

**Mexican Wolf Recovery Program:
Progress Report #16**

Reporting Period: January 1 – December 31, 2013

Prepared by: U.S. Fish and Wildlife Service

Cooperators: Arizona Game and Fish Department, USDA-APHIS Wildlife Services, US Forest Service, and White Mountain Apache Tribe



Table of Contents

Foreword
Background

	Page
Part A: Recovery Administration	
1. Mexican wolf Captive Breeding Program	1
a. Mexican Wolf Species Survival Plan	1
b. Mexican Wolf Pre-Release Facilities	2
2. Recovery Planning	4
3. Reclassification	5
4. Proposed Revision to the Nonessential Experimental Population and Environmental Impact Statement	5
5. Litigation	6
a. Center for Biological Diversity v. Jewell, et al., No. 1:12-cv-01970-RLW (D. D.C.)	6
b. WildEarth Guardians v U.S. Fish and Wildlife Service, No. 1:12-cv-01169-RHS-CG (D. N.M.)	7
c. Center for Biological Diversity v. Jewell, et al., No. 1:12-cv-1920-RCL (D. D.C.)	7
d. Center for Biological Diversity v. Jewell, et al., No. 4:13-cv-00210-RCC-CRP (D. Ariz.)	7
6. Blue Range Wolf Reintroduction Project Structure	8
7. Cooperative Agreements	9
8. Research	10
9. Mexican Wolf Interdiction Fund and Stakeholder Council	11
10. Literature Cited	12
Part B: Reintroduction	13
1. Introduction	13
2. Methods	14
3. Results	22
a. Population Status	22
b. Reproduction	24
c. Release and Translocations	24
d. Home Ranges and Movements	25
e. Mortality	26
f. Wolf Predation	26
g. Wolf Depredation	27
h. Management Actions	27
i. Proactive Management Activities	29
j. Non-IFT Wolf Sighting Reports	30
k. Uncollared Wolf Sign	31
l. Public Outreach	31
4. Summary	32
5. Discussion	33
6. Literature Cited	36
7. Pack Summaries	58
8. Individual Wolf Summaries	63
9. Personnel	66

Foreword

The U.S. Fish and Wildlife Service (Service) is the lead agency responsible for recovery of the Mexican wolf (*Canis lupus baileyi*), pursuant to the Endangered Species Act. The Mexican Wolf Recovery Program has two, interrelated components: 1) Recovery – includes aspects of the program administered primarily by the Service that pertain to the overall goal of Mexican wolf recovery and delisting from the list of threatened and endangered species, and 2) Reintroduction – includes aspects of the program implemented by the Service and cooperating States, Tribes, and other Federal agencies that pertain to management of the reintroduced Mexican wolf population in the Blue Range Wolf Recovery Area (BRWRA), which consists of the entire Apache and Gila National Forests in Arizona and New Mexico. This report details all aspects of the Mexican Wolf Recovery Program. The reporting period for this progress report is January 1 – December 31, 2013.

Background

The Mexican wolf is the smallest, rarest, southernmost occurring, and most genetically distinct subspecies of the North American gray wolf. Mexican wolves were extirpated from the wild in the southwestern United States by 1970, primarily as a result of a decades long concerted effort to eradicate them due to livestock conflicts. Recovery efforts for the Mexican wolf began when it was listed as an endangered species in 1976. A captive breeding program was initiated and saved the Mexican wolf from extinction with the capture of the last five remaining Mexican wolves in the wild in Mexico from 1977 - 1980.

A Mexican Wolf Recovery Team was convened in 1979 to write a recovery plan, which was approved by the Service in 1982. The recovery plan contains objectives for maintaining a captive population and reestablishing Mexican wolves within their historical range. In June 1995, with the captive population numbers secure, the Service released a draft Environmental Impact Statement (EIS) entitled: *Reintroduction of the Mexican wolf within its Historic Range in the Southwestern United States*. After an extensive public review and comment period, the Final EIS was released in December 1996.

In March 1997, the Secretary of the Interior signed a Record of Decision approving the Service's preferred alternative in the EIS to release captive-reared Mexican wolves into a portion of the BRWRA. The Mexican wolf Final Rule - Establishment of a Nonessential Experimental Population of the Mexican Gray Wolf in Arizona and New Mexico (Final Rule) - was published in the Federal Register on January 12, 1998, and provided regulations for how the reintroduced population would be managed (US Fish and Wildlife Service 1998). On March 29, 1998, the first Mexican wolves were released into the wild. All wolves within the BRWRA are designated as a nonessential experimental population under section 10(j) of the Endangered Species Act which allows for greater management flexibility to address potential conflicts such as livestock depredations and nuisance behavior. An Interagency Field Team (IFT) comprised of members from the Service, Arizona Game and Fish Department (AGFD), White Mountain Apache Tribe (WMAT), US Forest Service, and U.S. Department of Agriculture-Wildlife Services (USDA-WS) monitors and manages the reintroduced population.

PART A: RECOVERY ADMINISTRATION

1. Mexican Wolf Captive Breeding Program

a. Mexican Wolf Species Survival Plan

The 1982 Mexican Wolf Recovery Plan contains the objective of establishing and maintaining a captive breeding program as an essential component of recovery (US Fish and Wildlife Service 1982). A captive breeding program was initiated in 1977 through 1980 with the capture of the five remaining wild Mexican wolves in Mexico. The captive breeding program is managed for the Service and SEMARNAT (Mexico's Secretary of Environment and Natural Resources) under the American Zoological and Aquarium Association's (AZAA) Mexican Wolf Species Survival Plan (SSP) program. The SSP is a bi-national (United States and Mexico) captive breeding program. Its mission is to reestablish the Mexican wolf in the wild through captive breeding, public education, and research. The SSP designation is significant because it indicates to AZAA member facilities the need for the species to be conserved, and triggers internal support to member facilities to help conserve such imperiled species. Wolves in these facilities are managed in accordance with a Service approved standard protocol. The SSP is the sole source population to reestablish the species in the wild, thus, without the SSP recovery of the Mexican wolf would not be possible. The SSP has steadily expanded throughout the years to approximately 284 captive Mexican wolves managed in 52 facilities in the United States and Mexico in 2013. SSP members routinely transfer Mexican wolves between participating facilities to promote genetic exchange and maintain the health and genetic diversity of the captive population.

The SSP's goal of housing a minimum of 240 wolves with a target population size of 300 ensures the security of the species in captivity and produces surplus animals for reintroduction. In the United States, potential Mexican wolf release candidates are sent to one of three Service approved pre-release facilities (see below) where they are evaluated for release suitability and undergo an acclimation process. All wolves selected for release are genetically redundant to the captive population, meaning their genes are already well represented. This minimizes any adverse effects to the genetic integrity of the captive population, in the event that wolves released to the wild do not survive.

Each July, the SSP holds a bi-national meeting to plan and coordinate wolf breeding, transfers and related activities among facilities. The location of these meetings alternates between Mexico and the United States. In 2013, the annual SSP meeting was held at the Centro Ecologico del Estado de Sonora in Hermosillo, Sonora, Mexico, and hosted by the Comision Nacional de Areas Naturales Protegidos (CONANP), Dirreccion General de Vida Silvestre (DGVS), and Comision de Ecologia y Desarrollo Sustentable del Estado de Sonora (CEDES).



Map: General location of SSP facilities in the United States and Mexico. In some cases the white circle represents more than one facility.

b. Mexican Wolf Pre-Release Facilities

Mexican wolves are acclimated prior to release to the wild at these Service-approved facilities, which are designed to house wolves in a manner that fosters wild characteristics and behaviors. These facilities are the Ladder Ranch and Sevilleta Wolf Management Facilities, located in New Mexico near the BRWRA, and Wolf Haven International, located in Tenino, Washington. At these facilities, wolves are managed with minimal exposure to humans for the purpose of minimizing habituation to humans and maximizing pair bonding, breeding, pup rearing, and healthy pack structure development. Wolves are evaluated and selected for release to the wild based on genetic makeup, reproductive performance, behavior, physical suitability, and overall response to the adaptation process. These facilities have been successful in breeding wolves for release and are integral to Mexican wolf recovery efforts. To further minimize habituation to humans, public visitation to the Ladder Ranch and Sevilleta facilities is not permitted.

Release candidates are sustained on a zoo-based diet of carnivore logs and a kibble diet formulated for wild canids. Diets of release candidates are supplemented with carcasses of road-killed ungulate species, such as deer and elk, and scraps from local game processors (meat, organs, hides, and bones) from wild game/prey species only. Release candidates are given

annual examinations to vaccinate for canine diseases (e.g., parvo, adeno2, parinfluenza, distemper and rabies viruses, etc.), are dewormed, have laboratory evaluations performed, and have their overall health condition evaluated. Animals are treated for other veterinary purposes on an as-needed basis.

Sevilleta Wolf Management Facility (SWMF)

The SWMF is located on the Sevilleta National Wildlife Refuge (SNWR) near Socorro, New Mexico and is the only Mexican wolf pre-release facility managed entirely by the Service. There are a total of eight enclosures, ranging in size from 0.25 acre to approximately 1.25 acres, and a quarantine pen. In 2013 the staff of SNWR continued to assist in the maintenance and administration of the SWMF. Through the course of the year, 22 individual wolves were housed at the SWMF. Seven wolves were received at SWMF from participating SSP institutions in the United States and Mexico, plus three wolves were received from the BRWRA. Sixteen wolves were transferred out of SWMF; four wolves to Mexico, eight wolves to SSP facilities in the United States, and four wolves to the BRWRA. No births or deaths occurred at the SWMF in 2013. At year's end, the SWMF housed 10 wolves.



Photo: Mexican wolves at the Sevilleta Wolf Management Facility. Credit: US Fish and Wildlife Service.

Ladder Ranch Wolf Management Facility (LRWMF)

The LRWMF, owned by R. E. Turner, is located on the Ladder Ranch near Truth or Consequences, New Mexico. There are a total of five enclosures, ranging in size of 0.25 acre to 1.0 acre. The LRWMF is maintained by an employee of the Turner Endangered Species Fund (TESF), though the facility is managed and supported financially by the Service to keep it operating and available for housing and pre-conditioning release candidates. At the beginning of

2013, the facility remained empty to enable staff and volunteers to install erosion features, fix permanent fences and repair the water system without significantly disturbing the wolves. After repairs were completed the facility was able to accept incoming wolves. During 2013, 12 individual wolves were housed at the LRWMF. Nine wolves were received at LRWMF from participating SSP institutions, plus three wolves were received from the BRWRA. Eight animals were transferred out of LRWMF, all to participating SSP facilities. No births or deaths occurred at the LRWMF in 2013. At year's end, the LRWMF housed 4 wolves.



Photo: Pre-release enclosure at the Ladder Ranch Wolf Management Facility. Credit: Turner Endangered Species Fund.

Wolf Haven International (WHI)

The WHI is located in Tenino, Washington. There are 2 Mexican wolf pre-release enclosures at the facility, each just over 0.50 acre in size. Management and funding is supported entirely by WHI. The pre-release enclosures are entirely off exhibit, though WHI does house other gray wolves on display for viewing and educational purposes. During 2013, WHI housed 4 individual Mexican wolves in the pre-release enclosures. No births and no deaths of pre-release candidates occurred at the WHI. At year's end, WHI housed 4 Mexican wolves in the pre-release enclosures.

2. Recovery Planning

The Service published the Mexican Wolf Recovery Plan in 1982. The plan recommends a two-pronged approach to recovery that includes establishment of a captive breeding program and

reintroduction of wolves to the wild. This plan, however, did not provide objective and measurable recovery criteria for the recovery and delisting of the Mexican wolf as required by the Endangered Species Act; instead, it recommended the establishment of a wild population of at least 100 wolves. Although substantial progress in implementing the 1982 Mexican Wolf Recovery Plan has been achieved, a revised recovery plan has never been developed to establish recovery criteria specific to the Mexican wolf.

In December, 2010, the Service initiated a revision of the 1982 Mexican Wolf Recovery Plan. The new recovery team consists of four subgroups – Science and Planning, Tribal Liaisons, Stakeholder Liaisons, and Agency Liaisons. The Science and Planning subgroup is tasked with assisting the Service in writing the recovery plan, working together to update the scientific background and develop recovery strategies that include goals, objectives, and criteria that promote successful Mexican wolf recovery and delisting. The Tribal and Agency Liaison subgroups provide applied natural resources management perspectives pertinent to their local communities and constituents. The Stakeholder Liaison subgroup provides a diverse source of expertise in wolf recovery including human, social, and economic considerations.

Members of the Science and Planning Subgroup briefed the Director of the U.S. Fish and Wildlife Service in Washington, D.C. on the subgroup's draft recovery criteria in March 2013. During the remainder of 2013, the subgroup continued analyzing, developing, and reviewing materials related to the development of recovery criteria. No full recovery team meetings were held. As of summer 2013, Service staff tasked with recovery team oversight have been reassigned to high priority rule development, and will return to recovery planning upon completion of these rules (see below). A draft plan will be submitted for public and peer review prior to the publication of the final recovery plan.

3. Reclassification

On June 13, 2013, the Service published a proposed rule, Removing the Gray Wolf (*Canis lupus*) from the List of Endangered and Threatened Wildlife and Maintaining Protections for the Mexican wolf (*Canis lupus baileyi*) by Listing it as Endangered (78 FR 35664) for public comment and peer review. The public comment period closed on December 17, 2013. At the end of 2013 the peer review process was still underway. This rule proposes to delist the gray wolf in the United States but to maintain protections for the Mexican wolf by listing it as endangered. We intend to finalize this rule in 2015.

4. Proposed Revision to the Nonessential Experimental Population of the Mexican Wolf and Environmental Impact Statement

On June 13, 2013, the Service published the Proposed Revision to the Nonessential Experimental Population of the Mexican Wolf (78 FR 35719-35742) for public and peer review. The comment period closed on December 17, 2013. We are proposing to modify a number of the geographic and management-related regulations in our current Final Rule to improve the status of the nonessential experimental population and the effectiveness of our management. We intend to finalize this rule in 2015, based on our settlement agreement with the Center for Biological Diversity (see Litigation).

On August 5, 2013, the Service announced its intent to develop an Environmental Impact Statement, pursuant to the National Environment Policy Act (78 FR 47268-47270) to analyze our proposed action to revise the regulations associated with the nonessential experimental population. We invited state, county, tribal, and Federal entities to serve as Cooperating Agencies in the development of the EIS. We held a kick-off meeting on August 8-9, 2013, and a follow up meeting on December 10, 2013. We held a tribal working group meeting (open to all interested tribes, regardless of Cooperating Agency status) on December 12, 2013. We intend to publish the draft EIS in 2014, concurrent with a second opportunity for the public to review the proposed rule.



Photo: Mexican wolves M1052 and F1203 at the Sevilleta Wolf Management Facility. Credit: US Fish and Wildlife Service.

5. Litigation

a. Center for Biological Diversity v. Jewell, et al., No. 1:12-cv-01970-RLW (D. D.C.)

On August 4, 2010, the Service announced in the Federal Register a positive 90-day finding on two petitions to list the Mexican wolf as a subspecies. Pursuant to the court-approved settlement agreements, on October 9, 2012, the Service announced a 12-month finding on the two petitions, stating the petitioned action was not warranted because all of the individuals that comprise the petitioned entity already receive the protections of the Endangered Species Act. However, it was also stated that the Service continues to review the appropriate conservation

status of all gray wolves that comprise the 1978 gray wolf listing, as revised, and may revise the current listing based on the outcome of that review.

