduction of the Mexican wolf in this region.

Sincerely,


Manuel T. Serra
Chairman, Grant County Commission

Otero County:



October 10, 1995

Mr. David Parsons
Coordinator, Mexican Wolf Recovery
United States Fish and Wildlife Service
Mexican Wolf EIS
Post Office Box 1306
Albuquerque, New Mexico 87103-1306

Dear Mr. Parsons:

Otero County is speaking out strongly against the reintroduction of the Mexican Wolf.

We understand White Sands Wolf Recovery Area in Otero County is federal managed land and that the wolves would not be allowed to disperse off this recovery zone.

The County is in the position that it would be extremely hard to keep the wolf only in one area, especially since this wolf migrates to timber and there is no timber on this land. We also know that the wolf is listed as an endangered species under the Federal Endangered Species Act and under the State Wildlife Conservation Act. **We have strong concerns in this area.** Endangered species have stopped economic growth in the Western States for the past 10 years, never taking into account the impact it had on human life or economic impact. Everything from insects to Grizzly Bears have destroyed the quality of life in not only small, but largely populated areas. Otero County has no faith in the Federal Government system that this wolf's reintroduction will not destroy more of our economy and quality of life.

Case after case, and horror story after horror story, has proven that the Endangered Species Act does not work.

Mr. David Parsons
October 10, 1995
Page 1 of 3

Congressmen W. J. Tauzin of Louisiana and Richard W. Pombo of California are heading up a fight against the Endangered Species Act because it has devastated their state. When a fly can stop people from using their private land in California or anywhere else, it has gone too far.

We remember the fires in California where the landowners were not allowed to cut a firebreak on his own private land because of a kangaroo rat habitat. In the end, his house burned down along with the rat's habitat. People have been the ones to lose their rights here.

We know that history shows that the wolf will soon be a tool for the extreme preservationists. Otero County already has the Mexican Spotted Owl which has put 45,000 people's homes in Lincoln and Otero Counties in danger of a catastrophic fire and when we tried to be exempt from this, even with overwhelming evidence, we were rejected without a just cause.

Reintroduction of these wolves has raised concerns about the potential threats to humans, livestock, nearby residents, and any other environment in which the wolf comes into contact with. A week ago, a child in the Los Alamos area was taken out of his own backyard by a coyote, just think what would happen if this were a larger, hungrier wolf.

The wild horses on the White Sands Missile Range are dying due to the lack of water in the area, and Oryx have become overcrowded that they are invading Holloman Air Force Base and actually stopping planes on the runway. The addition of the wolves would only compound these serious problems and further deplete this area of one of our most precious commodities, water.

The Fish and Wildlife service has a fund set up to make payments to owners of livestock that had been killed or maimed by wolves to compensate for the market value of the livestock. This is a federally appropriated trust fund, but how do you compensate a parent for the loss of a child?

As you can see, other people in the County have signed a petition sent to you by the Otero County Commission opposing the reintroduction of the Wolf.

1. According to newspaper accounts the coyote incident referred to near Los Alamos involved a boy who was bitten, not taken out of his backyard, after the family had been unwisely feeding the coyote.

2. Wolves could contribute to reducing the horse and oryx populations. Wolves will not have any significant impact on the water.

3. The compensation fund is private, not federal. A human mortality would be unprecedented and is extremely unlikely to happen.

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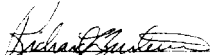
Mr. David Parsons
October 10, 1995
Page 3 of 3

Otero County is strongly opposed to the reintroduction of these wolves, and we will fight against its reintroduction.

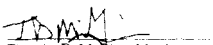
Thank you for your consideration to this matter.

Sincerely,

BOARD OF COUNTY COMMISSIONERS
OTERO COUNTY, NEW MEXICO


Richard L. Eakin, Chairman


Ronny Rardin, Vice Chairman


Timothy D. McQuinn, Member

Enclosures: (3)

wolf10-10-95

TC-1



311 EATE ST. TRUTH OR CONSEQUENCES, NM 87901

September 14, 1995

U.S. Fish and Wildlife Service
Mexican Wolf RIS
C. Box 1306
Albuquerque New Mexico 8710

Re: Draft EIS, Mexican Wolf Introduction
Sierra County Public Hearing September 14, 1995
(Region 17 85-88)

Dear Sir or Madam:

The Sierra County Commission has been elected "to provide for the safety, preserve the health, promote the prosperity and improve the morals, order, comfort and convenience of all their citizens, (4-17-1 NMSA 1978). It is also responsible to maintain the economic stability and the customs and culture of the community.

To this end, the Sierra County Commission has adopted Ordinance 92-012, December 1992, "Sierra County Environmental Planning and Review Process", "Interim Land Use Policy Plan", Ordinance 91-001, September 1991, and Ordinance 94-001, February 3, 1994, "To Prevent the Introduction of Predatory Species into Sierra County".

These ordinances require that all natural resource decision participation by Sierra County, affecting the local community, shall be guided by the principles of protecting private property rights, preserving custom and culture and the maintenance of traditional economic structures in order to propagate a free-market economy.

The National Environmental Policy Act (NEPA) and the Council on Environmental Quality (CEQ) regulations require all State and Federal Agencies to comply with such ordinances and to coordinate with the Sierra County Commission on all proposals relative to the planning and management of lands within the boundaries of Sierra County. A report on all proposed actions must be provided to the Sierra County Commission for review and coordination prior to federal or state initiation of action.

All endangered species proposals must consider and adhere to the Constitution of the United States of America, the CEQ, NEPA, the Constitution and State Laws of New Mexico, Sierra County Ordinances 91-001, 92-012, 94-001 and all other Sierra County Ordinances, laws and regulations.

Based upon the above assertions, the elected members of the Board of Commissioners of Sierra County register the following objections to the proposed introductions into Sierra County:

Sierra County asserts that scientific and economic data presented in the DEIS is either inadequate, incomplete and/or inconsistent within several elements of the DEIS and certainly in conflict with other existing economic data.

Sierra County further asserts that the economic impact to Sierra County, its destabilizing effect upon the County's tax base and the negative results artificial wolf introduction into Sierra County would have on its recreational, hunting trapping industries and its disastrous effect upon the livestock industry and corresponding agribusiness in Sierra County have not been properly represented or appropriately established.

NEPA regulations and federal case law would require a site-specific EIS for Sierra County to determine the economic, social and cultural effect of artificial introduction of the Mexican Wolf into Sierra County.

Based upon all preceding assertions, Sierra County would require reexamination of scientific and economic data contained in the DEIS and NEPA required site-specific EIS for Sierra County before the Sierra County Commission would consider concurrence with existing introduction proposals.

Sincerely,

Gary Whitehead
Chairman, Sierra County Commission

TC:al

enclosure:

cc: Secretary, Department of the Interior
U.S. Fish and Wildlife Service, Washington, D.C.
Senator Pete Domenici
Senator Jeff Bingaman
Congressman Joe Skeen
New Mexico/Arizona Coalition of Counties



Coalition Of Arizona/
New Mexico Counties
For Stable Economic
Growth

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FWS

October 28, 1995

**Coalition of Arizona/New Mexico
Counties for Stable Economic
Growth:**

U.S. Fish and Wildlife Service
Mexican Wolf EIS
P.O. Box 1306
Albuquerque, New Mexico 87103-1306

Dear Sirs,

These comments are being submitted by Apache, Cochise, Gila, Graham, Greenlee, La Paz, Mohave, Navajo and Yavapai counties in Arizona and Catron, Chaves, Eddy, Harding, Hidalgo, Grant, Lincoln, Luna, Otero, Sierra, Socorro, Torrance and Union counties in New Mexico, along with representation from the timber, livestock, mining, small business, sportsman and outfitter industries as members of the Coalition of Arizona/ New Mexico Counties (Coalition). Our representation currently exceeds 845,000 in combined county populations.

Introduction

Chapter 5 makes the statement that "opposition or strong concern" was expressed by our organization and some of our member counties. As stated in our earliest meetings and correspondence, we neither oppose nor support the introduction of Mexican wolves. The objective of an environmental document is to disclose to decision makers and the public what the environmental consequences can be expected from major federal actions. Just as the responsible official must wait for the production of the Final Environmental Impact Statement, read the document, determine its adequacy and make a decision to proceed or not proceed with the proposed action, we must do the same.

As communicated to you in the beginning of the EIS process, we are committed to assisting you in gathering and processing the necessary information to accomplish the above stated objective for this National Environmental Policy (NEPA) document.

History has produced many examples of people blindly carrying out agendas that have devastated entire nations because they believed in what they were doing, got paid enough or were "simply following orders." The U.S. Fish and Wildlife Service (FWS) has taken a series of actions in the last ten years which are cumulatively destroying our rural counties' abilities to meet our fiscal responsibilities. Even when the FWS has the opportunity to disclose this information outside the confines of the ESA, you have failed to do it.

We realize that the Endangered Species Act precludes consideration of economic impacts if it hinders the protection and recovery of threatened or endangered species. However, the Draft Environmental Impact Statement (DEIS) for the Mexican wolf reintroduction is governed by the NEPA and therefore the analysis must include an analysis of the social and economic impacts. In an extension of that, the analysis must include the cumulative impacts as well. The DEIS fails on both requirements.

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Coalition Of Counties

Specific comments

- . The geographic areas, from which the data the FWS is using to derive the impacts on domestic and wild ungulates, bear little comparison to the southwest conditions. Therefore the estimates of the wolf take of these prey is flawed. Also, the modeling does not take into account the fact that wild ungulates will be able to flee the boundaries of the primary and secondary zones and leave the domestic livestock secured and vulnerable inside of the pasture fences.
- . The stated objective to minimize adverse impacts on the income potential and current lifestyles, should also contain the words "avoid/or" preceding the word "minimize".
- . NEPA and Judge Muecke's recent ruling on protection for the Mexican spotted owl require that an extensive region-wide cumulative impact analysis be done on the human environment which includes the social and economic impacts.
- . The object of an Environmental Impact Statement (EIS) is to provide sufficient information upon which to make an informed decision. The DEIS has a lot of information, but most of it is speculation and exaggerated positive benefits.
- . The information on prey base is only confined to the primary and secondary zones. We request a short term and long term cumulative impact analysis for the entire experimental population area.
- . Leg hold traps have been banned in Arizona. Animal Damage Control (ADC) will have a more than difficult time attempting to capture problem wolves. The DEIS does not address this issue.
- . The presence of protected wolves will stop much of the efforts by ADC to control other predators because of the potential risk of harming the wolves. The DEIS makes this clear but fails to indicate to what extent this will impact the ability of livestock owners to protect their animals.
- . While there is proposed a depredation compensation fund, there is no mention of damaged or maimed animals. The DEIS should point out the difficulty in identifying kills or even locating the evidence of a kill. The DEIS should have also contained the actual payments made in Montana and Minnesota and the fact that there have been numerous complaints about getting paid and being paid timely. It should be pointed out that the Minnesota fund has twice run out of funds before further appropriations could be made from the state legislature.
- . It is not unreasonable to ask when the non-essential experimental designation will end and what will the status of the wolf be at that point.
- . The DEIS does not include the certainty of citizen suits altering the recovery plan and introduction scheme. Given the FWS's proclivity to settling these citizen suits through generous agreements, their cumulative impacts should be included in the analysis.
- . There is a total omission of discussions of state, local or tribal government plans, policies or laws. In conjunction with that omission, is an omission of any discussion of any consistencies or inconsistencies with those plans, policies or laws of what the FWS will do to alleviate those inconsistencies.
- . Both sites proposed for release are outside of the known historic range of the Mexican wolf. We understand that the preferred sites were located in close proximity to high population and recreational densities. If there is such an economic benefit to be derived from viewing these animals, why not put them closer to those who have such a great desire to see and hear them?
- . This decision is a significant regulatory action subject to the review of the Office of Management and Budget pursuant to Executive Order 12866. Additionally, this decision has a significant impact on a substantial number of small entities which makes it subject to the Regulatory Flexibility Act (RFA) (5 U.S.C. 605 et seq.).

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We can't locate any reference in the DEIS to a regulatory impact analysis having been completed pursuant to Executive Order (EO) 12866 or the Regulatory Flexibility Act. We hereby request that you include this information in the EIS and forward a copy of the information set forth in EO 12866 in subsections (a)(3)(B) & (C) and pursuant to §6(a) (3)(E)(i)(ii)& (iii) of the same EO, an identification for the public, those changes in the regulatory action that were made at the suggestion or recommendation of OIRA.

We have attached and thereby incorporate the comments of Dennis Parker, Biologist.

Conclusion

Our entire effort, for several years, has been to provide you data and information about the potential for direct, indirect, and cumulative impacts on our economic, social, cultural, physical and biological environments. Because we live here, we will suffer the losses or enjoy the benefits from your proposed action. For this same reason, our counties have a special expertise in the above environments and should have been accorded, at a minimum, cooperating agency status.

We may have pointed out some impacts that you differ in opinion with us on. Differing opinions and subjecting theories and test results to multiple trials for signs of repeated outcomes is the heart of science. The National Environmental Policy Act (NEPA) and its implementing regulation demand high quality information and science be employed in the creation of DEIS.

You have approached working with our member counties with the prejudice that all our information and data is somehow flawed. A true scientific analysis cannot exist where certain data points are taken from the research effort, merely because they have differing opinions. The availability of data rarely led to better results because they elevate the standards for information. The same is true of the results produced.

You have approached this effort contrary to scientific principles. You have arbitrarily discarded the original data simply because it did not fit your desired outcome. It certainly will not be the good public relation to admit in an official environmental document that the United States Service (FWS), was systematically destroying the rural economies and cultures of a region.

The scientific community committed themselves to wolf introduction to gather information and draft the DEIS. In the agreement, the local guaranties that they would only select that data and information that minimized the adverse impacts and exaggerated the benefits.

For this reason the analysis was doomed from the start and has now produced a flawed DEIS. Because of this critical flaw, the document has not produced the necessary information upon which to make an informed decision. Nor can the DEIS claim to be disclosing the environmental consequences of the proposed action to the public. Based on this, the only remaining alternative the Coalition can favor is the No Action.

At the October 20, 1995 meeting of the Board of Directors, it was decided to submit the following alternative for consideration:

Utilizing the existing alternative A, the affected counties would implement the introduction plan. This would mean that the counties in cooperation and coordination with the FWS, would:

- 1) Receive the appropriate administrative, enforcement and implementation funding to carry out the provisions listed below.
- 2) Be responsible for conducting the monitoring.
- 3) Be the authorizing and dispersal agent for mitigation payments for domestic livestock depredation.
- 4) Be responsible for capturing and returning wolves to the release areas.

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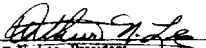
Coalition Of Counties

- 5) Be responsible for determining if wolves killed, injured or harassed by citizens protecting their property constituted a justifiable action;
- 6) By ordinance prescribe the civil fines and criminal punishment, pursuant to their state laws, for the killing, injuring or harassing of wolves that is alleged to be outside of the guidelines established in the experimental population rule. Any civil and/or criminal prosecution would only be conducted within the jurisdiction of the County Magistrate Court in which the alleged illegal killing, injury or harassment of released wolves occurred, and
- 7) Based on the monitoring of the impacts on the hunting and outfitter/guiding industries, domestic livestock, the predator and prey base in the release area and the efficacy of the domestic livestock depredation reimbursement program, have the authority to terminate the release program, capture any wolves left in the wild and return them to their breeding facilities.

The implementation of this alternative would be predicated on:

- 1) Pursuant to the Endangered Species Act, determination, through independent analysis, the genetic viability of the captive-bred stock.
- 2) Pursuant to the Endangered Species Act, an independent determination of the potential for adverse impacts the release of captive-bred stock may create on the wild population; and
- 3) No public access to any area would be terminated unless absolutely necessary to effect repopulation and only through the authorization of the County government pursuant to the laws of the, respective states, provided that no action will be taken prior to public hearings on the proposed closure.

Sincerely,


Arthur N. Lee, President

Attached Reintroduction of the Mexican Wolf Instrument Of Recovery or Instrument of Demise? By Dennis Parker, Biologist, Applied Ecosystem Management Inc

xc. Governors Fife Symington and Gary Johnson, the Arizona and New Mexico Congressional Delegations, the State House and Senate Leadership of Arizona and New Mexico and the Arizona and New Mexico Game Commissions

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1. Up to the end of this paragraph, the text of the comment is the same as the comment submitted by Cochise County. See above letter and FWS responses.

2. The FWS is willing to cooperate with counties on implementation of reintroduction and is exploring ways to enhance citizen involvement in wolf management. The FWS has no authority to delegate some of these responsibilities as suggested.

1

2

2

Eagar:

1. Experience from other wolf recovery areas, such as Yellowstone National Park, has indicated positive, rather than negative, impacts on recreation and tourism.



Nongame & Endangered Wildlife Program
 Arizona Game and Fish Department
 2221 W. Greenway Road
 Phoenix, Arizona 85021-4312

May 14, 1992

To Whom it May Concern,

On behalf of myself and the Eagar Town Council, I would like to voice our opinion on the feasibility of reintroducing the Mexican wolf into areas of Arizona and most especially the Blue River Primitive Range. As you are aware, the eastern portion of this state includes large areas of livestock grazing areas and mountainous recreation areas. Almost without exception, those people living in the Blue area are cattle ranchers who already deal with numerous obstacles, some of which are new regulations, grazing losses, fencing expenses and predator loss. It seems senseless to reintroduce a predator which has no natural enemies to control population growth and one which seems to have no known positive qualities.

As a Town Council, we are concerned with the economics of our area. Tourism is beginning to flourish and we see large numbers of visitors who come to enjoy the outdoors. Many people feel that they and their children or pets would be at risk to camp or hike in an area where wolves were present and would go elsewhere for their recreation thereby causing Eagar to lose tourist dollars.

The feelings of many are that wolves did not fit here 100 years ago and would not fit now. We also are of the opinion and hope that you of the Arizona Game and Fish Department will decide that it is important to resist the pressure of environmentalists to reintroduce the Mexican wolf into our mountains because of the many, many problems that would occur.

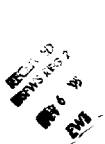
Sincerely,

Art Eagar
 Art Eagar
 Mayor

AE:ka

TOWN OF EAGAR

P.O. Box 1300 • Eagar, Arizona 85925 • (602) 335-4125 • 174 South Main Street



Lava Soil and Water Conservation District

117 SILVER AVENUE GRANT, NEW MEXICO 87001 • PHONE 1505-277-4142

Lava Soil and Water Conservation District:

1. Thank you for your comment.

October 31, 1995

U. S. Fish & Wildlife Service
 Wolf Recovery Program
 P. O. Box 1306
 Albuquerque, NM 87103-1306

RE: REINTRODUCTION OF MEXICAN WOLF

The Board of Supervisors of the Lava Soil and Water Conservation District would like to **SPEAK AGAINST THE MEXICAN WOLF'S REINTRODUCTION** on the following basis:

1. Who is going to guarantee that the Mexican Wolf will stay within the White Sands Missile Range boundary? Probably no one, wolves know no boundaries -- they will roam to find food wherever it suits them.
2. Have these wolves been conditioned to hunt and eat wildlife rather than domestic livestock? Here again, wolves are excellent predators, the spring calves look very tasty.
3. How and when will stockmen be compensated for loss of livestock? Will the wolf enthusiasts pay up? Livestock losses could be very costly for who?

Let's support the Mexican Wolf -- in the Albuquerque Zoo, where the wolf enthusiasts can visit him all the time.

Sincerely,
Alex Gonzales, Wes Wergert, Cynthia Spidle

Supervisors of the Lava Soil and Water Conservation District

Alex Gonzales, Chairman; Jessie Fitzgerald, member; F. Robert Garcia, member; Wes Wergert, member; Cynthia Spidle, administrative assistant.

Summary of Public Comments on the Draft Environmental Impact Statement on Reintroduction of the Mexican Wolf, with Fish and Wildlife Service Responses

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Introduction

The draft environmental impact statement (DEIS) on the U.S. Fish and Wildlife Service's (FWS) proposal to reintroduce the Mexican wolf was released for public review on June 27, 1995. The public comment period ended more than four months later, on October 3 1. Public review was extensive, with participation by almost 18,000 people or organizations, in a variety of ways (see Table 5- 1). Fourteen public open house meetings were held throughout the potentially affected areas; total registered attendance was 1,186. Three formal public hearings were held in Austin, Texas; Phoenix, Arizona; and Socorro, New Mexico; total registered attendance was 95 1. Each written and transcribed oral comment has been reviewed and considered in the preparation of the Final EIS (FEIS). All public comments are on file and available for inspection at the FWS Regional Office in Albuquerque, New Mexico.

Publication and Response to Comments

Due to space and cost considerations, not all of the thousands of comments received on the Mexican wolf DEIS can be re-printed and responded to individually in the FEIS (see Council on Environmental Quality regulations regarding keeping EISs to reasonable size, 40 CFR 1500.4, and responding to comments, 40 CFR 1503.4). Those comments, and FWS responses, that are re-printed separately in Chap. 5 of the FEIS are the comments of federal, state, local, and tribal agencies, members of the United States Congress, and state legislators. Those re-printed comments and their responses are not summarized in this document.

This document summarizes the comments received from the general public, corporations, and non-governmental organizations (see list below). All of these comments were carefully screened for major topics. These major topics are summarized, categorized, and responded to here.

The first section below, "Comments on Alternatives," includes topics specific to Alternatives A, B, C, or D, and comments that propose new alternatives. Comments on topics that go beyond the alternatives are treated separately under "Comments on Issues." Some representative quotes from comment letters are

also provided. Where this is done the quote is followed by a number in parentheses indicating the FWS filing number for the comment.

Non-governmental organization comments were received from: Arizona Wool Producers Association, Albuquerque Wildlife Federation, American Society of Mammalogists, American Zoo and Aquarium Association, Blue River Cowbells, Davis Mountains Trans-Pecos Heritage Association, Defenders of Wildlife, Gila National Forest Permittee Association, International Union for the Conservation of Nature-Wolf Specialist Group, Mesilla Valley Audubon Society, National Audubon Society, National Parks and Conservation Association, National Wildlife Federation, New Mexico Cattle Growers' Association, New Mexico Council of Outfitters and Guides with Gila Permittees Association, New Mexico Wildlife Legislative Council, New Mexico Wool Growers, Preserve Arizona's Wolves, Sangre de Cristo Audubon Society, Sierra Club-Albuquerque Group, Sierra Club-Grand Canyon Chapter, Sierra Club-Lone Star Chapter, Sierra Club-Rincon Group, Sierra Club-Southern New Mexico Group, Sierra Club Legal Defense Fund, Southwest Consolidated Sportsmen, Texas and Southwestern Cattle Raisers Association, Tucson Rod and Gun Club, The Wildlands Project, and The Wildlife Society.

Comments on the Alternatives in the DEIS

DEIS Alternative A: Based on specific decision criteria, the U.S. Fish and Wildlife Service proposes to reintroduce Mexican wolves, classified as nonessential experimental, into the White Sands Wolf Recovery Area or the Blue Range Wolf Recovery Area, followed by a second reintroduction into the other area if necessary and feasible. Wolves will be released into primary recovery zones and allowed to disperse into secondary recovery zones.

Comments Favoring Alternative A

Comment: This provides: important management flexibility, a lot of territory for the wolves to expand, and the greatest chance of survival for the wolves and achieves the best over all balance of conflicting issues.

Response: We agree.

Table 5- 1. How people commented.

Form	Number of Commenters	
<i>Mailed, Faxed, E-mailed and Hand Delivered Comments</i>		
Individual Letter, Post Card,	2,127	
Form Letter or Form Post Card	1,485	
Petition Signatures	12,598	
	Total	16.210
<i>Open House Written Comments</i>		
Alpine, AZ	37	
Clifton, AZ	5	
Douglas, AZ	21	
Phoenix, AZ	47	
Pinetop, AZ	5	
Safford, AZ	3	
Tucson, AZ	73	
Alamogordo, NM	73	
Albuquerque, NM	30	
Las Cruces, NM	27	
Reserve, NM	12	
Silver City, NM	9	
Truth or Consequences		
	Total	595
<i>Public Hearings</i>		
	Oral Comments (transcribed)	Written Comments
Austin, TX	79	35
Phoenix, AZ	79	26
Socorro, NM	10.5	745
Sub-totals	263	806
Total	1,069	
Grand Total: 17,874		

Comment: “So far this type of plan has worked well in both Yellowstone and the Great Smoky Mountains.” (592)

Response: The Yellowstone (and Central Idaho) wild gray wolf reintroductions have succeeded to date and the reintroduction plans have proved workable. The same is true of the red wolf reintroduction project in North Carolina and Tennessee. The Mexican wolf program is patterned after these previous FWS efforts and has the benefit of learning from these efforts.

Comment: This alternative allows a reasonable population density of wolves “while at the same time confining the wolves enough to minimize their contact with humans and livestock.” (697)

Response: We agree.

Comment: “The Blue Range and Gila National Forest combined represent the best and largest intact ecosystem left that is capable of housing and nurturing the Mexican grey wolves.” (712)

Response: We generally agree with this comment in regard to the U.S. portion of the Mexican wolf’s range. Additional suitable areas may exist within the subspecies’ entire historic range, but these have yet to be fully analyzed.

Criticisms of Alternative A

Comment: It is too expensive.

Response: We acknowledge that over seven million dollars is a lot of money, but we believe that the Endangered Species Act (ESA) allows incurring substantial costs to restore a subspecies like the Mexican wolf that appears to be virtually extinct in the wild.

Comment: It takes too long.

Response: We believe the **deliberate** approach of Alternative A is the most reasonable way to achieve successful wolf recovery in the long run.

Comment: The wolf recovery area boundaries are objectionable and the areas are too small; the plan to return dispersing wolves means that they will only be

allowed to reinhabit a small fraction of historic wolf habitat in the Southwest within the experimental population area.

Response: The boundaries represent the areas most likely to successfully support wolf recovery, consisting predominately of public land that has rated high for wolf recovery attributes. This would be the first phase of Mexican wolf recovery; additional recovery areas would be needed in the future to achieve the goal of removing the Mexican wolf from the endangered species list. Such additional areas could be within the designated experimental population area or, possibly, outside this area, including in Mexico if inter-governmental cooperation is achieved. No decisions have been made yet as far as future areas.

Comment: The primary release areas should be more central to the Blue Range Wolf Recovery Area, i.e., more towards the Gila National Forest, to allow for dispersal in all directions, i.e., the secondary zone should surround the primary zone.

Response: The **proposed** release areas were selected from recommendations provided by the Arizona Game and Fish Department (AGFD) and the New Mexico Department of Game and Fish (NMDGF). Delineation of the BRWRA (including the Gila National Forest in New Mexico) represents an expansion by the FWS of a recommendation by the AGFD for consideration of the Blue Range area in eastern Arizona as a potential wolf reintroduction area. The NMDGF did not recommend a release area in the Gila National Forest. In order to provide a recovery zone buffer around actual release sites, the FWS has changed the proposed action. Under the Preferred Alternative, wolf releases would be conducted in the eastern part of the BRWRA primary recovery zone.

Comment: The wolf should stay on the “endangered” list; there is potential confusion if experimental **non-essential** is used and wild wolves recolonize the same areas; **further**, the plan to relocate any wild wolves from Mexico that disperse into the experimental population area (outside the recovery areas) defeats the ESA goal of protecting such wild endangered animals.

Response: **Substantial evidence** is lacking that a wild Mexican wolf population exists **or will exist in the**

future in the United States. The likelihood of natural recolonization of a breeding population appears so low in the proposed wolf recovery areas that reintroduction of experimental non-essential animals is justified. If recolonization were to occur, those wolves, if captured, could contribute important genetic diversity to the captive population and could conceivably be released within the designated recovery areas. It would be confusing and impractical to have two different protection classifications for wolves within the vicinity of the recovery areas; people cannot be expected to determine classification of an animal before taking management action.

Comment: If wild Mexican wolves were to naturally recolonize in areas where the FWS proposes to reintroduce captive-raised animals, this should not be grounds for postponing the reintroduction; instead it should be considered a plus that would increase the chances of success of the reintroduction.

Response: If a wild "population" (i.e. at least two pairs that breed successfully for two years, see definition in Appendix G - Glossary) was detected in the recovery areas prior to the reintroductions, then the reintroduction of "experimental nonessential" wolves would potentially violate the ESA. Such a population may recover more successfully than captive-raised wolves. The FWS does not anticipate this outcome.

Comment: The low numbers of the Mexican wolf mean that it is essential; experimental nonessential is the wrong classification.

Response: See response below under Additional Alternative Suggestions.

Comment: The possibility of using only one area means that this project will not necessarily establish even a minimally viable population; more than one area and greater numbers are critical under conservation biology principles, to recover the wolf.

Response: Preliminary population viability assessments, using the simulation model VORTEX, predict that a population of 100 Mexican wolves in the BRWRA would have a high probability of surviving for 100 years. Modern principles of conservation biology suggest that multiple populations of the same species provide greater survival assurance than single

populations. The original Mexican Wolf Recovery Team recognized that the re-establishment of one population of 100 wolves in the wild would not be sufficient to remove the subspecies from ESA protection. The current Mexican Wolf Recovery Team is revising the population objectives for achieving recovery through the application of conservation biology principles. This EIS covers only the initial reintroduction of Mexican wolves to the wild; future reintroductions are neither assured nor foreclosed. However, any future reintroductions would require separate analysis under the National Environmental Policy Act (NEPA).

Comment: The listed criteria for deciding which recovery area to use and in what order "appear to leave a lot of loopholes available for not reintroducing the wolf. Is reintroduction of wolves a FWS commitment or not?" (1,821)

Response: We have clarified our proposal in the Preferred Alternative of the FEIS. The initial reintroduction would be conducted on the BRWRA. A subsequent reintroduction on the WSWRA would occur only if necessary to the objective of reestablishing a population of 100 wolves in the wild and if determined to be feasible. The criteria appearing on page 2-16 of the DEIS have been deleted.

Comment: "Drop that 'up to' [100 wolves for the BRWRA and 20 wolves for the WSWRA] business and go for the maximum number of individuals that you are confident the release areas (both of them) can accommodate. The inevitable mortalities associated with this program will soon make up for any overshoot and meanwhile, more wolves will be gaining the experience necessary to function fully in the wild." (1,034)

Response: We believe the recovery area goals are reasonably based on the areas' projected carrying capacities, while the actual populations will fluctuate above and below these levels over time. If our projections are far off - too high or too low - then the goals could be revised under the adaptive management approach of the Proposed Action.

Comment: The level of legal protection is too low.

Response: The legal protections afforded under the proposed experimental population rule are considered adequate. Except for narrowly defined exceptions, killing of the wolves would be a violation of the ESA and subject the offenders to severe penalties.

Comment: The land use restrictions are inadequate to protect the wolves.

Response: In other areas of gray wolf recovery, e.g., Montana, Minnesota, and Wisconsin, land use restrictions have proven almost entirely unnecessary for wolf recovery and such restrictions are counterproductive unless they are clearly needed.

Comment: Too much emphasis is given to conflicts with ranchers and not enough to the biological needs of the wolf.

Response: Potential conflicts with the livestock industry represent a major obstacle to successful wolf recovery; the emphasis on avoiding or mitigating these conflicts is for the purpose of reducing illegal killing of wolves (and increasing tolerance of wolf recovery by the livestock industry), thereby enhancing the ability of the wolf population to grow and sustain itself over time.

Comment: Allowing grazing in the wolf recovery areas will lead to wolf/rancher conflicts.

Response: Wolves and livestock grazing can co-exist; cooperation between the wolf management agencies and the livestock industry will minimize wolf/rancher conflicts.

Comment: The provisions to kill and harass wolves for protection of humans and livestock will be abused; the numbers of breeding pairs required before this could be allowed is too low.

Response: We anticipate some level of abuse of provisions for taking wolves, but believe that extensive public education and information efforts, as well as strong law enforcement, will keep the abuse levels low. The provisions on allowable take and harassment of wolves are narrowly drawn so that they are only to be used in ways that enhance wolf recovery, i.e., by removing depredating wolves and by conditioning wolves to generally avoid humans and livestock. On

the question of the numbers of breeding pairs needed before allowing harassment or killing, we should point out that there is no minimum number before non-lethal harassment is allowed. Non-lethal harassment can benefit wolf recovery by negatively conditioning wolves to humans and livestock. As far as the numbers before allowing private killing of livestock on public lands, under narrow conditions, we believe three breeding pairs on the WSWRA and six pairs on the BRWRA represent substantial progress toward recovery objectives for the areas. Furthermore, the number of wolves killed under this provision is expected to be very few, if any, and of minor consequence to the progress of wolf recovery once the prescribed number of pairs has been reached.

Comment: The allowance of **unavoidable** or unintentional take is unenforceable.

Response: We disagree. Notice of wolf locations will be publicized. Hunters are responsible to identify their targets before shooting so, with information and education efforts, illegal hunting take should be low. Information on how to avoid unintentional trapping will be made available. The few trappers in these areas will be on notice if they do trap a wolf that it likely would not be considered “unavoidable or unintentional.” The other area of expected unintended killing of wolves is through roadkilling and we see little point in making the unintended hitting of a wolf illegal.

Comment: Harassing or killing wolves on public lands should not be allowed.

Response: Public lands are multiple use lands and the limited harassment and killing of wolves allowed is considered appropriate to protect the other uses and to lead to successful wolf recovery in the long run.

Comment: Public lands ranchers will be put out of business by the unacceptably high level of livestock depredation, unless they are given more freedom to kill wolves.

Response: Although it is possible that some ranchers could be seriously affected in a given year, evidence from other areas where wolves and ranching co-exist does not support the idea that ranchers on these multiple-use public lands will be driven out of business without greater ability to kill wolves.

Comment: Better definitions are needed of how wolves impact game populations and how wolves would conflict with a major land use.

Response: The definition in the proposed experimental population rule and Appendix G of the EIS of “Impact on game populations in ways which may further inhibit wolf recovery” is considered adequate and was developed in cooperation with state game management agencies. There was no definition of “major land use conflict” and we have decided to drop that from the Preferred Alternative and the final experimental population rule, if one is needed. It is vague and adequate management flexibility exists under other Proposed Rule provisions.

Comment: It is not feasible to recapture and return wolves. Wolves will disperse to where they are categorized as endangered under the ESA.

Response: We disagree. In Minnesota and other areas, the FWS and other agencies have many years experience in trapping and translocating wolves. Wolves that left the large Mexican wolf experimental population area, and were known to have been part of the experimental population, would not lose their experimental status.

Suggested Alternative A Modifications

Comment: The Blue Range Wolf Recovery Area should be definitely identified as the first area to be used.

Response: Alternative A (the preferred alternative) now identifies the BRWRA as the initial reintroduction location.

Comment: White Sands reintroduction should occur first, followed by the Blue Range if the wolves are doing well. Lessons about wolf dispersal and depredation control could be learned in a less volatile setting; also, wild-adapted wolves from the WSWRA could be used as reintroduction stock in the BRWRA, perhaps paired up with wolves directly from the captive population.

Response: All these points were considered in deciding which area to use for the initial reintroduc-

tion (see discussion in Chap. 2). One very important consideration is that the objective of establishing 100 wolves in the wild could likely be accomplished on the BRWRA; whereas, it almost certainly could not be accomplished on the WSWRA. Considerable cost savings would result if only one area is used.

Comment: White Sands is too barren and inadequate to support many wolves and should not be presented as a stand alone option.

Response: The WSWRA is not presented as a stand alone option in the FEIS.

Comment: Both areas should be used.

Response: Our revised proposal (Alternative A) calls for both areas to be used only if the objective of 100 wolves cannot be achieved through reintroductions into the BRWRA.

Comment: The BRWRA and the WSWRA should be combined into one big wolf recovery area,

Response: We believe that it will probably be unnecessary to use both areas; however, if both areas are ultimately used, they will be managed as one population (sometimes called a metapopulation) consisting of two distinct subpopulations. Management of such a population may include periodic exchanges of wolves between the subpopulations.

Comment: “It appears to me that required release into the primary recovery area of the BRWRA in the later stages of the project would be counterproductive, as this probably would amount to artificial invasion of an already occupied area. I believe this requirement should be effective only in initial and intermediate stages.” (1,804)

Response: We recognize that aggressive, even fatal, encounters between wolves may occur if future releases were conducted in areas already occupied by previously reestablished wolves. If suitable release sites are not available because the primary recovery zone is fully occupied by re-established wolves, additional releases may not be necessary. If, on the other hand, additional releases are considered necessary at that time, the FWS might propose an amendment to the

experimental population rule to establish release sites elsewhere in the designated wolf recovery areas,

Comment: All BLM and State public lands around the BRWRA should be added as part of the wolf recovery area.

Response: The FWS established definite boundaries around proposed wolf recovery areas as a mitigation measure, primarily to reduce potential adverse effects of wolf reintroduction on the livestock industry. Furthermore, we believe that lands surrounding the BRWRA, which are managed by the Bureau of Land Management (BLM) or the States, provide generally unsuitable habitat for wolf recovery. BLM and State lands could be part of the unbounded recovery area for wolves under Alternative C, if wolves found suitable habitat there.

Comment: Big Bend National Park should be added to Alternative A.

Response: The capacity of this area to support **wolves** is unknown, but it is apparent that it, alone, could not support a viable population of wolves. It is close to Mexico where the wolves could disperse beyond U.S. protections. We consider Big Bend National Park; and it is close to large private ranch holdings in the U.S. to be an inappropriate place to try to reintroduce a viable population without first securing the cooperation of Mexico, consulting with private U.S. land-owners, and then conducting a detailed feasibility study.

Comment: Experimental status should not continue indefinitely but should be evaluated and possibly upgraded.

Response: This approach is theoretically possible, but the FWS believes it would be counterproductive to wolf recovery and has committed in the proposed experimental population rule that it has no intention of changing the designation.

Comment: Back roads should be closed in the areas regardless of illegal wolf killing to avoid conflicts.

Response: This would create unnecessary bad will toward the wolf without adding a conservation benefit.

Comment: For wolves that establish territories on public lands outside the designated recovery areas, the management approach should not be automatic removal; instead, consultation should be entered into with the land managers, similar to that provided for private and tribal lands outside the designated recovery areas. Also, allow for changes to the recovery area boundaries.

Response: A limited and defined area is considered necessary to allow the wolf the highest degree of acceptance and recovery and to allow the FWS and cooperating agencies to plan for wolf management. Allowing the recovery areas to expand out continually would defeat this purpose. However, if we thought it was important to survival and recovery of the reintroduced population, it is possible that after thorough evaluation we could recommend changes to the recovery area boundaries. These would have to be proposed as an amendment to the experimental population rule and be subject to formal agency and public review under rulemaking procedures and the National Environmental Policy Act.

Comment: Long range management plans are needed, including dispersal corridors to other recovery areas.

Response: The present proposal was developed to achieve the current recovery objective, minimize potential adverse effects of reintroducing Mexican wolves, and enhance public acceptance of wolf recovery. The establishment of corridors would require acquisition of lands and/or easements and is considered outside the scope of this proposal. The Mexican Wolf Recovery Team is currently developing long range recovery objectives for inclusion in the revision of the Mexican Wolf Recovery Plan.

Comment: "Permission for private parties to 'take' [wolves] should not be an 'unacceptable' level of livestock loss - not simply previous loss or injury." (550)

Response: After the initial population goals are achieved (3 breeding pairs for WSWRA; 6 breeding pairs for the BRWRA), any livestock depredation by

wolves should be cause for taking the offending animals out of the population because depredation is a learned behavior that wolves pass on to their young and it is a very counterproductive behavior for wolf recovery.

Comment: The point should be made that the occurrence of natural recolonization would not necessarily eliminate the need for any reintroduction at all.

Response: Acknowledged, see additional language in Alternative A under “Actions Associated with the Alternative.”

Comment: A wider radius of public access restrictions around release pens should be used - two to four miles; the radius should be on a case by case basis, not specified in the rule.

Response: No basis for the larger area suggestion is evident now, but if such a change proved necessary the FWS could propose to amend the experimental population rule to increase the radius.

Other Comments on Alternative A

Comment: While Alternative C is preferable, Alternative A is more realistic.

Response: Comment acknowledged.

Comment: Reintroduction into the second recovery area is necessary and feasible.

Response: The term “necessary” is used in the context of achieving the reestablishment objective of 100 wolves; and the term “feasible” relates to potential future management and biological constraints. Therefore, it is premature to determine if the use of a second recovery area is necessary or feasible.

Comment: How long would the population be managed as experimental?

Response: Until the Mexican wolf is taken off the endangered species list and management authority is returned to the states.

Comment: On the criteria to be used to decide whether to use both areas, the amount of funding and size of the staff are the most important. “What would occur if the project was not fully funded before and during the reintroduction? Are all funds government funds?” (44)

Response: The reintroduction project would not commence without adequate funding. The use of non-federal funds to supplement federal appropriations would be consistent with the current Administration’s policies regarding partnership approaches to achieving conservation objectives. Such an approach was used to partially fund the second reintroduction of wolves into Central Idaho and Yellowstone National Park. It is impossible to predict the FWS’s response to a funding shortfall sometime during the reintroduction project. It would depend upon the magnitude of the fund shortfall and the degree of progress made toward the wolf re-establishment objective. The responses could range from terminating the project and recapturing all reintroduced wolves to allowing wolves to remain in the recovery areas with some degree of monitoring.

Comment: Feral dogs present a depredation problem, especially near Whiteriver, AZ.

Response: Acknowledged; however, the Whiteriver area is not within the designated BRWRA.

DEIS Alternative B: Based on specific decision criteria, reintroduction of wolves, classified as nonessential experimental, into the White Sands Wolf Recovery Area or the Blue Range Wolf Recovery Area, followed by a second reintroduction into the other area if necessary and feasible. Wolf dispersal from the primary recovery zones will be prevented.

Comments Favoring Alternative B

Comment: “I would prefer to see the Mexican wolf confined to remote areas for at least 10- 15 years before being allowed to range into areas of active hunting and recreation” (3).

Response: No areas exist where hunting and recreational activities are totally absent. The WSWRA

primary recovery zone does have limited hunting activity and the BRWRA primary recovery zone has both hunting and recreation.