Also on October 9, 2012, the Center for Biological Diversity notified the Service of their intent to sue for violations of the Endangered Species Act in connection with the Service's not-warranted finding. On December 10, 2012, the Center for Biological Diversity filed a complaint for declaratory and injunctive relief challenging the determination made by the Service that listing the Mexican wolf as a subspecies or "distinct population segment" is not warranted. On February 6, 2013, the Court granted the Service an order staying further proceedings in the case until May 15, 2013. The brief stay was to allow the Service to complete its status assessment for the listed entity.

On June 13, 2013, the Service published a proposed rule, Removing the Gray Wolf (*Canis lupus*) from the List of Endangered and Threatened Wildlife and Maintaining Protections for the Mexican wolf (*Canis lupus baileyi*) by Listing it as Endangered (78 FR 35664) for public comment and peer review. On June 26, 2013, the parties filed a Joint Stipulation of Dismissal concluding the litigation. The public comment period on the proposed rule closed on December 17, 2013. At the end of 2013 the peer review process was still underway. This rule proposes to delist the gray wolf in the United States but to maintain protections for the Mexican wolf by listing it as endangered. We intend to finalize this rule in 2015.

b. WildEarth Guardians v U.S. Fish and Wildlife Service, No. 1:12-cv-01169-RHS-CG (D. N.M.)

On November 14, 2012, WildEarth Guardians filed a complaint for declaratory and injunctive relief to compel the Service to produce documents and records in connection with two Freedom of Information Act requests related to the Fox Mountain pack of Mexican wolves. The Service released a partial response to the requests on November 26, 2012. On February 8, 2013, the parties filed a Stipulation on Dismissal in which the Service agreed to produce a final response to the requests no later than February 28, 2013. The Service provided a final response in accordance with the settlement agreement.

c. Center for Biological Diversity v. Jewell, et al., No. 1:12-cv-1920-RCL (D. D.C.)

On November 28, 2012, the Center for Biological Diversity filed a complaint for declaratory and injunctive relief seeking to compel the Service to conclude a formal rulemaking to amend a federal regulation promulgated in 1998 under the Endangered Species Act that governs the Service's Mexican wolf reintroduction program. On May 24, 2013, the parties filed a Joint Stay Motion suspending the litigation to discuss settlement. On August 26, 2013, the District Court for the District of Columbia approved the settlement agreement that required the Service to submit its final determination concerning the Proposed 10(j) Rule Modification to the Federal Register for publication by January 12, 2015.

d. Center for Biological Diversity v. Jewell, et al., No. 4:13-cv-00210-RCC-CRP (D. Ariz.)

On December 26, 2012, the Center for Biological Diversity notified the Service of their intent to sue alleging violations of the Endangered Species Act in connection with the renewed and

amended Research and Recovery Permit for the Mexican Wolf Recovery Program and the associated Intra-Service Biological and Conference Opinion. On March 28, 2013, the Center for Biological Diversity filed suit challenging the Service's biological opinion on the Research and Recovery Permit for the Mexican wolf program activities and also alleged that the Service failed to conduct NEPA review of the issuance of the Research and Recovery Permit. The Service issued a new Research and Recovery Permit on April 4, 2013, which superseded the challenged permit. On August 29, 2013, the District Court for the District of Arizona approved the parties Stipulation of Dismissal of all claims for relief.

6. Blue Range Wolf Reintroduction Project Structure

Beginning in 2003, the BRWRA Reintroduction Project was managed jointly by the AGFD, NMDGF, USDA-Forest Service, USDA-WS, WMAT, and the Service. These agencies and additional cooperating counties worked together under a Memorandum of Understanding (MOU) and developed Standard Operating Procedures to guide the IFT in providing management for the free-ranging population (see the Arizona Game and Fish Department website at http://www.azgfd.gov/w_c/wolf/sop.shtml).

In 2010, the Service worked with its partners and cooperators to prepare and establish a new MOU. At the end of 2013, the signatories to this MOU included AGFD, USDA-Forest Service, USDA-WS, WMAT, and the Service, as well as the cooperating counties of Gila, Graham, Greenlee, and Navajo in Arizona and the Eastern Arizona Counties Organization (ECO). A copy of this MOU can be found at <http://www.fws.gov/southwest/es/mexicanwolf>

On December 2, 2011, the Arizona Game and Fish Commission voted to continue both its financial and infrastructure support of Mexican wolf conservation in the state, but voted not to support the release of any new wolves until the Service completes a new recovery plan, management plan, and a new 10(j) rule is in place. Previously, all initial releases of captive Mexican wolves in the U.S. have occurred in Arizona with the concurrence and support of the Game and Fish Department. On January 13, 2012, the Arizona Game and Fish Commission amended this policy stating the AGFD Director has the authority to approve a wolf release to effectively replace an animal(s) lost from the population due to an unlawful act, and when a wolf is lost to any other cause of mortality the Arizona Game and Fish Commission must approve a release.

Each year the IFT produces an Annual Report, detailing Mexican wolf field activities (e.g., population status, reproduction, mortalities, releases/translocations, dispersal, depredations, etc.) in the BRWRA. The 2013 report is included as PART B of this report. Monthly BRWRA project updates are available at <http://www.fws.gov/southwest/es/mexicanwolf> or you may sign up to receive them electronically by visiting <http://azgfd.gov/signup>. Additional information about the BRWRA Reintroduction Project can be found on the Service's web page at: <http://www.fws.gov/southwest/es/mexicanwolf> or AGFD's web page at: <http://azgfd.gov/wolf>.



Photo: Mexican wolves transported to Sevilleta Wolf Management Facility on a flight donated by LightHawk. Credit: US Fish and Wildlife Service.

7. Cooperative Agreements

In 2013, the Service funded cooperative agreements with AGFD, San Carlos Apache Tribe (SCAT), TESH, The Living Desert, University of Idaho, University of New Mexico, and WMAT. Agreements with AGFD have been matching agreements where the Service provides 75% of costs and the state agency provides 25%.

Cooperator	USFWS/Mexican Wolf Project Funds Provided in 2013
AGFD	\$ 165,000
SCAT	\$ 40,000
TESF	\$ 29,000
The Living Desert	\$ 30,000
University of New Mexico	\$ 10,000
University of Idaho	\$ 25,700
White Mountain Apache Tribe	\$ 205,000

In addition to the above agreements, the Service also provided funding for several miscellaneous contracts for veterinary and other services. For more information on Program costs to date visit <http://www.fws.gov/southwest/es/mexicanwolf/>

8. Research

a. Mexican Wolf Captive Breeding Program

The Mexican Wolf SSP program conducts a variety of research projects on behalf of the conservation of captive Mexican wolves as well as the reintroduction program.

Dr. Cheryl Asa and the Research Department at the Saint Louis Zoo and J. Arturo Rivera at San Juan de Aragon Zoo in Mexico City continued reproductive research on generic gray and Mexican wolves in 2013. In 1991, the Mexican Wolf Recovery Team selected the Saint Louis Zoo to establish and maintain a semen bank to preserve germplasm of genetically important males. Since that time the lab has been collecting, evaluating and freezing semen samples from individual Mexican wolves as directed by the Service and the SSP. In 2008, oocyte vitrification (freeze drying of eggs) was added so that female Mexican wolf gametes could be preserved. As part of their ongoing reproductive research efforts, several projects were conducted during 2013. These included semen collection and freezing, testing varying methodologies to reduce urine contamination during semen collection and alternative thawing methods, oocyte and ovarian slice vitrification, examination of the female wolf ovulatory cycle hormone profiles to diagnose female infertility, and the efficacy and potential side effects of deslorelin (Suprelorin) as a contraceptive. As of 2013, more than 7.25 billion sperm from over 38 males, and 645 oocytes plus 96 ovarian slices from 13 aging females were successfully collected and preserved.

Dr. Melanie Culver and Ph.D. candidate Robert Fitak with the University of Arizona are examining the effects of extirpation and reintroduction on the Mexican wolf through genome-wide association. The study has the potential to characterize the genetic loci responsible for any lost adaptive and accrued detrimental variation. The results will potentially aid in optimizing the management strategies of captive and wild populations of Mexican wolves to protect against concerns like inbreeding. A final report submitted for publication is expected in 2014.

In 2008, Dr. Dan Moriarty, University of San Diego, and Lowell Nicolaus, Northern Illinois University, began work analyzing thiabendazole as an aversion agent for use in Mexican wolves. This research focused on the potential to mitigate wolf conflicts with domestic livestock via conditioned taste aversion. A captive application of the study was completed at the California Wolf Center near Julian, CA in October 2008. This study was performed on generic gray wolves and had the support of the Humane Society of the United States. Results demonstrated the safety and efficacy of thiabendazole-based aversions in a captive setting. During 2010, the Service made preparations to replicate this effort on several Mexican wolves at the SWMF, and conducted two trials during 2011 that resulted in the treatment of 8 animals. The trials were replicated in 2012 and resulted in the treatment of an additional 5 wolves. In 2012, two wolves that had successfully undergone treatment in 2011 were re-tested, both wolves continued to demonstrate an aversion. Condition taste aversion trials at SWMF in 2013 resulted in the treatment of 10 wolves.

The USDA-APHIS-Wildlife Services is conducting a canine measurement study in order to provide scientific information useful for potentially identifying the species of predator involved

in a depredation. In 2013, the Service requested that SSP facilities capable of measuring wolf canine tooth spread during annual handling events do so to increase the reliability of identifications that would otherwise rely on qualitative evidence.

Dr. Carlos Sanchez initiated a multi-institutional project to determine the historic and current prevalence of nasal neoplasms in Mexican wolves. This effort may provide guidance for the diagnosis and management of nasal neoplasms in Mexican wolves.

b. Blue Range Wolf Recovery Area

John K. Oakleaf, senior wolf biologist with the Service and Ph.D. candidate at Texas Tech University, in collaboration with Dr. Stewart Breck, Dr. James Cain, and Dr. Phil Gipson, continued looking at the population dynamics and reintroduction characteristics of Mexican wolves in the BRWRA. The objective of this study is to investigate: 1) habitat colonization preferences of Mexican wolves and the distribution of preferred wolf habitat across the southwestern United States, 2) factors that promote successful initial releases and translocations of Mexican wolves, 3) factors that contribute to increased reproduction rates, 4) survival of Mexican wolves, and 5) dispersal patterns of Mexican wolves. Mr. Oakleaf is expected to complete this work in 2015.

9. Mexican Wolf/Livestock Interdiction Fund and Coexistence Council

The Service, in cooperation with the National Fish and Wildlife Foundation, established the Mexican Wolf /Livestock Interdiction Trust Fund (Interdiction Fund) on September 23, 2009. The objective of the Interdiction Fund is to generate long-term funding for prolonged financial support to livestock operators within the framework of conservation and recovery of Mexican wolf populations in the Southwest. Funding will be applied to initiatives that address management, monitoring, and other proactive conservation needs for Mexican wolves as they relate to livestock, including alternative livestock husbandry practices, grazing management alternatives, livestock protection, measures to avoid and minimize depredation, habitat protection, species protection, scientific research, conflict resolution, compensation for damage, education, and outreach activities.

In 2011, the Service appointed an 11-member Interdiction Fund Stakeholder council (ISC) which has the authority to identify, recommend, and approve conservation activities, identify recipients, and approve the amount of the direct disbursement of funds to qualified recipients. The ISC – which changed its name to the Coexistence Council in 2013, has developed an interim program to compensate livestock producers for wolf depredations and paid \$24,353 to producers in 2013. In addition, the Coexistence Council continued working toward a long-term strategic interdiction plan that focuses more on incentives rather than direct compensation for livestock losses. The long-term plan is expected to be completed in 2014.

10. Literature Cited

- US Fish and Wildlife Service. 1982, Mexican Wolf Recovery Plan 1982, US Fish and Wildlife Service, Albuquerque, New Mexico.
- US Fish and Wildlife Service. 1996, Reintroduction of the Mexican wolf within its Historic Range in the Southwestern United States, US Fish and Wildlife Service, Albuquerque, New Mexico.
- US Fish and Wildlife Service. 1998, Final Rule - Establishment of a Nonessential Experimental Population of the Mexican Gray Wolf in Arizona and New Mexico, 63 *Federal Register* 1752-1772.
- US Fish and Wildlife Service. 2003, Final Rule To Reclassify and Remove the Gray Wolf From the List of Endangered and Threatened Wildlife in Portions of the Conterminous United States; Establishment of Two Special Regulations for Threatened Gray Wolves, 68 *Federal Register* 15803-15875.
- US Fish and Wildlife Service. 2006, Proposed Rule, Western Great Lakes Population of Gray Wolves, 71 *Federal Register* 15265-15305.
- US Fish and Wildlife Service. 2007, Final Rule Designating the Western Great Lakes Populations of Gray Wolves as a Distinct Population Segment; Removing the Western Great Lakes Distinct Population Segment of the Gray Wolf From the List of Endangered and Threatened Wildlife, 72 *Federal Register* 6051-6103.

Mexican Wolf Blue Range Reintroduction Project
Interagency Field Team Annual Report
Reporting Period: January 1 – December 31, 2013

Prepared by:

Arizona Game and Fish Department, U.S. Department of Agriculture - Animal and Plant Health Inspection Service - Wildlife Services, U.S. Forest Service, U.S. Fish and Wildlife Service, and White Mountain Apache Tribe.

Lead Agencies:

Arizona Game and Fish Department (AGFD)
USDA-APHIS Wildlife Services (USDA-WS)
U.S. Fish and Wildlife Service (USFWS)
U.S. Forest Service (USFS)
White Mountain Apache Tribe (WMAT)

The 2013 annual report reflects the 2012 population parameters published in the 2012 annual report addendum (<http://www.fws.gov/southwest/es/mexicanwolf/documents.cfm>).

1. Introduction

This report summarizes results of Mexican Wolf Interagency Field Team (IFT) activities during 2013. The Mexican Wolf Blue Range Reintroduction Project (Reintroduction Project) is part of a larger recovery program that is intended to reestablish the Mexican wolf (*Canis lupus baileyi*) within its historical range.

The Reintroduction Project is conducted in accordance with a nonessential experimental population Final Rule (USFWS 1998) that established the 6850 mi² (17,740 km²) Blue Range Wolf Recovery Area (BRWRA) (Fig. 1). The BRWRA lies within the Alpine, Clifton, and Springerville Ranger Districts of the Apache-Sitgreaves National Forests (ASNF) and the Gila National Forest (GNF) in west-central New Mexico. In 2000, the White Mountain Apache Tribe (WMAT) agreed to allow free-ranging Mexican wolves to inhabit the Fort Apache Indian Reservation (FAIR). The FAIR is adjacent to the BRWRA in east-central Arizona, and adds 2440 mi² (6319 km²) of area that wolves may occupy.

In March 1998, the first release of Mexican wolves occurred on the Alpine and Clifton Ranger Districts of the Apache-Sitgreaves National Forest, Arizona. At the end of 1998, the wild population in Arizona and New Mexico consisted of four wolves in two packs. The wild population grew to its highest minimal count of 83 wolves in 2013 through natural reproduction, translocations, and initial releases. Three translocations and one initial release occurred in 2013. At the end of 2013, the wild population totaled a minimum of 83 wolves, five breeding pairs and 14 packs. More information on population statistics can be found at <http://www.fws.gov/southwest/es/mexicanwolf/> and http://www.azgfd.gov/w_c/es/wolf_reintroduction.shtml

Wolf age and sex abbreviations used in this document:

A = alpha

M = adult male (> two years old)

F = adult female (> two years old)

m = subadult male (one - two years old)

f = subadult female (one - two years old)

mp = male pup (< one year old)

fp = female pup (< one year old)

2. Methods

The IFT followed Standard Operating Procedures (SOPs) approved by the Lead Agencies. These SOPs can be found at <http://azgfd.gov/wolf>. Note: In December 2009 the USFWS finalized a settlement agreement and in a Consent Decree agreed to make no further decisions that relate to the Mexican Wolf Recovery Program pursuant to SOP 13.0: Control of Mexican Wolves. The USFWS continues to follow relevant portions of the 1998 Interagency Management Plan for guidance on control of Mexican wolves. All other SOPs are considered valid and continue to be utilized by the IFT in conducting wolf management operations. The following definitions apply to the SOPs and to this report:

Breeding pair: an adult male and an adult female that have produced at least two pups during the previous breeding season that survived until December 31 of the year of their birth (USFWS 1998).