Comment: This alternative is preferable because it is least costly and has the lowest overall impact on livestock and wild prey.

Response: We agree Alt. B has the lowest impact of the reintroduction alternatives. It is least costly overall, but on a per-wolf recovered basis it is more expensive than Alternatives A and C and it does not achieve the Recovery Plan goals.

Comment: “The intensity of wolf management required by the FWS is highest which would provide greater knowledge to the agency on issues evolving from wolfreintroduction.” (3,556)

Response: We understand the point but believe that the high level of wolf recapturing and translocation under this alternative would be disruptive to the wolves and the intensity of management would probably not provide much information that would serve the Mexican Wolf Recovery Plan goal of re-establishing an independently viable population.

Comment: “This plan seems to be the most viable for the next five years.” (116) This alternative allows evaluation to determine whether additional expansion of the wolf population is appropriate.

Response: Comment acknowledged. Alternative A also includes annual evaluation with a full review after three and five years.

Criticisms of Alternative B

Comment: The limited wolf recovery area boundaries are objectionable and the areas are too small. “The prevention of natural expansion goes against the notion of establishing natural populations.” (6)

Response: Comments acknowledged.

Comment: The projected wolf numbers are too low and don't meet the 1982 Recovery Plan goals; the low population could be easily extirpated. The high projected mortality rate is objectionable.

Response: Comment acknowledged.

Comment: It will be impossible to confine the wolves to the primary recovery zones. It is not feasible to recapture and return wolves and it is too costly.

Response: We believe this could be accomplished with adequate staffing and resources, but there would be many instances of wolves ranging beyond the primary recovery zones for a period of time until they were recaptured.

Comment: The wolf should stay on the “endangered” list.

Response: The legal protections afforded under the proposed experimental population rule are considered adequate. Except for narrowly defined exceptions, killing of the wolves would be a violation of the ESA and subject the offenders to severe penalties.

Comment: The land use restrictions are inadequate.

Response: In other areas of gray wolf recovery, e.g., Montana, Minnesota, and Wisconsin, land use restrictions have proven almost entirely unnecessary for wolf recovery and such restrictions are counterproductive unless they are clearly needed.

Comment: “It represents a job half done and will contribute to long term conflict in our communities as these issues remain unsettled.” (18)

Response: Comment acknowledged.

Suggested Alternative B Modifications

Comment: Blue Range reintroduction should occur first, followed by the White Sands if the wolves are doing well.

Response: We believe that reintroduction must occur on both areas for this alternative to contribute substantively to Mexican wolf recovery. Reintroductions could occur on both areas simultaneously. However, this is not the Preferred Alternative.

Comment: White Sands is too barren and inadequate to support many wolves and should not be presented as a stand alone option.

Response: Large areas within the WSWRA, especially in the San Andres and Oscura Mountains, are not barren. Studies have determined that habitats on WSMR could support about 20 wolves. We are not presenting the WSWRA as a stand alone option in any of the alternatives.

Comment: If Alternative B is successful, then expand it to Alternative A.

Response: Opportunities to assess the success of Mexican wolf reintroduction are similar between Alternatives A and B. If the reintroduction is initiated under Alternative A, there would be no need to expand the effort. In addition, opportunities to terminate the project are similar between the two alternatives, if the initial reintroduction is unsuccessful. We see no clear advantage to phasing the project as suggested.

DEIS Alternative C: Based on specific decision criteria, reintroduction of wolves, classified as endangered, into the White Sands Wolf Recovery Area or the Blue Range Wolf Recovery Area, followed by a second reintroduction into the other area if necessary and feasible. Wolves will receive full protection under the Endangered Species Act.

Comments Favoring Alternative C

Comment: The low level of control and allowing natural dispersal are good. Limiting the amount of management and handling of wolves will be good for the social structure and wildness of the wolves; their propensity to depredate may be less with this more natural approach.

Response: Management and handling are considered necessary for successful wolf recovery and have not been shown in other areas to substantially affect social structure, "wildness," or depredation rates.

Comment: The wolf numbers and the speed of recovery are good.

Response: Comment acknowledged.

Comment: The grazing restrictions will reduce wolf/rancher conflicts.

Response: We believe that restrictions on grazing under the full-endangered alternative could increase rather than reduce such conflicts. Rather than imposing such restrictions, wolf recovery can be accomplished through extensive information and education efforts and effective response to reports of depredation.

Comment: The potential land use restrictions under Alternative C as far as reducing grazing if it conflicts with wolf recovery are good measures in themselves and should be supported regardless of whether wolf recovery occurs.

Response: We do not see the Mexican wolf recovery program as an appropriate vehicle for imposing grazing reductions or other land use restrictions that are not strictly necessary to accomplish wolf recovery.

Comment: Wolves are the best judges of what is suitable wolf habitat. It is not feasible to recapture and return wolves under Alternatives A and B.

Response: Humans have to play a major role in deciding what is suitable wolf habitat from a human perspective because some areas the wolves may choose, e.g. next to a private sheep operation, are likely to increase conflicts with humans. We believe it is appropriate to trap and translocate wolves in these sorts of circumstances.

Comment: These **captive-raised** wolves will need **full** protection as they re-adjust to the wild.

Response: **The first animals reintroduced** from captivity would most likely show some "un-wild" behaviors and therefore would be most in need of management, rather than a mostly hands-off approach as required under full-ESA protection.

Comment: **This is the most cost-effective** alternative.

Response: **Comment acknowledged.**

Comment: Full ESA protection is important in view of state/local legislation against reintroduction.

Response: **Under** the experimental nonessential approach, the FWS would adopt a federal regulation

known as the Mexican Wolf Experimental Population Rule (Appendix C). This regulation and the other applicable provisions of the ESA would preempt conflicting local/state legislation.

Comment: The federal government should keep this level of “endangered” protection.

Response: As with the Yellowstone and central Idaho reintroductions, we believe full-endangered status reduces management flexibility compared to experimental nonessential

Comment: This alternative means less illegal killing will result.

Response: This is very difficult to predict, but more illegal killing may result if greater resentment against the wolf results from the higher level of protection.

Comment: C is better than A and B because it will not be possible to distinguish “nonessential experimental” wolves from wild wolves; this alternative will facilitate natural recolonization as well as reintroduction with the least harassment of the wolves.

Response: Under *Alt.s* A and B, any wolf that is found within the large experimental population area will be subject to management under the experimental population rule, i.e., there will not be two types of wolves in that area. The likelihood of breeding populations of wild wolves appearing in the designated recovery areas appears extremely low, but the FWS likely would continue to research and support this possibility regardless of which alternative is chosen.

Criticisms of Alternative C

Comment: This alternative is not politically feasible. “I do not believe this plan will work because I believe it will receive too much opposition from ranchers and land owners who live nearby.....it is important to appease their views as much as possible while still ensuring the successful release of wolves into the wild.” (14)

Response: Comment acknowledged.

Comment: This alternative allows the FWS much less management flexibility, for example, in addressing wolf impacts on its prey species.

Response: We agree.

Comment: This alternative could be the most expensive in the long run because the FWS may need to do a lot more to protect wolves from rural people who don’t have recourse to protect their livestock.

Response: We recognize this possibility; the cost estimates are approximations and we feel the lack of flexibility under *Alt. C* could drive costs higher eventually.

Comment: “Wolves that leave the dispersal areas would likely get killed.” (397)

Response: We agree that this could occur, but are not sure whether there would be more illegal killing under this alternative, in or out of the designated recovery areas.

Suggested Alternative C Modifications

Comment: Both recovery areas should be used.

Response: Wolf dispersal would be unrestricted under this alternative. Wolves **would** eventually discover and occupy suitable habitats in the region. Additional reintroductions would significantly increase project costs.

Comment: The Blue Range Wolf Recovery Area should be definitely identified as the first area **to** be used.

Response: Alternative C has been revised and the BRWRA has been identified as the only area for wolf reintroduction.

Comment: The recovery areas should be expanded in the future.

Response: This would not be necessary under Alternative C because there would be no definite boundaries on where the wolves could disperse to under this alternative. The main significance of the recovery areas

under this alternative is just to designate where the wolves would be initially released.

Comment: Wolves should also be reintroduced under this alternative into Big Bend National Park.

Response: The capacity of this area to support wolves is unknown, but it is apparent that it, alone, could not support a viable population of wolves. It is close to Mexico where the wolves could disperse beyond U.S. protections. We consider Big Bend National Park to be an inappropriate place to try to reintroduce a viable population without first securing the cooperation of Mexico and then conducting a detailed feasibility study.

Comment: It should include recapture and return to recovery areas.

Response: Then the alternative would be much more like Alternative A. The problem is that, except for cases of depredation or threats to human safety, the routine recapture and return of the animals would be inconsistent with their full-endangered status.

Comment: The alternative needs to more clearly call for land use restrictions and elimination of predator control devices in the wolf recovery areas.

Response: We believe that under this alternative these sorts of restriction would more likely be imposed, but the actual imposition would be pursuant to consultations under section 7 of the ESA and cannot be predetermined exactly here.

Comment: “Could some hybrid ruling/alternative be proposed, i.e., wolves are endangered within the primary recovery zones and nonessential/experimental beyond?” (46)

Response: This is an interesting idea but seems to conflict with the guidelines for establishing experimental populations and would be confusing in implementation.

Comment: This alternative should be implemented first and then a transition made to experimental nonessential if the population becomes established.

Response: We believe that the success or failure of efforts to recover the Mexican wolf depends more on the level of rural public acceptance than the classification (experimental vs. endangered) of the re-established population. It is not clear that recovery would be more successful if wolves were reintroduced with endangered species status.

Comment: This alternative should be used but with allowance for ranchers to shoot wolves in the act of killing livestock.

Response: This would conflict with ESA full endangered status.

Comment: This alternative should be used if taking of wolves becomes too much of a problem under Alt. A.

Response: Law enforcement against illegal killing would be expected to be just as vigorous under Alt. A as under Alt. C. The main difference in terms of legal killing of wolves by private parties under Alt. A is for cases of actual observed depredation by wolves on livestock. If legal killing of livestock-taking wolves is so excessive as to prevent wolf recovery, then it may not be feasible to recover Mexican wolves in areas that have livestock.

Other Comments on Alternative C

Comment: On page 4-39, what is meant by “limited control of wolves that kill livestock” under full ESA protection?

Response: As stated on page 2-34 of the DEIS under Mitigation Measures for Alternative C, individual depredating full-endangered wolves could be controlled only pursuant to a permit so long as the action enhanced the subspecies’ survival, 16 USC sec. 1539(a)(1)(A).

Comment: “If history is any indication, the potential for man-wolf conflicts will be no greater under this option versus options A and B.” (94)

Response: We believe the nonessential experimental approach does offer more flexibility to address and reduce these conflicts.

DEIS Alternative D: No action/natural recolonization.

Comments Favoring Alternative D

Comment: Reintroduction will not work and is not justified, so No Action is the best approach.

• **Response:** Comment acknowledged.

Comment: “I believe this is the best plan because: a. The wolves would truly be wild, b. These wolves already know how to survive, c. This is less interference with the wolves, d. The cost is less, e. The wolves’ fear of man is already instilled.” (4 1)

Response: We generally agree that these are favorable attributes to have in wolves; the problem is the lack of evidence that Mexican wolves still exist in any numbers and could actually come back on their own.

Comment: Money would be better spent researching the wolves’ continued existence in Mexico rather than reintroducing them.

Response: Field surveys to determine the status of Mexican wolves in the wild in Mexico were conducted in 1994 and 1995. No confirmed evidence of the existence of wild wolves was found. Similar surveys will continue in 1996. If populations of wild Mexican wolves large enough to cause the recolonization of historic wolf habitats in the United States existed in Mexico, we believe that considerably more evidence of their existence would be apparent.

Criticisms of Alternative D

Comment: Even if it does occur, natural recolonization will be too slow to ensure Mexican wolf recovery. There is no confirmation that a wild population exists, let alone evidence of recolonization; this approach ignores the FWS’s duty to recover the subspecies. “It is critical to proceed with reintroduction now.” (18)

Response: We generally agree.

Comment: Choosing this alternative increases the likelihood of illegal wolf releases by radical pro wolf activists.

Response: Comment acknowledged.

Comment: “The captive breeding program is largely wasted if wolves can’t be reintroduced.” (550)

Response: If reintroduction did not occur, the program would preserve the Mexican wolf for public viewing and education in zoos and wildlife parks.

Comment: Big Bend National Park lacks prey to support a wolf population.

Response: Our preliminary, somewhat cursory, analysis indicates the Park could probably only support about one family group of wolves, or about five animals, which would not be independently viable.

Comment: “I don’t really like the threat of land use control proposed in Alternative D.” (683)

Response: We believe that if wolves recovered naturally these sorts of restrictions would more likely be imposed, but the actual imposition would be pursuant to consultations under section 7 of the ESA and cannot be predetermined exactly here.

Comment: This Alternative poses many threats to ranchers, including that they may not be able to tell an “endangered” wolf from a free-ranging hybrid wolf.

Response: If Mexican wolves recolonize areas in the U.S. naturally, thus retaining their endangered status, the commenter’s concern may become a problem. However, we believe it is very unlikely that natural recolonization of Mexican wolf populations will occur.

Comment: How can doing no releases be so expensive?

Response: We agree that this is confusing. Of course, if the Mexican Wolf Recovery Program was termi-

nated entirely, there **would be** no program costs. In response to public concern, we have revised Alternative D to more clearly separate the natural colonization scenario from the status quo scenario. Project costs are presented both with and without the occurrence of natural recolonization. See changes in Appendix B and Table 2-8.

Comment: This is a waste of tax dollars, to have a Mexican Wolf Recovery Program that does not reintroduce wolves.

Response: Comment acknowledged.

Comment: “If the wolves didn’t come back on their own, then you would need to start the reintroduction meetings again **and how** long would that take?” (26)

Response: If, say, we were to wait five years and then re-propose a reintroduction, we would need to re-initiate the NEPA scoping and EIS process, which would probably take at least another two years to get to a Record of Decision.

Suggested Alternative D Modifications

Comment: The alternative needs to more clearly call for land use restrictions and elimination of predator control devices and other steps should be taken in order to facilitate natural recolonization.

Response: Restrictions on USDA Animal Damage Control (ADC) activities must be based on reported presence of wolves in the area. Based upon past sighting reports (which remain unconfirmed) and historically heavy wolf use, such restrictions are in place only for Hidalgo County, NM, south of State Route 9. These restrictions are under review by the FWS. Given the lack of evidence of wolf presence, the FWS considers additional restrictions inappropriate.

Comment: This alternative should more clearly call for “No Action” and not encourage natural recolonization.

Response: The no action alternative means no change from the status quo which has been to monitor and support the idea of natural recolonization. However, in recognition of the lack of clarity about the no

action/natural recolonization alternative we have dropped “natural recolonization” from the name and tried to clarify the description in Chap. 2.

Other Comments on Alternative D

Comment: The sighting of wolves does not mean the establishment of packs.

Response: Agreed. Before the FWS considered an area to have “population” of wolves, there would have to be at least two breeding pairs of wild wolves successfully raising young each year for two consecutive years (see definition under Appendix G.)

Comment: Natural recolonization should be supported in the identified areas even if reintroduction takes place in the other areas designated for reintroduction.

Response: We agree and likely would continue to research and support possible natural recolonization even if reintroductions are underway elsewhere.

Additional Alternative Suggestions

Comment: Wolves should be released as experimental essential.

Response: This is not addressed because the FWS determined that the nonessential experimental classification fits the Mexican wolf’s status. Only wolves surplus to the captive breeding program will be released. (See Appendix C - Proposed Mexican Wolf Experimental Population Rule, section on Findings Regarding Reintroduction, and Appendix D - Section 7 Consultation on Proposed Action, section on Effects on Mexican Gray Wolf, regarding definition of “surplus” wolves and significance of their removal from the captive population.) Their loss would not jeopardize the continued survival of the subspecies. Further, the nonessential experimental classification allows for management flexibility deemed vital to successful wolf recovery (USFWS 1993a). We disagree with the argument that experiment essential status is legally required for the Mexican wolf. This is essentially an argument that any reintroduction of a captive population, when no wild population already exists, must be

essential rather than nonessential. This is not required by ESA section 1 O(j) or the implementing regulations and it accords neither with past reintroduction practice in the case of the red wolf and black-footed ferret, nor with currently proposed reintroductions of captive animals.

Comment: “At least a third recovery area needs to be established (Animas/Peloncillo area?) to insure viability of the species.” (28)

Response: It is possible that additional recovery areas could be identified in future phases of Mexican Wolf recovery efforts but no other areas are under consideration now.

Comment: Wolves should be released in: Big Bend National Park; Utah; Colorado; northern New Mexico; the bottom of the Grand Canyon; western Arizona; the Buenos Aires National Wildlife Refuge; Albuquerque; Joshua Tree National Park.

Response: These are outside Mexican wolf historic range or otherwise unsuitable.

Comment: “We support the No Action/Stop Wolf Welfare Alternative. This Alternative is defined as follows: 1. There will be no release of captive-raised (or wild) wolves. 2. No action shall be taken to ensure Mexican wolf recovery. 3. Terminate immediately all public (taxpayer) funding of the captive Mexican wolf program, all associated studies and or/other expenditures” (152 et al., form letter)

Response: Alternative D incorporates points 1. and 2. Additional analysis of point 3. appears unnecessary. The only additional impact of point 3. beyond Alternative D would be to eliminate all program costs, which have been revised and reduced for Alternative D in the FEIS. Also, the captive breeding program could be harmed by the lack of federal involvement and support.

Comment: “Wolves, if they are to be introduced at all, should only be established in remote areas out of range of domestic herds and flocks.” (584)

Response: Other than the WSWRA, no large live-stock-free areas exist in the wolf’s historic range in the Southwest that are suitable for reintroduction.

Comment: “Ship all the wolves to Mexico for re-establishment in Durango and Chihuahua, whence their ancestors came. Let the Mexicans worry about the re-establishment program and any conflicts or problems which may arise. If the program is successful, by the time the wolves migrate back to the U.S. they will no longer be an endangered species, and we will be able to take appropriate action to control them again.” (62 1)

Response: If Mexico expressed interest in reintroducing wolves surplus wolves might be made available. The rest of the suggestion is beyond the authority of U.S. agencies. In the long run, though, full recovery of the subspecies likely will require recovery efforts in Mexico.

Comment: They should only be released in fully fenced and carefully monitored areas.

Response: This is impractical, extremely expensive, and would not achieve the goal of restoring viable wild populations.

Comment: “On April 15, 1994, a reasonable alternative was submitted...by [Applied Ecosystem Management] to the FWS for consideration as part of this DEIS. To date, there has been no mention whatsoever of this alternative in any FWS documents nor was any explanation given as to why this alternative has been dropped from consideration.” (3,263)

Response: The suggested alternative was not “dropped”; it was treated as one firm’s suggestion well after the alternatives scoping period was over. We did fully consider the AEM suggestion, which was in some ways comparable to Alternative C. In addition to a lengthy meeting between AEM and Mexican wolf recovery staff, the FWS Regional Director, John Rogers, explained the FWS’s response to the AEM suggestion by letter dated Aug. 18, 1994 to Pete Shumway, Chair of the Eastern Arizona Counties Organization (cc.’d to AEM).

Comments on Issues

The NEPA Process and Public Involvement

Comment: The decisions about wolf recovery should be based on science and not politics or emotion.

Response: We think this is what the NEPA process is largely designed to achieve.

Comment: “[Wolf hearings] are held as lip service to the ruse that there is public input into the fish and wildlife issues. That way, if something goes wrong it can be blamed on the public.” (547)

Response: The meetings and hearings are an important part of the public comment process, which is critical under NEPA and has resulted in many changes to the DEIS.

Comment: Because the captive management facility is already under construction at the Sevilleta National Wildlife Refuge, the hearing and public comment process is a waste. “This is a strong indicator that the plan will be implemented regardless of hearings and/or comments.” (590)

Response: The facility at Sevilleta NWR is necessary to provide additional space for captive Mexican wolves, not currently available in zoos and wildlife parks. Building the facility is not a commitment to reintroduction. Even if the decision is not to reintroduce animals at this time, the facility would house a valuable population of Mexican wolves that is not subjected to the stresses and selective pressures of a human-dominated environment.

Comment: The stipulated settlement agreement in the Wolf Action Group lawsuit legally committed the FWS to reintroducing wolves, so the entire public comment process has been a sham.

Response: The settlement agreement did not commit the FWS to reintroducing wolves; it committed the FWS to completing the planning and environmental impact assessment processes, which may or may not result in a final decision to reintroduce.

Comment: The public open house meetings should have included the opportunity to submit oral comments.

Response: The 14 open house meetings were designed to foster information sharing and for accepting written comments. They were considered more productive, in terms of generating substantive public comments, than formal hearings, of which three were also held.

Comment: Formal hearings should not have been held in Phoenix and Austin, but in smaller towns closer to the areas and people affected.

Response: A total of 17 meetings and hearings were held to receive public comment on the draft EIS. Eleven of the meetings and one hearing were held near proposed wolf recovery or potential natural recolonization areas. Hearings are expensive. We chose to hold only one per state in a centrally located city. Rural interests were well represented at all the hearings. We believe the distribution of meetings and hearings provided all concerned individuals and interest groups sufficient opportunity to obtain information and comment on the draft EIS.

Comment: There should be public meetings in all parts of the United States.

Response: To save expense and to keep the issues focussed, the FWS decided to only hold meetings in the affected areas. However, written comments were received from all over the country.

Comment: The open house meeting format was very helpful; organization was competent and impressive. “You have done a great job of letting all sides have their say.” (877)

Response: Thank you.

Comment: The open house meeting format was poorly organized.

Response: Comment acknowledged.

Comment: The public notice to affected members of the public about the availability of the DEIS was inadequate.

Response: We held four scoping meetings in 1991 and 1992, held 14 public open houses and 3 formal hearings in the affected areas, published notices in local newspapers as well as the federal register, issued press releases, maintained a 5,000 plus person mailing list to which regular status reports as well as DEIS summaries have been sent, met with various county commissions, met with private organizations and individuals, sent DEIS's to hundreds of agencies, elected officials, organizations, and individuals, distributed DEIS copies in public libraries, and took other steps to communicate about the Mexican wolf reintroduction proposal. We have exceeded NEPA's public notice requirements and we plan to continue to provide public notice through the final decision and beyond.

General Comments on the DEIS

Comment: The DEIS was done well. It is comprehensive, informative, and readable. Adequate and fair consideration has been given to the ecological, economic and social impacts of the Proposed Action.

Response: Thank you.

Comment: The DEIS is conclusory; contradictory; speculative; scientifically indefensible; unsupported; thoroughly pro-wolf. "There are many portions of the DEIS that lack the detailed information necessary to make an intelligent decision concerning wolf reintroduction that will be subject to political or value judgments and not scientific evaluation..... Such 'uncertainty', 'incomplete information', and 'uncertain future trends' falls short of the requirements in the ESA." (906)

Response: We believe the DEIS, with the changes and corrections made as a result of the comments received, will lead to a sufficiently detailed, and analytical, FEIS to allow a rational decision. The FEIS is based on the best available information. At the same time, we believe good analysis includes pointing out uncertainties and information gaps where they exist. Projecting future impacts obviously involves uncertainty; we doubt that any wild animal recovery project could proceed under the ESA if complete certainty was required.

Comment: "The review of existing literature in compiling the DEIS was inadequate...the DEIS is a product of selective research aimed at justifying a pre-ordained conclusion." (2,996)

Response: We reviewed every piece of literature that appeared relevant to Mexican wolf recovery and its impacts, not all of which was deemed useful for projecting impacts and not all of which is cited in the Literature Cited Appendix. The FEIS does include more discussion of the historical literature than the DEIS. The conclusion of the NEPA process is not pre-ordained.

Comment: "The draft environmental statement is calculated to minimize the effect of wolf reintroduction by emphasizing the experimental designation of the initial introduction. Once the introduction has succeeded, the experimental classification will be dropped and the full impact of the cost of protecting this species will be felt by the ranchers, hunters, rural communities, the State of New Mexico, and the taxpayers of the United States in general." (3,400A)

Response: There is **no** plan to drop the experimental classification until the Mexican wolf subspecies is removed from ESA protection and management reverts to the states; this likely would not occur for several decades.

Comment: Impacts on humans should be considered when considering impacts on the environment.

Response: Socio-economic impacts and impacts on the built environment are required to be considered under NEPA and are considered in the EIS.

Comment: The first pages of Chap. 1 give the misimpression that wolves will be recovered throughout the entire historic range.

Response: This has been corrected to clearly state that this proposal will only occur in a portion of the animal's historic range in the United States.

Comment: Chapter 4 will be misleading to decisionmakers and the public because it over-emphasizes negative economic impacts. This favors preservation of the status quo.

Response: We acknowledge the DEIS focuses more on the quantified adverse impacts, such as lost hunting days due to reduced herd size, than on potential positive impacts like increased recreation that are very difficult to project quantitatively. We believe we have adequately pointed out the potential positive impacts. The EIS is not intended as a cost-benefit analysis. Key qualitative issues are to be considered by FWS and the Department of Interior, including the goals of the ESA.

Comment: “Chapter 4, though technical, **provides** a wealth of good information as to the sources of the predictions for the impacts that reintroduced wolves will have on the prey and predator **populations**....The assumptions were quite generous when calculating worst case scenarios. Thus, my confidence in this document for presenting the full range of impact possibilities is quite high.” (3,2 17)

Response: The “high range” scenarios for the impacts are not technically “worst case scenarios.” Similarly, the “low **range**” projections are not technically “best case.” The ranges are the most reasonable estimates of the bounds on the actual impacts that will occur based on a variety of sources, including actual observations of impacts from other areas where wolves occur, expert surveys, and computer modelling.

Comment: The livestock impact focus is too much on cattle and not enough on other large and small livestock.

Response: The EIS does mention the potential for wolves to take other livestock, but we lack the means to make a quantitative projection. Only one sheep allotment exists within the BRWRA and no **privately**-owned sheep are in the WSWRA. Thus, while some sheep may be taken by wolves, the numbers should be small. Poultry and smaller livestock may be taken opportunistically by wolves, but the numbers should not be high due to the normal care taken to protect them from all kinds of predators.

Comment: “We are also concerned about the direct **conflict of** interest of those writing the DEIS. The conflict of interest arises from the fact that those who write the **EIS**s for endangered species, choose the alternatives, conduct and edit the science, edit the comments and make all the decisions, are the same

ones who benefit directly from their own contrived determinations.” (2,000)

Response: We acknowledge there may be some appearance of conflict inherent in the process. That is why we have extensive public and agency review and opportunities for judicial review.

Comments on Policy and Laws

Comment: The discussion of the Convention on Biological Diversity in Chap. 1 does not support wolf reintroduction because the U.S. is not a party to the Convention in that the Senate has not ratified it.

Response: We did point out that the U.S. is not a party to the Convention. We think this international law does help put the restoration of endangered species into a global perspective.

Comment: “The Mexican wolf reintroduction demonstrates the viability of [the ESA and other environmental laws] and their capacity to be fairly and effectively implemented.” (39)

Response: Comment acknowledged.

Comment: Reintroducing the Mexican wolf will just give the anti-ESA people more ammunition and put the Arizona Game and Fish Department in a more **difficult** position with its conservative legislature. Wildlife protection will be hurt in the long run.

Response: These political concerns are beyond the scope of this EIS process.

Endangered Species Act, the Mexican Wolf Recovery Plan, Endangered Status, and Experimental Nonessential Designation

Comment: Wolves should be released as experimental essential.

Response: See response to this comment above under Additional Alternatives Suggestions.

Comment: “The **finding of whether** the wolf experimental population is, or is not, essential to the

continued existence of the species in the wild must be made by rule making and not by an EIS.” (3,263)

Response: We have determined that the Mexican wolf, if released, should be classified as experimental nonessential. (See response to previous comment.) This determination appears in the Proposed Mexican Wolf Experimental Population Rule (Appendix C), which would be formalized and finalized in a final rule prior to experimental reintroduction of wolves.

Comment: Designation of the Mexican wolf as nonessential means that it is not endangered, therefore there is no reason to reintroduce it.

Response: The “experimental nonessential” terminology in section 1 O(j) of the ESA is confusing. It does not mean that the animal is not near extinction and it does not mean the reintroduction is just an experiment. It is a classification designed to make the reintroduction of endangered species more flexible and responsive to public concerns to improve the likelihood of success.

Comment: The experimental nonessential designation cannot legally be used because the reintroduced population would not be “wholly separate geographically from nonexperimental populations of the same populations.”

Response: We disagree; see comments and responses under Continuing Existence of Wild Mexican Wolves, below.

Comment: “The Mexican wolf is clearly a subspecies and hence does not qualify for listing, **let alone** reintroduction.” (34)

Response: The ESA allows the listing and recovery of subspecies.

Comment: The gray wolf is not endangered or near extinction, it is doing fine in zoos as well as in Canada and Alaska; there are no gray wolf subspecies; the gray wolf should be de-listed, and not reintroduced.

Response: This approach would conflict with scientific information on North American *Canis lupus* subspecies and with the FWS’s obligations under the ESA.

Comment: The DEIS is unclear on what number of wolves is necessary for de-listing and on what the FWS’s long-range plans for wolf recovery are. The recovery area goals are clearly inadequate to establish viable populations. “If it is anticipated that another population will need to be established for recovery purposes, this should be stated, along with an explanation as to why establishment of such a population was not addressed in this plan.” (3,368)

Response: Preliminary population viability assessments, using the simulation model VORTEX, predict that a population of 100 Mexican wolves in the BRWRA would have a high probability of surviving for **100** years. Modern principles of conservation biology suggest that multiple populations of the same species provide greater survival assurance than single populations. The original Mexican Wolf Recovery Team recognized that the re-establishment of one population of 100 wolves in the wild would not be sufficient to remove the subspecies from ESA protection. The current Mexican Wolf Recovery Team is revising the population objectives for achieving recovery through the application of conservation biology principles. This EIS covers only the initial reintroduction of Mexican wolves to the wild; future reintroductions are neither assured nor foreclosed. However, any future reintroductions would require separate analysis under the National Environmental Policy Act (NEPA).

Comment: “At least five populations with a minimum total population of 500 wolves should be the criteria for genetic and population sustainability before delisting.” (28)

Response: See above response.

Comment: “Since the FWS is mandated by the ESA to protect all threatened or endangered species, how can the agency state that the re-introduction of the Mexican Gray Wolf will not force the agency to enforce sections 7 & 9 of the ESA once populations begin to increase?” (906)

Response: A **nonessential**, experimental population of a threatened or endangered species, established under provisions of section 10(j) of the ESA is granted limited exceptions to the provisions of sections 7 and 9 of the ESA. For example, formal

consultation with the FWS is not required for Federal actions that may affect such populations occurring outside the National Wildlife Refuge System or the National Park System. An informal “conference” is required. However, section 7(a)(1) remains in full effect, requiring all Federal agencies to further the purposes of the ESA. Limited exceptions for allowable take of members of the nonessential, experimental population are defined in a special rule for the population. The FWS must find that the level of take allowed will not preclude the conservation of the species. Any take that is not authorized by the special rule is in violation of section 9, and the violator is subject to prosecution for taking an endangered species. Thus, nonessential, experimental populations retain substantial protection under the ESA. This fact is commonly misunderstood.

Mexican Wolf Taxonomy and Historic Range

Comment: The ESA requires the FWS to use the best science available, yet the FWS dismisses the disagreement among wolf taxonomists and the conclusions of experts that the Mexican wolf is indistinct from two other subspecies. The 1982 Mexican Wolf Recovery Plan taxonomic discussion is clearly not the best science available.

Response: The EIS acknowledges the disagreements among wolf taxonomists and the conclusion of some experts that the Mexican wolf is indistinct from two other formerly recognized subspecies. The discussion on taxonomy in chapter 1 incorporates new information that has come to light since publication of the 1982 Mexican Wolf Recovery Plan and it incorporates current expert thought on the taxonomic status of the Mexican wolf.

Comment: If the extent of the range is uncertain this should be indicated on the range maps with dashed lines.

Response: We agree. See the revised discussion of historic distribution of Mexican wolves and the revised range map in chapter 1 of the FEIS.

Continuing Existence of Wild Mexican Wolves

NOTE: See extensive separate FWS response to comment submitted by Mr. Dennis Parker on this topic in Appendix K.

Comment: The FWS has **large** numbers of wolf sightings from in or near the proposed wolf recovery areas (e.g., Wolok 1994), thus the requirements of geographical separation of experimental and nonexperimental populations would be violated.

Response: Neither Wolok nor any other researcher has confirmed the existence of wild Mexican wolves anywhere. The FWS has undertaken directly, or financially supported, investigation into this issue, without any confirmed reports. “Probable” reports in Wolok and other research are not confirmed, could well be released hybrids or other animals, are very sporadic, generally do not come from the proposed recovery areas, and offer no support for the idea that wolves are in the process of naturally recolonizing these areas. Even if there were confirmed wolf reports in these areas, there would have to be a “population” of wolves in the area before the FWS would consider an experimental introduction to be barred. See definition of population in the Glossary, Appendix G.

Comment: What efforts are being undertaken to find remaining wolves in Mexico? Doesn't trying to **conserve** wild wolves there make more sense than reintroducing captive-raised animals?

Response: Surveys **are underway** to **determine** the status of the Mexican wolf in the wild in Mexico. The existence of **wild** wolves **has not been confirmed**. Surveys will continue for at least one more year. While protected by law, wild wolves in Mexico, if they exist, receive little actual protection. If a viable population of wild wolves were discovered in Mexico, it would make good sense to make strong efforts to protect that population. Even if this scenario occurs, it may still make good sense to further secure wolf recovery by reintroducing captive raised Mexican wolves in the U.S.

Comment: The **fact** the FWS failed to cite Dr. Julio Carrera's 1994 report on his wolf investigations in Mexico is evidence the FWS is covering up the fact that he has found wolves there.

Response: Carrera has not confirmed wolves to exist in Mexico. His report was not cited as it was not in hand when the pertinent sections of the DEIS, Chap. 1 (Status) and Chap. 3 (Alternative D), were drafted; he was cited in those sections by personal communication. His written report is cited in the FEIS.

Comment: “What would happen if the reintroduction efforts were underway and natural wolf recolonization was determined to have occurred in SW New Mexico or SE Arizona? Would this halt the reintroduction process? This does not seem to be explicitly addressed in the DEIS?” (46)

Response: It would not necessarily halt the reintroduction process. As stated on pages 2-15 and 2-16 of the DEIS in the description of the Proposed Action, if natural recolonization of Mexican wolves were to occur anywhere in the U.S., this would be an important factor in deciding whether future reintroductions would be necessary to achieve the recovery goal of 100 animals ranging across 5,000 mi².

Comment: “The possible existence of wolves already living in the wild in Mexico would mean that a reintroduced captive, genetically different population would possibly be mingled with wild wolves, which is contrary to the prescribed process.” (584)

Response: They would not be mingled if they are so far separated as to have no interaction. If there are wolves in Mexico, it does not conflict with the ESA if this sort of co-mingling occurs; in fact, it would probably add favorable genetic diversity to both populations. The ESA’s concern with mingling is basically that experimental populations not be reintroduced in an area where a known wild, full-endangered, population exists. This is not the case here.

Comment: “Fish and Wildlife [should] negotiate for a travel corridor through the Peloncillos, allowing safe passage of potential recolonizing wolves from Mexico into the Gila along historic wolf runways.” (Soc. p. 144)

Response: This is outside the scope of the proposal being considered in this EIS. Furthermore, the existence of a source population in Mexico has not been documented.

Comment: Wild Mexican wolves already live in the: Sacramento Mountains, Burro Mountains, Blue Range, West Texas, and other areas.

Response: Evidence of this is lacking.

Captive Population

NOTE: see extensive separate FWS response to comment submitted by Dennis Parker on this topic in Appendix K.

Comment: The captive breeding program is a waste of taxpayers’ money and should be terminated; the wolves should be sterilized.

Response: This approach would conflict with the FWS’s obligations under the ESA.

Comment: The wolves in captivity are not genetically pure Mexican wolves, they are inbred, hybrid, and they are unlikely to be viable in the wild, thus unlikely to further the conservation of the subspecies; there has been inadequate peer review of these issues.

Response: On all of these issues, the FWS has endeavored to obtain the best expert opinion available; we disagree with the comment. See Appendix K.

Comment: The Aragon and Ghost Ranch lineages are pure Mexican wolves and the EIS should reflect this.

Response: Agreed. The discussion in Chapter 1, Status has been modified to reflect the FWS’s recent determinations regarding these lineages.

Comment: “The Mexican wolf should not become a domesticated ‘dog’.” (880)

Response: Comment acknowledged; there is a concern that gradual domestication could occur if the animals remain in captivity for many generations.

Comment: “Since its confinement to captivity, the Mexican gray wolf has made a biologically remarkable recovery. Now the most endangered wolf in the world is at the doorstep to a long awaited future.” (1,074)

Response: Comment acknowledged; the captive population has grown steadily and is healthy overall.

Comment: “Make sure you do not deplete the breeding stock now in captivity.” (1,148) “The term ‘surplus’ is misleading and should be changed to avoid confusion.....The death of one Mexican wolf would represent the loss of one percent of the entire population.. . [This] does indeed represent a serious blow to the survival of the species.” (1,543)

Response: The pertinent text in Chapter 2 has been revised to further clarify that “surplus” wolves are surplus to the captive population, which may be the source of confusion. Surplus wolves have enough close relatives in the captive population to render them unimportant as future breeders and, therefore, potential candidates for reintroduction. Until reintroduction proves successful, the survival of the subspecies is ensured entirely by the maintenance of a genetically and demographically healthy captive population. Surplus wolves have no significant role to play in that regard.

Comment: Captive wolves are adapted to people and will seek them out if they are released and their behavior will be abnormal and cause the program to fail.

Response: Wild Mexican wolves would be preferable, but none are available. The wolves taken from the Seville National Wildlife Refuge Captive Management Facility and other remote facilities will not be adapted to people in the way the zoo animals may be. Based on the red wolf reintroduction experience, we do expect some abnormal behavior in the animals released from captivity and are prepared to address it under the experimental population rule. Pups that are born in the wild should display more typical behaviors of wild wolves.

Comment: Part of the scientific justification of the reintroduction is to determine whether there has, in fact, been any deleterious effect on the wolves from years of captive existence.

Response: We agree that this will be an important question to study as part of the research and monitoring efforts, as it was in the similar red wolf case.

Mexican Wolf Life History, Ecology, and Disease Concerns

Comment: “Appendix A (and its referenced source in FWS 1994) (1) omits reference to the scientific literature, (2) draws inferences from northern populations which would better be represented as hypotheses regarding southern populations and (3) restates generalizations from the popular literature which do not clarify the existing scientific evidence regarding behavioral variation within wolf populations.” (3,656)

Response: Appendix A is an outline of Mexican wolf life history, ecology, and disease concerns and is not meant to be a comprehensive treatise on the subject. We have qualified the Introduction to emphasize the point that the wild Mexican wolf was not well-studied prior to its extirpation and that many of the assertions in Appendix A are based on studies of northern populations. There is little, if any, reliance on “popular literature” in Appendix A; while not all the references are to peer-reviewed literature, all of the references are to recognized experts or experienced investigators in the field.

Comment: “I can tell you that the larger wolves [in the Sierra Madre Mountains] in those days considerably exceeded the 90 lbs. top limit given in your report.” (373)

Response: It may be true that wild Mexican wolves grow larger than the weights indicated, but clear evidence is lacking.

Comment: “The Mexican wolf is a dangerous animal which kills just to be killing and does not stop until he kills all available.” (620)

Response: While surplus killing is occasionally documented in wolves it is considered rare. It has been **found** with very vulnerable domestic animals, like turkeys or sheep, and occasionally with yarded-up deer in snow conditions where the deer are unable to run quickly but enough crust exists to allow the wolves to run over the top of the snow.

Comment: Is hybridization of wolves with coyotes or dogs a risk as happened with the red wolf?

Response: In general, gray wolves demonstrate less evidence of past cross-breeding with coyotes than do red wolves. Hybridization between Mexican wolves and coyotes or dogs is biologically possible, but evidence suggesting that such cross-breedings frequently occurred in the wild is lacking. We consider this possibility a slight risk, but do not believe it will jeopardize recovery of the Mexican wolf. Monitoring of reintroduced wolves should detect situations where a wolf appears to be in a breeding situation with another canine species. If such a situation were to occur, efforts would be made to prevent the production of hybrid offspring.

Comment: “The wolf is a known carrier of rabies and could easily make a tremendous impact on the conditions of the ecosystem.” (ALA-5)

Response: As stated in Appendix A, the presence of a relatively small number of wolves should not significantly affect the incidence of rabies or other diseases in the recovery areas. Further, reports from the Lower 48 states of human death due to getting rabies from wolves have been exceedingly rare in recorded history (one case in Wyoming in 1833) (Johnson 1992).

Release Techniques

Comment: The suggested aversive conditioning techniques lack a record of success on wolves elsewhere.

Response: We are aware of the mixed results of various aversive conditioning techniques. The FWS will conduct an extensive review of the literature and obtain the opinions of appropriate experts before aversive conditioning techniques, if any, are attempted.

Comment: Explain what the typical battery life is for a telemetry collar, on p. 2-2.

Response: Battery life of standard telemetry collars used on wolves is typically 3 years or longer.

Comment: “if possible it may be wise to have a balanced representation of wolves from the several producing facilities in both the BRWRA and WSWRA . . . since it may become obvious later on

that wolves from some facilities have better survivability than do those from other facilities.” (845)

Response: To the maximum extent possible, wolves that are candidates for reintroduction would be moved to the FWS’s wolf management facility, or other designated facilities, at a young age to begin the acclimation process and selection for a future life in the wild. The suggested approach would be complicated by the fact that few wolves in the captive population spend their entire lives in one facility. Nevertheless, the idea merits consideration.

Comment: Your release locations and times should go unannounced, to give the wolves the best protection.

Response: The FWS will consider this suggestion when detailed release protocols are developed.