Operational breeding pair: an adult male and an adult female that have produced at least two pups during the previous breeding season and of which at least 2 pups survived until December 31 of the year of their birth, despite the loss and replacement of at least one biological parent of the offspring. This is a modification of the “Breeding pair” definition per the Final 10j Rule, to include pairs where alphas (one or both of the breeding adults in a pack) have been replaced but are functioning as a biological unit with a high probability of breeding success in the subsequent year.

Wolf pack: two or more wolves that maintain an established territory. In the event one of the two alpha (dominant) wolves dies, the remaining alpha wolf, regardless of pack size, retains the pack name.

Releases: wolves released directly from captivity, having no previous free-ranging experience. These “initial releases” may only occur in the Primary Recovery Zone, which is entirely within Greenlee County, Arizona (see Fig. 1 and Fig. 2).

Translocations: free-ranging wolves that are captured and moved to a location away from their site of capture; this includes captured free-ranging wolves that have been temporarily placed in captivity. Unlike initial releases, translocations can occur in the Primary Recovery Zone or in the Secondary Recovery Zone (Fig. 1). The Secondary Recovery Zone contains portions of Apache and Greenlee counties in Arizona, and portions of Catron, Sierra, and Grant counties in New Mexico (Fig. 2).

Depredation: confirmed killing or wounding of lawfully-present domestic livestock by one or more wolves.

Depredation incident: means the aggregate number of livestock killed or mortally wounded by an individual wolf or by a single pack of wolves at a single location within a one-day (24 hr) period, beginning with the first confirmed kill, as documented in an initial IFT incident investigation pursuant to SOP 11.0.

Releases and Translocations

Initial release candidates are genetic surpluses to the captive breeding program. Translocation candidates are wolves with prior wild experience, which are re-released into the wild from captivity or another location in the wild. Once selected, and prior to release, wolves are acclimated in USFWS-approved facilities. Pre-release facilities in New Mexico include the Ladder Ranch Wolf Management Facility, managed by the Turner Endangered Species Fund, and the Sevilleta Wolf Management Facility, managed by the USFWS at Sevilleta National Wildlife Refuge. A third pre-release facility, located at Wolf Haven International in Washington, is managed by Wolf Haven International.

In pre-release facilities, contact between wolves and humans is minimized. Carcasses of road-killed native prey species, primarily deer (*Odocoileus* spp.) and elk (*Cervus canadensis*), supplement the routine diet of processed canine food supplied to wolves. Genetically and socially compatible breeding pairs are established and evaluated for physical, reproductive, and behavioral suitability for direct release into the wild. Single wolves are also evaluated for release and potential pairing with wolves in the wild.

Prior to release, wolves may be adversely conditioned to food types (i.e., domestic livestock) and human presence. As close to release as possible, wolves may be subjected to taste aversion conditioning in efforts to deter their use of domestic livestock as a food source. Separately, or in addition to taste aversion conditioning, wolves in pre-release facilities may be hazed (purposefully harassed) prior to release in efforts to increase their avoidance of humans and/or inhabited areas.

Wolves are released or translocated using either a soft release or a hard release method. The soft release method holds wolves at the release site for one day to several months to acclimate them to the specific area. Soft release pens are constructed of chain link and are approximately 0.30 acres (0.0005 mi²) in size. A modified soft release consists of placing the wolves in an acclimation pen approximately 0.13 acres (0.0002 mi²) in size and built of nylon mesh, with electric fencing interwoven into the structure. Flagging is also attached to the pen walls approximately every two feet, as a visual barrier to discourage wolves from running into pen walls. Wolves generally self-release within a few days. A hard release is a direct release of a wolf (or wolves) from a crate into the wild or into an enclosure built of fladry (flagging hanging on a rope surrounding a small protected area; sometimes the fladry “fence-line” is electrified).



Photo: Mexican wolves M1051 and F1126 in an acclimation pen in the Primary Recovery Zone on the Apache National Forest. Credit: US Fish and Wildlife Service.

Radio Telemetry Monitoring

In 2013, all wolves equipped with radio-collars were monitored by standard radio telemetry from the ground and once weekly from the air as opportunity allowed. Visual observations, wolf behavior, evidence of a kill site, associated uncollared wolves, and fresh sign were also noted when possible. Location data were entered into the project's Access database for analysis.

Aerial locations of wolves were used to develop home ranges (White and Garrott 1990), which were calculated based on the definition in the Final Rule (USFWS 1998). Home ranges were calculated using ≥ 20 individual aerial locations on a pack, pair, or single wolf exhibiting territorial behavior over a period of \geq six months. To maximize sample independence, individual radiocollared wolf locations were included in home range calculations only if individual wolf locations were spatially or temporally separated from other pack members equipped with radio-collars. This limited pseudo-replication of locations. Home range polygons were generated at the 95% confidence level, using the minimum convex polygon (MCP) method (White and Garrott 1990) in the animal movement extension in the program ArcView (Hooge et al. 1999; ESRI, Redlands, CA, USA). Home ranges were not calculated for wolves that had < 20 aerial radio locations, displayed dispersal behavior, or exhibited non-territorial behavior during 2013.

Occupied Range

Occupied wolf range was calculated based on the definition in the Final Rule (USFWS 1998) and using the following criteria: (1) a five mi (eight km) radius around all locations of non-radio

monitored wolves and wolf sign occurring in an area consistently used over a period of at least one month; (2) a five mi (eight km) radius around radio locations of resident wolves when < 20 radio locations are available (for radio monitored wolves only); (3) a five mi (eight km) radius around radio monitored wolf locations (for wolves exhibiting dispersal or non-territorial behavior); and (4) a three mi (five km) radius around the minimum convex polygon developed from ≥ 20 radio locations of a pack, pair, or single wolf exhibiting territorial behavior.

Predation and Depredation Investigations

Throughout the year, project personnel investigated ungulate carcasses as they were discovered to determine sex, age, general body condition, and whether the carcass had been scavenged or was a wolf kill. USDA-WS wolf specialists investigated suspected wolf depredations on livestock within 24 hours of receiving a report. Not all dead livestock were found, or found in time to document cause of death. Accordingly, depredation numbers in this report represent the minimum number of livestock killed by wolves.

The 1996 Final Environmental Impact Statement (FEIS) predicted 1-34 confirmed killed cattle per year with a population of 100 Mexican wolves. This represents <0.05 % of all cattle present on the range (USFWS 1996). The Mexican Wolf Blue Range Reintroduction Project 5-year Review (AMOC and IFT 2005) reported, between 1998 and 2003, the mean number of cattle confirmed killed per year by wolves was 3.8, which extrapolates to 13.8 cattle killed per year from a population of 100 Mexican wolves. From 2005 to 2009, the number of confirmed cattle killed by wolves exceeded the predicted rate by the FEIS, and ranged between 36.5 depredations per 100 wolves in 2008 to 50 depredations per 100 wolves in 2007. From 2010 to 2012, the number of confirmed cattle killed by wolves was within the rate predicted by the FEIS and averaged 24 cattle killed per 100 wolves.



Photo: Mexican wolf M1107. Credit: Mexican wolf IFT.

Wolf Management

The IFT hazed wolves on foot or by vehicle in cases where wolves localized near areas of human activity, or were found feeding on, chasing, or killing livestock. When necessary, the IFT used rubber bullets, cracker shells, and fladry to encourage aversive response to humans and to discourage nuisance and depredation behavior. The IFT captured wolves with leg hold traps to collar, translocate, or remove wolves from the wild for specific management purposes. In addition, wolves that establish themselves outside the BRWRA are captured and brought back into the BRWRA or temporarily held in captivity, per the Final Rule (USFWS 1998).

Proactive Management Activities

The IFT utilized various proactive management activities in an attempt to reduce wolf-livestock conflicts in the BRWRA. Proactive management approaches and tools available to the IFT include:

Turbo Fladry: electric fence with red flagging installed around livestock holding pastures and private property designed to discourage wolf presence inside the perimeter of the fencing.

Hay and Supplements: feed and mineral supplements purchased for livestock owners who opt to hold livestock on private property during livestock calving season or wolf denning periods.

Range Riders: contract employees with radio telemetry equipment who assist stakeholders in monitoring wolf movements in relation to livestock, providing human presence and light hazing to move wolves away from cattle. Range Riders without telemetry equipment provided additional human presence to deter wolves.

Altering Livestock Grazing Rotations: moving livestock between different pastures within USFS grazing allotments in order to avoid areas of high wolf use that may correspond to den and rendezvous sites.

Exclusionary Fencing: eight-foot-high fence enclosing areas of private property for the purposes of protecting especially vulnerable animals or to address other specific property protection purposes.

Radio Telemetry Equipment: monitoring equipment used by the IFT, and in some cases issued to stakeholders, to facilitate their own proactive management activities and aid in the detection and prevention of wolf depredations.

Diversionsary Food Cache: road-killed native prey carcasses or carnivore logs provided to wolves in areas so as to reduce potential conflicts with livestock.

Supplemental Food Cache: road-killed native prey carcasses or carnivore logs provided to wolves in order to assist a pack or remnant of a pack in feeding young of the year when extenuating circumstances reduce their own ability to do so. Supplemental food caches also serve to reduce potential conflicts between wolves and livestock.

Population Estimation

The year-end population estimate is derived from information gathered through a variety of methods that are deployed annually by the IFT from November 1st through the year-end helicopter count. The IFT continued to employ comprehensive efforts initiated in 2006 to make the 2013 year-end population estimate more accurate. Management actions implemented included increased surveys and focus on trapping for uncollared wolves, greater coordination and investigation of wolf sightings provided through the public and other agency sources, deployment of remote trail cameras (blind and scented), and utilizing howl surveys and food caches in conjunction with remote cameras in areas of suspected uncollared wolf use.

Wolf sign (i.e. tracks, scats) was documented by driving roads and hiking canyons, trails, or other areas closed to motor vehicles. Confirmation of uncollared wolves was achieved via visual observation, remote cameras, howling, scats, and tracks. Ground survey efforts for suspected packs having no collared members were documented using global positioning system (GPS) and geographical information systems (GIS) software and hardware. GPS locations were recorded and downloaded into GIS software for analysis and mapping. Survey data were also recorded daily on forms and compiled in an Access database.

In November 2013 and January 2014, aircraft were used to document free-ranging wolves for the end-of-year 2013 population count and to capture wolves to affix radio collars. Including January data in the December 31 end-of-year count (and in this 2013 annual report) is appropriate, because wolves alive in January were also alive in the preceding December (i.e. whelping does not occur in mid-winter, and any wolf added to the population via initial release or translocation after December 31 and before the end of the survey is not counted in the year-end minimum population count). Fixed-wing aircraft were used to locate wolves and assess the potential for darting wolves from the helicopter. A helicopter was used to more accurately count the number of uncollared wolves associated with collared wolves in all areas and to capture target animals (e.g. uncollared wolves, injured wolves, wolves with old collars, or wolves outside the 10j boundary) where the terrain allowed.

As part of the 2013 population year-end count, the IFT coordinated with and surveyed members of the local public to identify possible wolf sightings. Ranchers, private landowners, wildlife managers, USFS personnel, and other agency cooperators were contacted to increase wolf sighting data for the database. All such sightings were analyzed by the IFT to determine those that most likely represented unknown wolves or packs for purposes of completing the year-end count.

Documentation of wolves or wolf sign, obtained through the above methods, was also used to guide IFT efforts to trap uncollared single wolves or groups. The IFT objective was to have at least one member of each pack collared. Through these various methods, the IFT was able to count the number of uncollared wolves not associated with collared wolves.



Photo: Mexican wolf M1038 after capture and processing during the annual survey. Credit: George Andrejko, AGFD.

Mortality

Wolf mortalities were identified via telemetry and public reports. Mortality signals from radio collars were investigated within 12 hours of detection to determine the status of the wolf. Carcasses were investigated by law enforcement agents and necropsies were conducted to determine proximate cause of death. Causes were summarized for all known wolf deaths.

For wolves equipped with radio-collars, mortality, missing, and removal rates were calculated using methods presented in Heisey and Fuller (1985). Wolves not located or documented alive for 3 or more months are considered missing or “fate unknown”. These wolves may have died, dispersed, or have a malfunctioned radio collar. The IFT calculated annual cause-specific mortality rates (i.e. human-caused versus natural/unknown mortality) for the population. Management removals can have an effect equivalent to mortalities on the free-ranging population of Mexican wolves (see Paquet et al. 2001). Thus, the IFT also calculated yearly cause-specific removal rates for wolves equipped with radio-collars. Wolves are removed from the population for four primary causes: (1) dispersal outside the BRWRA, (2) cattle depredations, (3) nuisance to humans, and (4) other (principally to pair with other wolves or to move a wolf to a more appropriate area without any of the other causes occurring first). Each time a wolf was moved, it was considered a removal, regardless of the animal’s status later in the year (e.g. if the wolf was translocated or held in captivity). The IFT calculated an overall failure rate of wolves in the wild by combining mortality, missing (only those wolves that went missing

under questionable scenarios), and removal rates to represent the overall yearly rate of wolves affected (i.e. dead, missing, or managed) in a given year.

Public Outreach

The IFT outreach efforts affirm the project's commitment to engage in effective communication, identify various outreach mechanisms, and standardize certain outreach activities. These goals help ensure timely, accurate, and effective two-way communication between and among cooperating agencies and the public. Project personnel conducted outreach activities on a regular basis, as a means of disseminating information to stakeholders, concerned citizens, and government and non-government organizations. This was facilitated through weekly and monthly updates, field contacts, handouts, informational display booths, web page updates, and phone contacts. The IFT provided formal presentations at local livestock producer meetings and conducted three public meetings in 2013 to gather comment on proposed Mexican wolf initial release and translocation actions within the BRWRA.

The IFT conducted outreach activities by continuing to utilize the Mexican Wolf Blue Range Reintroduction Project Outreach Plan developed during 2007. This plan provides an outline of activities the IFT uses to inform various target audiences about the reintroduction project and stimulate productive dialogue between stakeholders and cooperating agencies involved in the project.

During 2013, the IFT posted Mexican wolf reintroduction project updates within the BRWRA once each month, at places such as USFS offices, US post offices, and libraries, as well as on the AGFD Mexican wolf web site at http://www.azgfd.gov/w_c/es/wolf_reintroduction.shtml and the USFWS Mexican wolf web site at <http://www.fws.gov/southwest/es/mexicanwolf>. Interested parties could sign up to receive the update electronically by visiting the AGFD web site at <http://azgfd.gov/signup>. The IFT faxed monthly project updates to primary cooperating agencies, stakeholders and interested citizens.

The IFT also produced a wolf location map to inform cooperators and the public of areas occupied by wolves, with the map being updated quarterly and reflecting the previous three months of wolf aerial locations. The map was posted on the AGFD web site at www.azgfd.gov/w_c/es/wolf_reintroduction.shtml. In addition to the map, a description of wolf locations from weekly flights was posted to this web site within 48 hours of each flight per SOP 26. This information was also available through the USFWS Mexican wolf web site via a link at <http://www.fws.gov/southwest/es/mexicanwolf>. IFT personnel augmented these efforts by conducting routine/weekly contacts of individual grazing permittees to provide general locations of wolves on or adjacent to their grazing allotments or private lands.

Project personnel made contact with campers, hunters, and other members of the public within the BRWRA and provided them with information about the wolf project. These contacts focused on advising the public of the potential for encountering wolves, providing general recommendations for recreating in wolf-occupied areas and explaining legal provisions of the non-essential experimental population rule. The IFT also utilized these contacts to collect information on wolf sightings, tracks and scat from the public.



Photo: Mexican wolf F1251 and an unknown male of the Prieto Pack. Credit: Mexican wolf IFT.

3. Results

Specific information regarding wolves on the FAIR and the San Carlos Apache Reservation (SCAR) is not included in this report in accordance with Tribal agreements.

a. Population Status

At the end of 2013, the minimum population estimate was 83 wolves and five breeding pairs. Pups comprised 20% of this population which is a decrease from the previous year (27%).

At the beginning of 2013, the collared population consisted of 47 wolves among 14 packs and five single/unaffiliated wolves. At the end of 2013, routine trapping efforts to add radio collars to the population were offset by slight increases in the number of documented mortalities, removals, and fate-unknown wolves, which resulted in a fairly stable collared population of 46 wolves (24 adults, 16 subadults, and 6 pups) among 14 packs and five single wolves.

A total of 37 uncollared wolves were documented in the Mexican Wolf Nonessential Experimental Population Zone (MWNEPZ) at the end of 2013 (*note: uncollared wolves captured during the January 2014 helicopter operation would have been included as uncollared animals associated with known packs above*). Nineteen of the 37 uncollared wolves were associated with nine packs equipped with radio-collars (Table 1).

The IFT observed wolf sign and other information indicating the potential existence of three uncollared pairs (one in Arizona, two in New Mexico) and one uncollared single wolf in New Mexico not being associated with known collared packs. Additional uncollared animals were found on the FAIR and on the SCAR in 2013, and these areas will be priorities for IFT trapping efforts in the spring and summer of 2014.

Six natural pairings of breeding age wolves in the BRWRA population occurred in 2013. The natural pairing of dispersing wolf F1251 with an uncollared male wolf resulted in the designation of the Prieto pack. Following the loss of AM806 (2012), AF1042 paired with an uncollared male (AM1341 was equipped with a radio-collar in January 2014) wolf which resulted in the continued breeding success of the Bluestem pack. Dispersing wolf f1280 from the Bluestem pack joined AM1038 of the Hawks Nest pack. Following the loss of AF1212 to the Fox Mountain pack (2012), AM1287 of the Elk Horn pack was located with an uncollared female wolf (F1294) in January. With respect to the Paradise pack, M1249 replaced AM795, effectively pairing with AF1056. Following the removal of AF858 of the Rim pack, for management purposes, AM1107 of the Rim pack was located with an uncollared female wolf (f1305) in May.

A total of 11 single wolves equipped with radio-collars (M1240, M1243, M1244, M1245, F1251, m1277, f1278, f1281, f1295, m1296, M1334) were part of the population for a portion of the year. Six of these wolves (M1240, M1244, F1251, f1278, f1295, and m1296) were confirmed to be alive at the end of the year. F1251 and an uncollared male wolf formed the Prieto pack during 2013; F1251 is no longer considered a single animal (Table 1). Of the five remaining single wolves, M1240 and M1244 were considered dispersing wolves throughout the year; M1244 was located off and on with f1278 from May through December, 2013. f1278 and f1295 began dispersing in the spring/summer and were both located away from their natal packs during the 2013 population count; f1295 was located with m1282 of the San Mateo pack during the count. All ($n = 46$) of the wolves equipped with radio-collars were alive at the end of the year and all ($n = 83$) wolves at the end of the year were born in the wild.



Photo: Mexican wolf pups in the Luna pack den. Credit: US Fish and Wildlife Service.

b. Reproduction

In 2013, 9 packs exhibited denning behavior which included 3 packs in Arizona (Bluestem, Maverick, and Tsay-O-Ah) and 6 packs in New Mexico (Luna, Dark Canyon, Fox Mountain, Prieto, Canyon Creek, and Willow Springs). All of these packs but Prieto and Tsay-O-Ah were confirmed to have produced wild-conceived, wild-born litters. The IFT documented a minimum of 30 pups born with a minimum of 17 (7 pups in Arizona and 10 pups in New Mexico) surviving in the wild until year-end which showed a 57% pup survival rate (Table 1). This marked the twelfth consecutive year in which wild born wolves bred and raised pups in the wild. Of the 14 known packs at the end of 2013, all packs were formed naturally in the wild and the population consisted entirely of wild born wolves ($n = 83$).

c. Releases and Translocations

The IFT conducted an initial release of an individual wolf (M1133), one soft release translocation of a pregnant pair of wolves (AM1133 and AF1108), and one translocation of single wolf captured outside the boundary by in a private trapper (m1296), in attempts to: increase genetic diversity; increase the number of breeding pairs and wolves in the wild; and resolve management concerns (Table 2).

On January 7, the IFT released M1133 from captivity. This wolf was hard released near the Campbell Blue, in proximity to the Bluestem pack. The IFT hoped to facilitate a pair-bond between M1133 and AF1042 following the loss of AM806 in 2012. These animals did not pair-bond and M1133 subsequently traveled to the east into New Mexico. In late-January, M1133 was captured along the San Francisco River at the south end of the Lower San Francisco Plaza and returned to captivity for nuisance behavior.

One initial release of a bonded pair was planned for 2013, but did not occur. The Coronado pair were housed together during breeding season, and placed in a temporary holding pen within the Primary Zone of the Blue Range Recovery Area on April 26, 2013. The female had been tested and was found to be pregnant. After spending several days in the den box, she exited and did not return. It is believed that the pups did not survive. During the time when the pair was in the pen, Rim AM1107 visited the area and interacted with the Coronado pair at the fence. An uncollared wolf appeared with AM1107 after a few days, indicating that he had found a new mate and was defending his territory. Due to the two factors, no pups to anchor the pair in the area and the Rim male maintaining the territory, the chances of failure for the two wolves in the wild was very high. A decision was made to return the pair to captivity without a release occurring.

A translocation was also initiated for a second pair of wolves. AM1133 and AF1108 had both been in the wild previously, and they were paired while in captivity. Tests indicated that AF1108 was also pregnant. On April 27, the IFT translocated the Halfmoon pack, AM1133 and AF1108, from captivity. They were packed into the Gila Wilderness by mules on April 27, 2013 and placed into a temporary holding pen. These wolves were translocated to a soft-released mesh pen at the McKenna Park release-site in the Gila Wilderness. On May 3, the Halfmoon pack self-released from the mesh pen. AM1133 immediately traveled away from the area. AF1108

remained localized near the translocation site, suggestive of denning behavior. On May 11, the IFT recaptured AM1133 about 75 miles from the release site for being outside of the Recovery Area. AM1133 also killed a calf while traveling outside of the Recovery Area. AF1108 left the translocation site on June 10th. Any pups produced by AF1108 likely died before AF1108 moved from the translocation site. On June 25, AF1108 was legally killed while attacking a cow on private land approximately 32 miles from the release site.

m1296 was captured outside of the boundary by a private trapper on April 21. The IFT responded to the report and translocated m1296 inside the boundary on the same day. m1296 subsequently ranged across a broad area in New Mexico and observed traveling with f1327 from the San Mateo pack in December.



Photo: Mexican wolves M1133 and F1108 in an acclimation pen in the Secondary Recovery Zone in the Gila Wilderness. Credit: US Fish and Wildlife Service.

d. Home Ranges and Movements

The IFT calculated home ranges for 15 packs or individuals exhibiting territorial behavior. The MCP method produced an average home range size of 204 mi² (528 km²), with home ranges varying from 65 mi² to 457 mi² (168 km² to 1,183 km²) (Fig. 4; Table 3). Home ranges were not calculated for seven wolves (M1243, M1245, m1277, f1278, fp1281, f1295, and M1296) that

dispersed, traveled alone during all or portions of 2013 or had less than 20 aerial locations by the end of 2013 (see Appendix A for detailed summaries of these individuals).

Mexican wolves occupied 5791 mi² (14,998 km²) of the Mexican Wolf Nonessential Experimental Zone (MWNEPZ) during 2013 (Fig. 5). Within the BRWRA there were 3300 mi² (8547 km²) of occupied range. On the SCAR there were 98 mi² (254 km²) of occupied range. Outside of the BRWRA, SCAR, and FAIR, 1597 mi² (4137 km²) of occupied range was documented. Occupied wolf range occurred and was documented on the FAIR; however, this information is not displayed on the map nor are specific area values provided, as requested by the WMAT. In comparison, Mexican wolves occupied 5268 mi² (13,643 km²) of the MWNEPZ during 2012.

e. Mortality

The IFT has documented 100 wolf mortalities in the wild since 1998 (Table 4), seven of which occurred in 2013 (Table 5). Five of the documented wolf mortalities in 2013 were considered illegal, including: fp1288 (uncollared), M1245, f1292, m1334 (uncollared) and m1277. In addition, two other uncommon causes of death were documented; AF1108 was considered a legal shooting and f1289 died of unknown capture related causes. AF1108 was shot in the act of biting cattle on private land and was reported within 24 hours, which is consistent with take provisions in the Final Rule (USFWS 1998). This is the second incident of a public take consistent with the Final Rule (USFWS 1998) since the inception of the project (Table 4). f1289 died shortly after capture by the IFT. The exact cause of death could not be determined but the death was considered capture related. This is the third incident of capture related mortality since the beginning of the project (Table 4). Other more frequent causes of death should be considered a minimum estimate of mortality, since some pups and uncollared wolves may die without those mortalities being documented by the IFT. Four wolves from New Mexico (M1243, f1281, AM871, and AF861) and one wolf from Arizona (M1254) were listed as “fate unknown” during 2013.

The IFT monitored 61 individual wolves equipped with radio-collars for a total of 16,144 radio days during 2013. A total of fourteen (note: two wolves (fp1288 and M1334) that were documented dead and one wolf (m1296) that was removed for being outside the boundary were uncollared animals and not considered in this analysis) wolves equipped with radio-collars were considered removed ($n = 4$), dead ($n = 5$), or missing ($n = 5$). The overall survival rate was 0.73, or a corresponding failure rate of 0.27. The overall failure rate was composed of the human caused mortality rate (0.10; $n = 5$), natural mortality rate (0.00; $n = 0$), unknown/awaiting necropsy mortality rate (0.00; $n = 0$), boundary removal rate (0.02; $n = 1$), missing wolves rate (0.10; $n = 5$), cattle depredation removal rate (0.04; $n = 2$), nuisance removal rate (0.02; $n = 1$), and other removal rate (0.00; $n = 0$).

f. Wolf Predation

A total of 20 carcasses were investigated opportunistically during the winter (January – March) on four wolf packs in Arizona: 18 elk (90%) and 2 mule deer (10%). Age determinations

revealed: 11 adults, three yearlings, and six calves/fawns. Sex determinations revealed: six females, seven males, and seven unknown.

Of the 20 carcasses investigated: nine elk and one mule deer were confirmed or probable wolf kills; and seven elk and one mule deer were determined to be possible wolf kills. Of the 10 elk and mule deer that were confirmed or probable wolf kills, nutritional condition revealed (as determined by bone marrow fat samples collected): five (50%) in poor or compromised health, one in good health (10%), and four unknown (40%).

g. Wolf Depredation

USDA-WS members of the IFT completed a total of 61 investigations involving 72 animals during 2013 having potential Mexican wolf involvement. Of these 61 investigations, 58 involved cattle ($n = 70$), one involved a horse ($n = 1$) and two investigation involved dogs ($n = 2$). Average IFT response time between the reporting of an incident to the initiation of an on-site investigation was < 24 hours.

Of the 61 investigations completed in 2013, 30 (49%) were confirmed as being wolf related. Twenty-eight cattle deaths were confirmed as wolf depredations, zero cattle deaths were probable wolf depredations, three injured cows were confirmed as being wolf related, and one cattle injury had probable wolf involvement. One injured dog and one dog mortality were also confirmed as wolf related in 2013. Forty-seven percent ($n = 14$) of the 30 investigations confirmed as wolf related occurred in New Mexico and 53% ($n = 16$) occurred in Arizona (Table 7). Forty-nine percent ($n = 30$) of the total investigations were determined to be unknown or non-wolf related. These mortality causes included: unknown ($n = 36$), bloat ($n = 1$), cold weather ($n = 1$), gunshot ($n = 2$), black bear ($n = 1$), coyote ($n = 1$), natural causes ($n = 1$), birthing complications ($n = 1$) and lightning ($n = 3$).

Eighty-seven percent ($n = 53$) of the 61 investigations conducted were in response to reports from ranchers and the public and the remaining 13% ($n = 8$) were in response to reports from the IFT. Twenty-five percent ($n = 7$) of the confirmed wolf-caused livestock mortalities were found and reported by the IFT (Table 7).

In total, thirteen of the 28 (46%) confirmed depredations, resulting in the death of livestock, involved uncollared wolves (Table 7). Two wolves (Fox Mountain m1274 and Paradise AM795) were removed in 2013 for repeated depredations.

The confirmed killed cattle rate for 2013 extrapolates to 34 depredations/100 wolves using the number of confirmed killed cattle ($n = 28$; Table 7) compared to the final population count ($n = 83$). This projected number of depredations is within the 1-34 confirmed killed cattle per 100 wolves predicted in the FEIS and reflects an increase from the 2012 extrapolation.

h. Management Actions

In 2013, 36 different wolves were captured and/or removed a total of 39 times. Fifteen wolves were captured, collared for the first time, processed, and released on site for routine monitoring

purposes by the IFT (Table 8). Fourteen wolves were re-captured, given new collars, processed and released on site, or simply released on site with the current collar (Table 8). One wolf was captured by IFT for routine monitoring purposes and died of unknown capture related causes. One wolf was incidentally captured during coyote removal efforts conducted by WS. Two uncollared wolves were incidentally captured by private trappers, who reported the captures to the IFT. One wolf was processed and translocated back into the Recovery Area, while another wolf was processed and released on site. One collared wolf was captured by a private trapper in 2013, but not processed or released by IFT.

Four different wolves were captured and removed from the wild five times pursuant to approved removal orders. AF858 (Rim pack) was no longer reproductive and was removed to retain her genetic material for potential future use in the captive breeding program, and to open up a territory for use by younger wolves. AM795 (Paradise pack) and m1274 (Fox Mountain pack) were removed for repeated livestock depredations. M1133 was removed twice, once for nuisance behavior and once for being located outside of the boundary. Each of these removals of M1133 was conducted following an initial release or translocation (Table 2).

The IFT, from all management related trapping and captures, successfully added fifteen wolves to the collared population in 2013: five pups (fp1289, mp1330, mp1331, fp1332, fp1333) from the Bluestem pack; two pups (mp1290 and mp1336), one subadult (f1335), and one adult (AF1291) from the Maverick pack; one pup (fp1292) and one subadult ((f1327) from the San Mateo pack; one pup (mp1329) from the Willow Springs pack; one subadult (m1293) from the Dark Canyon pack; one subadult (f1294) from the Elkhorn pack; one subadult associated with the Rim male (f1305). In addition, one previously uncollared wolf (f1295 a subadult from the Fox Mountain pack) was incidentally captured during coyote removal efforts conducted by WS. This wolf was equipped with a radio-collar and released on site by IFT personnel. Two previously uncollared wolves were incidentally captured by private trappers and processed and collared by IFT (one subadult (m1337) from the Luna pack was released on site; and one subadult (m1296) not associated with a pack was translocated back into the Recovery area). One wolf (f1289) was captured by IFT for routine monitoring purposes and died of unknown capture related causes. One collared wolf (m1277), was captured by a private trapper in 2013, but not processed or released by IFT. Trapping was also conducted on the FAIR, however, wolf numbers on the FAIR are not provided at the request of the WMAT.