Comment: The FWS is proposing to release too many wolves in the early years. “If introduction is to be successful and the side effects be controlled you should slow the initial release so as to gain knowledge of the process and provide sufficient mitigation for the problems.” (1,787)

Response: Generally, the likelihood of success in animal reintroduction efforts is positively correlated with the number of animals released. Larger releases increase the chances of reproduction in the wild and provide a buffer against inevitable mortalities. Our numbers are comparable to the numbers the FWS released successfully in Yellowstone and Central Idaho.

Wolf Recovery Areas

Comment: The areas are too large and will tie up too much land.

Response: The largest area, the BRWRA, is estimated to be an appropriate size to support a sustainable wolf population of 100 animals. The WSWRA is too small to do so without active human management of the **population**. The designation of the areas carries no land use restrictions with it.

Comment: White Sands never was and never will be wolf habitat; it is subject to drought.

Response: The Animals section in the Chap. 3 description of the WSWRA includes historical documentation of wolves in the area. In Chap. 2, the section on Selection of Potential Areas for Releasing Mexican Wolves describes the favorable attributes the area possesses as future wolf habitat.

Scattered natural springs are available in the area; however, we recognize that severe drought conditions could reduce the deer herd and water availability. In that case, wolf impacts on the deer population could be significant (see Chap. 4).

Comment: White Sands was chosen for political, rather than biological, reasons, which is in violation of the ESA.

Response: Biological assessments have documented its suitability to support wolves. These assessments are based upon the best available information. Of course, an aspect of the area that is attractive for biological, management, and political reasons is the fact that it is federal land with an absence of livestock.

Comment: “It is likely that the rugged eastern canyonlands of the San Andres Mountains [of the WSWRA] will be avoided by Mexican wolves. This means, contrary to what the DEIS indicates, that not all of the San Andres Mountains may be suitable wolf habitat. One ecologist suggested that free water sources in the desert may be a limiting factor, especially to lactating females.” (2,030)

Response: We recognize that not all of the San Andres will be suitable habitat. While there is little doubt that at some point slope, alone, would limit the suitability of a specific area for wolves, anecdotal evidence suggests wolves can hunt on terrain that would be considered by humans to be quite rugged. Whether this ability will be shown by Mexican wolves is unknown. Our estimates of the number of wolves that could be supported on the WSWRA were based to a large extent on estimates of mule deer populations. Generally, our evaluations incorporated the assumption that wolves would be limited by the availability of water indirectly through the availability of prey, which is limited somewhat by the availability of water. We do not expect extensive use of the desert areas, based on historical accounts.

Comment: “If the reintroductions are to occur, the White Sands area seems best because of the tighter control and lower cost of cattle killed.” (4 1) Also, fewer wolves would be illegally killed.

Response: White Sands would involve fewer conflicts and provide learning opportunities for both wolves and wolf managers. The chief concerns with this area are the potentially major impacts on the deer population and the fact that the area probably will not support an independently sustainable wolf population.

Comment: The wolves are not going to respect the BRWRA western boundary and will immediately disperse onto the San Carlos and White Mountain reservations.

Response: We recognize that this could occur. We would conduct the initial releases on the east side of the primary recovery zone and would seek to have a cooperative management agreement in place to allow removal of the wolves from tribal lands if the tribes desire their removal.

Comment: The primary recovery zone of the BRWRA should include the Gila and Aldo Leopold Wilderness areas.

Response: Primary recovery zones were established largely on the basis of recommendations received from the States. The ultimate objective of the proposal is for wolves to colonize areas they determine to be suitable throughout the designated wolf recovery areas. At that point, the location of initial releases becomes unimportant. Another consideration is the operational difficulties of conducting soft releases (with wolves in pens for long periods) in wilderness areas, where the use of motorized equipment is prohibited.

Comment: The ranking system used to select the Blue Range area lacked adequate investigation.

Response: This ranking was largely based on a detailed 1992 investigation and report by the Arizona Game and Fish Department (AGFD 1992). While such a ranking is inherently rough, we are confident that the Blue Range area is superior to the other three Arizona candidate areas.

Comment: The ranking system should have included “weighting factors that note an emphasis on the more important attributes.” (3,217)

Response: The use of weighting factors was considered, but found to be inappropriate because of difficulties in assigning weights and the desire to avoid a false sense of precision in the analysis. We believe that the method used resulted in an appropriate ranking of the areas.

Comment: The idea behind the Proposed Action as stated by the FWS in its 1992 Notice of Intent to Issue the EIS was to analyze the various classification alternatives with respect to all five areas then under consideration; this should have occurred.

Response: The FWS stated in the 1992 Notice that the five sites would be evaluated and considered in the scoping process and the results explained in the EIS as far as how the five were narrowed down. This is explained in summary in the section of Chap. 2 entitled Selection of Potential Areas for Releasing Mexican Wolves and in more detail in a separate paper (USFWS 1993e). The FWS did not commit to carrying all five through the EIS.

Comment: “There is no historical evidence that these areas was part of the wolf habitat prior to the settlement of these areas.” (562)

Response: The Chap. 3 discussion under “Animals - History of wolves” for each area includes historical documentation of wolves in the areas.

Comment: “Monitoring and protecting reintroduced wolves which roamed back and forth across the [Mexican] border would probably be impossibly difficult.” (584)

Response: This is one of the reasons that the designated wolf recovery areas are far north of the border. Under the Proposed Rule, wolves would likely be captured before they could disperse to Mexico.

Comment: The potential natural recolonization areas would be the best places for reintroduction.

Response: Not according to our analysis (see Table 2-1). These areas are generally too small to support a viable population. Also, see response to previous question.

The Affected Environments

Comment: On p. 3- 15, it mistakenly says that the Apache and Gila National Forests are managed for even-aged stands; in fact, uneven-aged management is now practiced.

Response: We have changed this in the FEIS to reflect that management has moved toward emphasis on uneven-aged stands. This change has been driven by recent guidelines and analysis of alternatives for Forest Plan amendments to include protection of Mexican spotted owl and northern goshawk habitats.

Comment: On p. 3- 18, under Apache County, there are at least three wood processing plants.

Response: Comment acknowledged; language has been changed.

Comment: How much trapping occurs in the area?

Response: Little in the BRWRA in recent years due to low pelt prices and the trapping ban in Arizona. None in the WSWRA.

Management Strategies

Comment: The lack of definition of “problem wolves” gives too much management flexibility. “Harassment” must be more clearly defined. “Rendezvous sites” needs definition.

Response: With the addition of a definition of “rendezvous site,” all these terms are now defined in Appendix G. We believe management flexibility is positive. Refinement of the definition of “problem wolves” would occur under the FWS-approved interagency management plan that would be developed (see provision (3)(vii) of the proposed experimental population rule, Appendix C).

Comment: “Sub-populations, demes, corridors, inbreeding, etc., these are all concepts that should be present in this **DEIS.**” (3,356)

Response: We believe that appropriate concepts relating to conservation biology have been incorporated into the EIS.

Comment: Long term population goals are unclear; will they be capped at the numbers indicated?

Response: No, they will not be **artificially** “capped.” The overall goal is 100 wolves distributed across 5,000 mi². If both areas are used, the BRWRA is expected to be suitable for approximately 100 wolves and the WSWRA for 20 wolves. The actual numbers should not greatly exceed those numbers, through a combination of natural mortality and management actions. Further refinement of the goals may be needed depending on actual territorial requirements of the wolves observed after they are released.

Comment: If they are reintroduced in Arizona and New Mexico they will disperse to **Texas** in a relatively short time; their dispersal cannot be prevented.

Response: We believe they can be retrieved before they reached Texas.

Comment: A citizen advisory committee should be assembled to advise on management.

Response: We agree. See revisions in the description of the Preferred Alternative (Chap. 2, Alt. A).

Comment: “The adaptive management approach seems reasonable and practical. It should allow for the necessary flexibility to **successfully** deal with the many challenges, foreseen and unforeseen, that will surely arise during the program’s implementation.” (3,340)

Response: We agree.

Comment: “There is a distinction between informal and formal adaptive management. To provide formal channels of communication with grazers and hunters, I would encourage expansion of the concept to a formal procedure of long term management of predator, deer, elk and livestock populations.” (3,656)

Response: This suggestion goes beyond the scope of the less formal adaptive management approach we envision. However, it appears worthy of consideration by the management group after it is formed.

The Draft Experimental Population Rule

Comment: The Proposed Action in the DEIS emphasizes using BRWRA and/or WSWRA while the draft Proposed Experimental Population Rule emphasizes both areas being used; why the difference?

Response: The draft Proposed Mexican Wolf Experimental Population Rule was written to cover the Proposed Action in its fullest application, that is, as if both areas are ultimately used. It should not be interpreted as a statement that both areas actually will be used.

Comment: Concerning the provisions allowing take of wolves that attack livestock: they are too broad, the time limit for the private permit should be drastically reduced from up to 45 days, and take should not be allowed unless depredation exceeds a certain percentage of the herd present, e.g. 1 or 2%. Also, the allowance for taking nuisance wolves and for using lethal methods are too vague.

Response: We believe the provisions are reasonable and will not impede wolf recovery. It would be very **difficult**, if not impossible, to accurately monitor livestock depredation rates attributable exclusively to wolves. Protocols for various management measures, such as the taking of nuisance wolves and the use of lethal methods, will be defined in greater detail in the FWS-approved management plan referenced in the Proposed Rule. This gives us the flexibility to adapt to situations that may be **difficult** to perceive prior to the reintroduction of wolves.

Comment: The Mexican Wolf Experimental Population Area is about twice as large as needed to administer the rule.

Response: We disagree. No naturally occurring populations of Mexican wolves exist in or anywhere near the proposed Experimental Population Area (EPA). The most likely natural recolonization areas have been excluded from the EPA (see **Alt. D**). A

smaller EPA would have the potential of artificially creating “endangered” Mexican wolves by allowing experimental wolves to disperse outside the EPA more quickly. We believe the proposed EPA provides the management flexibility necessary.

Comment: The statement on p. 2-22 and in () (9) of the proposed experimental population rule that the FWS would terminate the reintroductions, if a court ordered the FWS to change the designation from nonessential experimental to a higher degree of protection, is illegal and has another major flaw. If the court required the FWS to proceed with the changed status then the FWS would have to proceed regardless of that statement.

Response: The purpose of the statement is to commit the FWS as much as legally possible to its Proposed Action, if it is chosen in the Record of Decision. There has been public and agency concern that the FWS would later change the nonessential experimental designation to endangered. Of course, the FWS cannot commit itself to violating a valid court order. Nevertheless, the FWS believes the statement is valid legally and is good policy.

Comment: The DEIS fails to demonstrate that the FWS has consulted with affected landowners and agencies on the Mexican Wolf Experimental Population Rule.

Response: The DEIS review process itself has provided some of this opportunity on the draft proposed rule; further, more focused consultations are to occur upon publication of the proposed rule in the Federal Register.

Research and Monitoring

Comment: The use of capture collars should be minimized; they cause stress and potential injuries and have other shortcomings.

Response: We agree, and do not plan to use these devices; references to them in Chap. 2 have been deleted. In fact, they are no longer manufactured.

Comment: The scientific research aspects of the reintroduction should not be cut back; if inadequate

funding is available for monitoring and research the project should not be undertaken; research should include impacts of the wolf and the factors contributing to success or failure of the reintroductions. “We suggest research needs include: (1) factors influencing movements, reproductive success, hunting success and mortality of reintroduced individuals and their progeny, (2) factors influencing predator/prey dynamics in the proposed reintroduction sites, and (3) regional landscape analysis of habitat fragments . . . surrounding the proposed reintroduction sites, the potential recolonization sites on the border and the potential remnant sites in the Sierra Madre Occidental.” (3,052)

Response: We agree that research is an important part of this effort, but it is not the purpose. However, monitoring the wolves is fundamental and we would not support releasing wolves if we did not believe we could adequately monitor them. We would work cooperatively with appropriate non-governmental (e.g. academic) researchers to implement essential monitoring and research efforts. The reintroductions should provide outstanding research opportunities on biological, ecological, and socio-economic aspects of wolf recovery.

Comment: Reintroduced wolves should not be trapped for scientific study purposes.

Response: The primary purpose of this proposal is to re-establish a wild population of Mexican wolves to prevent their extinction and promote their recovery to a more secure status. Research conducted on reintroduced animals or reestablished populations must be compatible with that purpose. Intrusive research cannot be legally conducted without permission from the FWS.

Comment: “Any thought of keeping track of wolf movements after the second generation is laughable. It will be impossible to find the dens and cubs in the densely forested wilderness areas.” (1,075)

Response: Wolf managers and researchers in other remote and densely forested areas have been very effective in finding, capturing, and radio-collaring wild-born wolves.

Comment: What will the FWS do when collars fail or fall off? When will it stop radio-collaring wolves that it captures and will it remove collars from collared wolves after a certain period?

Response: We plan to monitor reintroduced populations throughout the population growth phase and for 5 years beyond attainment of the established population objective. This does not necessarily mean that every wolf will be radio-collared during this period. Specific answers to these questions will be addressed by the management group through the informal adaptive management process.

Comment: How will the FWS keep people from tracking and killing wolves by following their radio collar signals?

Response: This has not been a problem in other areas with radio-collared wolves. The FWS does not publicly release radio frequencies. Even if someone had access to the frequencies, it would take considerable time, expense, and effort to locate a radio-collared wolf and get close enough to kill it.

Comment: Aerial overflights will disturb both wolves and other animals; other approaches should be used.

Response: Decades of wolf research using aerial monitoring of radio-collared wolves reveals no indication that wolves are disturbed. We plan to use both ground and aerial tracking.

Comment: Incentives for the local public to monitor and report wolf activity should be used; this will not only provide information but will help build local support.

Response: This **approach will** be considered.

Strategies to Control Wolves

Comment: Given the known historic difficulty of trapping Mexican wolves, why is the FWS confident that it will be able to control them through trapping?

Response: We disagree with the commenter's interpretation of history regarding this issue. Trapping was

one of many very effective techniques used to totally eradicate the Mexican wolf from the United States. Trapping has been used effectively in other wolf management programs. However, we do anticipate that some wolves will be more difficult to capture than others. In some cases other techniques may have to be used, such as firing tranquilizer darts from aircraft.

Comment: Wolves that eat livestock should not be killed, but removed from the area.

Response: Non-lethal control methods will be preferred and encouraged. Depredating wolves taken alive would generally be translocated to an area where they are less likely to depredate or put back into the captive population. Euthanasia is a last resort.

Comment: The FWS is too willing to kill or move wolves that threaten livestock or leave the recovery areas.

Response: We disagree; most of the management strategy has proved successful for wolf recovery elsewhere and we believe it is appropriate.

Comment: Killing wolves that kill livestock will disrupt the packs and the social learning necessary for wolf survival in the wild, thus will hurt wolf recovery without necessarily reducing the depredation rate. Young wolves from disrupted packs are more likely to depredate on easier-to-catch livestock.

Response: The comment is speculative. Another point to consider is that young wolves learn to hunt and recognize prey from their parents and will pass similar behaviors to their offspring. Thus, if livestock depredating wolves are allowed to remain in the population, the rate of livestock depredation may increase over time. In other areas where wolves are recovering either naturally or through reintroductions, ongoing control of livestock depredating wolves has not prevented wolf population growth.

Comment: 'What is the time frame for 'recapturing wolves that 'drift' outside the recovery areas?'' (906) What will the FWS do if the wolves repeatedly demonstrate a preference for public land that is outside the recovery area boundaries? More flexibility

is needed to reduce the costs and negative impacts of repeated trapping and moving of the wolves.

Response: As soon as we know that a wolf has relocated on public land outside the recovery area, capture efforts will begin. Wolves that “drift” out and back will not be considered for recapture until it is clear that they have relocated from the recovery area.

Public Take and Harassment of Wolves

Comment: Killing of wolves to protect livestock should be prohibited; instead ranchers should be compensated for the cows killed in the attack.

Response: A private group, Defenders of Wildlife, has a depredation compensation fund. We believe that, under narrow circumstances, allowing ranchers to kill wolves with evidence that wolves were actually attacking their livestock probably will reduce the level of illegal killing, increase public acceptance of wolf recovery, help to remove non-adaptive behaviors from the wolf population, and benefit wolf recovery in the long run

Comment: Public take of wolves on private lands is acceptable but not on public lands.

Response: We agree that it is less acceptable on public lands, but do provide for the granting of permits to private individuals, who have public land grazing allotments, to take wolves actually attacking cattle, under narrow circumstances where federal depredation control efforts in the area have not succeeded.

Comment: The provision for granting permits to ranchers to take wolves that kill livestock on public lands should not be construed as an entitlement by the ranchers.

Response: There are several conditions that must be met before such a permit would be granted, as spelled out in the proposed experimental population rule at sec. () (3)(v)(B), and the operative word is that the FWS “may” grant the permit, rather than “shall.”

Comment: The disallowance of rancher take of wolves killing their livestock on public lands shows

that the FWS intends to drive ranchers off public lands. What will the Service do if ranchers pull all their cattle onto private lands to lure the wolves?

Response: As stated in the previous response, we will permit some private taking of wolves on public lands. We do not intend to drive ranchers off and have tried to tailor the proposal to minimize conflict with ranchers, where possible and consistent with wolf recovery. Thus, harassment of wolves on public lands near livestock is allowed. The hypothetical situation appears very unlikely because the vast majority of the grazing land in these areas is public. Also, the wolves would not likely be “lured.”

Comment: Livestock owners are very unlikely to actually see wolves in the act of attacking livestock, thus giving them permission to kill wolves if they are seen in the act is meaningless.

Response: We agree that in open range grazing situations this is unlikely. The provision should provide some protection to livestock that are bunched and observed regularly by the rancher.

Illegal Killing of Wolves

Comment: “Hunters and trappers are notorious liars and could quite conceivably kill all the wolves” (2).

Response: We disagree with the comment and note that this has not happened elsewhere where wolf recovery has occurred.

Comment: This program will make criminals out of common people who act to defend their livestock.

Response: Legal killing of wolves is allowed under narrow circumstances; we do not expect that many people will kill wolves illegally.

Comment: The Yellowstone and Central Idaho reintroductions demonstrate that the compensation fund alone will not prevent illegal killing of wolves.

Response: Agreed; at least three illegal killings have occurred in those areas. Yet, the funds’ existence, including payment already to at least one sheep

rancher, may have helped reduce the level of illegal killing.

Comment: Drivers on public highways should be excused from accidental hitting of wolves, but off-road drivers in wolf habitat should not be excused.

Response: It is hard to conceive that an off-road vehicle could be moving fast enough to hit a wolf by accident before the wolf could move out of the way. If this proves to be a problem, which we do not expect, the rule could be amended.

Comment: On p. 2-22 and in the proposed rule, prosecution for illegal killings should be mandatory, instead of the “may” be prosecuted language used.

Response: We disagree; prosecutorial discretion is important for successful prosecutions. As indicated in the following response, we are committed to vigorous enforcement in appropriate cases.

Law Enforcement

Comment: Illegal killing of wolves should be vigorously prosecuted.

Response: We agree and intend to support this when there is evidence that illegal killing occurred.

Comment: More is needed in the EIS about penalties for violation of the taking provisions of the ESA and the experimental rule, and about the proposed enforcement measures and budget.

Response: The potential criminal penalties under Section 11 (b)(1) of the ESA are a fine of not more than \$50,000 and/or imprisonment for not more than one year. Depending on the violation other penalties could apply. Enforcement of violations would fall to the Law Enforcement Division of the FWS, which would be aided by the Mexican Wolf Recovery Program field staff and cooperating agencies. No separate Law Enforcement Division budget is proposed.

Comment: “U.S. Fish & Wildlife Service must be required to fully cooperate with local law enforcement

agencies allowing local agencies to take a lead role in how enforcement actions are to be initiated.” (S-23)

Response: Cooperation between federal, state, and local law enforcement agencies regarding violations of the ESA or the experimental population rule would be generally the same for the Mexican wolf as it is for other violations of the ESA.

Private Property Rights

Comment: Wolf recovery and associated encroachment by government personnel and increased regulation are an infringement of private property rights.

Response: Under the Proposed Action there would be no trespassing, wolf management, or land use restrictions imposed on private (or tribal) property without the owner’s consent. Appendix C, the proposed Mexican Wolf Experimental Population Rule, includes a specific Required Determination that the proposal has been reviewed and found not to constitute a taking of private property under the 5th Amendment. If enforcement against illegal killing of wolves is necessary on private lands it would only be undertaken pursuant to established federal law enforcement procedures.

Comment: The reduction of property rights resulting from depredation and federal regulation of use of private land will make lenders less likely to extend credit, with the land as collateral, to ranchers in or near the wolf recovery areas.

Response: We have no evidence that this has occurred in other areas where wolves have recovered. The Proposed Action includes no regulation of private land or restrictions of private land use. Further, the expected depredation rates are unlikely to reduce the creditworthiness of ranchers.

Human Safety

Comment: “The USFWS has set up its documentation standards to exclude most if not all legitimate wolf attacks.” (TC-6)

Response: The FWS has no formal standards to include or exclude wild wolf attack reports, but we do look for evidence of the reliability of the reports received. We do not consider attacks by captive wolf-dog hybrids very relevant to the issue of human safety from wolf attacks in the wild. We recognize that a very few documented wild wolf attacks have occurred in North America. We generally rely on the opinions of wolf experts on this subject (see Mech 1992, USFWS 1987).

Comment: “There may not be a verified record of wolves attacking humans, but, it is only a matter of time and you will have one or more.” (60 1)

Response: This is possible but considered extremely unlikely by wolf experts.

Comment: The slight risk to humans can be dealt with through minor precautions.

Response: We agree; these would include the same sorts of precautions as one would take when in black bear or mountain lion country.

Comment: Who will be legally responsible if the wolf does attack and injure a person?

Response: This is considered extremely unlikely to occur. The FWS position is that reintroduced native wildlife are wild animals. Nothing in this proposal is designed to affect the law of legal liability or to prevent a person from suing the federal government if they think they have a valid case.

Comment: “Even though it is highly unlikely that wolves will ever threaten human life, they should not be prevented from recovering wild populations even if they do occasionally threaten human life.” (1,543)

Response: The recovery provisions of the ESA make no distinction between life-threatening and non-life-threatening species. We do not believe this will be a significant issue for wolf recovery.

Comment: “Their is a real [human safety] problem if the wolves should cross with domestic dogs.” (590)

Response: Wolf-dog hybrids are unpredictable and potentially dangerous pets; they often lack the fear of

humans that wild wolves exhibit. The FWS discourages possession of them. It is rare for wolves and dogs to interbreed except where caged together by humans. It has never been shown to our knowledge that a wolf/dog hybrid has resulted from wild wolves being in a human-settled area that has then gone on to attack people.

Impacts on Wild Prey of Wolves

Comment: Wolves will kill old and sick prey that would die soon anyway and this will benefit the herd overall; also, wolves will keep deer and elk from overpopulating and exceeding the carrying capacity of their habitats. The EIS should discuss these points more.

Response: Potential positive impacts of wolf predation on its prey were mentioned on page 4-5 of the DEIS. It should be pointed out that wolves will not only kill old and sick prey.

Comment: Wolves will not be selective for old or sick prey and will take as many or more healthy wildlife.

Response: See answer to previous question. The modelling of wolf impacts on prey populations did assume certain rates of wolf predation on different age classes of deer and elk, based on knowledge of gray wolf predation (see Green-Hammond 1994 and Parsons 1994).

Comment: The Blue Range deer population is already depleted and cannot handle increased depredation. The herd should be replenished before wolf reintroduction.

Response: Our modelling included increasing, decreasing, and stable deer herd scenarios developed with input from state game managers. Even under the decreasing scenario for BRWRA deer, the effects on the herd are not catastrophic.

Comment: The Blue Range elk herd has expanded and the range conditions and herd health have deteriorated.

Response: Comment acknowledged, although the FWS has found no clear information that elk herd health has declined.

Comment: “Record populations of elk and deer in the Blue Range Recovery Area attest to the lack of a predator to control populations.” (36) “Much biological research supports the thesis that deer and elk are much more numerous now than at any time previous to European settlement; predation by wolves and by Native Americans kept large mammal populations low.” (2,976)

Response: Comments acknowledged, although it does not appear that the BRWRA or WSWRA deer are at record high populations.

Comment: “I hunted New Mexico all 48 years of my life. For the past three years I have hunted the Gila Wilderness. The game management practices of the Dep’t of Game and of New Mexico of the past 40 years have resulted in the most healthy, flourishing herd of elk in the country. The mule deer and other wildlife are producing more abundant number and healthier animals than ever before. Why would we consider interrupting the current successes with the reintroduction of the wolf is totally beyond me.” (710)

Response: Our projections are that these populations can withstand a resumption of the natural predation they experienced from wolves without catastrophic effects.

Comment: “The 1993 mule deer composition data for the San Andres Mountains that is used in the Assessment of Impacts to Populations and Human Harvests of Deer and Elk Caused by the Reintroduction of Mexican Wolves ([Green-Hammond] 1994), which was done for the DEIS, does not match any of the available deer composition data. The assessment uses a buck:doe:fawn ratio of 47: 100:43; but the actual empirical data from a helicopter survey conducted on 1/23/93 was 45: 100:37 and from ground surveys conducted during 12/1/93-1/24/94 was 30: 100:27. Those surveys indicate lower buck and fawn ratios than what was used in the assessment. Our mule deer composition data showed that a considerable deer population decline occurred during the 1994 drought year-the buck:doe:fawn ratio was

40: 100:7. Consequently, the results of the assessment above may not pertain to the conditions of the deer population at the time of the wolf reintroduction planned for 1997. Before wolves are released on the San Andres Mountains, the deer population should be reassessed using empirical data in order to insure that wolves are not being released into a prey poor environment.” (2,030)

Response: The differences pointed out between the empirical data on buck:doe:fawn ratios from January and December 1993 and January 1994 and the initial ratio used in our model would not likely broaden the range of effects predicted, because fawn:doe ratios varied in our model simulations and the limits of the range of effects result from the inclusion of increasing and decreasing herd scenarios. However, like the commenter, we are concerned about the effects of recent drought conditions on WSWRA deer herds; and the data provided reinforces that concern. The predicted marginal capability of the WSWRA deer herd to withstand the predation effects of wolf reintroduction, disregarding possible effects of current drought conditions, was one of the reasons for recommending the BRWRA as the initial reintroduction location in the Preferred Alternative. Also, a provision has been added that would require a reassessment of prey populations on the WSWRA before wolf reintroduction could occur there.

Comment: Wolves would help reduce the too-high WSWRA oryx population.

Response: This is possible, but wolf predation experts we polled predicted that wolf impacts on the non-native African oryx population, while uncertain, likely would be light.

Comment: Wolves would probably affect the prey less on White Sands, where hunting is limited, than in the Blue Range Area.

Response: While hunting is less, the deer population is much smaller on White Sands. There are no elk and we are unsure of the rate that wolves will take oryx. Thus, our projections show that wolf predation could cause a major deer decline under the decreasing deer herd scenario.

Comment: The DEIS contains inadequate discussion of wolf impacts on pronghorn and management that will result if significant impacts occur.

Response: We lack sufficient data to quantitatively project wolf predation impacts on pronghorn. We expect it to be relatively light because pronghorn prefer more open, lower elevation areas than wolves are expected to prefer and their speed facilitates escape.

Comment: “Fig. 4-1, page 4-4: this schematic graph suggests a declining trend in prey numbers for the ‘stable with wolves’ case. Shouldn’t the trend become parallel to the “stable without wolves” trend after some time as an equilibrium is established between the wolf-prey populations?” (46)

Response: That figure is a very generalized illustration. The commenter’s suggestion is valid; that is, if the hypothetical population trend lines were extended further into the future they would become horizontal, suggesting that an “equilibrium” condition had been reached. Of course, true equilibrium rarely, if ever, occurs in natural systems; and future prey numbers would fluctuate up and down in response to a variety of factors such as predator numbers, climate, human hunter harvest, management of predator and prey populations, competition for food, habitat condition, etc.

Comment: The impact numbers on the prey as given in the summary and Chap. 2 tables are confusing, the time reference is unclear.

Response: The “net impact” on prey is a picture of the prey population five years after the wolf recovery goal is achieved. See note 1, added to Table 2 in the Summary, and Table 2-8 in Chap. 2. It is not the annual impact. The reader should refer to the full text of Chap.4, under Alt. A, Impacts on Wild Prey, for a more complete understanding of prey impacts.

Comment: Inadequate data are available to predict the wolf/prey trends.

Response: We used data and expert opinions from the Arizona and New Mexico big game managers, which they use in setting hunts. We asked them to predict reasonable high and low population scenarios, as well as a stable scenario. We also examined data on

game impacts from other areas where wolves have recovered.

Comment: The estimates used for the amount of prey taken by wolves are too high; wolves need not have a negative impact on prey populations.

Response: The estimate for prey taken after the recovery goals are achieved is based on approximate requirements of six lbs. of meat per wolf per day, which is based on studies of gray wolves in other areas and some assumptions about how Mexican wolves will behave in comparison (see Appendix A - Prey section and Parsons 1994). Our model runs generally project that wolves would gradually reduce prey populations over a period of years such that the reductions may not be readily observable. We do recognize that culling and other potential wolf impacts on the prey herds are considered beneficial.

Comment: Wolves will devastate the recently replanted Rocky Mountain Bighorn sheep herds in Eastern Arizona.

Response: We have added more discussion on bighorn sheep and impacts on them in the BRWRA to Chap.s 3 and 4, with the assistance of the Arizona Game and Fish Department.

Comment: Wolves will devastate ungulate populations and hunting as they have in parts of Alaska, Minnesota, Alberta, and elsewhere; the DEIS estimates are too low.

Response: Many factors affect ungulate populations. Rarely can a change in ungulate populations be attributed to one single factor, such as predation by wolves. Experts generally agree that once suppressed, by whatever cause, the recovery of ungulate populations to higher levels can sometimes be significantly prolonged, and theoretically precluded, by continued predation. However, most experts agree that in healthy ecosystems the effects of predators on their prey is beneficial to the overall health and fitness of prey populations. Notably, the deer population in northern Minnesota has reached historically high levels, as has hunter take, while the wolf population has increased steadily at the same time (M. Nelson, Nat’l Biol. Survey, pers. comm.). The Proposed Rule contains a provision that would allow wolf popula-

tions to be reduced if ungulate populations are substantially reduced due to predation by wolves.

Comment: The provision to capture and move wolves if they “impact on game populations in ways which may inhibit further recovery” is unclear and that event is unlikely to occur.

Response: The quoted phrase is defined precisely in the Glossary (Appendix G). We agree that such a reduction in game populations caused by wolves is unlikely to occur.

Comment: The DEIS is inadequate for failing to model impacts on species other than deer and elk and on hunting on these other species.

Response: Adequate data for constructing models for these species is not available; and impacts to these species are expected to be minor. Impacts to large ungulate species other than deer and elk are discussed in qualitative terms.

Comment: More consideration needs to be given to other factors, such as disease, weather, and habitat loss, that will impact prey populations.

Response: The modelling effort for wolf impacts did include consideration of these sorts of factors. Generally, we agree that factors other than wolf predation, particularly weather, will have a greater influence on prey numbers.

Comment: “Research also indicates predation is additive and not compensatory which will definitely have negative effects on ungulate populations..... Ungulate populations suffer because wolves destroy the replacement segment of a wildlife population.” (906)

Response: We found the published research to be inconclusive as to whether wolf predation is additive, partially compensatory, or full compensatory. Several experts were polled on this issue; and their collective opinion was that from 15% to 47% of wolf-caused mortality would be compensated by reduced mortality from other sources. Model simulations included both ends of this range, which is reflected in the range of projected impacts to deer and **elk** populations.

Comment: Wolf predation may stimulate higher birth and twinning rates; also, deer in wolf territory are larger and fitter than in areas where wolves are not present.

Response: These phenomena could be expected, based on generally accepted ecological principles.

Comment: Wolf prey a lot on mice and other rodents; this will reduce the threat of rodent-borne diseases.

Response: Small mammals are estimated to make up only a small percentage by weight of the wolf’s diet and the wolves are expected to displace coyotes to some extent, which depend on small prey more than wolves. We lack evidence that wolf recovery has the effect suggested.

Comment: Wolves displacing of coyotes, which prey **on many** deer fawns, may mean that the deer herds increase.

Response: This is possible, but we lack sufficient data to make such a prediction.

Impacts on Hunting

Comment: Wolf reintroduction may bring more hunters on the chance they could kill a wolf (illegally).

Response: We lack evidence to support this. Poaching of wolves could be a problem, but it is unlikely to attract many more hunters.

Comment: The decline in hunting is overstated.

Response: We admit uncertainty in predicting the impacts on hunting. In other parts of the country where wolves have come back there have not been hunting reductions, but our modelling efforts suggests there should be such reductions in the Southwest if the deer and elk herds are appreciably reduced. If the game managers don’t reduce the level of hunting, then hunter success should drop.

Comment: The FWS should impose hunting restrictions in the wolf recovery areas to provide more prey for wolves.

Response: Regulation of hunting is a state, not a federal, role.

Comment: The DEIS overemphasizes impacts on hunting in the BRWRA in relation to non-consumptive uses. Hunting only represents about **10%** of the recreational visitor days.

Response: We acknowledge that the DEIS focuses more on quantified adverse impacts, such as lost hunting days due to reduced herd size, than on potential positive impacts like increased recreation that are difficult to project quantitatively.

Comment: “It won’t take a rocket scientist to see your cutting off a large part of your income from hunters.” (470)

Response: The projected reduction in hunting should mean that the state game agencies receive less in license fees than they would otherwise. This would not directly affect the federal FWS or its Mexican Wolf Recovery Program.

Comment: The reductions of game and hunting will hurt “private land owners who depend a great deal on deer as a source of revenue.” (55 **1**)

Response: This private land deer hunting is primarily an issue in Texas, where no impacts on hunting are projected to occur.

Comment: If there are too many elk or deer it is better to give more hunting permits to sportsmen.

Response: The purpose of wolf reintroduction is not to reduce the deer and elk herds, rather this is a projected effect.

Comment: Wolf predation could force game managers to ban or greatly reduce hunting; the DEIS doesn’t recognize that this could occur.

Response: To our knowledge, this has not occurred in other areas where wolf populations have re-established; and game managers in Arizona and New Mexico do not anticipate reductions in permitted hunting effort as a result of wolf reintroduction. A provision in the proposed rule would allow control of wolf populations if game populations significantly

decline as a result of wolf predation. Our analyses do predict a decline in game populations compared to what they would be without wolves, and some reduction in hunting opportunity in wolf recovery areas could occur 10-15 years after initial wolf reintroductions. These reductions are not projected to be drastic, as the commenter has suggested.

Comment: The projected herd reductions will mean fewer permits will ultimately be given out and it is already too hard to get hunting licenses. “The comment on p. **11** of the summary to the effect that hunters may not actually hunt less overall because of fewer deer and elk in the recovery areas but instead turn their attention to substitute areas or species is clearly erroneous.” (**10**)

Response: We agree that it is likely that the presence of wolves will ultimately mean fewer licenses will be given out than if there were no wolves. The numbers we present for hunting losses in the DEIS assume no effort by hunters to substitute for these lost opportunities by pursuing other hunting opportunities elsewhere (including, perhaps, in other states or on Indian reservations or for less popular species than deer and elk.). We believe there would be some substitution, though we lack information to project it quantitatively.

Comment: Hunters kill prime animals while wolves kill old, young, diseased, and other non-prime animals.

Response: Generally **this is true, but** wolves may take some prime animals as well, just as hunters may take some old or diseased animals.

Comment: The reduction in deer and elk should be compensated for as livestock depredation is.

Response: The livestock depredation fund is a private effort designed to offset losses of privately owned livestock. The taking of wild deer or elk by wolves does not affect anyone’s private property and is part of the natural predator-prey relationship, which has never been compensated for financially anywhere else, to our knowledge.

Impacts on the Livestock Industry

Comment: It is clear that in order to restore viable wolf populations in the Southwest they will eventually have to be put where there are livestock, so the fact that no livestock are on the WSWRA should not make that area more preferable than the BRWRA, which has livestock.

Response: The New Mexico Department of Game and Fish has cited the absence of livestock on WSWRA as one of the reasons it is opposed to wolf reintroduction in that area. The BRWRA, which contains livestock, has been selected as the preferred reintroduction area for various biological reasons beyond just the presence or absence of livestock.

Comment: Historically, cattle losses to wolves were higher than those projected; the livestock depredation estimates are too low.

Response: It is likely true that historic livestock losses were higher than projected losses in the EIS because cattle were more plentiful and native prey were less plentiful around the turn of the century. However, data on historic livestock losses, wolf abundance, and native prey abundance are incomplete and unreliable in some cases, but we have added more discussion of the historic data in Chap. 1, under Reasons for Listing.

Comment: The reasons for high historic depredation rates were depletion of the wolves' native prey and overstocking of cattle within the wolf range.

Response: See response to previous comment.

Comment: Gray wolves prefer cattle as prey because of their similarity to bison, their preferred prey.

Response: This interesting idea lacks historical support for the Mexican wolf. Most of the historic Mexican wolf **range** was not in the historic bison range.

Comment: The rates of depredation from Simonette River, Alberta, (Appendix F) were quite high and if rates that high occurred in the Southwest the livestock industry would be decimated.

Response: The Simonette River case showed the highest documented wolf depredation rates during a few years (1975- 1978) when control of depredating wolves was experimentally withheld. It was a relatively small area with a high wolf to cattle ratio. This sort of "worst case scenario" could be observed in portions of the southwestern wolf recovery areas, but, as in Alberta, would not likely be duplicated over a large area. Active control of depredating wolves under the Proposed Action would help prevent such worst case scenarios from occurring. The Simonette River livestock industry was not decimated.

Comment: Wolves will prefer easy-to-get calves to deer or elk.

Response: Observations of gray wolf behavior elsewhere indicate that wolves prefer wild prey, although they would be expected to take some calves. Under the proposal, wolves that do so will be controlled.

Comment: The livestock depredation estimates are totally speculative.

Response: They are based on the best evidence available regarding rates of wolf depredation on livestock in Minnesota, Montana, and Alberta. Observations from those areas were adjusted for differences in the Southwest, with the aid of an expert survey on these issues (see Appendix F - Summary of Livestock Depredation Survey Responses).

Comment: The livestock losses are projected as small, such as 1% of the livestock, but this is misleading. The percentage of total livestock in the state lost to depredation is not relevant, but the percentage should be based on the number of livestock in the wolf recovery areas.

Response: Our depredation projections are not percentages of livestock in the whole state. Rather, like the comparison studies our projections are based on, they are percentages of the total livestock in the wolf territories, i.e., the livestock available in the designated wolf recovery areas.

Comment: How can you have a **fraction of a cow** killed per year, such as .01 for the WSWRA?

Response: This means that on average one cow would be killed every ten years.

Comment: More explanation is needed in the livestock loss projections about how the average value of cattle and calves was arrived at.

Response: Additional clarification has been added to the notes of Table 4-4, pointing out that this value is based on state agriculture department figures as to the average value of all cattle in the state including everything from bulls to calves and high value cattle to culls.

Comment: Using depredation rates from Minnesota to project rates in the Southwest is unrealistic due to the very different industries.

Response: We recognize the differences and tried to take them into account in our projections and our expert survey, (see Box 4-3 and Appendix F). The data from Minnesota is very complete and considered by many experts to be relevant to other areas despite the different circumstances. In the grazing season in Minnesota, when the vegetation is thick and the animals are not tended regularly, livestock even in relatively small pastures are exposed and vulnerable to attack by the many wolves present.

Comment: Wolf recovery in Minnesota since 1979 has resulted in a great reduction in the number of farms and sheep in the wolf range.

Response: We disagree. Certainly, other socio-economic factors have had a far greater contribution to reduction in farm numbers, a national phenomenon. There is no evidence of wolves putting cattle ranchers out of business. Wolves do depredate on sheep in Minnesota more than cattle and in a few cases sheep ranchers over the last 15 or so years have claimed they stopped raising sheep due to wolf predation (B. Paul, USDA ADC, pers. comm.). However, there is only one sheep allotment in the proposed wolf recovery areas in the Southwest.

Comment: “The figures presented as possible wolf kills are not correct. They are so high that the ranching public will be up in arms.” (547)

Response: The figures are consistent with experiences from other areas where wolves and livestock and ranchers co-exist, without excessive illegal killing of wolves by ranchers.

Comment: The depredation projections are realistic.

Response: Comment acknowledged. Thank you.

Comment: As the wolf population grows and depletes the wild game it will turn more to livestock.

Response: This could occur to a minor extent, but the wolf is not projected to cause a major depletion of the wild game herds in the BRWRA, which is where the potential for livestock depredation is greatest, i.e., few livestock exist in the WSWRA.

Comment: Wolf reduction of big game herds will provide more grass for cattle.

Response: This is a possible, but uncertain, effect.

Comment: It will be hard for ranchers to tell whether a calf death resulted from wolves or natural causes. Lost newborn calves won't be discovered at all.

Response: If wolves are suspected (and their presence in an area will usually be known through monitoring efforts), then a specially-trained ADC wolf specialist will assist in determining the cause of the kill, using evidence on the carcass and in surrounding areas as well as information from the wolf monitoring efforts. This approach has worked fairly well in Minnesota and the Northern Rockies. However, not all kills can be found and identified, especially newborn calves.

Comment: Cattle ranchers are already struggling economically and predation contributes to this; any wolf depredation will make it worse.

Response: The level of wolf depredation is not expected to be high enough to cause major economic effects, although if individual ranchers suffer uncompensated losses they may face economic problems.

Comment: The livestock impact focus is too much on cattle and not enough on other large and small livestock.

Response: The EIS does mention the potential for wolves to take other livestock, but we do not consider the potential impacts on them to be significant enough to attempt to make quantitative projections, which would be quite difficult. Only one sheep allotment exists within the BRWRA and no privately-owned sheep are in the WSWRA. Thus, while some sheep will likely be taken by wolves, the numbers should be small. Poultry and smaller livestock could be taken opportunistically by wolves, but the numbers should not be high due to the normal care taken to protect them from all kinds of predators.

Comment: Ranchers in the BRWRA are having their grazing allotments severely reduced; wolf recovery on top of this will cause major economic stress.