The IFT conducted investigations in response to 11 reported cases of potential nuisance wolf behavior in 2013 (Table 9). Six of the reports involved possible wolves near residences, with only two found to involve Mexican wolves. Three reports were determined to be northern wolf-domestic dog hybrids, and one was a possible wolf but was not verified. Three of the other four nuisance investigations involved attacks on dogs, while the fourth involved wolves harassing livestock on private land. One report involved a wolf in close proximity to a human in the national forest. The San Mateo and Fox Mountain packs were each involved in two of the incidents and the Bluestem pack was involved in one incident. Trail cameras, tracking, telemetry, howling, and trapping were used by IFT members during investigations to gather evidence of wolf involvement on reported nuisance problems. Hazing was used to move wolves away from residences and livestock.



Photo: Mexican wolf F1108. Credit: US Fish and Wildlife Service.

i. Proactive Management Activities

The IFT, working with Non-Governmental Organizations (NGO), used proactive management to assist in reducing wolf-livestock conflicts in the BRWRA (Table 10). The Reintroduction Project and NGOs spent approximately \$114,650 on proactive management activities affecting an estimated 4,820 livestock (2910 in Arizona, 1910 in New Mexico). The IFT, agency contract employees, and NGO contract employees spent approximately 10,800 hours implementing proactive management activities during 2013.

The agencies and NGOs purchased hay and supplements during the calving season for four stakeholders in Arizona and New Mexico. No known depredations occurred on the four ranches. The project assisted another rancher in the purchase of water, which allowed livestock grazing in an allotment away from an active wolf den in New Mexico. No depredations are known to have occurred on the allotment during 2013. Project personnel met with Forest District Rangers, biologists and range staffs, to discuss livestock management during the wolf denning season. The IFT coordinated with the Alpine, Clifton, Springerville, Black Range, Glenwood, Quemado, and Reserve Ranger Districts and stakeholders in Arizona and New Mexico to address potential conflicts between livestock and wolves. In several of these cases, livestock were scheduled to graze in or near pastures where wolves were denning. In pursuing efforts to reduce interactions between livestock and denning wolves, the Districts and ranchers changed pasture rotations and moved livestock into alternate pastures during the denning season, where possible.

During 2013, the Reintroduction Project and NGOs contracted 13 range riders (six in Arizona, seven in New Mexico) to assist 16 stakeholders (eight in Arizona, eight in New Mexico) in monitoring wolves in proximity to cattle. Range riders monitored approximately 4,310 livestock within eight wolf pack home ranges, and provided additional oversight of livestock and light

hazing of wolves when they were among livestock. Nine depredations occurred on allotments (five in Arizona, four in New Mexico) while ranger riders were under contract in 2013.

The IFT issued radio telemetry equipment to stakeholders (six in Arizona, seven in New Mexico) in areas where wolf-livestock conflicts were prevalent. Most of these equipment loans were in association with range riders. The IFT trained stakeholders to use the telemetry equipment to monitor wolves in the vicinity of cattle or residences, and instructed them on non-injurious hazing techniques. Stakeholders were encouraged to contact the IFT for assistance and were required to report any wolf-livestock conflicts requiring hazing efforts. These measures resulted in stakeholders increasing their vigilance over livestock when wolves were in the vicinity and likely helped reduce the potential for livestock depredations.

Supplemental food caches were utilized to assist a pack or remnant of a pack in feeding young of the year when extenuating circumstances (such as a death of one of the adults) reduce their own ability to do so. Supplemental food caches also served to reduce potential conflicts between wolves and livestock. Supplemental food caches were utilized for the Bluestem pack in 2013. The IFT had not verified an alpha male in the pack when the alpha female denned. They established a supplemental food cache within a reasonable distance of the den and rendezvous sites to help the female feed the young of the year and to reduce the likelihood of livestock depredations. One livestock depredation involving the Bluestem pack occurred in 2013, and six pups survived to year-end.

Diversionsary food caches are utilized to reduce potential conflicts between wolves and livestock, primarily in areas where depredations have occurred in the past. Diversionsary food caches were established for three packs during the 2013 denning season (April-July): the Prieto pack, Willow Springs pack, and Fox Mountain pack. Two depredations were assigned to the Prieto pack prior to the establishment of a food cache. No depredations were reported once the food cache was in place. Between May and September, no depredations were assigned to the Willow Springs pack. Prior to establishment of a diversionsary food cache in April, members of the Fox Mountain pack were involved in two depredations. A range rider was employed after the third, and a second food cache was established after the fourth depredation. Following a fifth depredation assigned to members of the Fox Mountain pack, a removal order for M1276, m1274, or an uncollared male wolf of the Fox Mountain pack was issued by the USFWS. Yearling m1274 was removed in November, 2013 to fulfill this removal order.

j. Non-IFT Wolf Sighting Reports

In 2013, the IFT received a total of 66 wolf sighting reports from the public, which included 42 reports from Arizona, 22 reports from New Mexico and two reports from Texas (Appendix B). The IFT determined 22 reports, including both reports from Texas, were non-wolf sightings (coyote, dogs, etc.), 12 reports were sightings of known wolves within established territories (Arizona $n = 5$, New Mexico $n = 7$), four reports were likely uncollared/unknown wolves (Arizona $n = 3$, New Mexico $n = 1$), and five reports being probable wolf sightings (Arizona $n = 4$, New Mexico $n = 1$), and 23 reports did not have enough information to make a determination. The public is encouraged to report Mexican wolf sightings to help the IFT locate undocumented

packs and track movements of wolves within and around the BRWRA, and are provided the 1-888-495-WOLF (9653) number to report Mexican wolf sightings.

k. Uncollared wolf sign

The IFT analyzed unoccupied range, uncollared wolf sign and sighting reports to target 4 core areas in Arizona (Fig. 6) in an effort to document and/or radio collar unknown wolves in and around the BRWRA. The IFT searched a total of 898 mi (1091 km) of roads and trails in 2013. One single wolf and a pair of wolves were documented in Arizona and one single wolf and two pairs of wolves were documented in New Mexico (Fig. 7) as a result of these efforts.



Photo: Mexican wolf track. Credit: George Andrejko, AGFD.

l. Public Outreach

The IFT and other project personnel provided a total of 15 presentations and status reports to approximately 2,261 people in federal and state agencies, conservation groups, rural communities, schools, wildlife workshops, and various other public and private institutions throughout Arizona, New Mexico and White Mountain Apache Tribal lands. Ninety-nine percent of the presentations were for the BRWRA target audience. In addition, a total of 5,356 weekly contacts were made to cooperating agencies and stakeholders in 2013. Project updates were faxed to, or posted at, 41 different individuals/locations on a monthly basis across the BRWRA. Endangered Species Updates containing current project and recovery program information also went out to an average of 18,385 people a month. The AZGFD Mexican wolf website was

visited 3,030 times throughout 2013. Outreach presentations can be scheduled by contacting the IFT at 1-888-495-WOLF (9653).

Utilizing available USFS kiosks and various road pullouts within the BRWRA, the IFT maintained metal signs and laminated posters that provide information on how to minimize conflicts with wolves. The IFT also maintained USFWS reward posters at USFS kiosks and local businesses in the BRWRA as necessary, to provide notice of a \$10,000 reward for information leading to the apprehension of individuals responsible for illegal Mexican wolf killings.

4. Summary

The 2013 end-of-year count confirmed a minimum of 83 wolves, 46 (24 adults, 16 subadults, and 6 pups) of which were equipped with radio-collars. The population consisted of 14 packs (seven in Arizona, seven in New Mexico). Thirty seven uncollared wolves, including uncollared singles and groups were documented throughout 2013. Nineteen of the 37 uncollared wolves were associated with nine packs equipped with radio-collars. (Table 1). Five single wolves equipped with radio-collars (M1240, M1244, f1278, f1295, M1296) were still alive at year-end. There are likely more undocumented free-ranging wolves in the population, but most of these are likely single animals because wolf packs generally leave more sign and their existence/presence is easier to document.

The IFT conducted one initial release and three translocations in 2013. Of the four wolves released or translocated, one (m1296) remained in the wild at the end of 2013. M1133 was released in an effort to form a pair-bond with AF1042 of the Bluestem pack. They did not pair-bond and M1133 was removed to captivity for nuisance behavior. AM1133 was subsequently translocated with AF1108, as the Halfmoon pack, into the Gila Wilderness. AM1133 was removed for boundary issues in May and AF1108 was legally shot in June 2013. In April, m1296 was incidentally captured by a private trapper outside the BRWRA, and was subsequently translocated inside the BRWRA; m1296 remained in the wild and was located with f1327 of the San Mateo pack during the 2013 population survey.

Six packs produced wild-conceived, wild-born litters, which represents the twelfth consecutive year in which wild-born Mexican wolves bred and raised pups in the wild. In addition, all documented wolves in the population were wild-born.

The IFT documented seven mortalities of free-ranging wolves in 2013, including two adults, four subadults, and one pup.

Home ranges were calculated for 15 packs or individuals exhibiting territorial behavior. The MCP method produced an average home range size of 204 mi² (528 km²), with home ranges varying from 65 mi² to 457 mi² (168 km² to 1,183 km²).

Native prey used by wolves consisted primarily of elk; however, there were also 26 confirmed livestock depredation incidents resulting in 28 cattle killed. In addition, three injured cows, one injured dog and one dog mortality were confirmed to have been caused by wolves.

The IFT captured 32 wolves a total of 35 times for routine monitoring ($n = 29$), management actions ($n = 5$), medical attention ($n = 0$), and movement outside the BRWRA boundary ($n = 1$). Additionally, 2 wolves (uncollared m1296 and m1337) were processed and released by IFT personnel, following their incidental capture by private trappers. One wolf f1295, was incidentally captured during coyote management conducted by WS. One additional wolf (m1277) was captured private trappers in 2013, but not processed or released by the IFT. Four wolves (AF858, M1133, m1274, and AM795) were captured five times for management actions. Three wolves, f1289, M1133, and mp1329, were captured twice.

In 2013, the IFT analyzed 66 reports of wolf sightings from the public; 49% of these reports were non-wolf sightings (coyote, dogs, deer, etc.), 18% were sightings of known wolves within established territories, 8% were probable wolf sightings, 6% were likely uncollared/unknown wolves, and the remainder was categorized as unknown due to insufficient information. In response to these sightings, the IFT searched 898 mi (1091 km) of roads, trails, and canyons looking for unknown wolves in and around the BRWRA. As a result, the IFT was successful in documenting one single wolf and a pair of wolves in Arizona and one single wolf and two pairs of wolves in New Mexico.

Project personnel provided 15 presentations and status reports to approximately 2,261 people in federal and state agencies, conservation groups, rural and urban communities, guide/outfitter organizations, livestock associations, schools, fairs, and various other public and private institutions. In addition, 5,356 weekly contacts were made to cooperating agencies and stakeholders. Endangered Species Updates containing current project and recovery program information went out to an average of 18,385 people a month.

The IFT acknowledges the assistance of all agency personnel and volunteers who provided data and support services for the operational field portion of the Mexican wolf reintroduction project during this reporting period. Individuals listed in Appendix C collected data or provided other information for this report.

5. Discussion

The IFT documented the Mexican wolf population at a minimum of 83 wolves in 2013 (Fig. 8; Table 1). The minimum number of breeding pairs increased from four in 2012 (including one “Operational Breeding Pair”) to five in 2013 (Fig. 4; Table 1). In January, AF858 was removed for management reasons. AM795 from the Paradise pack and m1274 of the Fox Mountain pack were removed from the wild in October and November, respectively, in an effort to alter pack behavior following repeated depredations. In December, the IFT determined M1249 of the San Mateo pack had joined the Paradise pack, effectively replacing AM795; however, a removal order was still in effect for AF1056 of the Paradise pack.

The minimum total number of pups alive at the end of the year was lower ($n = 17$; Table 1) than the previous year ($n = 20$) and the number of known mortalities increased from four in 2012 to seven in 2013 (Table 4). Of the eleven single wolves documented during 2012: one joined an uncollared male wolf forming the Prieto pack and is no longer considered a single (F1251), two are

fate unknown (M1243 and f1281), three (M1245, M1277 and m1334) are confirmed dead and five remain in the wild with functioning radio collars (M1240, M1244, f1278, f1295, m1296). Of the five remaining single wolves, M1240 and M1244 were considered dispersing wolves throughout the year; M1244 was located off and on with f1278 from May through December, 2013. f1278 and f1295 began dispersing in the spring/summer and were both located away from their natal packs during the 2013 population count; f1295 was located with m1282 of the San Mateo pack during the count. Six natural pairings occurred in 2013. Dispersing wolf F1251 paired with an uncollared male wolf, which resulted in the designation of the Prieto pack. AF1042 paired with an uncollared male wolf (now AM1341 captured during the January 2014 helicopter operation) which resulted in the continued success of the Bluestem pack. Dispersing wolf 1280 from the Bluestem pack joined AM1038 of the Hawks Nest pack; AM1038's radio-collar had previously failed, thus this pairing resulted in the renewed monitoring of the Hawks Nest pack. AM1287 of the Elk Horn pack was located with an uncollared female wolf (F1294) in January 2013. AF1056 of the Paradise pack paired with M1249, replacing AM795. Following the removal of AF858 of the Rim pack, for management purposes, AM1107 of the Rim pack was located with an uncollared female wolf (f1305) in May. The formation of many new pairings in 2013, along with an estimated recruitment rate of 57% (17 pups alive out of 30 known produced) are positive indicators for the overall wolf population. Outside of the pairing of F1280 with AM1038 and M1249 with AF1056, the remaining new pairings referenced above all involved the pairing of one known collared wolf with previously unknown, uncollared wolves. This may indicate a moderate to high level of uncollared dispersal aged wolves available to form new pairings among existing members of the population. Traditionally productive packs (Paradise, and San Mateo) did not produce pups in 2013, likely due to the advanced age of one or more alpha animals in each pack. More newly formed packs (Elk Horn and Prieto) did not produce pups in 2013, likely due to the young age of one or more of the animals in each pack; although the Prieto pack did display denning behavior, no pups were documented as produced nor survived.

Based on meta-analysis of gray wolf literature, Fuller et al. (2003) identified a 0.34 mortality rate as the inflection point of wolf populations. Theoretically, wolf populations below a 0.34 mortality rate would increase naturally, and wolf populations above a 0.34 mortality rate would decrease. The Mexican wolf population had an overall failure (mortality plus removal plus missing rate) rate of 0.27 in 2013. This failure rate would predict an increasing population which was indeed the case in 2013. The failure rate remains low largely due to minimal ($n = 4$) management removals of wolves from the population. While the reduction in the number of management removals is encouraging, the majority of the population losses in 2013 were either due to human-caused mortalities or missing animals rather than management removals. It is difficult to determine the effect on the population from missing animals because individuals could still be alive. In this case, two missing animals (m1254 and f1281) have a substantial probability (>0.5) of being alive, while the other three wolves (m1243, AF861, and AM871) are likely dead based on the circumstances associated with the disappearance of the wolves. In 2013, all seven mortalities were human-caused mortalities (five illegal mortalities, one legal shooting, and one capture related death). Efforts to reduce the level of mortality, while replacing the individual animals lost through initial releases and translocations will continue to be a priority. The IFT will also continue to document the uncollared wolf component of the population.

The 2013 confirmed killed cattle rate extrapolates to approximately 34 depredations/100 wolves using the number of confirmed killed cattle ($n = 28$) compared to the final 2013 wolf population count ($n = 83$). This projected number of depredations was within the 1-34 confirmed killed cattle per 100 wolves predicted in the FEIS. It is important to note the standard for extrapolating the annual confirmed killed cattle rate/100 wolves uses the end of year wolf population count, which does not include wolves that died or were removed during 2013. Thus, the confirmed killed cattle rate per 100 wolves, as a matter of practice, underestimated the denominator which inflates the total rate.

A high number of mortalities may exceed growth from natural recruitment, translocations, and initial releases in a given year. Nonetheless, a combination of initial releases, translocations, natural pair formations, and reproduction in 2014 could result in another increase in the Mexican wolf population. The Reintroduction Project management objective for 2014 is a 10% increase in the minimum wolf population counts and/or the addition of at least two breeding pairs, while minimizing negative impacts of wolves. Suggested changes to the Mexican wolf reintroduction project are outlined in the Five Year Review and the IFT will continue to work on implementing these improvements in 2014.



Photo: Mexican wolf pups at the Willow Springs pack den. Credit: US Fish and Wildlife Service.

6. Literature Cited

- Heisey, DM and TK Fuller. 1985. Evaluation of survival and cause-specific mortality rates using telemetry data. *Journal of Wildlife Management* 49:668-674.
- Hooge, PN, W Eichenlaub, and E Solomon. 1999. The animal movement program. USGS. Alaska Biological Science Center.
- Fuller, TK, LD Mech, and JF Cochrane. 2003. Wolf population dynamics. Pages 161-191 *in* L. D. Mech and L. Boitani, editors. *Wolves: behavior, ecology, and conservation*. The University of Chicago Press, Chicago, Illinois, USA.
- Mexican Wolf Blue Range Adaptive Management Oversight Committee and Interagency Field Team. 2005. Mexican Wolf Blue Range Reintroduction Project 5-year review. USFWS, Albuquerque, New Mexico, USA.
- Paquet, PC, J Vucetich, ML Phillips, and L Vuetich. 2001. Mexican wolf recovery: three year program review and assessment. Prepared by the Conservation Breeding Specialist Group for the U.S. Fish and Wildlife Service, Albuquerque, New Mexico. USA.
- Singer, F. J., W. Schreier, J. Oppenheim, and E. O. Garton. 1989. Drought, fires, and large mammals. *BioScience*. 39:716-722.
- US Fish and Wildlife Service. 1996. Final environmental impact statement for the reintroduction of the Mexican wolf within its historic range in the southwestern United States. USFWS, Albuquerque, New Mexico, USA.
- US Fish and Wildlife Service. 1998. The final Mexican wolf experimental rule. 63 Federal Register. Pp 1763-1772.
- White, GC and RA Garrott. 1990. Analysis of wildlife radio-tracking data. Academic Press Incorporated, New York, New York, USA.

Table 1. Status of Mexican wolf packs in Arizona and New Mexico, as of December 31, 2013.

Pack	Wolf ID	Reproduction ^a	Pups at Year End ^b	No. Collared	No. Uncollared	Min pack Size ^c
Bluestem, AZ*	AF1042, M1275, f1289 ^e , mp1330, mp1331, fp1332, fp1333	6	6	6	4	10
Canyon Creek, NM	AF1246, AM1252	1	1	2	1	3
Dark Canyon, NM*	AF923, AM992, M1293	4	2	3	2	5
Elk Horn, AZ	AM1287, F1294	0	0	2	0	2
Fox Mountain, NM*	AF1212, AM1158, M1276, m1274 ^g	5	2	3	4	7
Halfmoon, NM	AM1133 ^h , AF1108 ^c	0	0	0	0	0
Hawks Nest, AZ	AM1038, F1280	0	0	1	1	2
Luna, NM*	AF1115, AM1155, m1284, m1285, m1286, m1337	6	2	6	2	8
Middle Fork, NM	AM871 ^f , AF861 ^f	0	0	0	0	0
Prieto, NM	F1251	0	0	1	1	2
Paradise, AZ	AF1056, M1249 ⁱ , AM795 ^g	0	0	2	0	2
Rim, AZ	AM1107, f1305, AF858 ^h	0	0	2	0	2
San Mateo, NM	AM1157, AF903, m1282, f1327, 1292 ^e , 1288 ^e	0	0	4	2	6
Willow Springs, NM*	AF1279, AM1185, mp1329	6	3	3	2	5
Radio collared wolf, NM	M1240	0	0	1	0	1
Radio collared wolf, NM	f1295	0	0	1	0	1
Radio collared wolf, NM	M1296	0	0	1	0	1
Radio collared wolf, NM	f1278	0	0	1	0	1
Radio collared wolf, NM	M1244	0	0	1	0	1
Radio collared wolf, NM	m1277 ^e	0	0	0	0	0
Radio collared wolf, NM	M1243 ^f	0	0	0	0	0
Radio collared wolf, NM	f1281 ^f	0	0	0	0	0
Radio collared wolf, NM	M1245 ^e	0	0	0	0	0
Uncollared wolf, NM	M1334 ^e	0	0	0	0	0
Day Spring, AZ	Uncollared wolf	0	0	0	2	2
Ash Canyon, NM	Uncollared wolf	0	0	0	1	1
Pueblo Creek, NM	Uncollared wolves	0	0	0	2	2
Boiler Peak, NM	Uncollared wolves	0	0	0	2	2

Pack	Wolf ID	Reproduction^a	Pups at Year End^b	No. Collared	No. Uncollared	Min pack Size^c
FAIR	Uncollared wolves	N/A ^d	N/A ^d	N/A ^d	N/A ^d	N/A ^d
SCAR	Uncollared wolves	N/A ^d	N/A ^d	N/A ^d	N/A ^d	N/A ^d
Totals¹		30	17	46	37	83

^a Reproduction-maximum number of pups documented in 2013.

^b Pups at year end documented surviving until December 31, 2013.

^c Min pack size-total number of wolves (collared, uncollared, pups) documented at year end.

^d Wolf numbers on FAIR and SCAR are not displayed at the request of the tribes.

^e Died during 2013.

^f Fate unknown during 2013.

^g Permanently removed from wild during 2013.

^h Removed from wild for management purposes during 2013

ⁱ Dispersed and joined existing pack.

¹ Totals include wolves occurring on FAIR and SCAR..

*A pack that meets the definition of a breeding pair per the final rule.

Table 2. Mexican wolves initial released or translocated from captivity or the wild in Arizona and New Mexico during January 1 – December 31, 2013.

Wolf pack	Wolf #	Release Site	Release Date	Released or Translocated
Single	M1133	Campbell Blue	January 7	Released
Halfmoon	AM1133	McKenna Park	April 27	Translocated
Halfmoon	AF1108	McKenna Park	April 27	Translocated
Single	M1296	Indian Peaks Area	April 21	Translocated

Table 3. Home range sizes of free-ranging Mexican wolf packs in Arizona and New Mexico, January 1 – December 31, 2013.

Wolf ID	Home Range Size 95% Min. Convex Polygon mi² (km²)	Number of Independent Aerial Locations	Duration of Time Radio Locations were Available during 2013
Bluestem	65 (168)	55	12 months
Canyon Creek	233 (604)	47	12 months
Dark Canyon	116 (302)	75	12 months
Elk Horn	102 (265)	45	12 months
Fox Mountain	425 (1102)	74	12 months
M1240	457 (1183)	32	8 months
Luna	123 (317)	57	12 months
Maverick	350 (906)	55	12 months
M1244	147 (382)	43	12 months
Paradise	169 (437)	45	12 months
Rim	70 (180)	45	12 months
San Mateo	415 (1075)	58	12 months
Tsay-O-Ah	185 (480)	50	12 months
Willow Springs	123 (320)	49	12 months
Prieto	76 (197)	43	12 months
Average^a	204 (528)	51.5	11.7 months

^aAverages were based on packs with enough locations to calculate home ranges.

Table 4. Wild Mexican wolf mortalities documented in Arizona and New Mexico, 1998-2013.

Year	Illegal Mortality ^a	Vehicle collision	Natural ^b	Other ^c	Unknown	Awaiting necropsy	Annual Total
1998	4	0	0	1	0	0	5
1999	0	1	2	0	0	0	3
2000	2	2	1	0	0	0	5
2001	4	1	2	1	1	0	9
2002	3	0	0	0	0	0	3
2003	7	4	0	0	1	0	12
2004	1	1	1	0	0	0	3
2005	3	0	0	0	1	0	4
2006	1	1	1	1	2	0	6
2007	2	0	1	0	1	0	4
2008	7	2	2	0	2	0	13
2009	4	0	4	0	0	0	8
2010	5	0	1	0	0	0	6
2011	3	2	3	0	0	0	8
2012	4	0	0	0	0	0	4
2013	5	0	0	2	0	0	7
Total	55	14	18	5	8	0	100

^aIllegal mortality causes of death may include, but are not limited to illegal shooting with a firearm or arrow, and trap related mortalities by the public.

^bNatural causes of death may include, but are not limited to predation, starvation, interspecific strife, lightening, and disease.

^cOther causes of death include capture-related mortalities and legal shootings by the public.

Table 5. Mexican wolf mortalities documented in Arizona and New Mexico during January 1 - December 31, 2013.

Wolf ID	Pack	Age (years)	Date Found	Cause of Death
fp1288	San Mateo	<1	January 20	Illegal Mortality
m1245	Single	2	March 7	Illegal Mortality
fp1292	San Mateo	1	April 5	Illegal Mortality
AF1108	Halfmoon	6	June 25	Legal Shooting
f1289	Bluestem	1	August 18	Capture related mortality
M1334	Unknown	1	September 21	Illegal Mortality
M1277	Single	1	December 21	Illegal Mortality

Table 6. Mexican wolf depredations of livestock documented in Arizona and New Mexico during January 1 – December 31, 2013.

	Confirmed	Probable	Total
Fatal	28	0	28
Injury	3	1	4

Table 7. Investigations of confirmed and probable depredations and injuries caused by Mexican wolves to livestock and dogs during 2013 in New Mexico and Arizona. Depredation incidents are defined as the aggregate number of livestock confirmed killed or mortally wounded by an individual wolf or a single pack of wolves at a single location within a 1-day (24-hour) period, beginning with the first confirmed kill, as documented in the initial IFT incident investigation pursuant to SOP 11.0. Number of depredation incidents on a given wolf at a given point in time is calculated based on the number of incidents in the preceding 365 days.

	Wolves in Area	Investigation Date	Located By IFT	Species	State	# Killed/ # Injured	Call	Wolves Responsible	Depredation Incident	No. of Incidents	Management Action
1	Unknown	1/19/2013	No	Cattle	NM	1 Killed	Confirmed Wolf	Uncollared	Yes	1	Increased sign search and monitoring for collared wolves in area
2	Fox Mountain	4/6/2013	No	Cattle	NM	1 Killed	Confirmed Wolf	AM1158 and M1276 or AF1212	Yes	2	Diversionsary feeding, increased monitoring and range rider
3	Unknown	4/21/2013	No	Cattle	AZ	1 Killed	Confirmed Wolf	Uncollared	Yes	1	Deployed remote cameras
4	Fox Mountain	4/24/2013	No	Cattle	NM	1 Killed	Confirmed Wolf	Uncollared	Yes	1	Diversionsary feeding, range rider
5	Unknown	4/25/2013	No	Cattle	AZ	2 Killed	Confirmed Wolf	Uncollared	Yes	1	Increased sign search and monitoring for any collared wolves potentially in the area
6	Unknown	4/29/2013	No	Cattle	AZ	1 Killed	Confirmed Wolf	Uncollared	Yes	1	Trapping for uncollared wolf
7	Fox Mountain	5/2/2013	Yes	Cattle	NM	2 Killed	Confirmed Wolf	M1276	Yes	2	Range rider, second food cache
8	AM1133	5/11/2013	Yes	Cattle	NM	1 Killed	Confirmed Wolf	AM1133	Yes	1	M1133 captured and removed to captivity
9	Prieto	5/12/2013	No	Cattle	NM	1 Killed	Confirmed Wolf	AF1251	Yes	1	Diversionsary feeding and increased monitoring
10	Prieto	5/14/2013	No	Cattle	NM	1 Killed	Confirmed Wolf	AF1251	No	1 ^a	Diversionsary feeding and increased monitoring
11	Tsay-O-Ah	5/14/2013	Yes	Cattle	AZ	1 Killed	Confirmed Wolf	Uncollared	Yes	1	Increased monitoring
12	Paradise	6/9/2013	No	Cattle	AZ	1 Killed	Confirmed Wolf	Paradise	Yes	1	Increased monitoring, Diversionsary feeding
13	Unknown	6/18/2013	No	Cattle	AZ	1 Killed	Confirmed Wolf	Uncollared	Yes	1	Increased monitoring
14	AF1108	6/25/2013	No	Cattle	NM	1 Injured	Confirmed Wolf	AF1108	Yes	1	None, wolf was legally shot

Table 7. Continued.

	Wolves in Area	Investigation Date	Located By IFT	Species	State	# Killed/ # Injured	Call	Wolves Responsible	Depredation Incident	No. of Incidents	Management Action
15	Unknown	7/8/2013	No	Dog	NM	1 Injured	Confirmed Wolf	Uncollared	No		Increased monitoring
16	Unknown	7/9/2013	No	Cattle	NM	1 Killed	Confirmed Wolf	Uncollared	Yes	1	Increased sign search and monitoring for any collared wolves potentially in the area
17	Unknown	7/10/2013	No	Cattle	AZ	1 Killed	Confirmed Wolf	Uncollared	Yes	1	Increased sign search and monitoring for any collared wolves potentially in the area
18	Fox Mountain	7/14/2013	Yes	Cattle	NM	2 Killed	Confirmed Wolf	Fox Mountain	Yes	3	Increased monitoring
19	Paradise	7/31/2013	No	Cattle	AZ	1 Killed	Confirmed Wolf	Paradise	Yes	2	Increased monitoring
20	Tsay-O-Ah	8/2/2013	No	Cattle	AZ	1 Killed/ 1 Injured	Confirmed Wolf	Tsay-O-Ah	Yes	1	Increased monitoring
21	Fox Mountain	8/6/2013	No	Cattle	NM	1 Injured	Confirmed Wolf	One collared member of Fox Mountain pack	Yes	4	Removal order issued
22	Paradise	8/19/2013	No	Cattle	AZ	1 Killed	Confirmed Wolf	Paradise	Yes	3	Increased monitoring
23	Unknown	8/22/2013	No	Dog	NM	1 Killed	Confirmed Wolf	Uncollared	No		Increased monitoring
24	Unknown	8/26/2013	No	Cattle	AZ	1 Killed	Confirmed Wolf	Uncollared	Yes	1	Increased sign search and monitoring for any collared wolves potentially in the area
26	Paradise	8/27/2013	No	Cattle	AZ	1 Killed	Confirmed Wolf	Paradise	Yes	4	Removal order issued
25	Unknown	8/27/2013	No	Cattle	AZ	1 Killed	Confirmed Wolf	Uncollared	Yes	1	Increased sign search and monitoring for any collared wolves potentially in the area
27	Unknown	8/28/2013	No	Cattle	AZ	1 Killed	Confirmed Wolf	Uncollared	Yes	1	Increased sign search and monitoring for any collared wolves potentially in the area
28	m1277	10/23/2013	No	Cattle	NM	1 Killed	Confirmed Wolf	M1277	Yes	1	Increased monitoring
29	Unknown	11/13/2013	No	Cattle	NM	1 Injured	Probable	Uncollared	No		Increased sign search in area

Table 7. Continued.