Response: Those reductions are not across the board and have not been finally implemented yet, as most are under appeal. We have mentioned this under Chap. 3, Livestock Grazing, and Chap. 4, Alt. A, Cumulative Impacts.

Comment: “I have lost livestock to predators....There are so many predators killing so much livestock that I cannot believe that the Mexican wolf can affect livestock production.” (2,995)

Response: We agree that the impact of wolf depredation will be relatively minor in comparison to the current rates of depredation from other predators and the effect on overall livestock production will be marginal.

Comment: “The ranching lifestyle is not economically viable, it will decrease over time, and the reintroduction of the wolf will not make a difference in that.” (Soc. p. 179)

Response: We have no opinion on the overall economic viability of ranching, but agree that wolf depredation will be a marginal factor in relation to other factors that affect the viability of ranching such as beef prices, grazing fees, cost of supplies, other predators (see response to previous question), government programs related to ranching, competing land uses, rancher demographics, climate, and so on.

Comment: The statement on p. 4-25 that ranchers probably would not place irreplaceable breeding stock out on the open range is wrong.

Response: The range livestock industry is aware of the existing depredation rates caused by predators other than wolves. “Irreplaceable” breeding stock is not often left on the open range subject to depredation, at least without insurance. Full-grown, healthy, breeding stock is less likely to be depredated upon than smaller stock, especially calves.

Comment: More discussion of federal grazing fees is needed and how the fee formula already takes depredation into account.

Response: We have mentioned this in Box 3-1 of the FEIS, but this is a very broad accounting of depredation rates nationally, which the limited wolf depredation described in this document will not affect.

Comment: Ranchers will need to spend their own time or money to hire someone to do “wolfwatching” to protect their herds.

Response: Ranchers may wish to take additional steps and spend additional funds to protect their herds, but we do not believe, based on experiences elsewhere in North America, that each herd will need a “wolfwatcher.”

Comment: Ranchers will need to implement more advanced herd protection techniques, like guarding dogs, which will defend not just against wolves but also against other predators, thus reducing overall losses; burying carcasses; using horned cattle; and so on.

Response: Guarding dogs have not yet been shown to be effective in large, open range, cattle operations; nevertheless, we agree that better techniques should be sought and that open dumping of carcasses encourages depredation.

Comment: Why not try using aversive baits, such as lithium chloride wrapped in sheep or cowhide, to negatively condition wolves to livestock?

Response: See response to a previous comment on aversive conditioning, above, under Release Techniques.

Comment: The mitigation measures suggested by the FWS to reduce depredation are unrealistic. Further, the costs of implementing such measures are not included in the reintroduction cost estimates.

Response: The measures suggested come from experts familiar with wolf depredation on livestock in Alberta (Bjorge and Gunson 1985). We concurred, on p. 2-24 of the DEIS, that some of the measures may not be suited for the Southwest. A learning process will be necessary to find which, if any, depredation mitigation measures will work. The cost estimates for this sort of “wolf extension” work are included in the estimates in Appendix B under the categories of Field Staff salaries and Information/education.

Comment: The FWS or Defenders of Wildlife should provide financial incentives to ranchers to undertake husbandry changes that will reduce depredation rates.

Response: This is outside the current authority of the FWS. However, the Defenders of Wildlife has provided some financial assistance to ranchers for depredation prevention measures in the northern Rocky Mountain area.

Comment: Livestock grazing should be reduced in the wolf recovery areas, which have been damaged by overgrazing. Wolf predation will help reduce cattle numbers that are too high anyway.

Response: Wolf depredation will not affect overall cattle numbers; any cattle lost to depredation could be replaced.

Comment: “The cowman who cleans his range of wolves does not realize he is taking over the wolf’s job of trimming the herd to fit the range.” (2,8 19)

Response: Comment acknowledged; see response to previous comment.

Comment: Public lands are not “leased” for grazing, grazing is a public land privilege that is “authorized.”

Response: We have made this correction.

Compensation for Livestock Depredation

Comment: The DEIS under-emphasizes the compensation fund and overemphasizes the impact of a small number of lost cattle.

Response: The EIS focuses on the federal aspect of wolf recovery, rather than on related private initiatives that are beyond federal control. The DEIS does mention the Defenders of Wildlife fund and the FWS recognizes this has been a valuable aid to wolf recovery in the northern Rockies.

Comment: Make sure enough money is available to cover losses. The Minnesota compensation program went bankrupt.

Response: The Defenders fund is a private program that the FWS does not guarantee. The amount currently in the fund appears adequate to cover projected depredation losses for several years and we understand more money may be raised for the fund. The Minnesota compensation program is funded by the state legislature with an annual appropriation of about \$45,000, for a state with about 2,000 wolves. The fund has not gone “bankrupt”; every loss claimed and approved has been paid (B. Paul, USDA ADC, pers. comm.). During a few years, the claims have exceeded the appropriated amount. Thus, some claims had to wait until the following year for payment.

Comment: The **compensation program** should exist initially, but then the responsibility turned over to ranchers to protect their animals; the compensation program will be held out as bait to ranchers, but then cut back and eliminated; the compensation fund should be conditioned on ranchers not illegally shooting wolves; the fund should post a bond to cover losses; the fund should not apply if wolves are released or recolonize with full ESA protection; it should pay a flat percentage fee to ranchers based on the number of livestock they have in the wolf areas; the fund’s existence will encourage over-reporting of losses and discourage proper livestock protection through husbandry techniques.

Response: As a private fund, these matters are generally up to the Defenders of Wildlife to decide. Comments should be directed to this organization, headquartered in Washington, DC, or to its field representative in Tucson, AZ.

Comment: If the compensation fund runs out of funds, the project should be terminated.

Response: The FWS Mexican wolf recovery program is not conditioned on the existence of the private compensation fund.

Comment: The compensation program is unworkable.

Response: The same sort of program has proved reasonably workable in Minnesota and Montana.

Comment: Wolves may feed on carcasses of cows that died of other causes; all the dead cattle will be blamed on the wolves because of the financial incentive.

Response: Defenders of Wildlife requires the opinion of an animal damage control or wolf expert who has examined the carcass to determine whether wolves killed it, before compensation will be paid.

Comment: "I believe the wolves would displace other livestock predators that ranchers currently are not compensated for. Therefore, I see [the compensation program] as a net benefit to ranchers even if all losses cannot be verified." (ALP- 14)

Response: This could occur, although we lack sufficient evidence to project the ultimate impact of wolves on the overall predator make-up of a given area.

Impacts on Predator Control Programs

Comment: ADC activities should be completely eliminated in recovery areas.

Response: This has not proven necessary to accommodate gray wolf recovery elsewhere.

Comment: ADC is not an appropriate agency to be involved in recovering wolves as they helped eliminate them initially and still kill many predators.

Response: We disagree. ADC brings important predator control knowledge to the program and has been a key player in gray wolf recovery in Minnesota and the Northern Rockies.

Comment: Indiscriminate predator control methods should be removed.

Response: In **occupied** wolf range (see definition in Appendix G - Glossary), ADC use of M-44s and lethal snares would be restricted and there could be changes in trapping techniques.

Comment: A steel-jawed leghold trap can injure wolves even if it doesn't hold them. We should consider eliminating them.

Response: Modified steel-jawed leghold traps have been shown to be one of the most efficient and humane ways to capture wolves for research and management purposes. Injury and mortality can occur, but the rates are very low.

Comment: The discussion on page 4-40 regarding restricting the private shooting of coyotes if wolves are "mistakenly shot" should be discussed for each alternative.

Response: This was discussed also under Alternative D for each potential natural recolonization area under Impacts on Predator Control Programs. It was not discussed under the experimental non-essential alternatives (A and B) because the FWS believes that hunter education would be a more effective approach than imposing restrictions. If hunters are on notice that wolves are in an area, then they are responsible for making sure of their target and could be prosecuted if they shot a wolf and unreasonably claimed they thought it was a coyote.

Comment: Not enough predator control is being done on coyotes now and adding the wolf will just make things worse. There should be no restriction of predator control methods.

Response: Some restrictions on non-discriminating predator control methods are necessary to ensure continued recovery of reintroduced Mexican wolves. Wolves will likely reduce the numbers of coyotes in an area themselves. ‘While, it is true that wolf presence in an area would reduce the use of non-discriminating coyote control tools, the Proposed Rule does not restrict the use of traps, aerial gunning, non-choking-type snares, calling and shooting, and possibly other techniques which are effective in the control of coyotes. However, the use of some of these tools or techniques may be limited by mutual agreement between FWS and ADC if such limitations are determined necessary to protect Mexican wolves. We believe that effective control of coyotes, if necessary, could continue in areas that become occupied by wolves.

Comment: The White Mountain Apaches are using M-44s for coyote control adjacent to the BRWRA; allowing this does not make sense as the expensive wolf recovery program will be harmed by unnecessary wolf mortalities.

Response: EPA label restrictions prohibit the use of M-44’s in areas known to be occupied by Mexican wolves. If reintroduction is authorized for the BRWRA, the FWS will attempt to enter into a cooperative management agreement with the White Mountain Apache Tribe for purposes including the capture and removal of wolves that enter their reservation.

Comment: On p. 4-49, Bednarz (1988) is incorrectly cited for the suggestion that wolves may displace lions into cattle-grazing areas outside White Sands Missile Range, possibly increasing predator control needs in these areas.

Response: While we agree that we incorrectly cited Bednatz, and have changed that reference, we do think that the competition from wolves could displace some of the mountain lions and not only into the more precipitous areas, which are already densely populated by lions. Inter-specific competition and aggression could result in some lions and coyotes leaving the area.

Comment: The proposed restrictions on predator control activities in wolf recovery areas would reduce

the costs of ADC operations; this cost-saving should be reflected in the EIS.

Response: We question this conclusion. Wolf reintroduction should result in greater ADC costs, which the EIS reflects in the projected cost estimates in Appendix B. The reason for this is the need to hire a full-time wolf control specialist. While wolves may cause some reductions in other predator numbers in a given area, the presence of wolves will not eliminate the need for animal damage control actions against these other predators altogether. The presence of wolves will reduce the availability of neck snares and M-44’s as a control measure, thus the lower availability of control tools may increase the cost of ADC efforts.

Impacts on Other Predators

Comment: Wolves will not necessarily displace lions.

Response: We agree that inadequate data exists to confidently project this effect and we have not done so in our calculations of overall effects on hunting, livestock, etc. We do occasionally point out the potential for this to occur.

Comment: Wolves will eliminate lions and bears.

Response: Evidence to support this is lacking from other areas. While anecdotal evidence exist of wolves displacing lions, wolves and bears clearly can co-exist without major conflicts.

Comment: The restrictions on predator control methods will cause other predator populations to increase, which will harm ranchers and wildlife.

Response: Limited restrictions on predator control programs will be imposed only in areas known to be occupied by wolves. It appears very unlikely that, in areas occupied by wolves, other predator populations would increase, given our current understanding of inter-specific aggression between wolves and other predators, and the fact that the presence of wolves would increase competition for food resources. Also, see our response in the previous section to the comment on inadequate predator control.

Comment: Wolves will reduce coyotes, which will thereby enhance the deer herd.

Response: We agree that this may occur, but lack sufficient information to project this impact quantitatively.

Impacts on Other Endangered Species

Comment: Wolves will kill other endangered species. Wolves will eat many “candidates for federal protection. Specifically the Arizona black-tailed prairie dog, Organ Mountains Colorado chipmunk, White Sands woodrat, and the hot springs woodrat. How can there be ‘No Effect’?” (S- 1).

Response: Other than the possible impact on state-listed desert bighorn sheep in the San Andres, discussed above, no other impacts on populations of endangered species are foreseeable (see Appendix D - Section 7 Consultation). Small mammals collectively make up only a very small percentage of the Mexican wolf’s diet; and wolves would be more likely to catch common than rare small mammals. Wolves may reduce numbers of coyotes, which are more apt to prey on small mammals. Category 2 candidate species were not legally protected by the ESA; in fact, this classification has been eliminated by recent revisions to ESA procedures (Federal Register, Vol. 61, No. 40, February 28, 1966).

Comment: “Under the alternatives discussed, which endangered, threatened, or sensitive species would take precedent if wolves impact other T&E species.” (906)

Response: Under Alternative A and B, management for all other T&E species could take precedence over management for the wolf. The only species actually projected to potentially require translocation of the wolf is the state-listed desert bighorn sheep in the San Andres. Under C and D, the agencies would be put in a multiple species management situation, with federally-listed species having priority over non-listed species if management conflicts actually occurred. As a federally endangered species, the wolf would take precedence over the state-listed San Andres desert bighorns.

Comment: Reintroduction in White Sands should be done at a time when the desert bighorn sheep is no longer endangered.

Response: Wolves are not expected to take large numbers of these rugged-terrain animals. If they did, the Proposed Rule allows wolf trapping and relocation if necessary to protect the herd.

Impacts on Agency, State, Tribal, and Local Government Policies and Plans

Comment: “Supposed conflicts with county laws is ridiculous and should not be recognized and certainly not entertained.” (21)

Response: NEPA directs the FWS to consider conflicts with county laws resulting from federal programs and to discuss any federal preemption that occurs, which Chap. 4 of the EIS does.

Comment: “The states and counties should have been included in any and all endangered species reintroduction programs and should be permitted to be cooperating agencies in all early planning and decision making. It is against Sierra and Catron Counties land use planning ordinances to leave the counties out of any land planning that concerns its citizens.” (TC-6).

Response: The FWS has attempted to cooperate with the counties, however, we previously advised the potentially affected counties by letter that formal cooperating agency status was not considered appropriate. The counties may conduct their own wolf recovery planning if they wish - as some already have - and the FWS is willing to cooperate with them, if requested. See response to previous comment.

Comment: Implementation funds should be given to counties to assist in the reintroduction efforts and to defray costs imposed on the counties.

Response: It is not clear now that funding county involvement would aid wolf recovery and the FWS does not normally defray county costs. Nevertheless, if wolves are released, the FWS would consider organizational arrangements for involving county and citizen

interests in wolf management decisions. See the discussion of this concept in the description of **Alt. A**, in Chap. 2.

Comment: Tribes should agree on the number of wolves in a designated area. Active involvement with affected tribes is needed to reduce management conflicts.

Response: Wolf recovery is not proposed on tribal lands therefore we do not think it is appropriate to seek agreement with tribes on allowable numbers. Because of the likelihood of some dispersal on to the White Mountain and San Carlos Apache reservations, if wolves are reintroduced, the FWS would pursue cooperative management agreements with the tribes.

Comment: “How can the FWS ‘compel’ a sovereign nation [the tribes] to develop wolf management plans that are approved by the “FWS” or even to compel a sovereign nation to enter into a cooperative wolf management plan directly with the FWS?” (906)

Response: The tribes would not be compelled by the FWS to do anything; nevertheless, **if wolves** are present on or near the reservations, the tribes may choose to work cooperatively with the FWS on wolf management.

Comment: “Proceed with the Mexican wolf releases irregardless of the level of cooperation you get from the states of **Arizona** or New Mexico.” (658)

Response: The ESA, implementing regulations, and FWS policies support our attempts to cooperate with the states on endangered species recovery efforts.

Comment: “The US Fish and Wildlife [should] consult with the new New Mexico Endangered Species Act, which requires coordination down at the count)- level on any type of plan.” (Soc. p. 149)

Response: While the wolf is listed as endangered under New Mexico law, this is not a New Mexico action that would be subject to the new Wildlife Conservation Act amendments. Nevertheless, we have consulted and coordinated with the New Mexico Game and Fish Department and with county officials.

Comment: The states will not want to become the primary wolf managers after delisting, if it occurs.

Response: It is hard to predict how the states will respond far into the future, if de-listing occurs. If the law remains the same as now, the non-endangered wildlife of the country generally will be subject to state management.

Comment: The DEIS is devoid of a “review of the land withdrawal that established White Sands Missile Range. Until a legal review is completed, the release of the Mexican wolf on White Sands Missile Range may be outside the authority of the Department of Defense.” (2,867)

Response: We have reviewed this issue in consultation with the Department of Defense and find no legal impediment to wolf reintroduction on WSMR.

Comment: The Bureau of Land Management should be involved as a cooperator in the DEIS; the BLM management plans for the lands to the west of the White Sands Missile Range have not been adequately considered.

Response: BLM was invited to be a cooperator, but declined. Not much BLM land is involved in the designated wolf recovery areas. BLM has cooperated in providing information on those BLM lands that are involved, including management plans. Impacts on these were discussed under Chap. 4, **Alt. C**, Impacts on Agency and Local Government Policies and Plans, for the WSWRA. This discussion has been dropped in the FEIS as the WSWRA has been dropped from **Alt. C** (see Appendix L). Impacts on BLM’s plans for the WSWRA are not anticipated under the other alternatives.

Comment: “At a time when the management agencies are attempting to embrace an ecosystem management approach to their management, refocusing on single species, such as the wolf, diminishes the ability of the [Forest Service in the **BRWRA**] in its attempt to practice more holistic management.” (1,745).

Response: Under the full-endangered reintroduction approach at least the potential would exist for the wolf conflicting with broader forest management goals. However, under the Proposed Action, the wolf would

not impose any management conflict with existing or future management, except in the limited, temporary, closure areas. We think wolf recovery would generally benefit from ecosystem management (which is a somewhat loose term), but does not depend on it, and ecosystem management would benefit from the return of this native top predator.

Comment: A Sept. 30, 1994, Memorandum of Understanding [MOU] exists between the FWS and the Forest Service and other federal agencies in which they agreed to “conserve” listed species. Does this MOU obligate the Forest Service to use, for example, its discretionary permitting authority to deny rights-of-way or their renewal in the BRWRA?

Response: The intent of an MOU is to mutually agree on and define the parties’ responsibilities in a mutual action. No MOU supersedes law or other management requirements. Wolf reintroduction and recovery actions not addressed or covered by the final Record of Decision or the Mexican wolf experimental population rule, such as release pen siting, would need to undergo scrutiny and analysis for compliance with other applicable laws and regulations. Nothing in the Proposed Action, the Proposed Rule, or in the MOU, would support the denial of rights-of-way to protect the wolf. It is conceivable that such denial could be required if Alternative C was adopted in the Record of Decision and the Section 7 consultation process determined that the rights-of-way jeopardized the wolf.

Comment: The informal Section 7 comment process called for under the proposal is vague and could change to a formal consultation process.

Response: Formal consultation under provisions of Section 7 of the ESA is prohibited by the Section 10 provisions for nonessential, experimental populations, except on lands within the National Park System or the National Wildlife Refuge System.

Impacts on Land Use

Comment: The failure to define when the wolves are conflicting with a major land use, such that their removal would be justified, leaves too much of a

loophole for terminating the recovery, e.g., if wolves conflict with livestock.

Response: We agree that the provision is vague and we also believe it is redundant with other provisions that give sufficient management flexibility, therefore we have deleted the provision from **Alt.s** A and B. We already have provisions for management of depredating and “problem” wolves (see Glossary), and for other purposes deemed necessary in the future; further, we do not anticipate that wolf recovery will conflict with other land uses.

Comment: Most of the public lands involved are multiple use lands and wolf recovery is an appropriate use; cattle grazing should not prevent other uses.

Response: We agree.

Comment: “Land use practices that promote diversity by the nature of their sustainability in relation to the overall health of the bioregion should be implemented in concordance with wolf reintroduction.” (45)

Response: We agree that such land use practices are favorable generally, but they are not a prerequisite for wolf reintroduction.

Comment: Wolf recovery in Montana, Idaho and Wyoming has demonstrated that no significant land use restrictions are needed.

Response: We agree.

Comment: The wolf will cause **much** public land and many land uses such as grazing, hunting, and logging to be closed down; the wolf is a vehicle for restricting land access and use.

Response: We disagree; no substantive land use restrictions have been necessary or imposed in other areas where endangered, threatened, and nonessential experimental populations **of wolves** are recovering. See previous comment and response.

Comment: **The** so-called limited closures are in fact not minor and will virtually shut down the denning and vaguely defined rendezvous areas to human use, such as logging for many months, at least for April

through October. This, together with possible backcountry road closures, could devastate the already threatened Southwest timber industry. Also, the closures around dens, etc., could result in road closures.

Response: We believe that proposed closures or use restrictions would be minor. They would be implemented only if deemed to be necessary to protect Mexican wolves from harm; no closure would exceed an area of about 3 square miles (i.e., a circle with a 1 mile radius which is about 2,000 acres); no closure would be in effect for more than 4 months, except possibly those around release pens; and release pen closures would only be necessary in the primary recovery zones when releases are actually being made. Only one active den site or one active rendezvous site would exist at any given time (except for a possible overlap of 1-2 weeks) in each active pack territory. Pack territories are expected to include about 250 square miles. Therefore, on average, no more than 3-6 square miles out of every 250 square miles (1.2-2.4%) of the total public land area would be closed or restricted at any time. Furthermore, no closures or use restrictions would be imposed on private or tribal lands without the consent of the owner or tribal government. Nevertheless, the level of concern expressed regarding this provision has caused us to define “disturbance-causing land use activities” as it is used in the Proposed Rule (see appendix G). The new definition specifically exempts certain land use activities from the closure provision. In addition, we have eliminated the “back-country road” closure provision from the rule because it is not clear that it would be effective in addressing the problem of illegal killing. Instead, more emphasis will be placed on public education and law enforcement.

Comment: The road and den and rendezvous site access closures would prevent Phelps Dodge from accessing wells and equipment on the Upper Eagle Creek and prevent other legitimate access to, and uses of, private property in the BRWRA.

Response: The road closure provision has been deleted. Closures around den and rendezvous sites would be flexible and on an as-needed basis. These would not occur in such a way as to prevent any private property owners access to any private property. See response to previous comment.

Comment: “Loss of use of back country roads has resulted in the lack of access to many areas of National Forest Land in Arizona in recent decades and is a trend which should be reversed not encouraged.” (10) Road closures would backfire and turn people more against the wolf. Any road closures should only be after a public comment period and consultations with affected agencies.

Response: The road closure provision has been deleted.

Comment: “The Draft EIS does not include an adequate analysis of the applicability of ESA sec. 7(a)(1) to federal agency permitting of land uses. For example, would the granting or renewal of a right-of-way across Forest Service lands be permitted if Mexican wolf habitat would be disturbed? Similarly, the Draft EIS does not include any analysis of whether modification of habitat by land uses in the recovery areas would be considered a ‘take’ of wolves under ESA sec. 9(a) and Babbit v. Sweet Home Chapter of Communities for a Greater Oregon et al.” (2,565)

Response: See response to the comment in previous section regarding the FWS/USFS Memorandum of Understanding and permitting rights-of-way. No formal ESA Section 7 consultation would be required regarding potential impacts of land uses on nonessential experimental Mexican wolves. Under the Proposed Action, there is no provision for preventing disturbance of Mexican wolf “habitat” and no critical habitat is designated. The proposed experimental population rule, under Section 1 O(j) of the ESA, already allows for (limited, temporary) restrictions on human access and disturbance-causing activities near occupied release pens, dens, and rendezvous sites. Enforcement of the experimental population rule would make enforcement of the Section 9 taking provisions redundant. Any harm to wolves resulting from pure habitat modification caused by authorized uses of public lands. i.e., not in violation of the closure provisions or other provisions regarding take or harassment, would be a legal take under the proposed rule. Illegal take could not result from habitat modifications occurring on private or tribal lands. Based on evidence from other areas, the FWS does not believe that Mexican wolves will be harmed by authorized land uses. This important point has been clarified in the FEIS, under Chap. 2, Alt. A, section

on Management. With or without wolves, additional agency permitting actions (e.g., new mine, road construction, or timber sale) would require compliance with applicable laws, including the National Environmental Policy Act. A complete **analysis of a** proposal under NEPA may disclose potential effects - both direct and long-term - on wolves and their habitat and appropriate mitigation of such effects could occur.

Comment: Cumulative impact on population density and growth are specifically required by the rules, yet no such analysis is found in the report.” (2,677)

Response: Wolf recovery is not expected, alone or cumulatively, to impact human population density or growth.

Impacts on Military Activities

Comment: “To release wolves in White Sands would create a security nightmare. The biologists would have to have a security clearance and I’m sure they wouldn’t approve of any weapons tested anywhere near wolf habitat.” (619)

Response: Under the Proposed Action biologists would not have to “approve” weapons testing. Even under Alternative C it is unlikely that the testing that occurs on White Sands would jeopardize wolf recovery or vice versa. Getting a security clearance for biologists does not present a major problem; for ten years an intensive lion study has occurred on the missile range without major conflicts.

Comment: “The DEIS claims that impacts from testing in the WSWRA will not (or should not) affect the wolf. What about tests scheduled to be run during the denning season? Will wolf denning take precedence over such tests?” (906)

Response: Under Alternative C, if consultations showed that tests could jeopardize wolf pups then possibly such conflicts could occur. Under A and B, the testing or other activities on the range would not require consultations with the FWS. The Proposed Rule (Appendix C), par. (j)(3)(ii), states: “no Federal agency or their contractors will be in violation of the

[ESA] for take of a wolf resulting from any authorized agency action.” The FWS believes that the probability of **wolves** being harmed by authorized activities on the White Sands Missile Range is very remote.

Comment: Isn’t there a lot of radioactive debris on the White Sands Missile Range that could **affect** the wolves’ long-term health?

Response: Some debris exists, but it has low levels of radioactivity. Testing activities are monitored to remove most debris, but some is widely scattered. The small amount of low level debris that exists is not considered a biological hazard, thus no areas have been closed to human access because of it.

Impacts on Recreation

Comment: The projection of increased recreational visitation is unsupported and overstated. The chances of seeing a wolf in the wild will be low. The people who see them the most will be the ranchers, who don’t want to see them.

Response: Actually seeing them may be uncommon, but in other areas such as northern Minnesota people can go on howling trips and the wolves frequently howl back. Many people are interested in looking for sign of wolves or just being in an area where they are present. Increased visitation associated with wolf reintroduction, visual sightings, and photography has been reported from Yellowstone National Park. Surveys from Arizona and New Mexico indicate the majority of people would enjoy seeing or hearing a wolf in the wild.

Comment: “If you close roads, recreation isn’t going to increase.” (388)

Response: The road closure provision has been deleted. The only restrictions on motorized public access now being proposed would be very limited, temporary, and site specific for the purpose of protecting wolves from disturbance or harm in release pens, at dens, and at rendezvous sites. The impact on recreation should be minor.

Comment: The minor closures around wolf dens and so on will not significantly impact recreation.

Response: We agree.

Comment: The primary focus of impact evaluation for recreation in the BRWRA should be on non-consumptive uses, because these uses constitute 75% of the recreational visitor days. Wolf recovery will enhance these.

Response: We do say that recreational visitation for the BRWRA could increase because of wolves, but we lack a basis for making quantitative projections. (Most of the WSWRA is closed to the public.)

Comment: Like bears, wolves will congregate around campsites and cause danger to campers, which will scare the campers away.

Response: We lack evidence that wolves have done this elsewhere.

Impacts on Regional Economies

Comment: The benefits of people coming to visit wolf areas, to buy wolf-related items, to study wolves, and to take tours and howling trips will offset the economic losses; this has been observed in the Yellowstone area after reintroduction there as well as in northern Minnesota.

Response: We agree that to some extent this is likely to occur, but did not make a quantitative projection of this in the DEIS. Additional information has been provided in the FEIS, in Appendix J.

Comment: The DEIS should have quantified the beneficial impacts of increased visitation and non-use values.

Response: See previous response. We do refer to the Yellowstone/Central Idaho wolf reintroduction EIS that does this sort of quantification but three main factors led to the FWS decision not to try to project such impacts in the Southwest: 1) conducting the necessary public surveys and analysis by professional economists was considered prohibitively expensive; 2) questions remain about the accuracy of these indirect quantification methods, and 3) NEPA regulations do not require a monetary cost-benefit analysis (see pages 4- 1 and -2 of the FEIS).

Comment: Wolf recovery will have a negative economic impact. The wolf will threaten food production regionally and nationally.

Response: Some negative impacts are projected, largely due to lost value of hunting and lost hunting expenditures. Only a very marginal impact on live-stock production regionally or nationally is projected.

Comment: Indirect and multiplier effects of the hunting expenditure losses have not been adequately considered; for some small rural retail establishments, hunter expenditures make the difference between profitability and closure.

Response: Effects were considered to the extent they were foreseeably and reasonably related to wolf reintroduction, based on advice from the FWS's economics consultant. A multiplier for hunting expenditure losses was not used for the following reasons. The large majority of deer and elk hunters in Arizona and New Mexico are residents of the two states (96% residents in Arizona and 74% in New Mexico). As a response to reduced deer and elk numbers in the recovery areas, these resident hunters may hunt other big game areas in their state, hunt the same areas with lower success rates, or spend the money they would have spent on hunting on some other purchase in the state. Changes in resident hunting expenditures likely would not result in appreciably less money being spent in the state, but could result in changes in the distribution of that money. The businesses that would likely feel the effects of this shift in spending most acutely are those closest to the recovery areas/hunting areas (and some of those businesses may obtain economic benefits from wolf-related visitation). These areas are very rural and sparsely populated, thus any multiplier of recreational expenditures in these areas likely would be very low (T. Power, Dep't of Economics, U. of Mont., pers. comm.). U.S. Forest Service economists have not calculated recreational expenditure multipliers for rural areas of Arizona and New Mexico (W. Stuart, USFS, pers. comm.).

Comment: Less income for ranchers means higher unemployment and less tax payment to government.

Response: The private compensation program is designed to minimize lost income to ranchers, but to

the extent that losses are not fully compensated there could be income losses and related economic losses. It is unlikely that this would rise to a level that would result in job losses. Some job creation from the actual implementation of the project is expected, e.g., for field personnel.

Comment: The analysis in Chap. 4 of the economic impact on guides and outfitters of reduced hunting opportunities is inadequate, particularly with respect to Catron County, where this is an important industry

Response: The Regional Economic Impacts section of Chap. 4 does state that Catron County guides could be affected by reductions, but these could be mitigated by additional opportunities to guide people interested in hearing, seeing, and photographing wolves in the wild. There is little basis for concluding that the guide business would be significantly hurt. The EIS does cite to one economic study on the guide/outfitter business in Catron County (SW Center for Res. Analysis 1994). We believe that study overstates the magnitude of these businesses in Catron County by extrapolating based on a small survey response (20%). Further, the study does not establish any link between wolf recovery and harm to the industry.

Comment: Negative wolf impacts combined with spotted owl and other endangered species impacts will devastate rural economies.

Response: We have added more discussion to Chap. 4, Alt. A and C, Cumulative Impacts, regarding the impacts from these other endangered species. There is no basis for concluding that adding the wolf will devastate local economies. Most of the impacts of the spotted owl on the timber economy have already occurred.

Costs of Wolf Reintroduction

Comment: The cost estimates are too low; the cost estimates should be carried out for 30 years or so like Alternative D; the likely long-term costs will be several times the projected \$7 million.

Response: Costs are reasonably projected to the estimated time of attainment of the reintroduction goal plus five additional years of monitoring to establish that the population is secure. The Alternative D costs estimates have been revised (see Appendix B). We agree that, if wolves are successfully reestablished, ongoing management costs will be incurred, but we cannot estimate those future costs now with reasonable confidence.

Comment: Wolf recovery is a waste of taxpayer money, particularly in times of massive public debt and in view of the fact that taxpayers paid for its eradication. All wolf related expenditures should end.

Response: Comment acknowledged.

Comment: All wolf related expenditures should continue; this is a small amount of money in comparison to other government expenditures.

Response: Comment acknowledged.

Comment: “Congress won’t support wolf reintro or wolf keeping, so where will the money come from?” (114)

Response: All FWS expenditures have come from Congressional appropriations; without them wolf recovery would probably not occur. Most of the costs of wolf keeping are borne by non-government entities, such as zoos.

Comment: Wolf recovery money would be better spent on beneficial wildlife.

Response: Recovery provisions of section 4 of the ESA do not set different requirements for “beneficial” and “non-beneficial” wildlife, which seem very subjective terms.

Comment: “Whatever [the cost] is estimated to be, we can expect that figure to be doubled because the government never stays within it’s budget.” (724) Yellowstone officials have already asked for larger wolf budgets than their EIS projected.

Response: Budget requests for the Yellowstone National Park reintroduction project have been within cost estimates presented in their EIS. The actual

appropriated budget for that reintroduction effort is less than the projected costs.

Comment: In reference to Appendix B: why are costs greater per year for less hands on management (Alt. C) than for Alt. A? Field staff salaries should be lower not higher.

Response: Wolf movements would not be restricted under Alternative C. We assumed that livestock depredation control activities would occur as they do in other areas with threatened and endangered wolf populations, thus higher ADC costs were projected. Wolves are expected to colonize the White Mountain, San Carlos, and Mescalero Apache Reservations, thus higher tribal staff costs were projected. Wolves would be distributed over a larger area, thus more field equipment and monitoring costs were projected.

Comment: The value of the wolf is not monetary.

Response: We agree that the benefits of wolf recovery defy easy quantification.

Ecosystem Impacts

Comment: Restoring a more natural balance to our wilderness areas is good and enhances long-term sustainability.

Response: Comment acknowledged.

Comment: Is the food chain broad and strong enough to support a new predator in these areas?

Response: Much of the food chain in these areas is relatively intact, except for the top predators.

Comment: There are other predators that have taken over the wolf's ecological role that are less threatening to human interests.

Response: The wolf is the only large, coursing, pack-hunting, mammalian predator native to southwestern ecosystems. That role has not been filled by coyotes, lions, or black bears, although the wolf's demise probably allowed these species to expand their distribution and increase their populations. Those species also cause some damage to human interests.

Comment: Wolf predatory behavior has a positive ecological effect by causing herbivores to congregate, thereby concentrating and facilitating the recycling of carbon in the environment.

Response: Comment acknowledged; we lack clear information to support or refute this idea.

Comment: "In the DEIS, the USFWS has created a new multi-predator system which may not be ecologically sound." (906)

Response: We believe that restoring a native predator will make the area more "ecologically sound", by most definitions of the term. The multi-predator system that would be created by the proposed action is one that previously existed in the proposed wolf recovery areas.

Comment: Before the wolf is restored, better understanding of the impacts of restrictions caused by other threatened and endangered species in the recovery areas is needed. To move toward ecosystem management, we need to understand the cumulative effects of all these recovery actions.

Response: We agree that continued analysis of the impacts of having multiple endangered species is needed (see Cumulative Effects discussion in chapter 4 for Alts A and C). We disagree that any potential conflicts of wolf management with the management of other species under Alts A or B, the nonessential experimental approaches would justify further delaying wolf reintroduction.

Comment: "Good range restoration could enable us to have healthier soils, better vegetation, more cows, more game, and wolves." (Soc., p. 108)

Response: We agree that these are good goals; however, we also believe wolf recovery can occur as range restoration occurs and is not dependent on it.

Comment: "If we are able to successfully establish populations of this large carnivore, I think it will be an important demonstration that we can truly manage large, intact ecosystems." (1088)

Response: Comment acknowledged.

Animal Rights and Welfare

Comment: It was injustice to exterminate Mexican wolves; reintroduction would make up for this.

Response: Comment acknowledged.

Comment: It will be cruel to reintroduce an animal that is used to captivity, and may violate anti-cruelty laws.

Response: We are not aware of any violations of anti-cruelty laws, but recognize there are humane issues involved and will try to avoid or minimize suffering of wolves prior to release and during any handling. The captive animals are expected to largely re-adapt to life in the wild although some will fail and those wolves may die.

Comment: It would be inhumane to reintroduce wolves in the very marginal White Sands habitat where they will starve or die of thirst.

Response: Our analyses predict that the habitat, water, and prey available on the WSWRA could sustain a population of about 20 wolves. However, recent concerns over the effects of prolonged drought conditions would cause us to reanalyze the status of prey populations before a reintroduction would occur there.

Comment: Wolf reintroduction involves so much handling, mortality, and harassment that it ultimately causes suffering and does not benefit the wolves. “They will be persecuted, slaughtered and tortured to death, exactly as they always were.” (2,997)

Response: Recovering populations in the wild may include as a cost the possible suffering or death of individual animals. We would implement handling protocols that support humane treatment of individual wolves, we would use the most humane trapping and management technologies available, and we would enforce laws against unauthorized killing or unnecessary harassment.

Comment: “Page 2-23 mentions euthanasia for control of problem wolves.... you can address animal welfare concerns by being sure to follow American Veterinary Medical Association (AVMA) guidelines on euthanasia.” (3,659)

Response: We have added a statement that any euthanasia would be done in accordance with the AVMA guidelines, where feasible.

Comment: The agencies plan “to train the wolves to hunt before they are released, by putting live animals into their cages for them to kill.” (2,997)

Response: Live animals regularly enter wolf enclosures with no assistance from humans providing some hunting opportunities for captive wolves. An ability to hunt is vital to released captive wolves’ chances for survival in the wild. If feasible, some trials in hunting skills may be conducted at the FWS’s captive wolf management facility. However, if conducted, it would be limited to small animals. Exposure to larger prey would be accomplished by providing dead carcasses (e.g., road kills) of deer and elk).

Comment: Keeping the wolves in captivity causes suffering and should be terminated promptly.

Response: We believe that the establishment of a captive population has probably prevented the extinction of the Mexican wolf and has made the re-establishment of wild populations possible. A goal of the captive population management program is to provide Mexican wolves an environment that is as natural and stress free as can be achieved in a captive setting. Pens are generally large and contain a variety of natural landscape features and hiding or escape cover. Any suffering by captive Mexican wolves serves the cause of long-term preservation of their subspecies.

Comment: Wolves cruelly hamstring their prey and often eat them while they are still living.

Response: We don’t dispute that this occurred, but we don’t know how much; hamstringing is not well documented in the scientific literature. It may occur incidentally as a result of attacking from behind rather than being an “intentional” hunting strategy. Characterizing long-established wild animal behavior as “cruel” seems debatable, i.e., a subjective judgement.

Social, Cultural, and Philosophical Issues

Comment: Public opinion polls show the majority of people surveyed support wolf recovery.

Response: We agree,

Comment: Wolf recovery is just to appease a few radical environmentalists.

Response: Wolf recovery is not to serve any group of citizens, rather it is to meet the goals of the Congressionally-approved ESA.

Comment: The majority of rural people are against it. Wolf recovery will have a negative impact on the custom and culture of the rural areas involved. The livelihoods of ranchers and the security of their children will be destroyed.

Response: Chap. 4 of the FEJS acknowledges that many rural people are against it and that some negative impact on their custom and culture may occur, although as suggested by the following comment, some positive effects could also result. According to polls, many rural people support wolf recovery. Wolves and ranchers (and their children) co-exist in other areas without severe impacts.

Comment: “ [Wolf recovery] will have a positive effect on our Custom, Culture and the economy of Sierra County.” (690 et al.)

Response: See previous comment and response.

Comment: “If we can get through the first few years without a major ‘people problem’ I think everyone will be able to adapt (including the wolves!).” (712)

Response: We generally agree.

Comment: “Wolves are an important part of Arizona’s history.” (586)

Response: Comment acknowledged.

Comment: Eliminating wolves was necessary to allow settling of the west and their absence is an

important aspect of the “custom and culture” and history of the rural areas involved.

Response: Comment acknowledged.

Comment: We should not let the Mexican wolf to go extinct because it may have as yet undiscovered value. Future generations should not be deprived of this animal. As the ancestor of dogs we owe much to them and should preserve them for possible genetic enhancement of dog breeds.

Response: Comment acknowledged; we think the comment reflects some of the ESA’s goals.

Comment: Humans have dominion over the animals and that includes not restoring an animal that is detrimental to humans.

Response: The ESA does not limit restoration to so-called “beneficial” species, a subjective judgment. Indeed, the ESA supports the concept that restoration of viable populations of virtually all native species is a human benefit.

Comment: The only people who will benefit are the wolf breeders, government trappers, and bureaucrats.

Response: No commercial wolf breeders are involved in the Mexican Wolf Captive Breeding Program. This program is not to benefit government workers. There are many easier, less controversial, ESA recovery projects that these workers could do if they were not working on the wolf.

Comment: The major cost in terms of hate and human conflict is not worth it.

Response: Social conflict, while certainly present, has not proven to be excessive in other areas where wolves have been restored. Continuing public involvement and education, the depredation compensation fund, and responsive, professional, wolf management should help to reduce the conflict.

Comment: The wolf is important symbolically to show human willingness to control “development” and to share the earth with other species.

Response: Comment acknowledged.

Public Information and Education

Comment: Wolves should be restored so people can learn from them. Both public and scientific understanding would benefit from the opportunity to observe southwestern ecosystems with the top predator restored, and to compare these areas to those without wolves.

Response: We agree that recovery would provide educational and scientific opportunities.

Comment: The FWS should listen to local ranchers for suggestions and input, and should work closely with them to try to get their cooperation and support. An advisory committee could go a long way toward helping this.

Response: We agree. We have talked with many ranchers and are considering the establishment of some type of advisory committee. This concept has been incorporated into the description of the Preferred Alternative, in Chap. 2.

Comment: “The wolves’ only chance for a safe and successful return to the wild is through massive public education and support.” (548) Hunters, trappers, drivers and others need strong education programs to reduce unintentional killings.

Response: We intend that such efforts would be part of the reintroduction program.

Comment: The projected costs in Appendix B should have greater expenditure for public education to ensure wolf recovery.

Response: The projected costs for information/education are for actual materials development, printing, etc. Staff and administrative costs are included elsewhere in the cost tables. We believe these estimates are realistic.

Other Issues

Comment: “All agencies involved in this effort should be willing and ready to provide just compensation for physical and emotional pain if it is a result of the wolf reintroduction.” (41) The FWS should

create a guaranteed right of indemnity for all losses that occur.

Response: This sort of “insurance” approach has not occurred with recovery of other species and is not planned here. The FWS would be subject to potential liability under this proposal in the same way it is for other governmental actions.

Comment: Domestic dogs will go “outlaw” and run with wolf packs.

Response: This might occur with some dogs, but little historical evidence exists of this phenomena (Young and Goldman 1944). Wolves are more likely to kill domestic dogs than to associate with them beyond brief encounters.

Comment: What veterinary measures will be taken?

Response: This has been explained in Chap. 2 of the **Final** EIS, under The Soft Release Approach, and in Appendix A.