	Wolves in Area	Investigation Date	Located By IFT	Species	State	# Killed/ # Injured	Call	Wolves Responsible	Depredation Incident	No. of Incidents	Management Action
30	Bluestem	11/15/2013	Yes	Cattle	AZ	1 Killed	Confirmed Wolf	Bluestem (except F1280 and fp1332)	Yes	1	Increased monitoring

^a No depredation incident was assigned. Livestock was killed within the same 24 hour period as the preceding entry.

Table 8. Mexican wolves captured in Arizona and New Mexico from January 1 – December 31, 2013.

	Pack	Wolf ID	Capture Date	Reason for Capture
1	Rim	AF858	January 21	Helicopter capture, removed from the wild in accordance with USFWS Removal Order.
2	Bluestem	fp1289	January 21	Helicopter capture. Routine monitoring purposes. Captured, collared and released on site.
3	Maverick	mp1290	January 22	Helicopter capture. Routine monitoring purposes. Captured, collared and released on site.
4	Maverick	AF1291	January 22	Helicopter capture. Routine monitoring purposes. Captured, collared and released on site.
5	San Mateo	fp1292	January 23	Helicopter capture. Routine monitoring purposes. Captured, collared and released on site.
6	Dark Canyon	m1293	January 24	Helicopter capture. Routine monitoring purposes. Captured, collared and released on site.
7	Willow Springs	AM1185	January 24	Helicopter capture. Routine monitoring purposes. Captured, re-collared and released on site.
8	Elkhorn	f1294	January 25	Helicopter capture. Routine monitoring purposes. Captured, collared and released on site.
9	Paradise	AM1056	January 25	Helicopter capture. Routine monitoring purposes. Captured, re-collared and released on site.
10	Bluestem	AF1042	January 25	Helicopter capture. Routine monitoring purposes. Captured, re-collared and released on site.
11	Fox Mountain	AM1158	January 25	Helicopter capture. Routine monitoring purposes. Captured, re-collared and released on site.
12	Single	M1133	January 29	Helicopter capture. Capture for nuisance behavior and transport to Sevilleta Wolf Management Facility in NM.
13	Canyon Creek	AF1246	January 31	Helicopter capture. Routine monitoring purposes. Captured, re-collared and released on site.
14	Luna	AF1115	February 1	Helicopter capture. Routine monitoring purposes. Captured, re-collared and released on site.
15	Fox Mountain	fp1295	March 28	Routine coyote trapping by Wildlife Services. Captured, collared and released on site.
16	Unknown	m1296	April 21	Private trapper captured uncollared wolf. IFT responded, collared, and released the wolf within the BRWRA. IFT responded, collared, and translocated the wolf for being outside of the BRWRA boundary.
17	Halfmoon	AM1133	May 11	Recaptured for being outside of the BRWRA boundary. Removed to captivity.
18	Rim	f1305	June 3	Routine monitoring purposes. Captured, collared and released on site.
19	San Mateo	f1327	June 21	Routine monitoring purposes. Captured, collared and released on site.

	Pack	Wolf ID	Capture Date	Reason for Capture
20	Bluestem	f1289	August 18	Routine monitoring purposes. Re-captured, but died during processing.
21	Willow Springs	mp1329	August 23	Routine monitoring purposes. Captured, collared and released on site.
22	Bluestem	m1275	August 28	Routine monitoring purposes. Captured, re-collared and released on site.
23	Bluestem	mp1330	September 5	Routine monitoring purposes. Captured, collared and released on site.
24	Bluestem	mp1331	September 6	Routine monitoring purposes. Captured, collared and released on site.
25	Bluestem	fp1332	September 6	Routine monitoring purposes. Captured, collared and released on site.
26	Bluestem	fp1333	September 8	Routine monitoring purposes. Captured, collared and released on site.
27	Willow Springs	mp1329	September 10	Routine monitoring purposes. Captured and released on site.
28	Fox Mountain	AF1212	September 15	Routine monitoring purposes. Captured and released on site.
29	Maverick	f1335	October 12	Helicopter capture. Routine monitoring purposes. Captured, collared and released on site.
30	Paradise	AM795	October 22	Helicopter capture. Captured and removed from the wild in accordance with USFWS Removal Order.
31	Maverick	mp1336	October 22	Helicopter capture. Routine monitoring purposes. Captured, collared and released on site.
32	Paradise	M1249	October 23	Helicopter capture. Routine monitoring purposes. Captured, re-collared and released on site.
33	Dark Canyon	AF923	November 20	Helicopter capture. Routine monitoring purposes. Captured, re-collared and released on site.
34	Single	M1240	November 20	Helicopter capture. Routine monitoring purposes. Captured, re-collared and released on site.
35	Fox Mountain	m1274	November 21	Helicopter capture. Captured and removed from the wild in accordance with USFWS Removal Order.
36	San Mateo	AF903	November 21	Helicopter capture. Routine monitoring purposes. Captured, re-collared and released on site.
37	San Mateo	AM1157	November 21	Helicopter capture. Routine monitoring purposes. Captured, re-collared and released on site.
38	Single	m1277	December 21	Private trapper captured m1277.
39	Luna	m1337	December 28	Private trapper captured uncollared wolf. IFT responded, collared, and released the wolf on site.

Table 9. IFT management actions resulting from reported cases of potential Mexican wolf nuisance activities in Arizona and New Mexico during 2013.

Date	Wolf ID	General Location	Type of Activity	IFT Response	Management Result
January 18	San Mateo	South of Quemado, NM	Pack was harassing cows on private land	Immediately investigated report, and found lots of wolf tracks near cattle, then elk carcass farther away	Pack was already moving away. Did not return to area.
January 29	Fox Mountain	Near Luna, NM	Three wolves passed near a residence.	IFT responded to call, and located 3 Fox Mountain wolves.	Pack moved several miles away.
January 30	N/A	White Mountain Lake, AZ	Animal bothering hounds near residences. Report of animal shot. Later returned on 2/4.	IFT responded and found large canine tracks with blood going away. On 2/4 they attempted to dart animal.	Animal was not a Mexican wolf, but was likely a northern wolf-dog hybrid. The County set traps for the animal
February 6	N/A	Reserve, NM	Report of an uncollared wolf near residences.	IFT personnel investigated and determined that the animal was not Mex. Wolf, but likely northern wolf-dog hybrid.	N/A
February 20	Unknown	Pinedale, AZ	Report of 2 collared wolves near a residence.	IFT investigated, and found wolf-sized tracks, but no radio telemetry signals for several days. Put up a trail camera on an elk carcass nearby.	No wolves were documented on the trail camera, and there were no more reports.
March 5	N/A	Snowflake, AZ	Reports of a wolf in Snowflake.	IFT trapped and removed a wolf-dog hybrid and turned it over to Navajo Co. Animal Control.	Genetics testing revealed animal to be a gray wolf-domestic dog hybrid. No Mexican wolf DNA was present in animal.
April 5	San Mateo	Sand Flats, NM	Report of 2 wolves near a residence, concern that they might attack a domestic dog.	IFT responded and confirmed that wolves from San Mateo pack had been in area.	Wolves moved off, and no additional reports.
July 1	f1295	Bill Knight Gap, NM	Report of a wolf in close proximity to a human exhibiting potential lack of fear of humans, in National Forest	IFT responded, observed wolf, moved away from IFT	Wolf moved away from IFT and no additional reports
July 5	Unknown	Mangas, NM	Rancher reported dog was attacked by a wolf while they were rounding up livestock	IFT investigated area, and investigated. Confirmed that wolf attacked the dog.	Wolves hazed from area.
August 10	Bluestem	Arizona	Pack interacted with Bear dogs – no injuries	No investigation needed.	No Response
August 22	Unknown	Aragon, NM	Report of a wolf attacking a dog.	IFT investigated and confirmed that the attacker had been a wolf.	Wolf had left area so no actions were taken.

Table 10. IFT proactive management activities in Arizona and New Mexico during 2013.

Proactive Management Activity	Purpose	Date	Location	Wolf ID	Management Result
Hay and supplements	Reduce livestock depredations.	Calving season	Reserve, NM	Fox Mountain	No known depredations
Hay and Supplements	Reduce livestock depredations.	Calving Season	Blue River, AZ	Uncollared Wolves	No confirmed depredations
Supplements	Reduce livestock depredations.	Calving Season	Springerville, AZ	Hawks Nest	No known depredations
Water and Feed	Use alternate Allotment to reduce problems	Yearlong	Glenwood, NM	Dark Canyon	No known depredations
Range Rider	Reduce predator depredations on free-ranging livestock.	4 months	Big Lake, AZ	Hawks Nest	No known depredations
Range Rider	Reduce predator depredations on free-ranging livestock.	3 months	Springerville AZ	Paradise	One confirmed depredation
Range Rider	Reduce predator depredations on free-ranging livestock.	5 months	Blue River, AZ	Bluestem	No known depredations
Range Rider	Reduce predator depredations on free-ranging livestock.	5 months	Springerville, AZ	Paradise, Uncollared	Six confirmed depredations
Range Rider	Reduce predator depredations on free-ranging livestock.	4 months	Greens Peak, AZ	Paradise, Uncollared wolves	1 depredation
Range Rider	Reduce predator depredations on free-ranging livestock.	5 months	Reserve, NM	Fox Mountain	4 confirmed depredations
Range Rider	Reduce predator depredations on free-ranging livestock	5 months	Apache Creek, NM	San Mateo	No known depredations
Range Rider	Reduce predator depredations on free-ranging livestock.	2 months	Quemado, NM	Fox Mountain, Elk Horn	No known depredation
Range Rider	Reduce predator depredations on free-ranging livestock.	5 months	Reserve, NM	Luna	No known depredations
Range Rider	Reduce predator depredations on free-ranging livestock	5 months	Govina, NM	Willow Springs	No known depredations
Range Rider	Reduce predator depredations on free-ranging livestock.	4 months	Strayhorse, AZ	Uncollared wolves	No known depredations
Range Rider	Reduce predator depredations on free-ranging livestock	3 months	San Carlos, AZ	Uncollared wolves	No known depredations

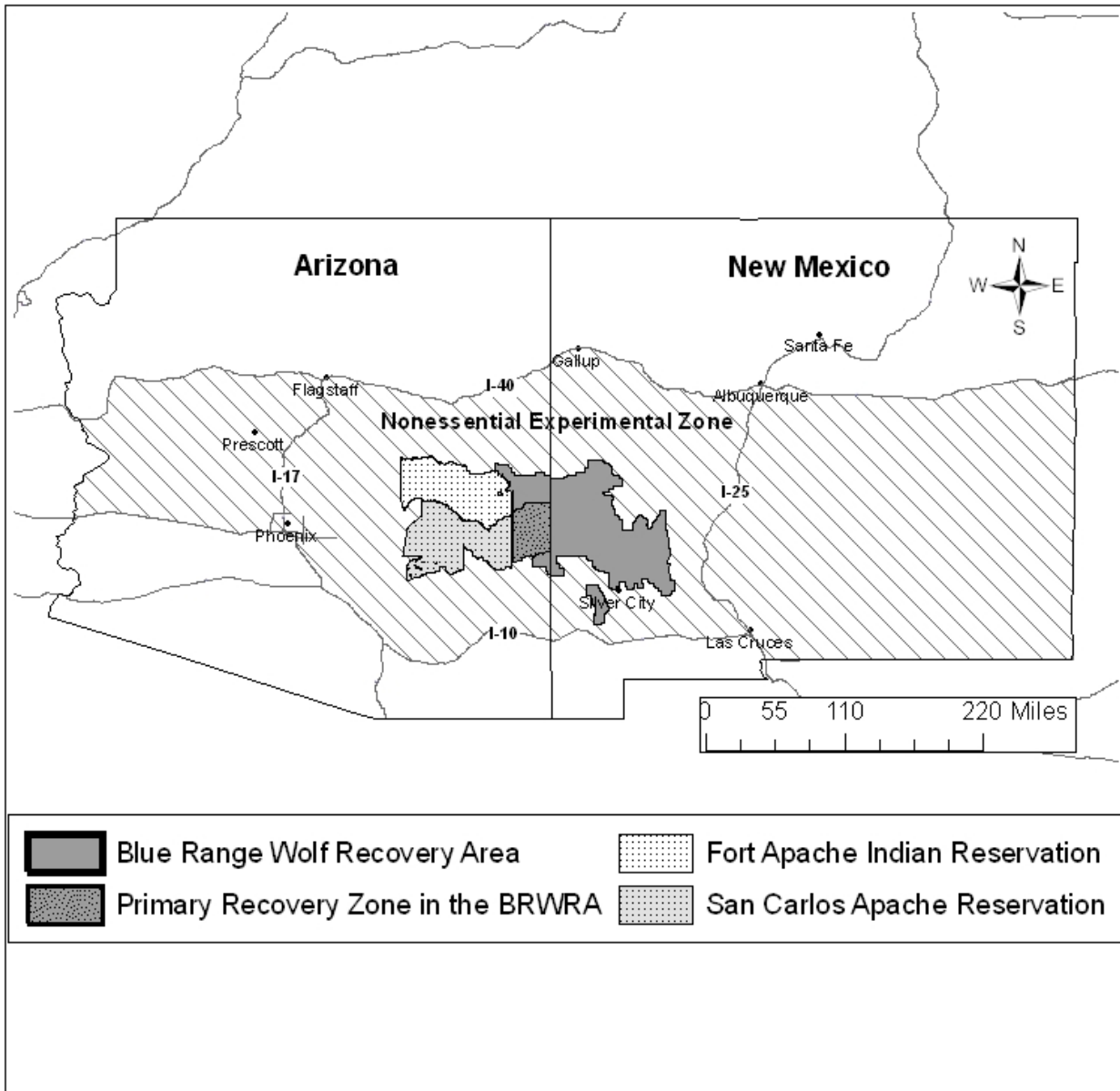


Figure 1. The Blue Range Wolf Recovery Area and Mexican wolf nonessential experimental zone (cross-hatched area) in Arizona and New Mexico.