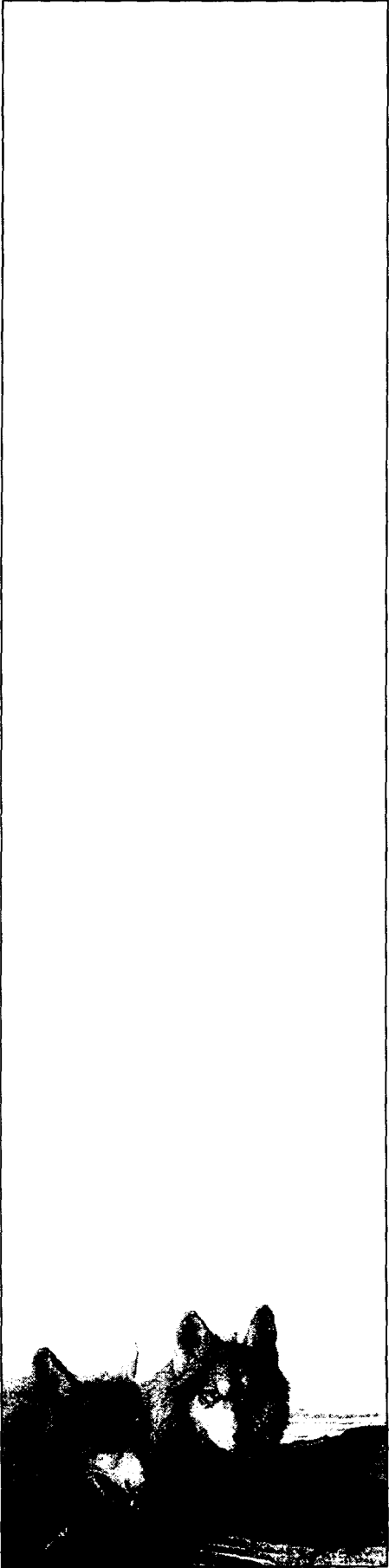
Comment: “Many of the fears expressed by the northern tier of states in reintroducing the grey wolf have proven, in reality, to have little or no foundation. So, I believe, will be the case in our Southwest.” (588)

Response: We generally agree, but believe that those fears should not be ignored.

Comment: The reintroductions in Yellowstone and Central Idaho should be fully studied to be sure it is working before any reintroductions in the Southwest.

Response: We are closely monitoring the results of recent reintroductions of gray wolves to Yellowstone National Park and central Idaho (see Appendix J). Relevant knowledge gained from those projects and the red wolf reintroductions in North Carolina and Tennessee (see Phillips 1992) will be applied to the Mexican wolf reintroduction **project**, if it is approved.

Comment: The FWS already has released captive Mexican wolves in the Southwest.



Appendices

APPENDIX A

Mexican Gray Wolf Life History and Ecology

Introduction

This summary is adapted closely, without further citation from Appendix Two to the Final Environmental Impact Statement on the reintroduction of gray wolves to Yellowstone National Park and central Idaho (USFWS 1994c). Information specific to Mexican gray wolves, where available, is referenced separately. The Mexican wolf was not well studied in the wild prior to its extirpation. Therefore, many of the assertions herein are based on studies of northern populations. Topics covered are: pack organization, mortality, prey, influence on ungulate populations, influence on other predators, livestock depredation, attacks on humans, pathogens and parasites, hybridization, and wolf movements.

Pack Organization

The basic social unit in gray wolf populations is the pack. This usually consists of five to 15 individuals with strong bonds to each other. Bailey (1931) noted that the Mexican wolf was commonly found in groups of up to eight animals prior to the advent of intensive governmental control efforts; after that it appears that group size became smaller (McBride 1980, Bednarz 1988). Bednarz reviewed the range of wolf pack sizes in other areas in which deer are the primary prey, as probably would be the case for the Mexican wolf, and estimated the latter's pack size would average 5.5 animals. McBride (1980) had followed many wolves in Mexico and never reported tracking a group larger than five individuals, with three being the most frequent group size.

New packs are formed when two lone wolves of the opposite sex find each other, develop a pair bond, breed, and produce a litter of pups. Central to the pack are the dominant (alpha) male and female. The remaining pack members are usually related to the alpha pair and constantly express their subordinate status through postures and expressions when interacting with the dominant animals. **Changes can occur in each wolf's social position in the pack.**

Breeding usually occurs only between the alpha male and female. Wolves become sexually mature at two years of age. Although courtship behavior occurs in varying degrees throughout the year, actual breeding takes place around February (McBride 1980). During the breeding season in late winter the pack may move extensively within its territory.

Pregnant alpha wolves complete digging of dens as early as three weeks before the birth of the pups. Mexican wolf dens are often dug under rock ledges (McBride 1980); or they may be dug under the roots of an upturned tree or, if in open country, under a bush (Bailey 1931). Water is usually nearby. Some dens are used by the same wolf pack year after year. Also, certain areas (on the order of 5 mi²) may contain several den sites which are used in different years by the pack. Some wolf packs can be sensitive to humans during this season and may abandon the den if disturbed. This poses a risk to younger pups that cannot regulate their body temperature.

Pups are born around April after a 63-day gestation period. Sizes of 16 wild Mexican wolf litters examined by McBride (1980) averaged 5.6 pups. With the denning area established in the spring, pack movements center around the den. However, adult pack members may travel long distances from the den for food. The maternal female is usually at the site more than other adults, but she may also range several miles away. All pack members may help feed the female and young. Pack members also provide play and protection for the growing pups. Pups are weaned at five to six weeks of age.

In northern regions, a pack will usually move from the den site (or occasionally from a second den site) to the first rendezvous site when the pups are six to ten weeks old, which is in late May through early July. The first rendezvous site is usually within one to six miles of the natal den site and often consists of open areas interspersed with timber, with water nearby. A succession of rendezvous sites are used by the pack until the pups are mature enough to travel with the adults, usually by September or early October. Each

successive rendezvous site is usually one to four miles from the previous site. Occupancy times vary from ten to 67 days. As with dens, rendezvous sites may be used by wolf packs year after year. Wolves appear less sensitive to human disturbance at later rendezvous sites than they do at the first one. It is not known whether, or to what extent, Mexican wolves use rendezvous sites.

By about October pups are mature enough to travel with the adults and the pack wanders throughout the territory. As the pack travels, preying primarily on ungulates, the alpha wolves usually lead the pack and choose the direction. Wolves often travel along established routes including game trails, roads, and waterways, occasionally cutting across from one such route to another. Daily travel distances for packs are typically in the range of one to nine miles, while distances between successive kills vary from eight to 34 miles. Some Mexican wolves in southwestern New Mexico and southeastern Arizona followed "runways", i.e., well-established loop routes of 70 to 100 miles along favored hilly terrain (Young and Goldman 1944).

In most wolf populations packs occupy exclusive territories. These range in average sizes from 80 mi², as in Minnesota, to over 660 mi² as in Alberta. Bednarz (1989) suggested Mexican wolf territories would average around 200 mi². Of course, actual territory size of Mexican wolf packs will vary with each pack and over time depending on numerous factors. Lone wolves may range over areas in excess of 1,000 mi².

As pack members are traveling they leave urine and scat markers which identify their territories. Foreign wolves entering established territories are occasionally killed.

Mortality

Wolves die from a variety of causes: disease, malnutrition, debilitating injuries, interpack strife, and human exploitation and control. In areas with little or no human exploitation the primary causes of mortality are disease and malnutrition in pups or yearlings. Deaths of adults often result from other wolves. Mortality rates in unexploited populations can average about 45% for yearlings and 10% for adults. Ten years is an old age for a wild wolf.

Fall and winter are critical periods for wolf survival. Beginning in the fall, wolf mortality rates are most influenced by the degree of exploitation and control by humans. Overwinter (October-March) mortality rates within packs range from 0% to 33% for a minimally exploited population to 14% to 88% for a heavily exploited population. Established wolf populations apparently can withstand annual human-caused mortality rates of 28% to 35%.

Prey

The wolf was the primary predator of large ungulates in most of North America, a role it now shares with humans. No other predator in the western United States replaces its ecological role. Although the coyote occasionally preys upon young, old, and vulnerable ungulates, its main diet consists of rodents and rabbits. Other predators that regularly prey on large mammals in North America include mountain lions, black bears, and grizzly bears. The mountain lion's methods of hunting (primarily "ambush") and social organization (solitary) contrast sharply with the cooperative ways of the wolf. Bears, usually solitary by nature, sometimes stalk and kill ungulates, taking mostly calves, but occasionally taking vulnerable adults.

Wolves depend upon ungulates for food year-round, although smaller mammals can be important alternatives. On average northern wolves eat 9.0 pounds of meat per wolf per day during winter. The lighter Mexican wolf is estimated to eat an average of 6.1 pounds of meat per day (Parsons 1994). Although the wolf is capable of eating large quantities of food in a short time, such quantities are not always available. Thus, wild wolves may go for several days without eating. They appear able to fast for periods of two weeks or more while searching for vulnerable prey. When food is available, wolves can replenish themselves to prepare for another period of fasting. The frequency of kills by a pack varies, depending on many factors including: (1) pack size; (2) diversity, density, and vulnerability of prey; (3) terrain and snow conditions; and (4) degree of utilization of the carcasses.

The natural prey of the Mexican wolf are expected to be mule and white-tailed deer, elk, javelina, and, occasionally, pronghorn, bighorn

sheep, jackrabbits, cottontails, turkeys, and small rodents. They also may take two types of **non-indigenous** prey present in the 'White Sands Missile Range area-feral horses and oryx. Because the wolf's expected prey varies in size, the kill rate of each species varies according to the amount of food each provides. Smaller ungulate prey are preferred (Mech 1970). Wolves consume an average of 75% of the live weight of the ungulates they kill (Peterson 1977). About 5% of the ungulate weight consumed by wolves consists of scavenged carrion (Fuller and Keith 1980).

In Minnesota, where wolves eat white-tailed deer almost exclusively, estimated kill rates range from 15-19 deer per wolf per year. In areas where elk are the dominant prey, kill rates are generally lower. In Riding Mountain National Park, Canada, an average of 14 ungulates per wolf per year were killed, consisting of deer, elk, and moose. It has been estimated that the wolves reintroduced to Yellowstone National Park will each kill an average of twelve ungulates annually. The average Mexican wolf is expected to kill a combined live weight of 2,823 pounds of prey annually, which will be mostly deer and elk with roughly 15% to 25% consisting of alternate prey (Parsons 1994). The composition of prey species in the diet will vary depending on species availability and vulnerability.

Influence on Ungulate Populations

Wolf predation on larger ungulate populations usually reduces the fluctuations in ungulate numbers over time. Smaller die-offs from winter-kill may occur when wolves are present because wolves are preying on weakened animals before they die.

Predation is one component of total annual ungulate mortality. Wolves can, but typically do not, deplete their prey; but, they may keep some ungulate populations at low levels if the populations are already low and other limiting factors exist. Computer models predict that the wolves reintroduced into the Yellowstone National Park area will eventually cause ungulate reductions ranging from 5% to 30% for different populations, but they will not have devastating effects. (See Chap. 4 on Environmental Consequences for

discussion of **modelling** of Mexican wolf impacts on ungulates.)

Influence on Other Predators

Wolf impacts on other predators can vary. Coyotes may be less abundant where Mexican wolves are present (Leopold 1959); however, historical anecdotes about Mexican wolves on this subject cited by Brown (1983) are contradictory (see also Paquet 1992). Ligon (1927) did indicate that the coyote's range in New Mexico expanded markedly during the same period that the wolf was extirpated; this range expansion took place in the mountainous areas formerly favored by wolves. Red foxes and other small carnivores may benefit from increased scavenging opportunities created by wolves, although wolves may attack them opportunistically. Black bears and wolves usurp carcasses from each other and wolves occasionally prey upon black bears, but no published information suggests populations of either species are significantly affected. Bears and gray wolves coexist throughout much of **Alaska** and Canada.

Some evidence suggests the Mexican wolf's demise lead to expansion of mountain lions into habitat formerly occupied by the wolf (Bednarz 1988). These two predators compete; researchers have observed several instances of wolves chasing lions, driving them off their kills, and even killing them (Hornocker Wildlife Research Institute 1993). Wolf re-establishment may compel lions to limit their activities to areas where they are relatively safe from wolf attacks.

None of the other large predatory mammals in the Southwest are threatened or endangered (although the grizzly bear is regionally extinct), except for the extremely rare ocelot and jaguar, which have been sporadically reported from southeastern Arizona (USFWS 1990). No information exists regarding historic interactions, if any, between these species and Mexican wolves.

Livestock Depredation

Accounts of depredation stress that in the late 1800s and early 1900s the Mexican wolf preyed heavily on cattle, causing intolerable losses to ranchers (Gish 1977, McBride 1980). Brown

(1983) asserted that, of 41 Mexican wolf stomachs examined by federal predator control agents in the early 1900s, 19—or 46%—contained livestock. Bednarz (1988) noted that Brown did not report the qualification made by Ligon included with the original summary of these data (Pred. Animal and Rod. Cont. Serv. 1918): “Many trappers fail entirely to report stomach contents, while others are careless, and records that are made by them have little value.” These predator control agents had an incentive to exaggerate the extent of depredation to justify their programs (Dunlap 1988). Nevertheless, McBride (1980) also reported high proportional representation of livestock in wolf stomachs and scats he analyzed in Mexico from 1958 to 1968, while trapping on ranches where depredation was reported.

High historical depredation rates are inconsistent with the situation now in other areas where gray wolves and cattle co-exist, such as the northern Rocky Mountains and northern Minnesota, where depredation is quite uncommon relative to livestock numbers available (range: 0.004% to 0.09% of available cattle killed by wolves annually; Mack et al. 1992). One explanation offered for the apparently high historical depredation rates in the Southwest is that new settlers greatly reduced the natural prey base of wolves through over-hunting and habitat degradation at the same time they introduced large numbers of livestock throughout the region (Brown 1983, Scudday 1977). Bednarz (1988) suggested other possible causes for the actual or perceived high wolf depredation rates, including, 1) overstocking of rangelands (see Ligon 1927) resulted in widespread cattle mortality and the availability of carcasses for scavenging (see USFWS 1993d); 2) extensive killing of wolves disrupted natural social units leading to a high proportion of lone wolves that depredated more heavily; and 3) livestock killed by coyotes and dogs were attributed to wolves. Also Gipson (quoted in McIntyre 1994) questions the validity of historic accounts of wolf depredation rates. (See Chap. 4 on Environmental Consequences and Appendix F for discussion of projecting future Mexican wolf depredation rates in the Southwest.)

In addition to cattle, wolves may kill sheep, horses, donkeys, turkeys, and other domestic

animals, including household pets. They may also scavenge domestic animal remains.

Attacks on Humans

Very few reliable accounts exist of attacks by healthy wild gray wolf on humans, none involving death (USFWS 1987, Mech 1992). This is despite the fact that millions of people work and recreate each year in wolf range in Canada, Alaska, Minnesota, and other areas. Rabid wolves have, on extremely rare occasions, attacked people, who then died of rabies. Johnson (1992) refers to two cases from Alaska (the last one 53 years ago, in 1943) and one suspected case in the Lower 48 states, from Wyoming in 1833. (See discussion below under Pathogens and Parasites.)

No accounts exist of Mexican gray wolf attacks on humans. Nevertheless, humans should be aware and cautious when travelling in wolf range, as they should when near any wild predator.

‘Pathogens and Parasites

The Mexican wolf in the wild is not likely to transmit parasites or disease-causing pathogens that are not already carried by other canids (L. Munson, Univ. of Tenn., pers. comm.). The wolf’s contribution to the overall parasite or pathogen problems in any given area is expected to be slight because of the relatively small anticipated population size of the reintroduced wolves. Even so, the pathogens that wolves could potentially be exposed to in the wild will be addressed here. The pathogens include canine parvovirus, canine distemper, infectious canine hepatitis, leptospirosis, and rabies. No statistics on canine parvovirus or distemper in domestic or wild animals in the Southwest have been compiled; however, these pathogens do occur in canids, primarily in areas of dense human population. Cases of canine parvovirus are much more common in domestic dogs than canine distemper (K. Grants, Arizona State Veterinarian, pers. comm.). Canine parvovirus has been linked to the deaths of some captive Mexican wolf pups. Neither canine hepatitis nor leptospirosis is a concern in the Southwest. Nevertheless, the

protocol for Mexican wolves to be released into the recovery areas will be vaccination for rabies, parvovirus, distemper, hepatitis, and leptospirosis while in captivity and just before release (B. Snyder, Rio Grande Zoological Park, pers. comm.).

While rabies could infect wolves in some of the recovery areas, wolves are not likely to play a significant role in its spread (Johnson 1992). Reports from the lower 48 states of human exposure to rabies from wolves have been very rare throughout history (one documented case in Minnesota) (Ibid.). However, other canids in the Southwest, as well as potential prey animals, can carry rabies. In southeastern Arizona, a total of 280 wild animals were confirmed to have rabies from 1989 through the first half of 1994. These were mostly skunks and bats, and occasionally coyotes, foxes, and bobcats (Ariz. Dept. of Health Services 1994).

An outbreak of rabies in coyotes and domestic dogs has been occurring in 16 Texas counties south of San Antonio. Since 1988, 450 coyotes and dogs tested positive for rabies in these counties. Coyotes are believed to be the primary carriers of the disease there. However, of about 1,200 humans that received a rabies vaccination during this outbreak, 90% were exposed to domestic dogs that may have had rabies. Texas has initiated a program to stop the northern progress of the outbreak, involving public education and wide-spread vaccination of coyotes (G. Fearneyhough, Texas Dept. of Health, pers. comm.). In the event that captive-raised wolves would be reintroduced into the wild, the initial stock would be vaccinated for rabies. Wild-born wolves would not be routinely trapped for vaccination except in cases of serious outbreaks, but they could be opportunistically vaccinated when they were captured for other reasons.

Wild Mexican wolves may be susceptible to internal and external parasites, including mites, ticks, fleas, heartworm, tapeworm, and hookworm. None are considered a significant transmission threat to humans when carried by wild wolves because of the expected low wolf numbers.

Some significant pathogens and parasites that Mexican wolves are not expected to be exposed to include canine hepatitis, leptospirosis, echinococcus, whipworms, Lyme disease, plague, brucel-

losis, and scabies. Canine hepatitis and leptospirosis are rare in the Southwest. Neither echinococcus, which is transmitted via tapeworms, nor whipworms have been reported in Arizona, New Mexico, or Texas in recent years.

Lyme disease has been reported in wolves in Minnesota and Wisconsin (Thieking et al. 1992). Dogs are relatively severely affected by Lyme disease, thus, it is plausible that this disease could negatively influence wolf populations (Ginsberg 1994). However, Lyme disease has not been documented in domestic or wild animals in New Mexico or Arizona (J. Thilstead, NM Dep't. of Agric. Vet. Diagnostic Ctr., pers. comm.). Further, the organism that causes Lyme disease has not been found in ticks from New Mexico or Arizona (T. Brown, NM Environment Dep't Vector Control Div., pers. comm.).

Plague is not associated with wolves. Brucellosis has not been found to affect wolves, except canine brucellosis, which has not been reported in other canids in the Southwest. Canine brucellosis is primarily limited to domestic dog breeding kennels and is not associated with free-ranging canids (M. Johnson, Yellowstone NP, pers. comm.). No cases of scabies in canids have been reported in the Southwest for several years. Scabies is host-specific, meaning that canine scabies could affect wolves but could not be transmitted to other species such as wild prey, livestock, or humans (B. Snyder, Rio Grande Zoological Park, pers. comm.). Scabies outbreaks in desert bighorn sheep populations in parts of New Mexico such as White Sands Missile Range will not affect any wolves that may ingest infected sheep, nor can such wolves spread the scabies outbreak to other sheep.

Hybridization

Mexican wolves could potentially interbreed with domestic or feral dogs or coyotes. Past interbreeding between wild northern gray wolves and coyotes has been documented in Minnesota, Ontario, and Quebec (Lehman et al. 1991). Nevertheless, obviously hybrid phenotypic forms (that is, canids that appear intermediate between wolves and coyotes) are not found in the wild (L.D. Mech, Nat'l Biol. Survey, pers. comm.),

except possibly in southeastern Ontario (Kolenosky and Standfield 1975).

There are no records of Mexican wolves interbreeding with coyotes and, while the future potential exists, the likelihood is not considered great (Brown 1983). This potential will be further minimized by: (1) releasing mated pairs, (2) closely monitoring and studying released wolves and their offspring, (3) capturing and relocating wolves that disperse out of wolf recovery areas, and (4) re-establishing wolf populations in numbers sufficient that potential wolf mates are available for dispersing wolves.

Wolf Movements

Three key types of movements could be displayed by reintroduced Mexican wolves: homing, pack territory shifts, and dispersal from packs.

Homing

This is the movement of displaced wolves toward their place of origin. Mostly it has been observed in releases of translocated wild wolves (Fritts 1992). However, in a 1972 experimental release of five captive-raised wolves in Alaska, three of the animals travelled toward the town where they were raised, 175 miles away (Henshaw and Stephenson 1974). The animals used in this experiment were “hard released,” that is, they were let go without prior acclimation through holding them in pens in the release area. This is the only previous case of releasing captive-raised gray wolves on the mainland; two other releases occurred on islands, inhibiting any homing tendency.

In a review of all documented U.S. releases of both captive and wild-raised wolves, Fritts (1992) found that 10% of the wolves actually returned to their place of capture or prior holding facility. Several others apparently attempted to do so. Homing was least likely to occur under the following circumstances: the released animal was a pup; the release site was more than 40 miles or so from the animal’s place of origin; and the animal remained around the release site initially after release. If captive-raised Mexican wolves homed, they likely would head toward the eastern part of

the Sevilleta National Wildlife Refuge, to the Mexican Wolf Captive Management Facility, where they came from. This is more than 40 miles north of the WSWRA primary recovery zone and more than 120 miles northeast of the BRWRA primary recovery zone.

Pack Territory Shifts

If, or when, a released group has settled into a definable territory, there is no assurance it will stay there. A newly colonizing wolf pack may shift its territory in response to climate, food availability, human disturbance, and other factors. A colonizing pack may have a larger, more fluid, territory than a pack surrounded by other wolf packs; also, some evidence suggests that wolf packs colonize in areas that were first “pioneered” by dispersing lone wolves (Ream et al. 1991).

Dispersal from Packs

This occurs when young wolves, often yearlings, disassociate from their natal pack and either move into a breeding vacancy in another pack or become lone wolves. Dispersal is a key process in wolf re-establishment. It leads to new pack formation, more breeding pairs, and wider areas of wolf occurrence. However, mortality rates during dispersal are high compared to when wolves are in packs (Mech 1977).

Wolves exhibit three main dispersal strategies: appropriating part of the territory of the natal pack, establishing a territory adjacent to the natal pack’s, and long-distance dispersal (Mech 1987). The latter can involve directional dispersal, in which the wolf moves on a relatively straight path, or nomadic dispersal, in which the wolf wanders in various directions.

Little is known about the dispersal patterns of Mexican wolves in particular, although gray wolf dispersal generally has been well-studied. Most of these studies have analyzed dispersal in the context of numerous wolf packs within a given area of established wolf range, e.g., northern Minnesota. These findings may not correlate to the situation of wolves being released into an area where no other wolf packs exist.

However, some researchers have studied dispersal from wolf packs that were naturally recolonizing a wolf-free area, a situation most comparable to releasing captive-raised wolves into a wolf-free area. Ream et al. (1991) studied dispersal from packs that were recolonizing the northern Rocky Mountains in the 1980s. They

found all three types of dispersal behavior described by Mech (1987), including long-distance directional dispersal in which a few lone wolves travelled for hundreds of miles over several months. If released into the wild, Mexican wolves would likely display the types of movements discussed above.

APPENDIX B

Projected Total Costs of Implementing the Alternatives

Alternative A (Preferred Alternative): Nonessential experimental releases with dispersal allowed, first in the Blue Range Wolf Recovery Area (BRWRA) with the White Sands Wolf Recovery Area (WSWRA) as a back-up area.

Notes: Field project staff would include 1 field project leader (biologist), 1 wildlife biologist, 1 biological technician, 1 animal damage control specialist, and 1 or 2 part-time tribal wildlife biologists (if the tribes choose to cooperate in wolf management). The animal damage control position would be assigned to the USDA Animal Damage Control Division and funded by a transfer of FWS appropriations. The tribal biologist positions would be divided between the San Carlos and Apache Tribes and funded by FWS appropriations through cooperative agreements with the tribes. Other field positions would be assigned to designated lead and/or cooperating agencies and funded by FWS appropriations and state matching funds (if the states choose to cooperate in wolf management). This cost estimate for Alt. A assumes that population objectives will be reached in 9 years and intensive population monitoring will continue for an additional 5 years for a total project life of 14 years. The cost of operating the Sevilleta Wolf Management Facility has been included as an added cost for each alternative, reflecting the dual purposes for this facility of holding captive wolves in the absence of a reintroduction decision and acclimating wolves for release if reintroduction is approved.

Table B-1.

Activity	<u>Reintroduction Costs/Year 1997-2001</u>	<u>Management Costs/Year¹ 2002-2010</u>
Field staff salaries ²	\$203,600	\$ 203,600
Administration/overhead ³	\$ 151,000	\$ 147,000
Equipment/maintenance	\$ 20,000	\$ 20,000
Release pen construction	\$ 19,000	----
Wolf care and feeding ⁴	\$ 5,000	----
Sevilleta facility O&M	\$ 60,000	\$ 60,000
Information/education	\$ 8,000	\$ 6,000
Monitoring/research	\$ 80,000	\$ 65,000
Total Annual Cost	\$ 546,600	\$ 501,600
Total Cost of Alternative A	\$7,247,400 (1996 dollars)	

Alternative B: Nonessential experimental releases in the BRWRA and WSWRA with prevention of dispersal beyond the primary recovery zones.

Notes: Field project staff would include 1 field project leader (biologist), 2 wildlife biologists, 1 biological technician, 1 part-time animal damage control specialist, and 1 or 2 part-time tribal wildlife biologists. Staff agency affiliations and funding arrangements would be similar to those for Alt. A. Field staff needs are greatest for this alternative because reintroductions would take place simultaneously in the BRWRA and the WSWRA primary recovery zones and because intensive management will be necessary. This cost estimate for Alt. B assumes that population objectives will be reached in 5 years and intensive population monitoring will continue for an additional 5 years for a total project life of 10 years.

Table B-2.

Activity	<u>Reintroduction Costs/Year 1997-2001</u>	<u>Management Costs/Year¹ 2002-2006</u>
Field staff salaries ²	\$ 261,000	\$ 161,000
Administration/overhead ³	\$ 162,000	\$ 158,000
Equipment/maintenance	\$ 18,000	\$ 18,000
Release pen construction	\$ 14,000	----
Wolf care and feeding ⁴	\$ 7,000	----
Sevilleta facility O&M	\$ 60,000	\$ 60,000
Information/education	\$ 8,000	\$ 6,000
Monitoring/research	<u>\$ 0,000</u>	<u>\$ 65,000</u>
Total Annual Cost	\$610,600	\$ 568,600
Total Cost of Alternative B		\$5,890,000

Alternative C: Releases in the BRWRA only with full protection under the Endangered Species Act.

Notes: Field project staff would include 1 field project leader (biologist), 1 wildlife biologist, 1 biological technician, 1 animal damage control specialist, and 1 full-time or 2 or more part-time tribal wildlife biologists. Staff agency affiliations and funding arrangements would be similar to those for Alt. A. Tribal staff involvement is higher for this alternative because wolf dispersal would not be controlled. Estimated costs are less than in the draft EIS because reintroductions would be limited to just the BRWRA. This cost estimate for Alt. C assumes that population objectives will be reached in 5 years and intensive population monitoring will continue for an additional 5 years for a total project life of 10 years.

Table B-3.

Activity	Reintroduction	Management
	<u>Costs/Year</u>	<u>Costs/Year'</u>
	1997-2001	2002-2006
Field staff salaries'	\$ 224,000	\$ 224,000
Administration/overhead-'	\$ 155,000	\$ 151,000
Equipment/maintenance	\$ 25,000	\$ 25,000
Release pen construction	\$ 11,400	
Wolf care and feeding'	\$ 5,000	
Sevilleta facility O&M	\$ 60,000	\$ 60,000
Information/education	\$ 10,000	\$ 8,000
Monitoring/research	\$ 100,000	\$ 0,000
Total Annual Cost	\$ 590,400	\$ 548,600
Total Cost of Alternative C		\$5,692,000

Alternative D - No action.

Notes: For purposes of estimating costs, two possible scenarios are considered: (1) wolves fail to recolonize naturally and (2) wolves recolonize naturally. In both cases it is assumed that certain ongoing recovery activities would continue (the status quo), such as investigating sighting reports and maintaining a captive population at the Sevilleta facility. If Mexican wolves do not recolonize former habitats in the U.S., the Mexican wolf recovery staff would consist of 1 lead FWS biologist. This level of involvement could continue as long as the subspecies has status under the ESA, thus only annual costs are provided. Assuming that one population of wolves did naturally recolonize one area, the project staff would include 1 project leader (biologist), 1 biological technician, and 1 part-time animal damage control specialist. Because of the speculative nature of this scenario, only annual costs are estimated.

Table B-4.

Activity	Reintroduction Costs/Year No Recol.	Management Costs/Year' With Recol.
Field staff salaries*	\$ 60,500	\$ 103,000
Administration/overhead ³	\$ 18,000	\$ 25,000
Equipment/maintenance	\$ 8,000	\$ 19,000
Release pen construction	\$ ----	
Wolf care and feeding ⁴	\$ ----	----
Sevilleta facility O&M	\$ 60,000	\$ 60,000
Information/education	\$ 1,500	\$ 3,500
Monitoring/research	<u>\$ - - -</u>	<u>\$. 0 0 0</u>
Total Annual Cost	\$ 148,000	\$ 217,500

Footnotes:

¹ Includes five-year monitoring/research phase beyond attainment of recovery area objectives.

² Includes all federal, state, and tribal staff costs directly related to wolf reintroduction and/or monitoring and protection of naturally recolonizing populations.

³ Includes full-time recovery program coordinator position.

⁴ Applies only to wolves in release pens.

APPENDIX C
Proposed Mexican Wolf
Experimental Population Rule

NOTE: The attached proposed experimental population rule was published in the Federal Register on May 1, 1996. It is almost identical to the draft version printed as Appendix C to the DEIS in June of 1995, except that it updates the NEPA review process and is re-written in “plain English” in a few areas. As a result of the review processes for the DEIS and the internal agency draft of this FEIS, various changes have been made to Alternative A between the DEIS and this FEIS that are not yet reflected in the Proposed Rule. The Fish and Wildlife Service still is reviewing public and agency comments on this **officially** published proposed rule. A future decision to proceed with Alternative A, or any alternative that involves experimental reintroduction, would need to be followed by issuance of a final experimental population rule.

By the Board. Linda J. Morgan, Chairman.
 Vernon A. Williams,
 Secretary.
 [FR Doc 96-10763 Filed 4-30-96; 8:45 am]
 BILLING COOE 4915-00-P

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

RIN1018-AD07

Endangered and Threatened Wildlife and Plants: Proposed Establishment of a Nonessential Experimental Population of the Mexican Gray Wolf in Arizona and New Mexico

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Proposed rule.

SUMMARY: The U.S. Fish and Wildlife Service (Service) proposes to reintroduce the endangered Mexican gray wolf (*Canis lupus baileyi*) into two designated recovery areas within the subspecies' probable historic range. The Blue Range Wolf Recovery Area consists of the entire Apache and Gila National Forests in east-central Arizona and west-central New Mexico. The White Sands Wolf Recovery Area consists of all land within the boundary of the White Sands Missile Range in south-central New Mexico together with designated land immediately to the west. The wolves reintroduced into these areas are classified as one nonessential experimental population under section 10(j) of the Endangered Species Act (Act) of 1973, as amended. The proposed rule sets forth management directions and provides for limited allowable legal take of wolves within a defined Mexican Wolf Experimental Population Area.

DATES: Comments from all interested parties must be received by July 1, 1996.

ADDRESSES: Send comments and materials concerning this proposal to the Mexican Wolf Recovery Program, U.S. Fish and Wildlife Service, P.O. Box 1306, Albuquerque, New Mexico 87103-1306. Comments and materials received will be available for public inspection, by appointment, during normal business hours at the above address. Copies of the draft Environmental Impact Statement or its summary CM be obtained at this address.

FOR FURTHER INFORMATION CONTACT: Mr. David R. Parsons (see ADDRESSES section) at telephone 505/248-6920; or facsimile 505/248-6922.

SUPPLEMENTARY INFORMATION:

Background

Legislative: The Endangered Species Act Amendments of 1982, Pub. L. 97-304, made significant changes to the Act, including the creation of section 10(j), which provides for the designation of specific populations of listed species as "experimental populations." Under previous authorities of the Act, the Service was permitted to reestablish (reintroduce) populations of a listed species into unoccupied portions of its historic range for conservation and recovery purposes. However, local opposition to reintroduction efforts, stemming from concerns by some about potential restrictions, and prohibitions on Federal and private activities contained in sections 7 and 9 of the Act, reduced the effectiveness of reintroduction as a management tool.

Under section 10(j), a population of a listed species reestablished outside its current range but within its probable historic range may be designated as "experimental." at the discretion of the Secretary of Interior (Secretary), if reintroduction of the experimental population furthers the conservation of the listed species. An experimental population must be separate geographically from nonexperimental populations of the same species. Designation of a population as experimental increases the Service's management flexibility.

Additional management flexibility exists if the Secretary finds the **experimental population to be "nonessential"** to the continued existence of the species. For purposes of section 7 (except section 7(a)(1), which requires Federal agencies to use their authorities to conserve listed species), nonessential experimental populations located outside national wildlife refuge or national park lands are treated as if they are proposed for listing. This means that Federal agencies are under an obligation to confer (as if the species were only proposed for listing) as opposed to consult (required for a listed species) on any actions authorized, funded, or carried out by them that are likely to jeopardize the continued existence of the species. Nonessential experimental populations located on national wildlife refuge or national park lands are treated as threatened, and formal consultation may be required. Activities undertaken on private lands are not affected by section 7 of the Act unless they are authorized, funded, or carried out by a Federal agency.

Individual animals used in establishing an experimental population can be removed from a source

population if their removal is **not** likely to jeopardize the continued existence of the species (see Findings Regarding Reintroduction, below), and a permit has been issued in accordance with 50 CFR Part 17.22.

The Mexican wolf was listed as an endangered subspecies on April 28, 1976 (41 FR 17742). The gray wolf species in North America south of Canada was listed as **endangered** (except in Minnesota where it was listed as threatened) without reference to subspecies on March 9, 1978 (43 FR 9607). The Mexican Wolf Recovery Plan was adopted by the **Directors** of the Service and the Mexican **Direccion General de la Fauna Silvestre** in 1982. The plan guides recovery efforts for the subspecies, laying out a series of recommended actions. The recovery plan is currently being revised, and the revised document will more precisely define the points at which downlisting and delisting will occur.

Biological: This proposed experimental population rule addresses the Mexican wolf (*Canis lupus baileyi*), an **endangered** subspecies of gray wolf that was extirpated from the southwestern United States by 1970. The gray wolf (*C. lupus*) is native to most of North America north of Mexico City. An exception is in the southeastern United States, which was occupied by the red wolf (*C. rufus*). The gray wolf occupied areas that supported populations of hooved mammals (ungulates), its major food source.

The Mexican wolf historically occurred over much of New Mexico, Arizona, Texas, and northern Mexico, mostly in or near forested mountainous terrain. Numbering in the thousands before European settlement, the Mexican wolf declined rapidly when its reputation as a livestock killer led to concerted eradication efforts. Other factors contributing to its decline were commercial and recreational hunting and trapping of wolves: killing of wolves by game managers on the theory that more game animals would be available for hunters; habitat alteration; and human safety concerns (although no documentation exists of Mexican wolf attacks on humans).

The subspecies is now considered extirpated from its historic range in the southwestern United States because no wild wolf has been confirmed since 1970. Occasional sightings of "wolves" continue to be reported from United States locations, but none have been confirmed through clear evidence. Recent field research has revealed no confirmed reports of wolves remaining in Mexico. Investigations are continuing.

When Mexican wolves were eradicated, their natural history was poorly understood. Appendix A to the draft Environmental Impact Statement provides life history and biological descriptions of Mexican wolves to the extent they are known or can be inferred from historical evidence, observations of captive Mexican wolves, and studies of gray wolves in other geographic regions. (The draft Environmental Impact Statement should be referred to for background and supporting information and literature references on all aspects of this proposed rule: see ADDRESSES section.)

Recovery efforts: The Mexican Wolf Recovery Plan's objective is to conserve and ensure survival of the subspecies by maintaining a captive breeding program and reestablishing a viable, self-sustaining population of at least 100 Mexican wolves in a 5,000 square mile area within the subspecies' historic range. (The recovery plan is currently under revision.)

A captive breeding program was established in the 1970's with two wild male Mexican wolves caught from 1977 to 1980 (from Durango and Chihuahua, Mexico) and one wild pregnant female wolf caught in 1978 (from Durango, Mexico). Two additional captive populations were determined in July 1995 to be pure Mexican wolves: each has two founders. The captive population has increased to 139 as of March 1996: 114 are held at 23 facilities in the United States and 25 at five facilities in Mexico. This population has been managed since 1990 for maximum reproduction to support the proposed reintroduction effort. The goal is to have at least 100 animals in the United States facilities prior to any releases into the wild.

On April 20, 1992, the Service issued a "Notice of Intent to Prepare an Environmental Impact Statement on the Experimental Reintroduction of Mexican Wolves (*Canis lupus baileyi*) into Suitable Habitat within the Historic Range of the Subspecies" (57 FR 14427). This notice also announced the time and place of public scoping meetings. The draft Environmental Impact Statement was released for public review and comment on June 27, 1995 (60 FR 33224). The location and times of 14 public meetings were also announced in this notice. In September of 1995, the Service announced that three public hearings would be held in October 1995 (60 FR 49628). All announced meetings and hearings were held. The public comment period closed on October 31, 1995. Approximately 18,000 people have commented or expressed an opinion on the draft

Environmental Impact Statement. Following an analysis of the public comments, a final Environmental Impact Statement will be issued around July 1996.

The proposed Mexican wolf recovery actions and this proposed rule were developed by the Service after consultation with representatives of Federal, State, and other agencies, with potentially affected private parties, and with wolf experts nationally. Public comments received at and after scoping meetings for the draft Environmental Impact Statement were considered. (See draft Environmental Impact Statement, Chapter 1 section on Scoping and Chapter 5-Consultation and Coordination.)

Mexican wolf recovery areas: The Service has determined that the proposed reintroductions in the White Sands Wolf Recovery Area and the Blue Range Wolf Recovery Area have the greatest potential for successfully achieving the current recovery objective for Mexican wolves. (See paragraph (j) (6) of the proposed rule and Figures 1 and 2 for precise boundaries of these areas. Chapters 2 and 3 of the draft Environmental Impact Statement describe the selection of these two areas and provide detailed descriptions of them.)

The two wolf recovery areas are within the Mexican wolves probable historic range. Both contain vast, relatively remote, and isolated expanses of federally-managed land. Suitable wolf habitat containing relatively abundant prey such as deer and elk is available. As the Mexican wolf is considered extinct in the wild in the United States, both areas are wholly separate geographically from any known, naturally-occurring nonexperimental populations of wild wolves. A larger Mexican Wolf Experimental Population Area, which also is wholly separate geographically from any known, naturally-occurring nonexperimental populations of wild wolves, is defined in the rule, paragraph (j) (6), (see Figure 3). Mexican wolf recovery is not proposed throughout this larger area. Its purpose is to establish that any wild wolf found in this larger area is a member of the nonessential experimental population, and therefore subject to the provisions of this rule, and not an "endangered" status wolf with full protection of the Act.

Reintroduction procedures: Male and female pairs from the captive population will be selected for release based on genetics, reproductive performance, behavioral compatibility, response to the adaptation process, and other factors. Selected pairs will be

moved to the Service's captive wolf management facility on the Sevilleta National Wildlife Refuge in central New Mexico where measures will be taken to improve their adaptation to life in the wild.

Wolves will be reintroduced by a "soft release approach designed to reduce the likelihood of quick dispersal away from the release areas. This involves holding the animals in pens on site for up to several months in order to acclimate them and to increase their affinity for the area. (The soft release approach is described in more detail in Chapter 2 of the draft Environmental Impact Statement.) The releases will begin in 1996 or as soon thereafter as feasible.

Approximately five family groups of captive raised Mexican wolves will be released over a period of 3 years into the White Sands Wolf Recovery Area, with the goal of reaching a long-term sustainable subpopulation of 20 wolves by 1998. In the Blue Range Wolf Recovery Area, approximately 14 family groups will be released over a period of 5 years, with the goal of reaching a long-term sustainable subpopulation of 100 wild wolves by 2004. The proposed action is flexible, using either the White Sands Wolf Recovery Area or the Blue Range Wolf Recovery Area, or both, and in the order of their use.

Management of the reintroduced population: The proposed nonessential experimental designation enables the Service to develop measures for management of the population that are less restrictive than the mandatory prohibitions that protect species with "endangered" status. This includes limited allowance of both governmental and private take of individual wolves under narrowly defined circumstances. Management flexibility is needed to make reintroduction compatible with current and planned human activities, such as livestock grazing and hunting, in the reintroduction area. It is also critical to obtaining needed State, tribal, local, and private cooperation. Thus, this flexibility will improve the likelihood of success.

Reintroduction will occur under management plans that allow dispersal by the new wolf subpopulations beyond the primary recovery zones where they will be released, into the secondary recovery zones of the two designated wolf recovery areas (see Figures 1 and 2). The Service and cooperating agencies will not allow the wolves to establish territories outside these wolf recovery area boundaries without landowner consent on private or tribal lands within the Mexican Wolf Experimental Population Area

No measures are expected to be needed to isolate the experimental population from naturally occurring populations because no Mexican wolves are now known to occur in the wild. However, the Service will attempt to take every reasonable step to ensure that no naturally occurring wild population (see definition in Rule Glossary) that might exist within the recovery areas (which is considered highly unlikely) are affected by the reintroduction of captive-raised, nonessential experimental wolves. Surveys for wolf sign in these areas will be conducted prior to any reintroduction. If a naturally occurring wild population is found within one or both of the designated wolf recovery areas, the proposed reintroduction there would not go forward with such wild wolves present. Further, if a naturally occurring wild population is found within one or both of the designated wolf recovery areas within 90 days after members of the experimental population are initially released (which also is considered highly unlikely), all wolves in the reintroduced subpopulation in such recovery area(s) would be removed and the reintroduction would not continue there. Such a wild population would have full endangered status under the Act.

Identification and monitoring: Prior to placement in release pens, the adult wolves will receive permanent identification marks and radio collars. Pups will receive surgically implanted transmitters prior to release and the pups will be recaptured and fitted with radio collars when they are large enough. Wild-born pups of the reintroduced population that are captured will be given a permanent identification mark and radio collar.

The Service and cooperating agencies will measure the success or failure of the reintroductions, and the effects of such success or failure on the conservation and recovery of Mexican wolves, by continuously monitoring, researching, and evaluating the status of released wolves in the wild. The agencies will prepare periodic progress reports, annual reports, and full evaluations after 3 and 5 years that will recommend continuation or termination of the reintroduction effort. The reports will also evaluate whether, and how, to use the second wolf recovery area, that is, the one not used initially.

Findings regarding reintroduction: The Service finds that the reintroduced experimental population is reasonably likely to become established and survive in the wild within the Mexican wolf probable historic range. Under the proposed rule and based on available

data, the Service projects that the Blue Range Wolf Recovery Area subpopulation will achieve the 1982 Mexican Wolf Recovery Plan goal of 100 wolves occupying 5,000 square miles by 2004.

The White Sands Wolf Recovery Area will support an estimated 20 wolves occupying 1,000 square miles by 1998. This likely would not be an independently viable subpopulation. Nevertheless, a subpopulation in this size range could be maintained through supplemental releases (or, speculatively, by natural immigration of wolves from another nearby population if one existed, e.g., from a reintroduced subpopulation in the Blue Range Wolf Recovery Area). Even if the White Sands Wolf Recovery Area subpopulation is not viable, per se, the Service finds that, through monitoring and research, such a reintroduction would provide vital information about the ecology and behavior of wild Mexican wolves and about the ability of captive-raised gray wolves to survive in the wild. A reintroduction there would provide a valuable assessment of the soft release approach to reintroducing captive-raised wolves. Further, wolves successfully reintroduced into the White Sands Wolf Recovery Area could be used as release stock for future reintroductions elsewhere, which would increase the likelihood of success compared to using captive-raised wolves as release stock.

Some members of the experimental population are expected to die during the reintroduction efforts after removal from the captive population. The Service finds that even if the entire experimental population died, this would not appreciably reduce the prospects for future survival of the subspecies in the wild. That is, future reintroductions still would be feasible even if the reintroductions proposed here failed. The individual Mexican wolves selected for release will be as genetically redundant with other members of the captive population as possible, thus minimizing any adverse effects on the genetic integrity of the remaining captive population. The Service has detailed lineage information on each captive Mexican wolf. The captive population is managed for the Service under the American Zoo and Aquarium Association's Species Survival Plan program. The Association maintains a Studbook and provides an expert advisor for small population management.

Management of the demographic and genetic makeup of the population is guided by the SPARKS computer program. Kinship values, which range

from zero to one, are a measure of the relatedness of an individual to the rest of the population. Wolves with higher kinship values are genetically well-represented in the population. Only those individuals whose kinship values are above the mean for the captive population as a whole will be used for release. In addition, the PEDPAC computer program will be used to identify suitable release candidates by examining the influence of removing an individual animal on the survival of the founders' genes. This management approach will adequately protect the genetic integrity of the captive population and thus the continued existence of the subspecies. The United States captive population of Mexican wolves has approximately doubled in the last 3 years demonstrating the captive population's reproductive potential to replace reintroduced wolves that die. In view of all these safeguards the Service finds that the reintroduced population would not be "essential" under 50 CFR 17.81(c)(2).

The Service finds that release of the experimental population will further the conservation of the subspecies and of the gray wolf species as a whole. Currently, no viable populations of the Mexican wolf subspecies are known to exist in the wild. No wild populations of the gray wolf species are known to exist in the United States south of Montana, Minnesota, Wisconsin, and Michigan. (The Service is in the process of reintroducing wild gray wolves from Canada into central Idaho and Yellowstone National Park in Wyoming.) The Mexican wolf is the most southerly and the most genetically distinct of all North American gray wolf subspecies. The Mexican wolf is also considered the rarest of the surviving (nonextinct) subspecies and has been accorded the highest recovery priority by international wolf experts.

Releasing captive-raised Mexican wolves furthers the objective of the Mexican Wolf Recovery Plan. The Plan, if fully implemented, will result in the reestablishment of a wild population of at least 100 Mexican wolves. Also, release of wolves into the wild will reduce the potential negative effects of keeping them in captivity in perpetuity. If a reintroduction into the wild from the captive population does not occur within a reasonable period of time, genetic, physical, or behavioral changes resulting from prolonged captivity could render the captive animals unsuited for reintroduction and devastate their prospects for recovery.

Designation of the released wolves as nonessential experimental is considered necessary to obtain needed State, tribal,

local, and private cooperation. This designation also allows for management flexibility to mitigate negative impacts of Mexican wolf recovery), such as livestock **depredation**. Without such flexibility intentional illegal killing of wolves would likely harm the **prospects** for successful recovery.

Potential for conflict with Federal and other activities: As indicated, considerable management flexibility has been incorporated into **the proposed experimental population rule to reduce potential conflicts between wolves and the activities of governmental agencies, livestock operators, hunters, and others.** No **major** conflicts with current **management** of Federal, State, private, or tribal lands are anticipated. Mexican wolves are **expected to be able to tolerate most** of the current land uses in **the designated wolf recovery areas.** However, temporary **restrictions** on human activities may be imposed around release sites, active dens, and **rendezvous sites. Limited backcountry National Forest road closures may be necessary** if illegal killings of wolves occur: **this** would not affect the White Sands Wolf Recovery Area. Also, the USDA's Animal **Damage Control** Division will discontinue use of M-44's and **choking-type snares** in "occupied Mexican wolf range" (see definition in proposed Section 17.84(j)(10)). Other **predator control** activities may be restricted or modified pursuant to a cooperative management agreement or a conference between the United States Department of Agriculture's Animal Damage Control Division and the Service.

The Service and other authorized agencies may **harass, take, remove, or translocate Mexican wolves** under certain circumstances described in detail in the proposed rule. Private citizens also are given broad authority to **harass Mexican wolves (for purposes of scaring them away from livestock) and they may take (including to kill or injure) them under narrow circumstances, that is, in cases of defense of human life or when wolves are in the act of attacking their livestock (if certain conditions are met).** In addition, ranchers **can** seek compensation from a privately-funded **depredation compensation fund if depredation on their livestock occurs.**

The Service does not intend to change the proposed "nonessential **experimental**" designation to "essential **experimental**," "threatened", or "endangered" and the Service does not intend to **designate critical habitat** for the Mexican wolf. Critical habitat can not be **designated under the nonessential experimental**

classification, 16 U.S.C. 1539(j)(2)(C)(ii). The Service foresees no likely situation **which would result in such changes in the future.** Nevertheless, to ensure that such changes do not occur, **the following** condition exists in the **proposed rule, paragraph (j)(9)-if** legal actions or lawsuits **compel** a change in the population's legal status to essential **experimental, threatened, or endangered, or compel the designation** of critical habitat for wolves within the experimental population area, then all **reintroduced Mexican wolves will be removed** from the wild and the **experimental population rule will be** revoked.

Public Comments Solicited

The Service solicits comments or suggestions on the proposed **experimental population rule from the public, States, tribes, other concerned governmental agencies, the scientific community, industry, potentially affected landowners, or any other interested party.** Comments must be received **within 60 days of publication** of this proposed rule in the Federal Register.

The Service will hold public hearings to obtain additional verbal and written information. The location, dates, and times of these hearings will be **announced in a forthcoming issue of the Federal Register, in newspapers, and in a mailing to those persons on the Mexican Wolf Recovery Program mailing list.**

Any final decision on this proposal will take into consideration the comments and any additional information received by the Service. These may lead to a final rule that differs from this proposal.

National Environmental Policy Act

A draft Environmental Impact Statement on the Service's proposal to reintroduce the Mexican wolf in the southwestern United States has been prepared and is available to the public (see ADDRESSES section). The draft Environmental Impact Statement should be referred to for analysis of the **Proposed Action** and alternatives to it; also, the draft **Environmental Impact Statement** contains detailed references for the **background information provided here.**

Required Determinations

This proposed rule has been reviewed by the Office of Management and Budget under Executive Order 12866. **The rule will not have significant economic impact on a substantial number of small entities under the Regulatory Flexibility Act (5 U.S.C. 601,**

et seq.). The final rule will not significantly change costs to industry or governments. Furthermore, the rule **produces no adverse effects on competition, employment, investment, productivity, innovation, or the ability of United States enterprises to compete with foreign-based enterprises in domestic or export markets.**

This proposed rule has been reviewed under Executive Order 12630, the **Attorney General Guidelines, Department Guidelines and the Attorney General Supplemental Guidelines to determine the takings implications of the proposed rule, if it were promulgated as currently drafted. One issue of concern is the depredation of livestock by reintroduced wolves.**

However, such **depredation by a wild animal would not be a "taking" under the 5th Amendment.** One of the reasons for the **experimental nonessential designation is to allow the agency and private entities flexibility in managing the wolves, including the elimination of a wolf when there is a confirmed kill of livestock.**

This proposed rule has been reviewed under Executive Order 12612 to determine Federalism considerations in policy formulation and implementation. **Evidently, one or more counties in the vicinity of the wolf reintroduction area have enacted ordinances specifically prohibiting the introduction of the wolf (among other species) within county boundaries. However, the United States Congress has given the Secretary of the Interior explicit statutory authority, in section 10(j) of the Act, to promulgate this rule, and under the Supremacy Clause of the United States Constitution, this has the effect of preempting State regulation of wildlife to the extent in conflict with this proposed rule.** Nevertheless, the Service has endeavored to cooperate with State wildlife agencies and county and tribal governments in the preparation of this proposed rule.

Author

The primary author of this document is Mr. David R Parsons (see ADDRESSES section) at telephone 505/248-6920; or facsimile 505/ 248-6922.

List of Subjects in 50 CFR Part 17

Endangered and threatened species, Exports, Imports, Reporting and recordkeeping requirements, and Transportation.

Proposed Regulation Promulgation

Accordingly, the Service hereby proposes to amend part 17, subchapter B of chapter I, title 50 of the Code Of Federal Regulations, as set forth below:

PART 17—[AMENDED]

Authority: 16 U.S.C. 1361-1407; 16 U.S.C. § 17.11 Endangered and threatened
 1531-1544; 16 U.S.C. 4201-4245; Pub. L. 99- wildlife.
 625, 100 Stat. 3500, unless otherwise noted. * * * * *

1 The authority citation for part 17 continues to read as follows:

2. In § 17.11 (h), the table entry for "Wolf, gray under MAMMALS is revised to read as follows:

Species		Historic range	Vertebrate popu- lation where endan- gered or threatened	Status	When listed	Critical habitat	Special rules
Common name	Scientific name						
Mammals							
Wolf, gray	<i>Canis lupus</i>	Holarctic	U.S.A. (48 conterminous States, except MN and where listed as an experi- mental popu- lation).	E	1. 6. 13. 35. 561, 562.	17.95(a)	NA
Do	do	do	U.S.A. (MN)	T	35	17.95(a)	17.40(d)
Do	do	do	U.S.A. (WY and portions of ID and MT—see 17.84(i))..	XN	561, 562	NA 17.84(i)	
Do	do	do	U.S.A. (specific por- tions of AZ NM and TX—see 17.84(j))..	XN	NA	17.84(j).	

3. Section 17.84 is amended by adding paragraph (j) to read as follows:

§ 17.84 Special rules—vertebrates.

(j) Mexican gray wolf (*Canis lupus baileyi*).

(1) The Mexican gray wolf (Mexican wolf) subpopulations reestablished in the Blue Range Wolf Recovery Area and in the White Sands Wolf Recovery Area within the Mexican Wolf Experimental Population Area, identified in paragraph (j)(6) of this section, are one nonessential experimental population. This nonessential experimental population will be managed in accordance with these provisions.

(2) The Fish and Wildlife Service (Service) finds that reintroduction of an experimental population of Mexican wolves into the subspecies' probable historic range will further the conservation of the Mexican wolf subspecies and of the gray wolf species. The Service also finds that the experimental population is not "essential." under 50 CFR 17.81(c)(2).

(3) You must not take any wolf in the wild within the Mexican Wolf Experimental Population Area except as provided in this rule. The Service may refer take of a wolf contrary to this rule to the appropriate authorities for prosecution.

(i) Throughout the entire Mexican Wolf Experimental Population Area, you will not be in violation of the Endangered Species Act (Act) for unavoidable and unintentional take (including killing or injuring) of a wolf, when such take is non-negligent and incidental to a legal activity, such as hunting, trapping, driving, or recreational activities, and you report the take promptly (within 24 hours) to the Service's Mexican Wolf Recovery Coordinator or to a Service appointed agency representative.

(ii) Also throughout the entire Mexican Wolf Experimental Population Area, excluding areas within the national park system and national wildlife refuge system, no Federal agency or their contractors will be in violation of the Act for take of a wolf resulting from any authorized agency action. This provision does not exempt agencies and their contractors from complying with section 7(a)(4) of the Act which requires a conference with the Service if they propose an action that is likely to jeopardize the continued existence of the Mexican wolf.

(iii) No land use restrictions will be imposed on private or tribal reservation lands for Mexican wolf recovery without the concurrence of the private owner or tribal government. On public lands, public and tribal agencies may temporarily restrict human access and

disturbance-causing land use activities, such as timber harvesting and mining, within a 1-mile radius around release pens when wolves are in them, around active dens between March 1 and June 30, and around active wolfrendezvous sites between June 1 and September 30, as necessary. If documented illegal killing of a wolf occurs the United States Forest Service may, in consultation with the Service, close back-country roads on National Forest lands (except thoroughfares) for as long as necessary to protect the wolves.

(iv) In areas within the national park system and national wildlife refuge system, Federal agencies must treat Mexican wolves as a threatened species for purposes of complying with section 7 of the Act.

(v) On public lands leased for grazing anywhere within the Mexican Wolf Experimental Population Area, including within the designated wolf recovery areas, when and where livestock are legally present, livestock owners or their agents:

(A) May harass wolves, for purposes of scaring them away, in the general vicinity (within 500 yards) of livestock (i.e., cattle, sheep, horses, mules, and burros or as defined in State and tribal wolf management plans as approved by US) in an opportunistic, noninjurious manner (no temporary or permanent physical damage may result) at any

time: provided that wolves cannot be purposely attracted, tracked, waited for, or searched out and then harassed; and provided that such harassment is reported to the Service's Mexican Wolf Recovery Coordinator or to a Service appointed agency representative within 7 days; and.

(B) May receive a written permit under the Act from the Service or an agency designated by the Service, valid for up to 45 days, to take (including kill or injure) a specific number of wolves actually engaged in the act of killing, wounding or biting livestock; provided that, prior to the issuance of such a permit, six or more breeding Mexican wolf pairs occur in the Blue Range Wolf Recovery Area, or three or more breeding Mexican wolf pairs occur in the White Sands Wolf Recovery Area; and provided that an authorized agent of the Service, the United States Department of Agriculture (USDA) Animal Damage Control Division, or the State has documented previous livestock loss or injury caused by wolves and agency efforts to resolve the problem are completed. Livestock owners or their agents must report take of wolves under such a permit to the Service's Mexican Wolf Recovery Coordinator or to a Service appointed agency representative within 24 hours. There must be evidence of freshly wounded or killed livestock by wolves.

(vi) On private or tribal land anywhere within the Mexican Wolf Experimental Population Area, property owners, livestock owners, tenants, or their designated agents:

(A) may harass wolves in the immediate vicinity (within 500 yards) of people, buildings, facilities, pets, livestock, or other domestic animals in an opportunistic, noninjurious manner (no temporary or permanent physical damage may result) at any time; provided that wolves cannot be purposely attracted, tracked, or searched out and then harassed; and provided that such harassment is reported to the Service's Mexican Wolf Recovery Coordinator or to a Service appointed agency representative within 7 days; and.

(B) may take (including kill or injure) any wolf actually engaged in the act of killing, wounding, or biting livestock; provided that livestock freshly (less than 24 hours) wounded (tom flesh and bleeding) or killed by wolves is present; and further provided that the take is reported to the Service's Mexican Wolf Recovery Coordinator or a Service appointed agency representative within 24 hours.

(vii) Authorized Service, USDA Animal Damage Control Division, tribe,

and State employees may capture and/or translocate any Mexican wolf in the nonessential experimental population consistent with the Service's approved inmanagement plan or special management measure. Such plan or measure may include capture and/or translocation of wolves that prey on livestock, attack pets or domestic animals other than livestock on private land, impact game populations in ways which may inhibit further wolf recovery, prey on members of the desert bighorn sheep herd found on the White Sands Missile Range and San Andres National Wildlife Refuge, so long as the State of New Mexico lists it as a species to be protected, are considered problem wolves, are a nuisance, or are conflicting with a major land use, or are necessary for research. Authorized Federal, State, or tribal personnel may also carry out wolf capture and/or translocation for other purposes the Service has authorized, such as genetic management, and may use lethal methods of take when reasonable attempts to capture wolves alive fail and the Service determines that removal of a particular wolf or wolves from the wild is necessary. Authorized Federal, State, or tribal personnel may carry out any management measure that is a part of a Service approved management plan. Also, the USDA Animal Damage Control Division will discontinue use of M-44's and choking-type snares in "occupied Mexican wolf range" [see definition in proposed section 17.84(j)(10)]. The Service may restrict or modify other predator control activities pursuant to a cooperative management agreement or a conference between us and the USDA's Animal Damage Control Division.

(viii) You may harass or take a Mexican wolf in self defense or defense of others, provided that you promptly report the harassment or take to the Service's Mexican Wolf Recovery Coordinator or to a Service appointed agency representative. If the Service or an agency authorized through a cooperative management plan determine that a wolf presents a threat to human life or safety, the Service or the authorized agency may place it in captivity or euthanize it.

(ix) Intentional taking of any wolf in the Mexican Wolf Experimental Population Area, except as described above, is prohibited. The Service encourages individuals authorized to take wolves to use nonlethal means. You must immediately (within 24 hours) deliver all wolves (live or dead), pelts, or parts taken to the Service's Mexican Wolf Recovery Coordinator or to a Service appointed agency representative.

(4) You may not possess, sell, deliver, carry, transport, ship, import, or export by any means whatsoever, any wolf or wolf pan from the experimental population taken or possessed in violation of these regulations or in violation of applicable State or tribal fish and wildlife laws or regulations or the Act.

(5) You may not attempt to commit, solicit another to commit, or cause to be committed, any offense defined in this section.

(6) The two designated recovery areas for Mexican wolves classified as nonessential experimental that lie within the subspecies' probable historic range are:

(i) **The White Sands Wolf Recovery Area** in south-central New Mexico, including all of the White Sands Missile Range, the White Sands National Monument, and the San Andres National Wildlife Refuge, and the area adjacent and to the west of the Missile Range bounded on the south by the southerly boundary of the USDA Jomada Experimental Range and the not-them boundary of the New Mexico State University Animal Science Ranch; on the west by the New Mexico Principal Meridian; on the north by the Pedro Armendaris Grant boundary and the Sierra-Socorro County line; and on the east by the western boundary of the Missile Range (Figure 1). Actual releases of captive-raised wolves will take place, generally as described in our draft Environmental Impact Statement on Mexican wolf reintroduction, within the White Sands Wolf Recovery Area primary recovery zone. This is the area within the White Sands Missile Range bounded on the north by the road from the former Cain Ranch Headquarters to Range Road 16, Range Road 16 to its intersection with Range Road 13, Range Road 13 to its intersection with Range Road 7; on the east by Range Road 7; on the south by Highway 70; and on the west by the Missile Range boundary. The Service will allow the wolf subpopulation to expand into the White Sands Wolf Recovery Area secondary recovery zone, which is the remainder of the White Sands Wolf Recovery Area not in the primary recovery zone.

(ii) **The Blue Range Wolf Recovery Area**, including all of the Apache National Forest and all of the Gila National Forest in east-central Arizona and west-central New Mexico (Figure 2). Actual releases of captive-raised Mexican wolves will take place, generally as described in our draft Environmental Impact Statement on Mexican wolf reintroduction, within the Blue Range Wolf Recovery Area primary recovery zone. This is the area within

the Apache National Forest bounded on the north by the Apache-Greeniee County line; on the east by the Arizona-New Mexico State line; on the south by the San Francisco River (eastern half) and the southern boundary of the Apache National Forest (western half); and on the west by the Greeniee-Graham County line (San Carlos Apache Reservation boundary). The Service will allow the wolf subpopulation to expand into the Blue Range Wolf Recovery Area secondary recovery zone, which is the remainder of the Blue Range Wolf Recovery Area not in the primary recovery zone.

(iii) The boundaries of the Mexican Wolf Experimental Population Area are the portion of Arizona lying north of Interstate Highway 10 and south of Interstate Highway 40; the portion of New Mexico lying north of Interstate Highway 10 in the west, north of the New Mexico-Texas boundary in the east, and south of Interstate Highway 40; and the portion of Texas lying north of United States Highway 62/180 and south of the Texas-New Mexico boundary (Figure 3). The Service is not proposing wolf recovery throughout this area, only within the White Sands and Blue Range Wolf Recovery Areas described in paragraph (j)(6)(i) and (j)(6)(ii) of this subsection. The purpose of the larger experimental population area designation is to distinguish the legal status of any wolf found there. After the first captive wolf release, wolves found in the wild in the Mexican Wolf Experimental Population Area will be subject to management under this rule, if a wolf is captured inside the Mexican Wolf Experimental Population Area after the first release but outside the designated wolf recovery areas, it will be returned and re-released or put into the captive breeding program. If a wolf is found in the United States outside the boundaries of the Mexican Wolf Experimental Population Area (and not within any other wolf experimental population area) the Service will presume it to be of wild origin with full endangered status (or threatened in Minnesota) under the Act, unless evidence, such as a radio-collar or identification mark, establishes otherwise. If such evidence exists, the Service or an authorized agency will attempt to promptly capture the wolf and return and re-release it or put into the captive breeding program. Such a wolf is otherwise not subject to this rule outside the designated Mexican Wolf Experimental Population Area.

(7) If Mexican wolves of the experimental population occur on public lands outside the designated wolf recovery areas, but within the Mexican

Wolf Experimental Population Area, the Service or an authorized agency will attempt to recapture any radio-collared lone wolf and any lone wolf or member of an established pack causing livestock depredations. The agencies will not routinely recapture and return pack members that make occasional forays onto public land outside the designated wolf recovery areas and uncollared lone wolves on public land. However, the Service will capture and return to a recovery area or to captivity packs from the nonessential experimental population that establish territories on public land outside the designated wolf recovery areas. If any wolves move onto private or tribal lands outside the designated recovery areas, but within the Mexican Wolf Experimental Population Area, the Service or an authorized agency will develop management actions in cooperation with the land owner including recapture if requested by the land owner or tribal government.

(8) The Service will continuously evaluate Mexican wolf reintroduction progress and prepare periodic progress reports, detailed annual reports, and full evaluations after 3 and 5 years that recommend continuation or termination of the reintroduction effort.

(9) The Service does not intend to change the "nonessential experimental" designation to "essential experimental," "threatened," or "endangered" and does not intend to designate critical habitat for the Mexican wolf. Critical habitat cannot be designated under the nonessential experimental classification, 16 U.S.C. 1539(j)(2)(C)(ii). The Service foresees no likely situation which would result in such changes. The Service would remove from the wild all reintroduced Mexican wolves designated as nonessential experimental and revoke the experimental status and regulations if legal actions or lawsuits compel a change in the population's legal status to essential experimental, threatened, or endangered or compel the designation of critical habitat within the Mexican Wolf Experimental Population Area, or if within 90 days of the initial release date, the Service discovers a naturally occurring population of wild wolves, consisting of at least two breeding pairs that for 2 consecutive years have each successfully raised two offspring, existing within the White Sands Wolf Recovery Area or Blue Range Wolf Recovery Area boundaries. The Service would manage and protect any such naturally occurring wolves as endangered species under the Act.

(10) Definitions—Key terms used in the rule have the following definitions.

Breeding pair. An adult male and an adult female wolf that have produced at least two pups that survived until December 31 of the year of their birth, during the previous breeding season.

Depredation. The confirmed killing or maiming of lawfully present domestic livestock on Federal, State, tribal, or other public lands, or private lands by one or more wolves. The Service, USDA Animal Damage Control, or Service-authorized State or tribal agencies will confirm killing or maiming of domestic livestock.

Engaged in the act of killing, wounding, or biting livestock. To be engaged in the pursuit and grasping, biting, attacking, wounding, or feeding upon livestock that are alive, if wolves are observed feeding on livestock carcasses, you cannot assume that wolves killed the livestock until proper authorities investigate and confirm that wolves were responsible for that or other livestock losses in the immediate area (1-mile radius).

Harass. Harass is defined as "intentional or negligent act or omission which creates the likelihood of injury to the 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" (50 CFR 17.3). For the purposes of this proposed experimental population rule the Service permits only "opportunistic," noninjurious harassment (see definition below) and limits it to approaching wolves on foot, horseback, or nonmotorized or motorized vehicle (no closer than 20 feet); discharging firearms or other projectile launching devices in proximity to but not in the direction of wolves; throwing objects in the general direction of but not at wolves; or making any loud noise in proximity to wolves. The basic intent is to scare or chase wolves from the immediate area without causing physical injuries.

Impact on game populations in ways which may inhibit further wolf recovery. The Service encourages States and tribes to describe unacceptable impacts on game populations in their management plans subject to our approval. Until such time the term will mean the following: Two consecutive years with a cumulative 35 percent decrease in population or hunter harvest estimates for a particular species of ungulate in a game management unit or distinct herd segment compared to the prewolf 5-year average (unit or herd must contain average of greater than 100 animals). If wolf predation is shown to be a primary cause of ungulate population declines (greater than 50 percent of documented adult or young mortality), then wolves

may be moved to reduce ungulate mortality rates and assist in herd recovery, but only in conjunction with application of other common, professionally acceptable, wildlife management techniques.

Occupied Mexican wolf range. (1) Area of confirmed presence of resident breeding packs or pairs of wolves or area consistently used by at least one resident wolf over a period of at least one month. The Service must confirm or corroborate wolf presence. Exact delineation of the area will be described by

(i) Five-mile radius around all locations of wolves and wolf sign confirmed as described above (nonradio-monitored);

(ii) 5-mile radius around radio locations of resident wolves when fewer than 20 radio locations are available (for radio-monitored wolves only); or

(iii) 3-mile radius around the convex polygon developed from more than 20 radio locations of a pack, pair, or single wolf taken over a period of at least 6 months (for radio-monitored wolves)

(2) This definition applies only within the Mexican Wolf Experimental Population Area.

Opportunistic, noninjurious harassment (see "harass") This is the only type of harassment the Service permits under the experimental population rule. Opportunistic means as the wolf presents itself (i.e., the wolf travels onto and is observed on private land or near livestock). You cannot track a wolf and then harass it or harass it by

aircraft. You cannot chase and harass a wolf for an extended period of time (over 15 minutes). Any harassment must not cause bodily injury, maiming, or death.

Population of naturally occurring wild wolves. At least two breeding pairs of wolves successfully raising at least two young each year (until December 31 of the year of their birth), for 2 consecutive years in the Mexican Wolf Experimental Population Area.

Primary recovery zone. An area where the Service proposes to release Mexican wolves, and where the Service may return and re-release them if necessary, and where managers will actively support recovery of the reintroduced population.

Problem wolves. Wolves that have depredated on lawfully present domestic livestock or wolves from a group or pack including adults, yearlings, and young-of-the-year that were directly involved in the depredations; or fed upon the livestock remains that were a result of the depredation; or were fed by or are dependent upon adults involved with the depredations (because before these young animals mature to where they can survive on their own, they will travel with the pack and learn the pack's depredation habits). Wolves that have depredated on domestic animals other than livestock, two times in an area within 1 year. Wolves that are habituated to humans, human residences, or other facilities.

Secondary recovery zone. An area adjacent to a primary recovery zone which the Service does not propose for Mexican wolf releases, but in which the Service allows released wolves to disperse, and where managers will actively support recovery of the reintroduced population.

Take. The Act defines "take" as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct" (16 U.S.C. 1532(19)). See above definition of Harass which includes definition of permitted harassment, and see definition of Unavoidable and unintentional take below.

Unavoidable and unintentional take. Accidental, nonnegligent take (see above definition of "Take") which occurs despite reasonable care, is incidental to an otherwise lawful activity and without the purpose to do so. Examples would include striking a wolf with an automobile or capturing a wolf in a trap set obviously for another species. Note--Shooting a wolf when the individual states he or she believed it to be an animal other than a wolf does not qualify as unavoidable or unintentional take. Shooters have the responsibility to be sure of their targets.

Wolf recovery area. A designated area where managers will actively support reestablishment of Mexican wolf populations.

Figures to § 17.84(j)

BILLING CODE 4310-55-P

NOTE: Figs 1, 2, and 3 (pages 19245 through 19247) of the Federal Register notice are not reproduced here, in order to save space, as they are the same as Figs 2-3, 2-2, and 2-4, respectively, in this FEIS. Also, all of the last page of the Federal Register notice, p. 19248, is reproduced below.

BILLING CODE 4310-55-C

Dated: December 20, 1995.

George T. Frampton, Jr.,

Assistant Secretary for Fish and Wildlife and Parks.

[FR Doc 96-10665 Filed 4-30-96; 8:45 am]

BILLING CODE 4310-55-P

APPENDIX D
Section 7 Consultation on Preferred Alternative
Intra-Service Section 7
Biological Evaluation Form
Consulationa/Conference/Concurrence

Originating Person: David R. Parsons

Date: February 24, 1995

I. Region: 2

II. Service Activity (Program): Mexican Wolf Recovery

III. Pertinent Species and Habitat:

A. Listed species and/or their critical habitat within the action area:

White Sands Wolf Recovery Area:

Endangered

Black-footed ferret

American peregrine falcon

Bald eagle

Northern aplomado falcon

Whooping crane

Todsen's pennyroyal

Kuenzler hedgehog cactus

Mustela nigripes

Falco peregrinus anatum

Haliaeetus leucocephalus

Falco femoralis septentrionalis

Grus americana

Hedeoma todsenii

Echinocereus fendleri var. *kuenzleri*

Threatened

Mexican spotted owl

Strix occidentalis lucida

Blue Range Wolf Recovery Area:

Endangered

Black-footed ferret

American peregrine falcon

Bald eagle

Gila topminnow

Gila trout

Northern aplomado falcon

Whooping crane

Todsen's pennyroyal

Mustela nigripes

Falco peregrinus anatum

Haliaeetus leucocephalus

Poeciliopsis occidentalis

Oncorhynchus gilae

Falco femoralis septentrionalis

Grus americana

Hedeoma todsenii

Threatened

Mexican spotted owl

Loach minnow

Beautiful shiner

Chihuahua chub

Strix occidentalis lucida

Tiaroga cobitis

Cyprinella formosa

Gila nigrescens

Spi kedace	<i>Meda fulgida</i>
Apache trout	<i>Onceryncus apache</i>
Little Colorado spinedace	<i>Lepidomeda vittata</i>

B. Proposed species and/or proposed critical habitat within the action area:

White Sands Wolf Recovery Area:

Proposed Endangered with Critical Habitat

Southwestern willow flycatcher	<i>Empidonax traillii extimus</i>
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Proposed Nonessential Experimental Population

Mexican gray wolf	<i>Canis lupus baileyi</i>
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Blue Range Wolf Recovery Area:

Proposed Endangered

Arizona willow	<i>Salix arizonica</i>
Parish's alkali grass	<i>Puccinellia paribii</i>

Proposed Endangered with Critical Habitat

Southwestern willow flycatcher	<i>Empidonax traillii extimus</i>
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Proposed Nonessential Experimental Population

Mexican gray wolf	<i>Canis lupus baileyi</i>
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C. Category 1 and 2 candidate species within the action area:

White Sands Wolf Recovery Area:

Category 1 Candidates

Goodding's onion	<i>Allium gooddingii</i>
Mimbres figwort	<i>Scrophularia macrantba</i>
Mountain plover	<i>Charadrius montanus</i>

Category 2 Candidates

Arizona black-tailed prairie dog	<i>Cynomys ludovicianus arizonensis</i>
Organ Mountains Colorado chipmunk	<i>Eutamias quadrivittatus australis</i>
White Sands woodrat	<i>Neotoma micropus Leucopbaea</i>
Hot Springs cotton rat	<i>Sigmodon fuliventer goldmani</i>
Swift fox	<i>Vulpes velox</i>
Occult little brown bat	<i>Myotis lucifugus occultus</i>
Greater western mastiff bat	<i>Eumops perotis californicus</i>
Spotted bat	<i>Euderma meculatum</i>
Ferruginous hawk	<i>Buteo regalis</i>
Apache northern goshawk	<i>Accipiter gentilis apache</i>
Western snowy plover	<i>Charadrius alexandrinus nivosis</i>
Loggerhead shrike	<i>Lanius Ludovicianus</i>
White-faced ibis	<i>Plegadis cbihi</i>
'Texas horned lizard	<i>Pbrynosoma cornutum</i>

Bonita diving beetle
 Anthony Blister beetle
 Los Olmos tiger beetle
 White Sands pupfish
 Alamo beardtongue
 Grama grass cactus
 Mescalero milkwort
 Night-blooming cereus
 Guadalupe valeria
 Kerr's milk-vetch
 Nodding cliff daisy
 Organ Mountains evening primrose
 Organ Mountains figwort
 Sand prickly pear
 Standley whitlow-wort
 Sierra Blanca cliff daisy

Deronectes neomexicana
Lytta mirifica
Cicindela nevadica olmosa
Cyprinodon tularosa
Penstemon alamosensis
Pediocactus papyracanthus
Polygala rimulicola var. *mescalerorum*
Greggi var. *greggi*
Valeriana texana
Astragalus kerrii
Perityle cernua
Oenothera organensis
Scrophylaria laevis
Opuntia arenaria
Draba standleyi
Chaetopappa elegans

Blue Range Wolf Recovery Area:

Category 1 Candidates

Goodding's onion
 Mimbres figwort
 Gila springsnail
 New Mexico hot spring snail
 Chiricahua leopard frog

Allium gooddingii
Scrophularia macrantha
Fontelicella gilae
Fontelicella thermalis
Rana cbiricabuensis

Category 2 Candidates

Southwestern otter
 Greater western mastiff bat
 Occult little brown bat
 Spotted bat
 Allen's big-eared bat
 Pale Townsend's big-eared bat
 Big free-tailed bat
 Long-legged myotis
 Fringed myotis
 Yuma myotis
 Long-eared myotis
 Cave myotis
 Silky pocket mouse
 Hot Springs cotton rat
 Organ Mountains Colorado chipmunk
 White Sands woodrat
 White-sided jackrabbit
 Apache northern goshawk
 Northern goshawk
 Ferruginous hawk
 Northern gray hawk
 Mountain plover
 Western snowy plover

Lutra canadensis sonorae
Eumops perotis californicus
Myotis lucifugus occultus
Euderma maculatum
Idionycteris phyllostotis
Plecotus townsendii pallescens
Nyctinomops macrotis
Myotis volans
Myotis thysanodes
Myotis yumanensis
Myotis evotis
Myotis velifer
Perognathus flavus goodpasturi
Sigmodon fuliventer goldmani
Eutamias quadrivittatus australis
Neotoma micropus leucophaea
Lepus callotis gaillardii
Accipiter gentilis apache
Accipiter gentilis
Buteo regalis
Buteo nitidus maximus
Charadrius montanus
Charadrius alexandrinus nivosis

Loggerhead shrike	<i>Lanius ludovicianus</i>
White-faced ibis	<i>Plegadis chihi</i>
Gila chub	<i>Gila intermedia</i>
Gila roundtail chub	<i>Gila robusta grahami</i>
Sonora sucker	<i>Catostomus insignis</i>
Desert sucker	<i>Catostomus clarki</i>
White Sands pupfish	<i>Cyprinodon tularosa</i>
Longfin dace	<i>Agosiachrysogaster</i>
Speckled dace	<i>Rhinichthys osculus</i>
Little Colorado River sucker	<i>Catostomus</i> sp.
Arizona southwestern toad	<i>Bufo microscaphus</i>
Yavapai (lowland) leopard frog	<i>Rana yavapaiensis</i>
Mexican garter snake	<i>Tbamnopsis egues</i>
Narrow-headed garter snake	<i>Tbamnopsis rufipunctatus</i>
Texas horned lizard	<i>Phrynosoma cornutum</i>
California floater	<i>Anodonta californiensis</i>
White Mountains water penny beetle	<i>Psephenus montanus</i>
Three Forks springsnail	" <i>Fontelicella</i> " <i>trivia/is</i>
False ameleus mayfly	<i>Ameletus falsus</i>
Grama grass cactus	<i>Pediocactus papyracantbus</i>
Gila groundsel	<i>Senecio quaerens</i>
Hess' fleabane	<i>Erigeron hessii</i>
Rock fleabane	<i>Erigeron scopulinus</i>
Alamo beardtongue	<i>Penstemon alamosensis</i>
Duncan's pincushion cactus	<i>Coryphantha duncanii</i>
Pinos altos flameflower	<i>Talinum humile</i>
Night-blooming cereus	<i>Greggi</i> var. <i>greggi</i>
Three-nerved scurfpea	<i>Pediomelum trinervatum</i>
Slender spiderflower	<i>Cleome multicaulis</i>
San Carlos wild buckwheat	<i>Eriogonum capillare</i>
Mogollon clover	<i>Trifolium neurophyllum</i>
Nutriso milkvetch	<i>Astragalus nutriosensis</i>
White Mountain paintbrush	<i>Castilleja mogollonica</i>

IV. Geographic area or station name and action:

The U.S. Fish and Wildlife Service Region 2 Regional Office proposes to reintroduce nonessential experimental populations of Mexican wolves (*Canis lupus baileyi*) into (1) the Blue Range Wolf Recovery Area (BRWRA), which comprises the Apache and Gila National Forests in their entirety (see DEIS Fig. 2-3); and (2) the White Sands Wolf Recovery Area (WSWRA), which encompasses the White Sands Missile Range (WSMR) and lands belonging to the Bureau of Land Management and private parties adjacent and to the west of WSMR to the New Mexico Principal Meridian (see DEIS Fig. 2-2). Geographic boundaries are described in detail in Chapter 2 - Proposed Action.

V. Location (See Figs. 2-2 and 2-3):

- A. **County and state:** Apache and Greenlee counties, Arizona; and Catron, Dona Ana, Grant, Lincoln, Otero, Sierra, Socorro counties, New Mexico.
- B. **Section, township, and range (or latitude and longitude):** NA

- C. Distance (miles) and direction to nearest town: Several towns occur within or near the project areas (see Figs. 2-2 and 2-3).**

VI. Description of DEIS proposed action:

The Service proposes to reintroduce 3 family groups of Mexican wolves per year for 5 years into the BRWRA primary wolf recovery zone (see Fig. 2-2) and allow population expansion throughout the wolf recovery area, which encompasses the entire Apache and Gila National Forests. The total area of the BRWRA is 7,055 mi². The Service also proposes to reintroduce 2 family groups per year for 3 years into the WSWRA primary wolf recovery zone (San Andres Mountains) allowing population expansion throughout the wolf recovery area (see Fig. 2-3). The total area of the WSWRA is 4,050 mi². Reintroduction would be initiated on one of the two areas and, if determined to be appropriate, progress to the second area 2 to 4 years later.

A “soft release” technique would be used, with wolves being held in on-site release pens for 4-6 months. Mexican wolves “surplus” to the captive population would be selected for release, removed from the zoo environment, and placed in an isolated Service-owned holding facility at least one year prior to being placed in on-site release pens.

All released wolves will have radio transmitters: collars for adults and implants for pups. Monitoring will be frequent, evaluation continuous, and formal assessments of project success will occur at 3- and 5-year intervals. Each assessment will result in a determination to either continue, modify or terminate the project. The initial reintroduction could take place as early as 1996.

Reintroduced populations would be designated “nonessential experimental” under Section 10(j) of the ESA. Mitigation would be accomplished through provisions of the special rule, which would authorize take of Mexican wolves under specified circumstances.

If reintroduction occurs in the BRWRA, it is anticipated that a population of 102 wolves occupying 5,000-7,000 mi² would be established in 8 years. In the WSWRA, a population of 20 wolves occupying 2,000-4,000 mi² would be established in 3 years.

See Chapter 2 for a more detailed description of the proposed action.

VII. Explanation of effects of the action on species and critical habitat listed in item III A, B, and C:

The principal prey of all gray wolves, including Mexican wolves, is large ungulates (Mech 1970). In seven extensive investigations of the contents of wolf droppings (see Mech 1970: 175) animals the size of beavers or larger composed 59 to 96% of the food items identified. Most prey species were ungulates. Remains of mice, mink, muskrats, squirrels, rabbits, birds, fish, lizards, and snakes as well as invertebrates and vegetable matter have been found in wolf droppings. However, Mech (1970) states that “predation on small animals is seen to play only a minor role in the life of the wolf.” Bednarz (1988), in his review of the biology of Mexican wolves, concludes that, while small rodents and vegetable matter are not of primary importance in the wolf’s overall diet, they may be important for short periods of time when larger prey species are not available.

Historically, Mexican wolves were typically associated with montane forests and woodlands and intervening or adjacent grasslands above 4,500 feet in elevation (Brown 1983). There are few records of wolves inhabiting desert, desertscrub, or semidesert grassland habitats.

Gray wolf packs occupy large territories and wolf densities ranging from 1 per 10 square miles to 1 per 500 square miles have been reported (Mech 1970). Historic densities of Mexican wolves were never documented; however, Bailey (1931) estimated wolf densities on the Gila National Forest in 1906 at “not more than one to a township” (36 square miles). The Service predicts that restored wolf densities will be about one per 50 square miles.

The re-establishment of wolves in the BRWRA and/or WSWRA could affect other wildlife species in the following ways: (1) by killing them for food, (2) by competing with other predators for food, (3) by interspecific aggression resulting in the killing or territorial exclusion of other predators., (r) by the transmission of

diseases, (5) by providing additional sources of carrion for scavengers, and (6) by changing wildlife management programs in ways that affect other species.

No change in existing management practices is required under the Service's proposed action for Mexican wolf reintroduction. However, land managing agencies may choose to enhance habitat for wolves. The most effective management strategy for wolves is to increase populations of their principal ungulate prey species and to provide protection from illegal killing by humans. Prescribed fire, logging, and development of permanent water are the most commonly used methods for improving ungulate habitat in areas being considered for Mexican wolf reintroduction. Some restrictions to traditional animal damage control activities will be imposed in areas occupied by wolves. The use of M-44's and choking-type snares will be eliminated, and trap size may be limited and/or trap check frequencies may be specified.

Black-footed Ferret - No effect. Wolves do not regularly prey on mammals smaller than beavers. No known populations of black-footed ferrets exist within the proposed wolf recovery areas. The consumption of prairie dogs (the principal prey of black-footed ferrets) by wolves has not been documented and is not considered likely. Wolves can contract and transmit diseases, such as canine distemper, rabies, and plague, which can seriously impact ferrets. However, wolf densities are expected to be low and these types of diseases already occur within existing populations of coyotes, foxes, skunks, and other species in the WSWRA and BRWRA. Management actions that may be undertaken to benefit the Mexican wolf will not affect black-footed ferrets.

American Peregrine Falcon - No effect. Wolves do not prey on American peregrine falcons nor do wolves prey substantially upon the principal prey of this falcon--birds taken in flight (S. Williams, personal communication, Bent 1938).

Bald Eagle - No effect, possible beneficial effect. Wolves do not prey on eagles nor do they prey substantially upon the principal prey of eagles--fish, waterfowl, rabbits. Bald eagles are known to feed upon carrion (S. Williams, personal communication, Bent 1937). Wolves may increase the amount of large ungulate carrion available to bald eagles.

Northern Aplomado Falcon - No effect. **Wolves** do not prey on aplomado falcons nor do wolves prey substantially upon the principal prey of this falcon--birds, small mammals, and insects (S. Williams, personal communication, Bent 1938).

Whooping Crane - No effect. Whooping cranes are not expected to occur in proposed wolf recovery areas. Whooping cranes occur in the Southwest only in winter, and at that time they prefer habitats (cultivated fields and wetlands) that are not present in proposed Mexican wolf recovery areas.

Mexican Spotted Owl - May effect, not likely to adversely effect. Certain habitats will be occupied by both Mexican spotted owls and Mexican wolves. While some small mammals will be taken by both spotted owls and wolves, there is no overlap among the principal prey of these two predators. The Service's proposed action requires no special management measures to improve habitat for Mexican wolves. If land managing agencies choose to implement habitat improvement actions for the benefit of Mexican wolves, the Section 7 consultation process would adequately protect the Mexican spotted owl.

Southwestern Willow Flycatcher - No effect. Wolves do not prey on small songbirds nor do wolves prey upon insects, the principal prey of this flycatcher.

Mexican Gray Wolf - May effect, beneficial effect. No wild Mexican wolves are known to exist in the United States portion of the subspecies' historical range (Girmendonk 1994, Wolok 1994). The last confirmed wild wolf in Mexico was live-captured in 1980 (McBride 1980). McBride (1980) estimated that less than 50 Mexican wolves remained in Chihuahua and Durango and that no more than 50 adult breeding pairs were present

in the entire Republic of Mexico. Today, very few, if any, wolves are believed to remain in Mexico (Julio Carrera, personal communication). The objective of the proposed action is to restore two populations of Mexican wolves to the wild to promote the recovery of the subspecies. A captive population of 88 Mexican wolves is held in 20 zoos or captive breeding centers in the U.S. and 5 facilities in Mexico. There are 75 animals in the U.S. population and 13 in the Mexican population. These are the only Mexican wolves known for certain to exist. The potential exists to adversely affect the genetic integrity and viability of the captive population if animals removed from the captive population for reintroduction to the wild subsequently die. Up to 50% of reintroduced Mexican wolves can be expected to die (Phillips et al. In Press). However, despite relatively high mortality of reintroduced, captive-reared wolves, wild populations can be established, as has been demonstrated in the red wolf recovery program (Phillips et al. In Press).

Mexican wolves selected for reintroduction will be as genetically redundant with members of the captive population as possible. The captive population is managed for the Service under the American Zoo and Aquarium Association's (AZA) Species Survival Plan (SSP) program. The AZA maintains a **Studbook** and provides a small population management advisor. Management of the demographic and genetic makeup of the population is guided by the SPARKS computer program. Only those individuals whose kinship values are above the mean for the captive population as a whole will be used for reintroduction. Kinship values, which range from 0 to 1, are a measure of the relatedness of an individual to the rest of the population. Wolves with higher kinship values are genetically well represented in the population. In addition, the PEDPAC computer program will be used to identify surplus animals by examining the influence on founder gene survival of removing an individual animal from the population. These protocols will adequately protect the genetic integrity of the captive population and, thus, the continued existence of the subspecies (E. Spevak, New York Zoological Society-Bronx Zoo; and I? Miller, Species Survival Commission-The World Conservation Union, personal communications). The U.S. captive population of Mexican wolves has approximately doubled in the last three years, demonstrating the existing reproductive potential to replace Mexican wolves that may die following reintroduction.

Under the draft proposed rule for the experimental population, lethal take would be permitted in defense of human life and during an actual attack on livestock by wolves (on public lands, the latter provision applies only after nonlethal control actions have failed). Since wolves have a strong tendency to avoid humans (Mech 1992) and attack less than 1 percent of available livestock (Mack, et al. 1992), negligible take is predicted under these provisions. Generally, management-related take will be conducted by proven nonlethal methods. Successful reintroduction, monitoring, and management techniques developed by the red wolf and northern Rocky Mountain wolf reintroduction projects will be used in the Mexican wolf reintroduction project.

The potential exists for a relatively a high level of initial mortality among reintroduced, captive-reared Mexican wolves. This mortality level is expected to decrease as the proportion of wild-born wolves increases. Lethal take authorized by the special rule for the experimental population is predicted to be negligible. Over the long term, the combined mortality associated with the adaptation of captive wolves to a wild environment and authorized lethal take are not expected to preclude the reestablishment of a viable wild population of Mexican wolves. Therefore, while the proposed action may contribute to increased short-term mortality of Mexican wolves, it will ultimately result in the reestablishment of wild populations of Mexican wolves (where none currently exist) and, thus, beneficially contribute to the long-term recovery and conservation of this endangered subspecies.

Todsens' Pennyroyal, Kuenzler Hedgehog Cactus, Goodding's Onion, Mimbres Figwort, Arizona Willow, and Parish's Alkali Grass - No effect. Mexican wolves will not directly affect plants. The Service's proposed action requires no special management measures to improve habitat for Mexican wolves. If land managing agencies choose to implement habitat improvement actions for the benefit of Mexican wolves, the Section 7 consultation process would adequately protect threatened and endangered plants.

Gila Topminnow, Gila Trout, Loach Minnow, Beautiful Shiner, Chihuahua Chub, Spikedace, Little Colorado Spinedace, and Apache Trout - No effect. While the consumption of fish by wolves has been

documented (Mech 1970), fish are not a principal prey species of wolves. The Service's proposed action requires no special management measures to improve habitat for Mexican wolves. If land managing agencies choose to implement habitat improvement actions for the benefit of Mexican wolves, the Section 7 consultation process would adequately protect threatened and endangered fish species.

Gila Springsnail and New Mexico Hotspring Snail - No effect. No direct or indirect effects to snails as a result of wolf reintroduction are expected.

Category 2 Candidates - The list of category 2 candidate species provided by the New Mexico Ecological Services Office has been reviewed and none are expected to be adversely affected by the reintroduction of Mexican wolves.

VIII. Effect determination and response requested:

A. Listed species/critical habitat:

Determination

Response requested

no effect

(species: black-footed ferret, American peregrine falcon, bald eagle, northern aplomado falcon, whooping crane, **Gila** topminnow, **Gila** trout, Todsens's pennyroyal, Kuenzler hedgehog cactus, loach minnow, beautiful shiner, Chihuahua chub, spikedace, and Apache trout)

concurrence

may effect, is not likely to adversely affect

(species: Mexican spotted owl)

concurrence

formal consultation

may effect, is likely to adversely affect

(species: None)

concurrence

formal consultation

may effect, undetermined effect

(species: None)

concurrence

informal consultation

B. Proposed species/proposed critical habitat:

Determination

Response requested

no effect

(species: southwestern willow flycatcher, Arizona willow, and Parish's alkali grass)

concurrence

may effect, is not likely to adversely affect
(species: Mexican gray wolf)

concurrence

may effect, is likely to adversely affect
(species: None)

concurrence

is likely to jeopardize/adverse modification of
critical habitat
(species: None)

concurrence
 conference

may effect, undetermined effect
(species: None)

concurrence
 informal consultation

C. **Category 1 and 2 candidate species:**

Determination

Response requested

no effect

(species: goodding's onion, Mimbres **figwort**, **Gila** springsnail, New Mexico hot spring snail, Arizona black-tailed prairie dog, Organ Mountains Colorado chipmunk, White Sands **woodrat**, hot springs cotton rat, swift fox, occult little brown bat, greater western mastiff bat, spotted bat, ferruginous hawk, Apache northern goshawk, western snowy plover, mountain plover, logger-head shrike, white-faced ibis, Texas horned lizard, Bonita diving beetle, Anthony blister beetle, Los Olmos tiger beetle, White Sands **pupfish**, Alamo beardtongue, **grama** grass cactus, Mescalero milkwort, night-blooming cereus, Guadalupe valeria, Kerr's milk-vetch, nodding cliff daisy, Organ Mountains evening primrose, Organ Mountains **figwort**, sand prickly pear, Standley whitlow-wort, Sierra **Blanca** cliff daisy, southwestern otter, silky pocket mouse, **white**-sided jackrabbit, northern goshawk, northern gray hawk, **Gila** chub, **Gila** roundtail chub, Sonora sucker, desert sucker, Arizona southwestern toad, Yavapai (lowland) leopard frog, Chiricahua leopard frog, Mexican garter snake, narrow-headed garter snake, **Gila** groundsel, Hess' fleabane, rock fleabane, Alamo beardtongue, Duncan's pincushion cactus, Pinos Altos flameflower, three-nerved **scurfpea**, slender spiderflower, San Carlos wild buckwheat, **Mogollon** clover, Nutrioso milkvetch, and White Mountain paintbrush.)

concurrence

may effect, is not likely to adversely affect
(species: None)

concurrence

may effect, is likely to adversely affect
(species: None)

concurrence

may effect, undetermined effect
(species: None)

X concurrence
___ informal consultation

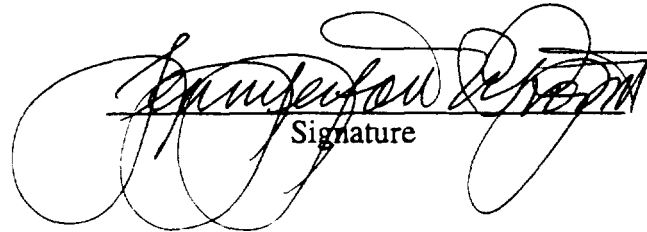
IX. Reviewing office evaluation:

A. Concur X Nonconcurrence

B. Formal consultation required

C. Conference required

D. Remarks (attach additional pages as needed):


 Signature

31 May 1995
 Date

x. References

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APPENDIX E

Arizona Game and Fish Department's Twelve-Step Procedure for Reestablishment of Nongame and Endangered Species (AGFD 1987)

Activities for Project Originators	Function
1. Assess status of species/population and available resources.	Determine feasibility of re-establishment project.
2. Complete re-establishment scorecard, submit it to Nongame Branch.	Facilitate priority ranking and preliminary review from programmatic perspective.
Activities by Nongame Branch	Function
3. Prepare proposal abstract, distribute it and scorecard throughout AGFD.	Elicit broad review of project and of possible conflicts or effects on other programs, projects, etc.
4. Submit briefing memo to AGFC through AGFD Director. No general press release.	Provide AGFC with background on potential project.
5. Review AGFD comments and develop project checklist. Submit summary to AGFD Director.	Identify and address any specific concerns and actions necessary to mitigate them; determine whether to proceed with or to reject the projects
6. Solicit comment on project concept from public and appropriate agencies, organizations.	Communicate goals, provide early awareness of intent.
7. Discuss project and public input and AGFD recommendations with AGFC.	Determine appropriate action; terminate project or proceed. Inform public of decision.
8. Prepare re-establishment proposal. Distribute for review both inside and outside AGFD, and submit to AGFC.	Document specifics of proposal project. Elicit philosophical, technical review.
9. Summarize comment, revise proposal and complete AGFD Environmental Checklist. If necessary, draft Environmental Assessment or Impact Statement.	Ensure NEPA compliance and requisite coordination with existing programs, projects.
10. Submit final draft project proposal for outside review and to AGFC.	Provide for peer, agency and public comment.
11. Summarize comment, review proposal. Submit final project proposal to AGFD Director for action.	Ensure policy review, compliance with procedures and determine final approval or denial of proposal.
12. Notify AGFC and public of decision.	Provide information on decision and notice of project implementation schedule.

APPENDIX F

Background Information on Livestock Depredation Projections

Summary of Wolf Depredation on Domestic Livestock in Other Areas

(Note: Based on pages 4-7 through 4-14 of USFWS 1994c).

Alberta

In Alberta, estimates of cattle (including adults and calves) within wolf range varied from 300,000 from 1974-1 979 (Gunson 1983) to about 235,000 from 1980 to 1991 (M.J. Dorrance, Alberta Agriculture, pers. comm.). Published estimates of the total number of sheep within wolf range in Alberta are not available, but are substantially fewer than cattle, perhaps about 10,000 head (M.J. Dorrance, Alberta Agriculture, pers. comm.). An estimated 1,500 wolves live in the area in which wolves and livestock both range. Alberta has a wolf control program in which wolves that kill livestock are controlled by provincial personnel. Landowners also may kill wolves on their property at any time.

Losses of livestock to wolves were highly variable among years, between areas, and among operators. Cattle killed or injured annually by wolves in Alberta range from 22 adults and 34 calves to 217 adults and 296 calves for an average of 76 adults and 159 calves per year from 1974 to 1990. These levels represent 0.29-1.65 cattle killed or injured/1,000 available or 0.029%-0.165% with an annual average of 0.089% of the cattle living within wolf range (Mack et al. 1992). Wolves apparently selected calves and yearlings over adults. Calves represent 49%-87% of cattle killed by wolves.

All major predators selected calves over adults. However, unlike bear depredation which peaked in early spring (coinciding with bear emergence from dens) or coyote depredation which peaked coincident with calving, wolf depredation peaked in August and September. This coincides with wild ungulate calves and fawns maturing and increased food demands from growing pups before they are completely mobile and can hunt with the pack (Dorrance 1982).

Wolf depredation on livestock other than cattle is low in Alberta, primarily because other types of livestock are not exposed to depredation within wolf range (M.J. Dorrance, Alberta Agriculture, pers. comm.). Sheep (including adults and lambs) killed or injured by wolves in Alberta ranged from 1-127, or an average of 31 per year from 1974 to 1990. Numbers of sheep in wolf range are not available but are roughly estimated at around 10,000 head.

From 1974 to 1980, swine, goats, and poultry comprised 4% of the total livestock killed by wolves for which farmers were compensated (J.R. Gunson, Alberta Fish and Wildlife, unpubl. data) and 1% of total livestock killed by wolves from 1981 to 1990 (M.J. Dorrance, Alberta Agriculture, unpubl. data). Coyotes were responsible for 99.98% of the losses of these classes of livestock (primarily poultry) during 1990-1991 (M.J. Dorrance, Alberta Agriculture, pers. comm.).

Livestock operators are compensated for livestock killed by wild predators. Losses are compensated up to 100% of commercial value for confirmed kills and up to 50% of commercial value for probable kills. From 1972 through 1989 the number of approved claims for the entire Province ranged from 22 in 1972 to 79 in 1975 with an annual average of 53 claims. Compensation paid under this program during the same period ranged from \$14,993 in 1972 to \$115,296 in 1982 with an annual average of \$46,227 (Alberta Forestry, Land and Wildlife 1991). During this time the wolf population averaged about 1,500 animals.

The Simonette River experimental area involved remote wooded grazing leases on provincial lands in west central Alberta. Moose, elk, white-tailed and mule deer were common, as were coyotes, black bear and wolves. Pastures were small and isolated and were in, or adjacent to, territories of four wolf packs. The evaluation was conducted from 1975 through 1980. There was no wolf control during the first 4 years and livestock operators were compensated for 100% of value for livestock killed by predators and 80% for missing cattle. Government wolf control was resumed in the winter of 1979-1980. Estimated wolf numbers were 14-15 in 1975 and 39-40 wolves

in 1979-1980; wolves were reduced to 12-13 in the winter of 1979-80.

Total cattle deaths from all causes (including missing animals), from an average of about 2,000 cattle present, increased from 2.9% in 1976 to 3.7% in 1979; total cattle mortality was 2.5% in 1980 following wolf control. Of 38 cases where cause of death was known, 42% was due to wolf depredation, 11% from black bear depredation, and 47% from non-predator causes. Deaths and injuries due to wolf depredation ranged from one to 27 per year with an annual average of eleven. Loss rates, due to wolf depredation ranged from 0.55 to 17.33/1,000 head of livestock available with an annual average of 0.59%.

Minnesota

Wolves frequently encounter livestock in Minnesota without depredations occurring (Fritts and Mech 1981). In Minnesota, the USDA Animal Damage Control division administers a wolf control program in response to complaints of wolf depredation on domestic livestock. Wolves are controlled on a reactive site-specific basis where complaints of livestock depredation by wolves are verified (Fritts 1982). The estimated population of wolves in Minnesota is about 1,500-1,750 (Fuller et al. 1992).

From 1979 to 1991, an average of 23 calves and four adult cattle were killed or injured by wolves each year (Mack et al. 1992). Calves comprised 85% and adults 15%. Depredation rates for cattle ranged from 0.04/1,000 to 0.18/1,000 with an annual average of 0.12/1,000 or 0.012% of those available.

Sheep losses from 1979-1991 ranged from 1 to 112/year and averaged 50/year in Minnesota. The rate of sheep killed or injured ranged from 0.03/1,000-7.04/1,000 with an annual average of 2.11/1,000 or 0.211% of those available. A higher proportion of lambs than adults were killed. Compensation payments averaged 22.5/year for adult sheep versus 51.5/year for lambs or a 1:2.3 adult to lamb ratio (Fritts et al. 1992).

Depredations varied widely among years. Annual variation in verified livestock losses in Minnesota ranged from one to nine adult cattle and eight to 35 calves with an average of four adults and 23 calves. Annual variation for sheep was greater.

Average number of animals killed or wounded per verified complaint was 1.2 for cattle and 4.4 for sheep. Annual variation in the number of cattle reported killed by wolves ranged from one to 17 adults and twelve to 98 calves with an annual average of 27 cattle killed or injured per year. Reported sheep losses ranged from one to 242 with an annual average of 50 sheep verified as killed by wolves. On average, 55% of the reported claims of losses to wolves could be verified (Fritts et al. 1992).

Verified complaints of depredations average 30 per year and affected an average of 2.1 farms (0.33% of producers) annually. Conflicts were highly seasonal and involved primarily cattle (mainly calves), sheep, and turkeys. Number of operators affected also varied considerably from year to year.

Livestock producers in Minnesota are compensated for verified complaints of wolf depredation on livestock by the Minnesota Department of Agriculture. From 1977 through 1989, compensation payments have ranged from a low of \$8,668 in 1977 (the first year of the program) to a high of \$43,664 in 1989 with an annual average of \$23,715 (Fritts et al. 1992). During 1990, 1991, and 1992, \$42,739, \$32,266, and \$17,922 (\$11,340 pending) were paid in compensation, respectively. During 1989, 1990, and 1991, turkeys comprised large portion of the losses (as discussed above) with 1,866, 1,170 and 1,075 turkeys confirmed dead as a result of wolves in those years (often turkeys mass in corners of pens and many suffocate). The wolf population averaged about 1,460 animals during this time.

Northwestern Montana

A small population of wolves has been recolonizing northwestern Montana since the early 1980s. The first reproduction was documented in 1986 within Glacier National Park, Montana. From 1987 to 1992 wolves killed an average of three cattle and two sheep per year. Depredation rates on cattle ranged from 0 to 0.08/1,000 with an average of 0.04/1,000 or 0.004% of those available. Depredation rates on sheep ranged from 0 to 0.88/1,000 with an average of 0.18/1,000 or 0.018% of those available (Mack et al. 1992). The wolf population averaged about 44 animals during this time.

Summary

A review of several areas in North America (Mack et al. 1922) indicates that wolf depredation is highly variable among years and within areas. Overall, the rate of wolf depredation on domestic livestock across large geographic areas is very low, averaging usually less than 0.1% of livestock within wolf range.

Cattle and sheep are the species most affected in Alberta, Montana, and Minnesota (with the exception of turkeys in Minnesota). Recent development of large free ranging turkey growing operations within wolf range in Minnesota has resulted in turkeys constituting about 75% of the livestock losses to wolves in some recent years and accounting for most of the increase in losses (Fritts et al. 1992). In all areas, losses of adult cattle are much lower than that of calves. The loss of adult sheep versus lambs varies by area and by year, and ranged from 42% lambs in Alberta (Gunson 1983) to 70% lambs in Minnesota (Fritts et al. 1992). Losses of sheep per capita available are higher than cattle losses.

On average, wolf depredation affects a small number of available livestock and a small percentage of livestock operators, usually less than 1% of the livestock operators in an area each year. In most areas where livestock live with wolves few operators actually lose livestock to wolves. However, while on an industry-wide basis the loss of livestock to wolf depredation is very small, a few individual operators may be quite adversely affected in any one year because these few operators may sustain a large portion of the annual loss within a large geographic area.

Wolf Depredation on Domestic Dog

Wolves on rare occasions kill domestic dogs. Tompa (1983) indicated that in British Columbia from 1978-1980 there were 13 wolf/dog related complaints with 29 dogs killed or injured by wolves. During the three years, all 29 dogs killed or injured were attacked between October and March.

Fritts and Paul (1989) reported on wolf/domestic dog interactions in Minnesota. Generally, rural residences and those at the edge of small communities in areas of high wolf populations seemed most likely to experience problems. No seasonal pattern was evident in Minnesota. In an area with about

68,000 households with dogs that may be exposed to wolves, 47 complaints of wolf-dog interaction were received from 1979 through 1987. In 60% of the reports, wolf killing or wounding of dogs was verified. In all other incidents it was verified that either no damage resulted or wolves were not involved. Verified complaints ranged from one to six reports per year with an annual average of 3.1. This is a rate of 0.04 incidents per 1,000 households - or one incident per 22,000 households - per year.

Summary of Livestock Depredation Survey Responses

A written survey was conducted in late 1993 with 20 experts who were chosen for their knowledge of livestock, wolves, or of the proposed Mexican wolf recovery areas (USFWS 1994b). The subject was projecting rates of future livestock depredation by Mexican wolves. The focus question was whether some **multiplier** should be applied when projecting likely depredation rates in the Southwest based on comparison with known depredation rates from northern areas where wolves and livestock co-exist, i.e., Alberta, Minnesota, and Montana. If the respondents felt a multiplier was appropriate they were asked to be as quantitative as possible in describing how it should be determined. If they did not feel a multiplier was appropriate, they were asked to explain why. The FWS had suggested a "length-of-grazing-season" multiplier to account for differences in grazing seasons and the respondents were asked to comment on it.

Seven of the 20 respondents stated it was unfeasible or inappropriate for them to propose a particular multiplier or a method to determine one; three of these felt that the FWS's proposed multiplier resulted in depredation projections that were far too low. One respondent stated he lacked evidence that a multiplier was necessary and he lacked evidence that depredation rates would be higher or lower in the Southwest than in the northern comparison areas. No respondents believed that depredation rates would be lower in the Southwest.

Three respondents stated the FWS's suggested "length-of-grazing-season" multiplier was basically appropriate. Eight other respondents (plus one concurring verbally) suggested their own methods to determine an appropriate multiplier, with various

caveats. Two of these made suggestions on determination methods but did not propose a particular multiplier or range. Six respondents proposed particular multipliers or ranges. Most of these multipliers were higher than the basic length-of-grazing-season multiplier FWS had initially suggested. The multipliers proposed ranged from 1.2 to 3.5 times the northern area rates.

Specific factors cited by the six respondents as justifying their particular multipliers for livestock depredation in the Southwest, besides the FWS proposed length-of-grazing-season adjustment, included: more calving on the open range, higher cattle density, lower wild prey availability, difficulty of locating missing livestock, the “startup” effects of

having a small wolf population with exposure to a small number of cows and not having rates that can be averaged over larger areas and over several years, the effect of non-fatal wounding of livestock by wolves, and the lack of feeding pastures in the Southwest.

Based on these survey responses, the FWS has calculated low and high range depredation estimates for each designated wolf recovery area (Box 4-3; Table 4-3 summarizes the calculations in Tables F- 1 and F-2, below.) Because there are no livestock in the WSWRA primary recovery zone (Alt. B), no calculations are presented for that area, as the estimated depredation is zero.

Low and High Range Estimates of Mexican Wolf Depredation

Table F- 1. Low range of estimated annual number of cattle killed after Mexican wolf re-establishment based on comparison with Alberta, Minnesota, and Montana study areas.

Notes: Estimates are calculated by using the livestock depredation comparison equation developed for the Yellowstone/Central Idaho wolf reintroduction EIS (USFWS 1994c), modified by using a length-of-grazing-season multiplier (abbreviated as LOGSM) for each potential reintroduction area (see Box 4-3).

Mexican Wolf Recovery Area	Comparison Area		
	Alberta	Minnesota	Montana
BRWRA Primary and Secondary Recovery Zones combined (Alt. A and C) - 82,617 cattle - 100 wolves LOGSM = 1.5	7.5	1.0	11.3
BRWRA Primary Recovery Zone (Alt. B) - 10,494 cattle 20 wolves LOGSM = 1.5	0.2	0.03	0.3
WSWRA Primary and Secondary Recovery Zones combined (Alt. A) - 3,220 cattle - 20 wolves LOGSM = 2	0.08	0.01	0.1

Table F-2. High range of estimated annual number of cattle killed after Mexican wolf reestablishment based on comparison with Alberta, Minnesota, and Montana study areas.

Notes: Estimates are calculated by using the livestock depredation comparison formula developed for the Yellowstone/Central Idaho wolf reintroduction draft EIS (USFWS 1994c), modified by the use of a multiplier. The multiplier is derived by adding 3.0 to the area's length-of-grazing-season multiplier (abbreviated as LOGSM) (see Box 4-3).

Mexican Wolf Recovery Area	Comparison Area		
	Alberta	Minnesota	Montana
BRWRA Primary and Secondary Recovery Zones combined (Alt.s A and C) - 82,617 cattle - 100 wolves LOGSM + 3.0 = 4.5	22.5	3.0	33.9
BRWRA Primary Recovery Zone (Alt. B) - IO, 494 cattle - 20 wolves LOGSM + 3.0 = 4.5	0.6	0.1	0.9
WSWRA Primary and Secondary Recovery Zones combined (Alt. A) - 3,220 cattle - 20 wolves LOGSM + 3.0 = 5.0	0.2	0.03	0.3

APPENDIX G

Glossary

Alternatives Different ways that the Mexican wolf could be re-established and managed within its former range in the southwestern United States. Four alternatives are developed and analyzed in depth in the Mexican wolf FEIS.

Breedingpair An adult male and an adult female wolf that have produced at least two pups that survived until December 31 of the year of their birth, during the previous breeding season.

Compensation Payment to owners of livestock that had livestock killed or maimed by wolves to compensate for the market value of the livestock.

Control Deliberate planned management of wolves to minimize human-wolf conflict. This includes establishing barriers (i.e., noise makers, guard dogs, moving and herding livestock, or building fences), harassing wolves, aversive conditioning of wolves, capturing problem wolves and releasing and monitoring them on site, capturing problem wolves and relocating them to other areas, placing problem wolves in captivity, or euthanizing problem wolves.

Critical habitat The specific areas within the geographical areas occupied by a species at the time it is listed on which are found the physical or biological features essential to the conservation of the species and which may require special management considerations or protection. By law, critical habitat can not be designated for nonessential experimental populations and it is not proposed for the Mexican wolf.

Delist To remove a species, subspecies, or population from the federal list of threatened species and endangered species and subsequent protection of the Endangered Species Act (ESA). This action, in effect, places the species, subspecies or population under management authority of the states or tribes.

Depredation The confirmed killing or maiming of lawfully present domestic livestock on federal, state, tribal, or other public lands, or private lands by one or more wolves. The Fish and Wildlife Service (FWS), Animal Damage Control (ADC), or FWS-authorized state or tribal agencies will confirm killing or maiming of domestic livestock.

Disturbance-causing land use activity Any land use activity that could adversely affect reproductive success or any other natural wolf behavior in a way that may reduce the affected wolf's chances of survival and may, therefore, be temporarily restricted within a one-mile radius of release pens, active dens, and rendezvous sites. Such activities may include, but are not limited to: timber or wood harvesting, management-ignited fire, mining or mine development, camping outside designated campgrounds, livestock drives, off-road vehicle use, hunting, and any other use or activity with similar potential to disturb wolves. The activities specifically excluded from this definition are: legally permitted livestock grazing and use of water sources by livestock; livestock drives if no reasonable alternative route or timing exists; vehicle access over established roads to private property and to areas where legally permitted activities are ongoing if no reasonable alternative route exists; use of lands within the national park or national wildlife refuge systems as safety buffer zones for military activities; prescribed natural fire **except** in the vicinity of release pens; and any authorized, specific land use that was active and ongoing at the time wolves chose to locate a den or rendezvous site nearby.

Domestic animals Any animal purposely raised (fed, cared for, and sheltered) by humans and usually dependent upon humans for its survival. This would include livestock, food/fiber animals, captive game animals, fowl, working animals, guarding animals, and pets.

Downlist A change of the classification of wolves from “endangered” to “threatened.”

Endangered species Any species which is in danger of extinction throughout **all** or a significant portion of its range and which is formally listed as endangered under the ESA.

Endangered Species Act of 1973, as amended. 16 U.S.C. 1531 et. seq. (ESA) Congressional Act which provides for the listing, protection, and recovery of endangered and threatened fish, wildlife, and plants.

Engaged in the act of killing, wounding, or biting livestock To be engaged in the pursuit and grasping, biting, attacking, wounding, or feeding upon livestock that are alive. If wolves are observed feeding on livestock carcasses it cannot be assumed that wolves killed the livestock until investigation by proper authorities has confirmed that wolves were responsible for that or other livestock losses in the immediate area (1-mile radius).

Experimental population A 1982 amendment to the ESA established the experimental population designation (Section 1 O(j)) and defined an experimental population as: “. . . any population (including any offspring arising solely therefrom) authorized by the Secretary for release under paragraph (2), but only when, and at such times as, the population is wholly separate geographically from nonexperimental populations of the same species.” The term applies to populations that are derived from endangered or threatened species for which the Secretary of Interior has determined that a release will further the conservation of that species. The experimental population designation allows for more flexible management for introduced endangered species or threatened species.

Experimental population area Designating an experimental population must include a description of the area in which such population will be found and where it will be identified as experimental. This establishes the area within which the experimental population

rule applies. Outside those boundaries the gray wolf (except in Minnesota) is protected as an endangered species. The experimental population area must be geographically separate from areas containing existing wolf populations.

Experimental population rule Designation of an experimental population includes the development of a special rule to identify geographically the location of the experimental population and identify, where appropriate, procedures to be utilized in its management. A special rule for each experimental population is developed on a case-by-case basis. Development of the special rule includes publication of the proposed regulation in the Federal Register, public comment on the proposed regulation, and publication of the final regulation prior to reintroduction of experimental populations. The proposed Mexican wolf experimental population rule is in Appendix C of the FEIS.

Harass According to the ESA implementing regulations, harass is defined as “intentional or negligent act or omission which creates the likelihood of injury to the 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” (50 CFR 17.3). For the purposes of this EIS and the proposed experimental population rule, only “opportunistic, noninjurious harassment” (see definition below) is permitted and it is limited to approaching wolves on foot, horseback, or nonmotorized or motorized vehicle (no closer than 20 feet); discharging firearms or other projectile launching devices in proximity to but not in the direction of wolves; throwing objects in the general direction of but not at wolves; or making any loud noise in proximity to wolves. The basic intent is to scare or chase wolves from the immediate area without causing physical injuries. The circumstances under which members of the experimental population of Mexican wolves may be harassed are described in the Proposed Action in Chap. 2 of

the FEIS and in Appendix C, the proposed experimental population rule.

Hard release The immediate and direct release of wolves into a new environment.

Impact on game populations in ways which may inhibit further wolf recovery States and tribes are encouraged to describe unacceptable impacts on game populations in their management plans subject to FWS approval. Until such time the term will mean the following: Two consecutive years with a cumulative 35 percent decrease in population or hunter harvest estimates for a particular species of ungulate in a game management unit or distinct herd segment compared to the pre-wolf five-year average (unit or herd must contain average of greater than 100 animals). If wolf predation is shown to be a primary cause of ungulate population declines (greater than 50 percent of documented adult or young mortality), then wolves may be moved to reduce ungulate mortality rates and assist in herd recovery, but only in conjunction with application of other common, professionally acceptable, wildlife management techniques.

Incidental take (*see* below for full definition of “take” for this EIS) The taking (killing, wounding, maiming, injuring, or physically harming) of wolves, under permit or conditions established by the FWS in an experimental population rule, that occurs accidentally and despite reasonable care during otherwise legal activities (e.g., as the result of legal activities and in conjunction with ADC control activities for other species). Within an experimental population area all wolves taken under the conditions permitted by the experimental population rule by agencies or the public will not be considered take under the ESA. All wolves taken outside the provisions of the experimental population rule will be considered take under the ESA.

Land use restrictions Restrictions on human activities on land. Such restrictions are used for a wide variety of purposes. Relatively few such

restrictions are required to successfully recover wolf populations unless human-caused mortality of wolves is unusually high. Examples of the types of restrictions that have been used by natural resource managers to assist in wolf population management are closures to reduce human access to wolf dens or rendezvous sites or prohibition on certain types of motorized access. Land-use restrictions also include restrictions on certain human activities in the habitat of an endangered or threatened species in order to comply with Section 7 of the ESA. That section requires that “Each Federal agency shall, in consultation with and with the assistance of the Secretary, insure that any action authorized, funded, or carried out by such agency (herein after in this section referred to as an “agency action”) is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species which is determined by the Secretary, after consultation as appropriate with affected States, to be critical, unless such agency has been granted an exemption for such action. . . .” In nonessential experimental population areas the section 7 requirements of ESA only apply inside national parks and national wildlife refuges.

Livestock Cattle, sheep, horses, mules, and burros. The states and tribes may better define and possibly expand the definition of livestock in their wolf management plans given the criteria that the FWS has established that livestock must be large enough to be capable of sustaining wounds that can be determined to be caused by wolves and must be reasonably likely to be prey items for wolves.

M-44 cyanide devices A 3-component, spring-activated ejector device developed specifically to kill coyotes and other canine predators. Components consist of (1) a capsule holder wrapped with fur, cloth, or wool, (2) ejector mechanism, and (3) a hollow tube (to be driven into the ground) for holding the ejector mechanism. When the capsule holder

is pulled, a spring-activated device propels sodium cyanide into the animal's mouth causing its death. The EPA registration and ADC policy do not allow the use of these devices in areas known to be occupied by listed species that may be killed by them.

Mexican Wolf Recovery Plan A document prepared by the Mexican Wolf Recovery Team, a group of individuals with expertise regarding the biological and habitat requirements of the Mexican wolf, outlining the tasks and actions necessary to recover the subspecies within parts of its former range. The original plan was completed in 1982. The revised Recovery Plan is under preparation.

National Environmental Policy Act (NEPA) An Act passed by Congress in 1969 which is the basic national charter for protection of the environment. NEPA established a process that requires consideration of environmental consequences for federal actions. Procedures ensure that high quality environmental information is available to public officials and citizens before federal decisions are made and actions are taken. Specifically, the responsible federal official must submit a detailed report on "major federal actions significantly affecting the quality of the human environment" prior to taking such actions. The EIS process is a primary means of meeting NEPA requirements.

Nonessential Under the provisions of the 1982 amendment of the ESA (Section 10(j)) which authorizes reintroductions of experimental populations, experimental populations must be designated either "essential" or "nonessential." "Nonessential" refers to an experimental population whose loss would not be likely to appreciably reduce the likelihood of the survival of the species. Except in national wildlife refuges or national parks, "nonessential" populations are treated under Section 7 of the ESA as "proposed species." Thus, federal agencies must only confer with the FWS on activities that the agencies believe might jeopardize the species. Moreover, the agencies would be

under no obligation under Section 7(a)(2) to avoid actions likely to jeopardize the species. In national parks and national wildlife refuges they are treated as threatened species. Congress expected that most experimental populations would be considered "nonessential."

Nonexperimental wolves Wolves receiving all protections accorded an endangered species under the ESA as distinguished from wolves that are members of an experimental population.

Occupied Mexican wolf range Area of confirmed presence of resident breeding packs or pairs of wolves or area consistently used by at least one resident wolf over a period of at least one month. Confirmation of Mexican wolf presence is to be made or corroborated by the FWS. Exact delineation of the area will be described by: (1) 5-mile radius around all locations of wolves and wolf sign confirmed as described above (non radio-monitored), (2) 1-mile radius around radio locations of resident wolves when fewer than 20 radio locations are available (for radio-monitored wolves only), or (3) 3-mile radius around the convex polygon developed from more than 20 radio locations of a pack, pair, or single wolf taken over a period of at least six months (for radio-monitored wolves). This definition applies only within the Mexican wolf experimental population area.

Opportunistic, noninjurious harassment (see "harass")
This is the only type of harassment permitted under the proposed experimental population rule. Opportunistic means as the wolf presents itself (i.e., the wolf travels onto and is observed on private land or near livestock). A wolf could not be tracked through snow or by dogs and then harassed or harassed by aircraft. A wolf could not be chased and harassed for an extended period of time (over 15 minutes). Any permissible harassment must not cause bodily injury, maiming, or death.

Pack A group of wolves, usually consisting of a male, female, and their offspring from one or more generations.

Population (of non-reintroduced wild wolves) At least two breeding pairs of wild wolves successfully raising at least two young each year (until December 31 of the year of their birth), for two consecutive years in an experimental population area.

Potential natural recolonization area U.S. areas considered most suitable for possible natural wolf immigration from Mexico in the event that remaining source populations exist in Mexico.

Preferred Alternative The alternative which the agency believes would fulfill its statutory mission and responsibilities, giving consideration to economic, environmental, technical and other factors.

Primary recovery zone An area in which wolves are proposed for release, and to which they may be returned and re-released if necessary, and where managers will actively support recovery of the reintroduced population.

Problem wolves Wolves that have depredated on lawfully present domestic livestock or other members of a group or pack of wolves including adults, yearlings, and young-of-the-year that were directly involved in the depredations; or fed upon the livestock remains that were a result of the depredation; or were fed by or are dependent upon adults involved with the depredations (because before these young animals mature to where they can survive on their own, they will travel with the pack and learn the pack's depredation habits). Wolves that have depredated on domestic animals other than livestock, two times in an area within one year. Wolves that are habituated to humans, human residences, or other facilities.

Proposed Action The action put forth by the Fish and Wildlife Service, after considering input from the public, experts, and affected agen-

cies, as the most reasonable way to re-establish and manage the Mexican wolf within its former range in the southwestern United States. It is one of the alternatives developed in the DEIS.

Public Land Land under administration of federal agencies including, but not limited to, the USDI National Park Service, USDI Bureau of Land Management, USDI Fish and Wildlife Service, USDA Forest Service, US Department of Energy, and US Department of Defense. For purposes of Mexican wolf management, public land also includes portions of state lands that are interspersed within the boundaries of federal public land.

Recovery The act or process of restoring threatened or endangered species to a non-threatened and non-endangered status.

Reintroduction The release of animals into an area that was part of their probable historic geographic range, but from which they have declined or disappeared, for the purpose of establishing a new wild population.

Remove from the wild Capture and placement into captivity or euthanasia of wolves.

Rendezvous site A gathering and activity area regularly used by a litter of young wolf pups after they have emerged from the den. Typically, the site is used for a period ranging from about one week to one month in the summer. Several sites may be used in succession.

Secondary recovery zone An area adjacent to a primary recovery zone which is not proposed for wolf releases, but to which released wolves are allowed to disperse (except under Alternative B, herein), and where managers will actively support recovery of the reintroduced population.

Soft release The release of wolves to the wild from a temporary confinement facility where they were held to acclimate them to the general area of the release. Soft release is a relative term depending largely on the duration of

holding at the release site and the freedom of the wolves to conduct basic biological activities.

Take The ESA defines “take” as: “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct” (16 USC sec. 1532(19)). See above definition of Harass which includes definition of permitted harassment, and see definition of Unavoidable and Unintentional Take below.

Threatened species Any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

Toxicants A poison or poisonous substance.

Unavoidable and unintentional take Accidental, non-negligent take (see above definition of take) which occurs despite reasonable care, is incidental to otherwise lawful activity and without the purpose to do so. Examples

would include striking a wolf with an **auto-**mobile or capturing a wolf in a trap set obviously for another species. **NOTE:** Shooting a wolf when the individual states they believed it to be an animal other than a wolf, does not qualify as unavoidable or unintentional take. This is consistent with most **state** laws where killing of wild animals or domestic animals because of mistaken identity is illegal. Shooters have the responsibility to be sure of their targets.

Viable population or minimum viable population of wolves (population viability) The number, distribution, and persistence of wolves considered necessary for a population to have a reasonable likelihood of survival for the foreseeable future. Population goals are being formulated in the revision of the Mexican Wolf Recovery Plan.

Wolf Recovery Area A designated area where managers will actively support re-establishment of wolf populations.

APPENDIX H

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APPENDIX I

List of Scientific Names

Common Name	Scientific Name
Animals	
Abert's squirrel	<i>Sciurus aberti</i>
African wild dog	<i>Lycaon pictus</i>
American peregrine falcon	<i>Falco peregrinus</i>
Mexican fox squirrel	<i>Sciurus nayaritensis</i>
Apache trout	<i>Oncorhynchus apache</i>
Arizona gray squirrel	<i>Sciurus arizonensis</i>
Arizona montane vole	<i>Microtus montanus arizonensis</i>
Bald eagle	<i>Haliaeetus leucocephalus</i>
Barbary sheep	<i>Ammotragus h-via</i>
Beautiful shiner	<i>Cyprinella formosa</i>
Beaver	<i>Castor canadensis</i>
Bell's vireo	<i>Vireo bellii</i>
Big Bend gambusia	<i>Gambusia gaigei</i>
Bighorn sheep	<i>Ovis canadensis</i>
Bison	<i>Bison bison</i>
Black bear	<i>Ursus americanus</i>
Black-capped vireo	<i>Vireoatricapillus</i>
Black-footed ferret	<i>Mustela nigripes</i>
Black-tailed jackrabbit	<i>Lepus californicus</i>
Bobcat	<i>Felis rufus</i>
California condor	<i>Gymnogyps californianus</i>
California leaf-nosed bat	<i>Macrotus californicus</i>
Chihuahua chub	<i>Gila nigrescens</i>
Chihuahua pronghorn	<i>Antilocarpa americana chihuahua</i>
Chipmunk	<i>Eutamias</i> spp.
Cliff chipmunk	<i>Eutamias dorsalis</i>
Coatimundi	<i>Nasua nasua</i>
Colorado chipmunk	<i>Eutamias quadrivittatus</i>
Colorado squawfish	<i>Ptychocheilus lucius</i>
Common black-hawk	<i>Buteogallus antbracinus</i>
Cottontail rabbit	<i>Sylvilagus</i> spp.
Coues white-tailed deer	<i>Odocoileus virginianus couesi</i>
Coyote	<i>Canis latrans</i>
Desert bighorn sheep	<i>Ovis canadensis mexicana</i>
Desert cottontail rabbit	<i>Sylvilagus audubonii</i>
Desert mule deer	<i>Odocoileus bemonius crooki</i>
Desert pupfish	<i>Cyprinodon macularis</i>
Eastern cottontail	<i>Sylvilagus floridanus</i>
Elk	<i>Cervus elaphus</i>
Feral cow	<i>Bos</i> spp.
Feral dog	<i>Canis familiaris</i>
Feral hog	<i>Sus scrofa</i>
Feral horse	<i>Equus caballus</i>

Gila chub	<i>Gila inter-media</i>
Gila monster	<i>Heloderma suspectum</i>
Gila spring snail	<i>Fontelicella gilae</i>
Gila topminnow	<i>Poeciliopsis occidentalis occidentalis</i>
Gila trout	<i>Oncorhynchus gilae</i>
Gila woodpecker	<i>Melanerpes uropygialis</i>
Golden-mantled ground squirrel	<i>Spermophilus lateralis</i>
Gould's turkey	<i>Meleagris gallopavo mexicana</i>
Gray vireo	<i>Vireo vicinor</i>
Gray wolf	<i>Canis lupus</i>
Green rat snake	<i>Senticolis triaspis</i>
Grizzly bear	<i>Ursus arctos horribilis</i>
Ground squirrel	<i>Spermophilus</i> spp.
Hare	<i>Lepus</i> spp.
Ibex	<i>Capra</i> spp.
Jackrabbit	<i>Lepus</i> spp.
Jaguar	<i>Panthera onca</i>
Jaguarundi	<i>Felis yagouaroundi</i>
Javelina	<i>Dicotyles tajacu</i>
Kit fox	<i>Vulpes macrotis</i>
Least tern	<i>Sterna antillarum</i>
Lesser long-nosed bat	<i>Leptonycteris curasoae</i>
Little Colorado River spinedace	<i>Lepidomeda vittata</i>
Loach minnow	<i>Tiaroga cobitis</i>
Lowland leopard frog	<i>Rana yavapaiensis</i>
Meadow jumping mouse	<i>Zapus budsonius</i>
Mexican gray wolf	<i>Canis lupus baileyi</i>
Mexican long-nosed bat	<i>Leptonycteris nivalis</i>
Mexican spotted owl	<i>Strix occidentalis lucida</i>
Moose	<i>Alces alces</i>
Mountain lion	<i>Felis concolor</i>
Mule deer	<i>Odocoileus bemonus</i>
Narrowhead garter snake	<i>Thamnophis rufipunctatus</i>
New Mexico hot spring snail	<i>Fontelicella thermalis</i>
New Mexico ridgenose rattlesnake	<i>Crotalus willardi obscurus</i>
Northern aplomado falcon	<i>Falco femoralis</i>
Northern goshawk	<i>Accipiter gentilis</i>
Ocelot	<i>Felis pardalis</i>
Oreohelix	<i>Oreohelix</i> spp.
Oryx	<i>Oryx gazella</i>
Porcupine	<i>Erethizon dorsatum</i>
Pronghorn	<i>Antilocarpa americana</i>
Raccoon	<i>Procyon lotor</i>
Razorback sucker	<i>Xyrauchen texanus</i>
Red fox	<i>Vulpes vulpes</i>
Red wolf	<i>Canis rufus</i>
Ringtail	<i>Bassariscus astutus</i>
Rio Grande silvery minnow	<i>Hybognathus amarus</i>
Rock squirrel	<i>Spermophilus variegatus</i>
Rocky Mountain bighorn sheep	<i>Ovis canadensis</i>

Roundtail chub
 Sierra del Carmen white-tailed deer
 Skunk
 Sonora chub
 Sonora ocelot
 Southern pocket gopher
 Southwestern willow flycatcher
 Spikedace
 Spotted bat
 Thick-billed parrot
 Tree squirrels
 Vole
 Water shrew
 Western snowy plover
 White-sided jackrabbit
 White-tailed deer
 Whooping crane
 Wild turkey
 Wood rat
 Yaqui catfish
 Yaqui chub
 Yaqui topminnow

Plants

Alder
 Apache plume
 Arizona walnut
 Arizona cypress
 Arizona sycamore
 Ash
 Aspen
 Big tooth maple
 Black grama grass
 Black walnut
 Blue grama grass
 Boxelder
 Broom snakeweed
 Buffalo grass
 Ceanothus
 Corkbark fir
 Cottonwood
 Creosote bush
 Desert willow
 Douglas fir
 Emory oak
 Engelmann spruce
 Fir
 Fremont cottonwood
 Galleta

Gila ro busta
Odocoileus virginianus carmini
Mephitis spp. and other genera
Gila ditaenia
Felis pandalis sonoriensis
Tbomomys umrinus
Empidonax traillii
Meda fugida
Euderma maculatum
Rhynchopsitta pachyrhyncha
Tamiasciurus and *Sciurus* spp.
Microtus spp. and other genera
Sorex palustris
Cbaradrius alexandrinus
Lepus callotis
Odocoileus virginianus
Grus americana
Meleagris gallopavo
Neotoma spp.
Ictalurus pricei
Gila purpurea
Poeciliopsis occidentalis sonoriensis

Alnus spp.
Fallugia paradoxa
Juglans major
Cupressus arizonica
Platanus wrightii
Fraxinus spp.
Populus tremuloides
Acer grandidentatum
Bouteloua eriopoda
Juglans niger
Bouteloua gacilis
Acer negundo
Xanthocephalum sarotbrae
Buchloe dactyloides
Ceanothus fendleri
Abies lasiocarpa
Populus spp.
Larrea spp.
Chilopsis linearis
Pseudotsuga menziesii
Quercus emoryi
Picea engelmanni
Abies spp.
Populus fremontii
Hilaria jamesii

Gambel oak	<i>Quercus gambelii</i>
Gramma grass	<i>Bouteloua</i> spp.
Gray oak	<i>Quercus grisea</i>
Hackberry	<i>Celtis</i> spp.
Honey mesquite	<i>Prosopis glandulosa</i>
Jojoba	<i>Simmondsia chinensis</i>
Juniper	<i>Juniperus</i> spp.
Lechuguilla	<i>Agave lecheguilla</i>
Live oak	<i>Quercus virginiana</i>
Maple	<i>Acer</i> spp.
Mesquite	<i>Prosopis</i> spp.
Mountain mahogany	<i>Cercocarpus montanus</i>
Narrowleaf cottonwood	<i>Populus angustifolia</i>
Oak	<i>Quercus</i> spp.
Pine	<i>Pinus</i> spp.
Piñon pine	<i>Pinus cembroides</i>
Ponderosa pine	<i>Pinus ponderosa</i>
Prickly pear	<i>Opuntia</i> spp.
Red osier	<i>Cornus stolonifera</i>
Redberry juniper	<i>Juniperus pincbotii</i>
Sand sage	<i>Artemisia filifolia</i>
Snakeweed	<i>Gutierrezia sarothrae</i>
Sot01	<i>Dasyliirion wheeleri</i>
Spruce	<i>Picea</i> spp.
Sycamore	<i>Platanus</i> spp.
Tarbush	<i>Flourensia cernua</i>
Texas madrone	<i>Arbutus texanus</i>
Tobosa	<i>Hilaria mutica</i>
Torrey yucca	<i>Yucca torreyi</i>
Walnut	<i>Juglans</i> spp.
Wheeler sot01	<i>Dasyliirion wheeleri</i>
White pine	<i>Pinus strobus</i>
White fir	<i>Abies concolor</i>
Whitethorn acacia	<i>Acacia constricta</i>
Willow	<i>Salix</i> spp.

APPENDIX J

Update on Yellowstone and Central Idaho Gray Wolf Reintroductions and Economic Benefits of Wolf Recovery

Since spring, 1995, both the Yellowstone and Central Idaho reintroductions have exceeded expectations. Some key numbers: 29 wolves released altogether in 1995; nine pups produced; four wolves known killed (two shot, one clearly illegally, resulting in one successful prosecution; one wolf hit by a vehicle; one still under investigation); significant increases in tourism and related businesses near the Lamar Valley; two sheep confirmed killed by one wolf, two sheep missing, compensation paid; one hunting dog killed; no land use restrictions; two lawsuits against the project, so far unsuccessful. The movements, mortality, and behaviors of the wolves have generally been as expected. The second phase in Yellowstone and Central Idaho is underway now, with 37 more wolves to be released. If this year's efforts go as well as last year's, and population growth rates continue to **be** good, then the FWS may not need to reintroduce in future years, as was previously thought.

Central Idaho

- Twelve wolves released in 1995 are being monitored and five pairs have formed. Two 1995 wolves have died and one disappeared. No domestic animals have been killed. No land use restrictions have been needed.
- In 1994 the Nez Perce Tribe entered into a cooperative agreement with the FWS and manages wolves in Idaho.
- Twenty wolves were released in January 1996. Several are traveling together and have moved northward. Most wolves remain on Forest Service lands, **but** cross private land regularly.
- Controversy is expected to increase as wolves have pups and as livestock are put on allotments this spring.

Yellowstone National Park

- Fourteen wolves, representing three packs were released in 1995. They produced nine pups in two litters. They were seen by about 40,000 visitors. They prey primarily on elk. No land use restrictions have been needed.
- Two 1995 wolves have been illegally killed and another was hit by a truck. One is recently listed as missing. A man who shot a wolf illegally was convicted by a local jury and received 3 months in jail, 3 months at a half-way house, a \$10,000 fine, and 1 year of supervised probation.
- Two sheep were killed and two are missing north of the Park. A lone 1995 male wolf was moved once and then killed under FWS orders when it **attacked** sheep a second time. The producer was compensated by Defenders of Wildlife (100 percent for the two killed and 50 percent for the two missing).
- Four pairs have formed in 1996 from 1995 wolves. Three of the pairs remain in the Park. Another pair (Soda Butte) is north of the Park on a mix of Forest Service and private land. The FWS has rejected requests to move them at this time. This pack killed a hunting dog in December 1995.
- Seventeen wolves were put into four pens in the Park in January 1996. They will be released in early April. By May 1996 there could be 8 breeding pairs and up to 40 pups in the area.

Overall Wolf Recovery

- The 1996 reintroductions from British Columbia were successful beyond expectations. In 1996, reintroduction efforts, excluding salaries, cost about \$200,000. Of

that, \$80,000 was from private sources. If the 1996 wolves are as successful as those released in 1995, no further reintroductions will be necessary. Budgets have been less than estimates presented in the FEIS.

Economic Benefits

According to Yellowstone National Park Service's Norman Bishop, the Bioeconomics projections in the FEIS (USFWS 1994c) of millions of dollars of economic benefits from wolf recovery are now being largely borne out. Adding up food, lodging, fuel, and wolf souvenirs reveals a positive impact on local economies because of people's desire to see, hear, or photograph them and to have a memento of that experience.

Cooke City, the small town just outside the remote northeast gate of Yellowstone Park, reports a booming business for motels, restaurants, and gift shops. It is inside this entrance where wolves are thriving after being reintroduced. According to Marsha Karle, Chief of Public Affairs for the Park Service, there was a 12.9 percent increase in traffic at the entrance over 1994. Looking at the month of August, the numbers just coming through the gate were up 17.1 percent over the previous year, a figure Karle called "substantial." Karle described the month of August as "a good month for sighting a wolf" The month of June, traditionally part of the slow season at the Park, showed an even greater number of visitors, up 22 percent from the previous year. According to ranger Rick McIntyre, "anyone on the ground can see this is a major thing." The traditionally slow season was this year's peak viewing season. He estimated that 40,000 people saw wolves from May 13 to July 6.

While no quantitative study exists, Karle said information from Cooke City merchants indicates the presence of wolves supported the local economy. "We do know that businesses in Cooke City were doing extremely well this year," she said. Motels were filled. Business at restaurants and souvenir business increased dramatically. Also, the park

concessionaire sold huge numbers of wolf-related products. "Anything with a wolf on it was selling like hotcakes this year," said Steve Tedder, vice-president for TW Recreational Services at Yellowstone. "Any items which had anything to do with wolves were just really popular." Meanwhile, ranger Rick McIntyre said that the Roosevelt Lodge Gift Shop, the store closest to the wolves in Yellowstone, reported a 44 percent increase in sales in 1995, an increase the manager attributed mainly to the presence of wolves. The manager of the Yellowstone Institute bookstore reported increased sales and a gift shop in Lamar Valley, in the vicinity of where the wolves are, reported sales 126 percent over the previous year.

In northern Minnesota, the small town of Ely (population 5,000) has boomed since the launching there, in 1993, of a wolf educational facility. According to International Wolf Center Board President, Dr. L. David Mech, the Center contributes roughly one million dollars annually to the Ely economy; the Center would not be there if the wolf were not there. The Center draws many thousands of visitors annually. Mech says Ely has put in new motels and introduced a special flight from the Twin Cities during the summer because of the Center. "This was one of the best summers for our lodging establishments, especially the large increase in the two-nighters, which I directly attribute to the Wolf Center," said Linda Friar, Executive Director of the Ely Chamber of Commerce. Her assessment was based on comments by resort owners.

At Glacier National Park, Amy Vanderbilt, public information officer, reported that quantifying the benefits of wolves in dollars would be difficult because the presence of wolves here is due to their decade-long recolonization of northern Montana rather than rapid intentional reintroduction. She did report, however, a 30 percent increase in backcountry visitation and that the curio and gift shops around the park are adding and selling wolf-related books, videos, artwork, and other items because of visitor demand.

APPENDIX K

Response to Mr. Dennis Parker's Comment on the DEIS

A lengthy, detailed, unpublished, undated paper entitled, "Reintroduction of the Mexican Wolf: Instrument of Recovery or Instrument of Demise?", was submitted as a comment (Tu-4) on the DEIS by Mr. Dennis Parker, a biologist. The paper was also attached, referred to, or incorporated in several other public comments received, especially from county governments. By way of **response** to the **numerous** biological issues raised, particularly related to genetics and captive breeding, the FWS sent the paper out for review by a number of experts, many of whom had written the scientific papers cited by Mr. Parker. Their responses to key issues raised by Mr. Parker were compiled by David R. Parsons, Mexican Wolf Recovery Coordinator, in November 1995. Their responses provide background information on the captive population and wolf recovery generally. Complete copies of Mr. Parker's comment and the responses are available for review at the FWS Regional office in Albuquerque.

Reviewers:

Ms. Norma Ames - Former Leader, Mexican Wolf Recovery Team
Dr. Jonathan D. Ballou - Smithsonian Institution
Dr. Mike Bogan - National Biological Service
Dr. Steve Chambers - U.S. Fish and Wildlife Service
Dr. Phil Hedrick - Arizona State U., Mexican Wolf Recovery Team
Dr. L. David Mech - National Biological Service
Dr. Patricia Mehlhop - University of New Mexico
Dr. Philip S. Miller - The World Conservation Union
Mr. David Parsons - Leader, Mexican Wolf Recovery Team
Dr. Rolf Peterson - Michigan Technological University
Mr. D. Peter Siminski - Mexican Wolf Species Survival Plan Coordinator, Arizona Sonora Desert Museum, Mexican Wolf Recovery Team
Dr. Michael E. Soulé - University of California, Santa Cruz
Dr. Edward M. Spevak - Wildlife Conservation Society
Dr. Robert Wayne - University of California at Los Angeles
Dr. Robert J. Wiese - American Zoo and Aquarium Association

General Heading: Will reintroduction conserve the Mexican wolf?

Parker's Statement: "... there are no examples of Grey wolf restoration achievement via the use of captive-raised and released animals. . . . the release of ... grey wolves on Alaska's Coronation Island in 1960 (Ames 1986) . . . has . . . proven to be inadequate for the purpose of affirmative reintroduction argument **with** the subsequent extinction of this island population."

Review Comments:

The Coronation Island experiment failed not because of use of captive-raised founders but because of inadequate prey (Klein 1994 in Carbyn et al. Ecology and Conservation of Wolves in A Changing World.) (Mech)

Wolf decline on Coronation Island had nothing to do **with** reintroduction technique. Rather, prey supply was exhausted because the island was so small. (Peterson)

Do note that these captive-raised wolves [the ones introduced to Coronation Island] did learn to take appropriate prey and reproduced successfully. (Siminski)

Parker chooses to not mention the very successful reintroduction from captive-raised animals of another large North American **canid**, the red wolf. Although not a gray wolf, the successful red wolf reintroduction presents a reasonable model for a successful gray wolf reintroduction. (Siminski)

The citation for the Coronation Island example should be "(Ames 1987)." Examples of restoration attempts using captive-raised wolves were too few in 1987 to base a condemnation now of future attempts on the failures. A tabulation of such attempts and their results-now including results for the red wolf releases-might be more informative. (Ames)

The answer to the question of whether reintroduction will "conserve the Mexican wolf" seems to me

to be that we cannot know for sure. We can, however, be fairly sure that keeping Mexican wolves *only* in captivity will not achieve that end. (Ames)

Parker ignores the highly successful red wolf reintroduction using captive-raised wolves in North Carolina and the Great Smokies. (Mech)

The author cites several instances, and there are others, of successful reintroductions of other species which provide some reason to believe that reintroduction of wolves is a feasible alternative to maintaining the few remaining individuals in zoos until they expire. (Bogan)

The use of captive bred animals for reintroduction has also shown itself to work in a number of cases, e.g., Arabian oryx, golden lion tamarin, American bison, Andean condor, and the red wolf. The argument that because one small isolated wolf introduction eventually failed no further attempts should be made is ludicrous. (Spevak)

The proposed Mexican wolf reintroductions would not be to islands and would have a greater number of individuals in each starter population. I do not accept Parker's implication that because it hasn't been done before except in a very limited way, we should not do it. (Mehlhop)

General Heading: Is the genetic base of the captive population sufficient for the establishment of the isolated, viable and self-sustaining population of Mexican wolves called for by both the ESA and the Mexican Wolf Recovery Plan?

Parker's Statement: "The genetic base of the official captive population of Mexican wolves is limited to a sole, founding female and 2 founding males (Ames, 1986),...."

Review Comments:

Parker does not reference the recent molecular genetic analysis done by myself [Dr. Robert Wayne] and colleagues (accepted for publication in Conservation Biology) that specifically addresses the genetic relationships of the three Mexican wolf captive lineages and their suitability for reintroduction. Our

analysis used advanced molecular techniques and showed that the three captive lineages are likely drawn from the same source population and are distinct from other North American wolves. (Wayne)

This is no longer the case, now that the Ghost Ranch and Aragon lines have been deemed to be Mexican wolf following molecular studies by Robert Wayne et al. (Wiese)

The certified captive population now has 7 founders. (Parsons)

Parker's Statement: "Current recommendations call for the retention of 90% of initial quantitative genetic variation for 200 years (Ralls and Ballou, 1986)."

Review Comments:

The general guideline of maintaining 90% of the genetic variation for 200 years is just that, a general guideline for maintaining genetic diversity in captive populations. It is not in any way a critical level or threshold that indicates the dividing line between viable and unviable populations. (Ballou)

This simply is outdated information. In 1990 the AZA [American Zoo and Aquarium Association] abandoned this rigid, single goal for all species and moved to make SSP [Species Survival Plan] goals species specific (Hutchins and Wiese, 1991; Wiese and Hutchins, 1994; Wiese, et al. 1994). Many SSPs now have goals which call for the retention of less than 90% gene diversity and/or for far less than 200 years. (Wiese)

If we look at the proportion of founder alleles retained as of 1994 under the three-founder scenario, the estimated number of founder alleles retained is 5.41 out of 6.0 or 90.2% retention (Hedrick, 1995) which is coincidentally at the level that Parker quotes as a target from Ralls and Ballou. (Hedrick)

The management of the Certified line has been excellent **and** professional in all respects and has only resulted in an average inbreeding coefficient of 0.184 (Hedrick, 1995) for the living animals after

nearly twenty years (approximately five generations) of captive breeding. With a small number of founders, this is a very impressive record and is probably as small an increase as could be possible. (Hedrick)

Although the recommendations of Ralls and Ballou are reasonable targets for a captive management program, Parker's implication that a program that does not meet these goals is doomed to failure is without support. He treats these values as a threshold, whereas their theoretical basis consists of continuous functions of rate of loss of genetic variability and accumulation of inbreeding depression. (Chambers)

The cheetah is a case in point. This species shows less genetic variability than Mexican wolves and survives in large numbers in the wild where there is habitat protection and no human persecution. There is presently nothing to indicate that this would not also be true for the Mexican wolf. (Spevak)

As a comparison, the Przewalski's horse (the only wild species of horse and an animal that is also extinct in the wild and until recently existed only in captivity), has an average inbreeding coefficient of 0.25 (Ballou, 1994), even though there are 13 founders for this captive population. It is **now** being reintroduced into both China and Mongolia and both of these reintroductions appear to be unaffected by any genetic problems in the horse. (Hedrick)

Parker presents several misunderstandings, misinformation, old information and false conclusions in this section. (Siminski)

Parker's Statement: "A measure often **used to** quantify the degree to which an individual is inbred is "Wright's Inbreeding Coefficient," Inbreeding coefficients for captive Mexican wolves born in 1989 consistently average .188 (Mexican Gray Wolf International Studbook, 1989), or nearly double the maximum allowable for retention of sufficient genetic variability."

Review Comments:

Mr. Parker makes another error in his comparison of the gene diversity to be retained in the captive breeding program and Wright's Inbreeding Coefficient. When an AZA SSP speaks of retaining a specific amount of "gene diversity", we are referring to "gene diversity" as defined by Weir (1990). This type of gene diversity is also referred to as "expected heterozygosity" by some authors. This is a much different type/measure of genetic variation than Wright's Inbreeding Coefficient for small, captive populations. In effect Mr. Parker is comparing apples and oranges in this section. This error makes me question his genetic expertise throughout the entire document. (Wiese)

A metric commonly used to assess the severity of inbreeding depression is the number of lethal equivalents contained within the population. An analysis by Ralls et al. (1988) of 40 captive mammal populations revealed that the number of lethal equivalents ranged from 0 to 30, with a median of 3.14. I have performed a similar analysis of inbreeding depression in the current Mexican wolf captive population (Miller and Hedrick 1995) and concluded that, with respect to both survival to 180 days and to individual weight, inbreeding depression is not detectable. The number of lethal equivalents in the pedigree, calculated using a method identical to that used by Ralls et al. (1988), was found to be 0.136. Statistical analysis shows this value to be indistinguishable from zero. (Miller)

The degree of inbreeding in the [Certified] population has been kept to near the minimum possible for a pedigree initiated with only three founders. (Miller)

The introduction of animals from the ASDM-GR and Aragon lineages into the Certified lineage will result in a great reduction in the inbreeding coefficient. Crosses between the lineages will have an inbreeding coefficient of 0.0. (Hedrick)

The [inbreeding] coefficient can be lowered by introduction of new stock (and documented genetic variation) from the other two lineages. In my opinion, Hedrick (1995) presents good justification for doing so. (Mehlhop)

Parker's Statement: "Study by Laikre and Ryman (1991) also provides clear evidence against the conception that Grey wolves are resistant to close inbreeding and therefore do not suffer from inbreeding depression."

Review Comments:

Laikre and Ryman (1991) showed only that, in captivity, inbreeding depression can afflict wolves. In the wild, the Isle Royale study suggests that apparently deleterious gene combinations are selected out, thus cleansing the population and allowing the better combinations to survive and maintain the population. (Mech)

Inbreeding in one population (i.e., Laikre and Ryman, 1991) can not be taken as absolute evidence that it will occur in a different population, even of the same subspecies. The most recent work on inbreeding has shown that inbreeding is closely related to the individual founders of the population, rather than which species or subspecies is being considered (Lacy et al. 1995). Therefore, one population of wolves may show significant inbreeding depression and another population of the same subspecies may show little or no inbreeding depression. (Wiese)

Inbreeding depression in the Fennoscandic wolf captive population does not by necessity imply the existence of inbreeding depression in the Mexican wolf captive population. (Miller)

Parker fails to distinguish between cumulative inbreeding coefficients and the per generation rate of increase in the inbreeding coefficient. Genetic risk to the captive population will greatly depend on how rapidly the population expands after founding. A population that has expanded very rapidly from a population bottleneck, as has the Mexican wolf population, may avoid or overcome significant effects of inbreeding depression despite relatively high inbreeding coefficients. The very fact that the population has demonstrated the vigor to expand rapidly is a positive sign. (Chambers)

The Scandinavian wolves, however, were not bred following the type of systematic, scientifically based

plan that is being followed for Mexican wolves. (Chambers)

The management of the Scandinavian zoo population increases the chance of inbreeding and reducing genetic variability by maintaining breeding pairs for years and preventing others from breeding. This has led to inbreeding coefficients up to .574 almost twice the maximum found in the certified Mexican wolf population. The Mexican wolf population is managed to reduce the chances of this situation. (Spevak)

The inbreeding coefficient in the Scandinavian wolf study cited by Parker (Laikre and Ryman, 1991) was almost twice as high (0.34 vs. 0.184) as that in the Mexican wolves. (Hedrick)

For inbreeding depression to happen, the increased homozygosity caused by inbreeding needs to result in an increased expression of deleterious recessive traits. This has not happened [in the captive population of Mexican wolves]. (Siminski)

Parker's Statement: "Of 11 pairs of captive Mexican wolves mated for the 1994 breeding season, only 7 produced young. Of the young produced (23), fully 39% (9) succumbed either at or within a short time of birth. 8 of the 9 deceased pups were killed and/or eaten by either their parents or other wolves. The ninth pup was killed when it was struck by lightning."

Review Comments:

That year's [1994] reproductive performance is within the normal range of Mexican wolf annual reproductive performance. There is not a pattern of decreasing reproductive performance in the captive population. That all pups do not survive or that all pairs do not reproduce is likely due to individual wolf differences, the captive environment and chance. No pattern indicating inbreeding depression exists. (Siminski)

Detailed study of the Mexican wolf studbook fails to assign a specific genetically-based cause of death for any of the pups born in 1994. (Miller)

In a recent study to find the extent of inbreeding depression in the Certified lineage of Mexican wolves, Miller and Hedrick (1995) did not find any inbreeding depression for either survival to 180 days or for weight from all the data currently available (as of July, 1994). Miller and Hedrick found that most of the mortality was not due to obvious genetic causes but was attributed to various environmental factors. In specific response to the comments of Parker about 1974, there is no evidence of mortality due to genetic causes among the 1994 pups. Further, **because** of the excellent management of the certified lineage, the level of inbreeding is relatively low and there have been very few highly inbred individuals. This is in contrast to the Scandinavian wolf study cited by Parker and the Przewalski's horses mentioned above. (Hedrick)

The pups having been killed by wolves is more probably related to the captive conditions than to inbreeding. We have had this happen with unrelated captive wolves. (Mech)

He does not give the comparable numbers for the wild or even for other captive populations. I find it interesting that none of the nine deaths can be attributed to inbreeding. Cannibalism can not be automatically attributed to inbreeding; neither can lightning strikes. (Wiese)

The failure of 4 of the **11** pairs mated in 1994 to produce young cannot be laid to inbreeding without further information on management practices at the facilities involved. (Ames)

Based on the information in Mr. Parker's paper, none of the 29 pups born in captivity died from causes that can be linked, in any statistical or pathological way, to inbreeding. (Soulé)

The argument that of the **11** pairs mated only 7 produced young indicates reduced fecundity has no bearing in fact. (Spevak)

Parker's **Statement**: "Monorchidism and cryptorchidism . . . are conditions known to occur within the captive Mexican wolf population. The presence of one or the other of these conditions results in either reduced viability . . . or the non-viability . . . of the animals so afflicted."

Review Comments:

The discussion of monorchidism and **cryptorchidism** is confused. Cryptorchidism (monorchid or bilateral) is not a classic indicator of inbreeding depression, although it has been noted in Mexican wolves. I am not aware of any evidence of Parker's assertion that cryptorchidism results in reduced viability of afflicted animals; he may be **confusing** viability with fecundity. I am also not aware of any evidence that monorchids even suffer reduced fertility, although one can assume that bilateral cryptorchids would be infertile. (Chambers)

This condition is known from a small number of individuals and has to date shown no discernible inheritance pattern. Consequently, it cannot be used as evidence for inbreeding depression in the population. (Miller)

There is presently no evidence of genetic determination of these traits and the current prevalence of cryptorchidism and monorchidism is very low. (Hedrick)

There is no pattern of increasing cryptorchidism in the captive population. (Siminski)

General Heading: Are claims of captive Mexican wolf population viability and suitability for reintroduction purpose substantiated by the best scientific information available, as required by the Endangered Species Act?

Parker's Statement: "... the totality of journal-published and peer-reviewed literature pertaining to Grey wolf genetics is of the unanimous consensus that a population of Grey wolves founded from a genetic base as restricted as that which characterizes the captive Mexican wolf population is not viably suited for reintroduative purposes (Ralls and Ballou, 1986; Laikre and Ryman, 1991; Wayne, Lehman, Girman, Gogan, Gilbert, Hansen, Peterson, Seal, Eisenhauer, Mech and Krumenaker, **1991**; Shields, 1983; Theberge, 1981; among many others)."

Review Comments:

I think the credentials of the Genetics committee and that of Wayne and Fain are excellent. Six professional geneticists or wolf biologists, all with PhDs, evaluated or carried out this research. The research by Wayne and his group (Garcia-[Moreno] et al., 1995) is in press in *Conservation Biology*, the research by Fain (Fain et al., 1995) has been submitted to the *Journal of Heredity* for publication, and the research by Miller and Hedrick is in preparation for submission to *Zoo Biology*. (Hedrick)

I am in strong disagreement with the assumption that the conservation utility of the population is nonexistent simply because the population is quite inbred. (Ballou) [Note: Ballou's response assumed only 3 founders and accepted Parker's assessment of levels of inbreeding.]

Our recent results show that the genetic variability (heterozygosity) of the captive certified Mexican gray wolves is not significantly less than that in wild populations of gray wolves. Another component of genetic variation, allelic diversity, is lower than an average population of gray wolves but together these results do not warrant the grave concern about the "genetic base" of Mexican wolves voiced by the author [Parker]. Moreover, because our results suggest that all three captive populations should be interbred, the genetic diversity of the captive breeding program should be significantly increased. (Wayne)

My reading of the literature does not agree with his. Regardless of the accuracy of the inbreeding estimates for the captive group, most conservation geneticists are pragmatists, and the papers he quoted do not say that animals should never be reintroduced if they have inbreeding coefficients above some threshold. (Soulé)

This discussion relies on very theoretical and unproven considerations and assumes that no outbreeding would ever take place. (Mech)

The Wayne et al. (1991) study, of which I am a co-author, made no such pronouncements about reintroductions. (Mech)

Theberge (1983, [not 1981]) said nothing about reintroductions. (Mech)

The fact that the three lines were inbred in the past has little relationship to the total combined population. The offspring from a sire and dam from different lines will not be inbred. Inclusion of the Ghost Ranch and Aragon lines to the population will increase the population's gene diversity (as defined by Weir, 1990). If future breeding is managed correctly and the three lines are crossed cautiously to maximize gene diversity, long-term inbreeding can be minimized as well (Ballou and Lacy, 1995). (Wiese)

While additional founders are preferable for almost any small captive population, a low amount of genetic variation can not accurately predict failure as Mr. Parker suggests. At this time the captive population is doing well and, in fact, reproduction has to be limited due to captive space constraints. (Wiese)

Reintroduction efforts are justified as a legitimate recovery process based on both pedigree analysis and molecular genetic studies. (Miller)

This is an unwarranted statement. None of these authors presented conclusive data on reproductive failure of wild wolves that demonstrated a genetic problem. (Peterson)

I underscore the importance of release in the wild if the current captive stock is to serve a useful purpose; their potential contribution diminishes with each generation. (Peterson)

Parker does not include in his citations those that contradict his apparently negative response. In addition, careful reading of some of the studies he does cite show they do not completely support that response. (Ames)

The literature that Parker cites recognizes that with a smaller genetic base there are more barriers to success, but none of these papers states that a population with the founder base of the Mexican wolf is unsuitable for reintroduction. (Chambers)

The use of hyperbole about “the entirety of journal published and peer reviewed work pertaining to Gray wolf genetics and limited founder population viability” detracts from any serious argument. It is valid that small populations with limited founder representation have lower chances of long term survival but it is also valid that many small founder events have become viable, e.g., island colonization. (Spevak)

From Parker’s discussions of wolf genetics, I cannot conclude, as he does, that reintroduction will not conserve the species. (Mehlhop)

I think that Parker is confusing the term viability with variability in page 3, line 2 and 10. (Hedrick)

Parker’s Statement: “According to the USFWS, . . . the wild male wolf which was caught with the lone, wild female founder in Mexico, back in 1978, was not the sire of the litter she subsequently birthed in captivity, after all. . . . [this] claim, is objected to by the person who actually caught these wolves in Mexico.”

Review Comments:

The adult male founder (#4), captured with the pregnant female founder (#5) in March 1978 in Durango, Mexico, never bred in captivity and has never been counted as a founder. The unknown sire of #5’s wild-conceived litter is referred to in the Mexican Wolf Studbook as #9000. This animal could have been male #4, but the point is moot because neither #4 or #9000 made any further contribution to the captive population. Number 5’s wild mate (whoever he is) is one of the founders of the Certified captive population. (Parsons)

General Heading: What is the present status of the Mexican wolf in the wild?

Parker’s Statement: “In 1994, Dr. Julio Carrera, who is leading wolf surveys in Mexico, documented wolf howls . . . and recorded reports of wolves”

Review Comments:

The statement is correct; however, Dr. Carrera has yet to confirm the existence of a wild wolf in Mexico. (Parsons)

Several errors exist, however, in Parker’s presentation. (Ames)

General Heading: Can inbreeding questions be resolved by the addition of ASDM-GR line and Aragon Zoo line wolves to the official captive Mexican wolf breeding program?

Parker’s Statement: “. . . this animal [male founder of the ASDM-GR line] may have actually been a wolf-dog hybrid (Woody, 1986).” . . . ‘Skulls of animals born to the line [ASDM-GR] show definite dog, as well as wild canine characteristics.’ (Woody, 1986).”

Review Comments:

This section needs reconsideration in the light of our genetic evidence showing that the two uncertified lines are likely drawn from the same populations as the certified Mexican wolves and have no evidence of a dog ancestry. (Wayne)

What Woody (1986) actually wrote in 1986 was: “The records also recorded *undocumented* statements that the animal was actually a dog-wolf hybrid.” [emphasis added]; and: “Skulls of animals born to the line show definite dog, as well as, wild canine characteristics. *It has not been determined if the dog characters in the skulls are due to a dog heritage or the result of successive generations raised in captivity.*” [emphasis added] (Parsons)

The molecular evidence from microsatellite loci (Hedrick, 1995; Garcia-[Moreno] et al., 1995) show no indication that the male founder of the ASDM-GR line had ancestry from a dog or a wolf-dog hybrid. (Hedrick)

The information from the skulls is not as definitive as that from microsatellites [DNA] for determining ancestry from dogs or other taxa. The phenotype of the skull can be strongly influenced by captive

breeding conditions so that the phenotype may appear more **doglike** due entirely to environmental factors. However, DNA information from microsatellites will not be influenced by any such environmental affects resulting from captivity. In other words, the skull morphology should be given much less weight in determining ancestry than DNA evidence. (Hedrick)

Parker's Statement: "... findings of Bogan and Mehlhop (1983), whose taxonomic analysis of ASDM-GR specimens had previously confirmed the presence of pronounced dog tendencies within this line."

Review Comments:

The study by Bogan and Mehlhop (1983) did not "confirm" the presence of pronounced dog tendencies within this breeding line. To the contrary, they state (1983:18) "most captive individuals from both the ASDM and WCSRC lines showed affinities with the southern wolf groups (i.e., *C. l. baileyi*) rather than with coyotes, dogs, or wolves from northern New Mexico." (Bogan)

Bogan and Mehlhop (1983) did not confirm the presence of pronounced dog tendencies within this line, as Parker states. To the contrary, they concluded that eight of nine animals showed affinities to southern wolves and the ninth to northern wolves (*youngi*) and that none of the ASDM and WCSRC animals showed affinities to dogs or coyotes. In that study, Bogan and Mehlhop presented evidence that captive rearing may have brought about some of the morphological changes detected, such as shortening of the rostrum. (Mehlhop)

While bones are shaped by environmental factors as well as by genes, DNA analysis now offers a means to identify an animal by its genes, a factor far less immediately malleable than its bones. (Ames)

Parker's Statement: "Verification of this line's [the Aragon line] lineage is lacking at the present time, and its value as a contributor to the captive Mexican wolf population is currently suspect."

Review Comments:

The Aragon lineage has been shown to be characteristic of the Mexican wolf using microsatellites. There is no evidence of dog ancestry from the molecular analysis in the Aragon lineage (Hedrick, 1995; Garcia-[Moreno] et al., 1995). (Hedrick)

Recent molecular work by Robert Wayne (USFWS report) establishes the ASDM-GR lineage and the Aragon lineage as Mexican gray wolves with no apparent infusion of other **canid** genes. USFWS has just [July 1995] agreed to incorporate these wolves into the captive breeding program. (Spevak)

These additional lineages [ASDM-GR and Aragon] are unrelated to the certified lineage and even though there have been a number of **incidences** of inbreeding in these lineages the offspring produced from their crossing will have a zero inbreeding **coefficient**. The initial separation of these lineages may actually have preserved genetic variability. Each lineage would tend to become fixed for different alleles through genetic drift and thereby maintain **overall** levels of genetic diversity. (Spevak)

Other Comments by Reviewers:

The paper appears to have been written not as an objective analysis but to try to discredit the proposed Mexican wolf reintroduction. I say this because the paper misinterprets or misconstrues the literature it cites, and it ignores other salient studies, all in ways that lead to a conclusion against Mexican wolf reintroduction. (Mech)

Because of the manner in which the material I am familiar with has been slanted, I feel that the overall paper was more an attempt to support a preconceived notion than to provide a dispassionate analysis. (Mech)

I would characterize the document as an "opinion piece" that would not be suitable in its present form for publication in the scientific literature although I can envision it appearing in a newspaper in some form. (Bogan)

Scientific contradiction or controversy alone is insufficient reason for not proceeding with a carefully planned and reviewed action. (Bogan)

As an aside, I noted that of the **16** articles listed under "Citations," no more than ten could have been peer-reviewed. (Bogan)

Many other assertions of the author that the USFWS "stands alone" or his reference to all scientists having a contrary opinion are incorrect or at best distortions of statements made by one or a few scientists. (Wayne)

Clearly, the author is trying to overstate and misstate the support for particular points. (Wayne)

If peer-reviewed publication is to be a prerequisite for considering new information, I must point out that Parker's paper does not meet the standard. (Chambers)

If his real reasons for opposing reintroduction are socio-economic in origin, then he should have written a report on the socio-economics of wolf reintroduction. In my opinion, the biological studies and discussions support reintroduction. (Mehlhop)

It appears that D. Parker has not seen the recent report by Hedrick (1995) of the Genetics Committee of the Mexican Wolf Recovery Team (P. Hedrick, R. Nowak, [G. Lopez] and M. Ashley) which was based on an extensive review of the published literature and new molecular genetics data from Robert Wayne (UCLA) (Garcia-Moreno et al., 1995) and Steven Fain (USFWS Forensics Laboratory) (Fain et al., 1995). (Hedrick).

In conclusion, the arguments presented by Parker concerning the genetic aspects of Mexican wolf management and reintroduction are not supported by detailed analysis of the captive population. (Miller)