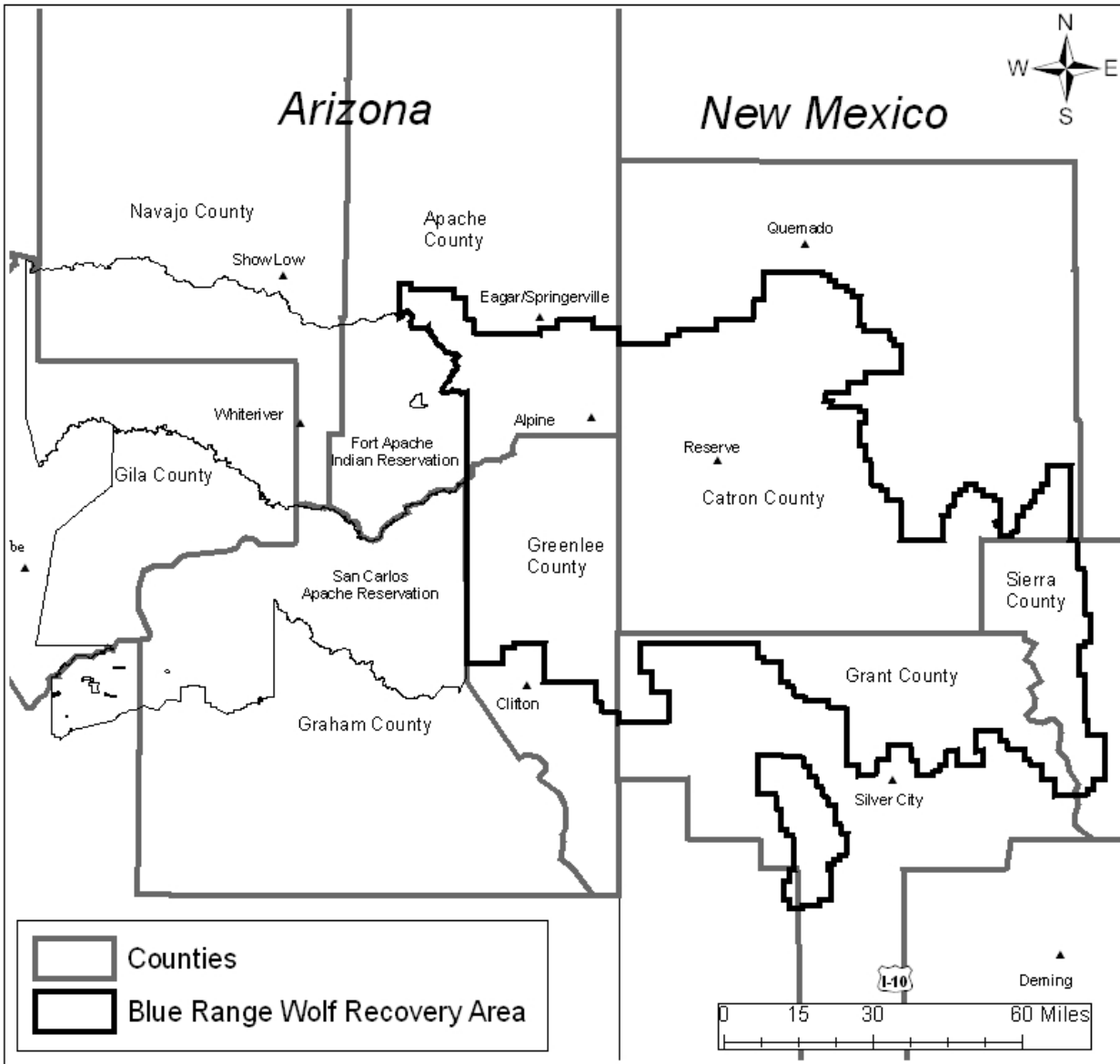


Figure 2. Counties that occur in or adjacent to the Blue Range Wolf Recovery Area in Arizona and New Mexico.

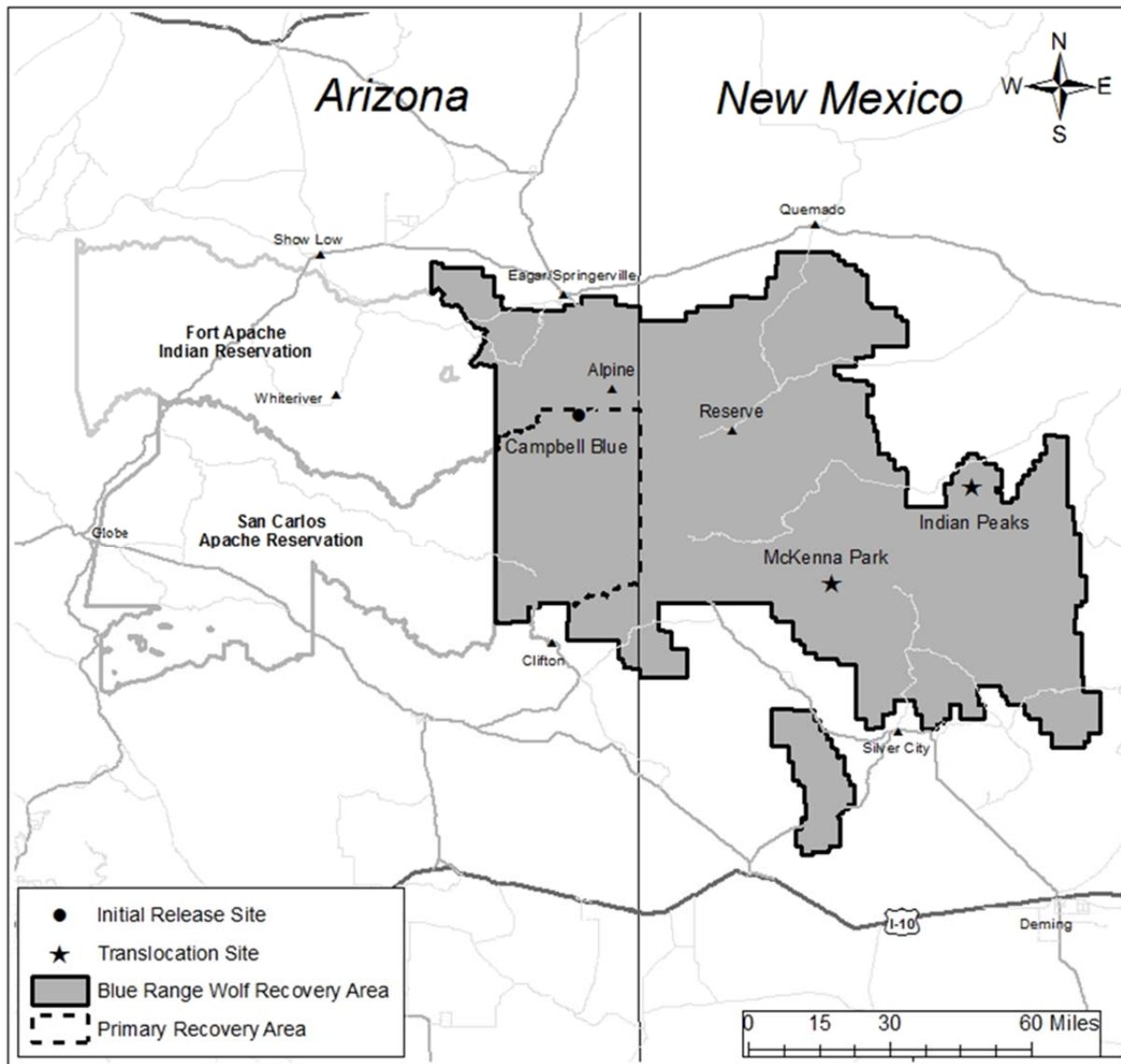


Figure 3. Two translocation sites and one initial release site were used during 2013 in Arizona and New Mexico within the Blue Range Wolf Recovery Area.

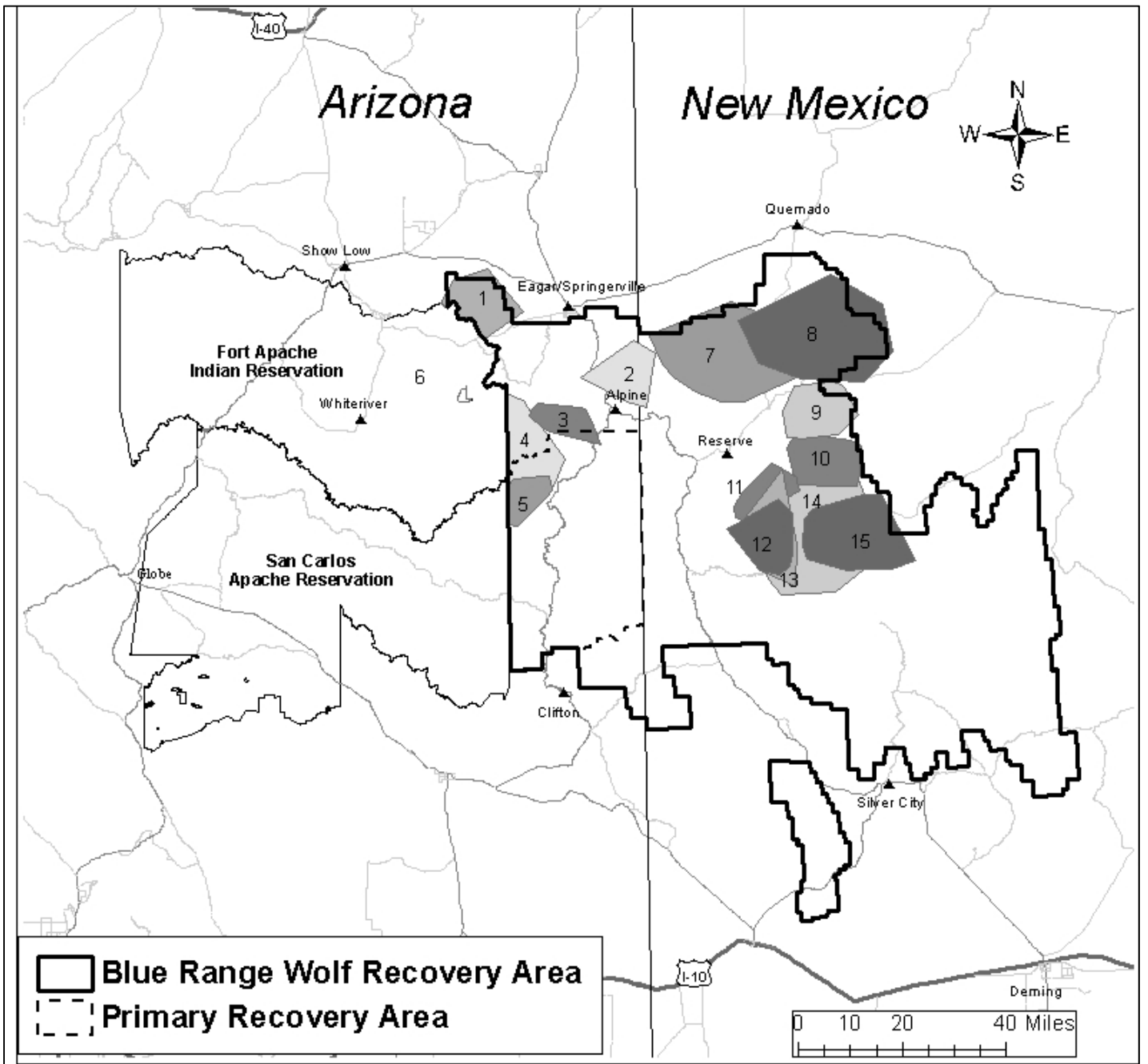


Figure 4. Mexican wolf home ranges for 2013 in Arizona and New Mexico. The shaded polygons and corresponding numbers on the map represent wolves having >20 independent radio locations and exhibiting movement characteristics consistent with a home range during 2013. See the following page for information regarding the wolf packs and home ranges.

Figure 4. Continued.

Map Number	Wolf Pack	Number of Wolves	Wolf Fate at the End of 2013	Breeding Pair Status	Home Range Size (mi ²)
1	Paradise	2	Free-ranging	No	169
2	Elk Horn	2	Free-ranging	No	102
3	Bluestem	10	Free-ranging	Yes	65
4	Maverick	6	Free-ranging	No	351
5	Rim	2	Free-ranging	No	70
6	Tsay-O-Ah	N/A ^a	Free-ranging	No	186
7	Fox Mountain	7	Free-ranging	Yes	426
8	San Mateo	6	Free-ranging	No	416
9	Willow Springs	5	Free-ranging	Yes	124
10	Luna	8	Free-ranging	Yes	123
11	Prieto	2	Free-ranging	No	76
12	Dark Canyon	5	Free-ranging	Yes	117
13	Single M1244	1	Free-ranging	No	148
14	Single M1240	1	Free-ranging	No	457
15	Canyon Creek	2	Free-ranging	No	234

^a Wolf information (including numbers) on the Fort Apache Indian Reservation is not displayed at the tribe's request.

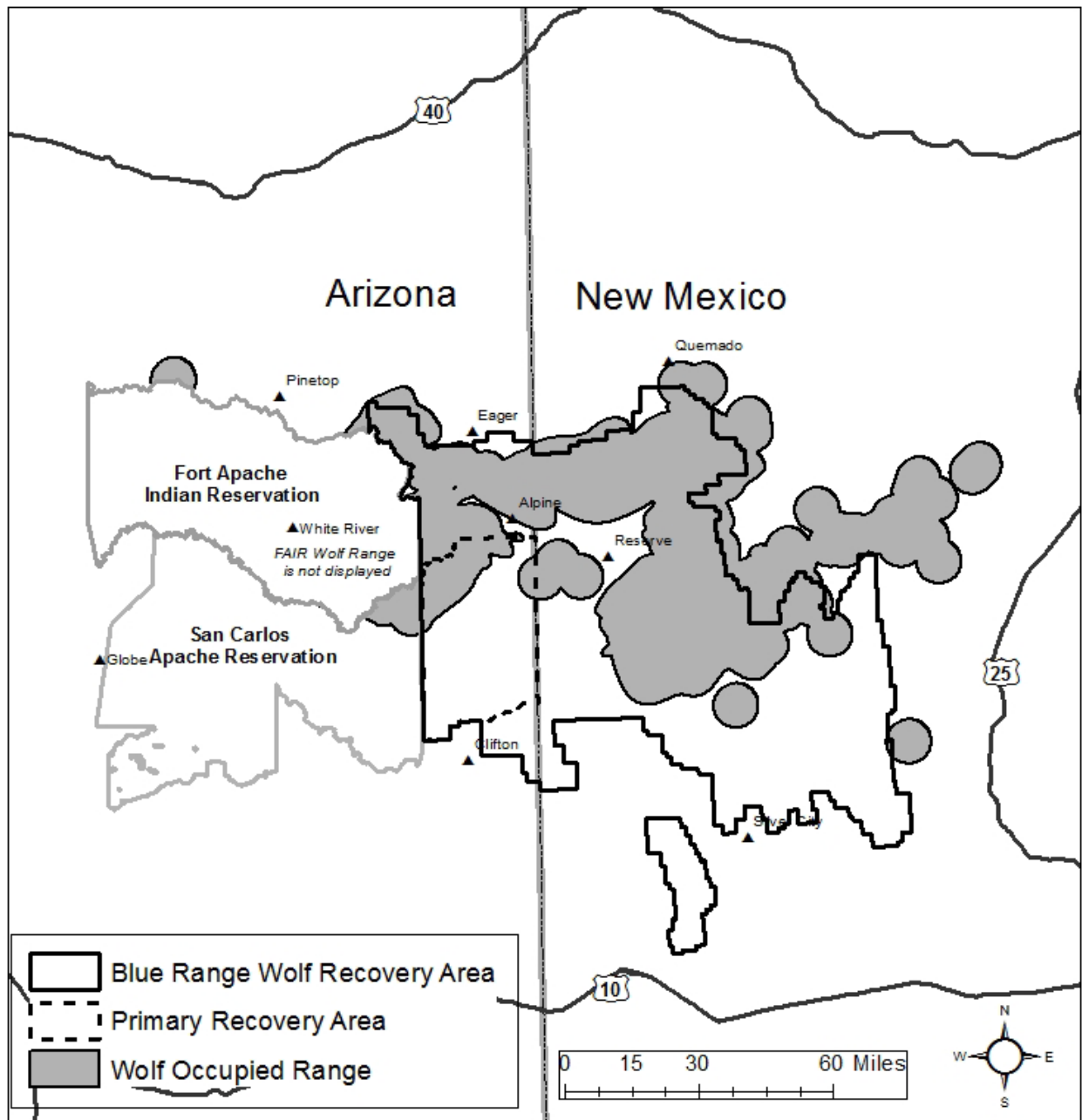


Figure 5. Mexican wolf occupied range in Arizona and New Mexico (2013) within the Mexican Wolf Nonessential Experimental Zone as defined in the Final Rule (USFWS 1998).

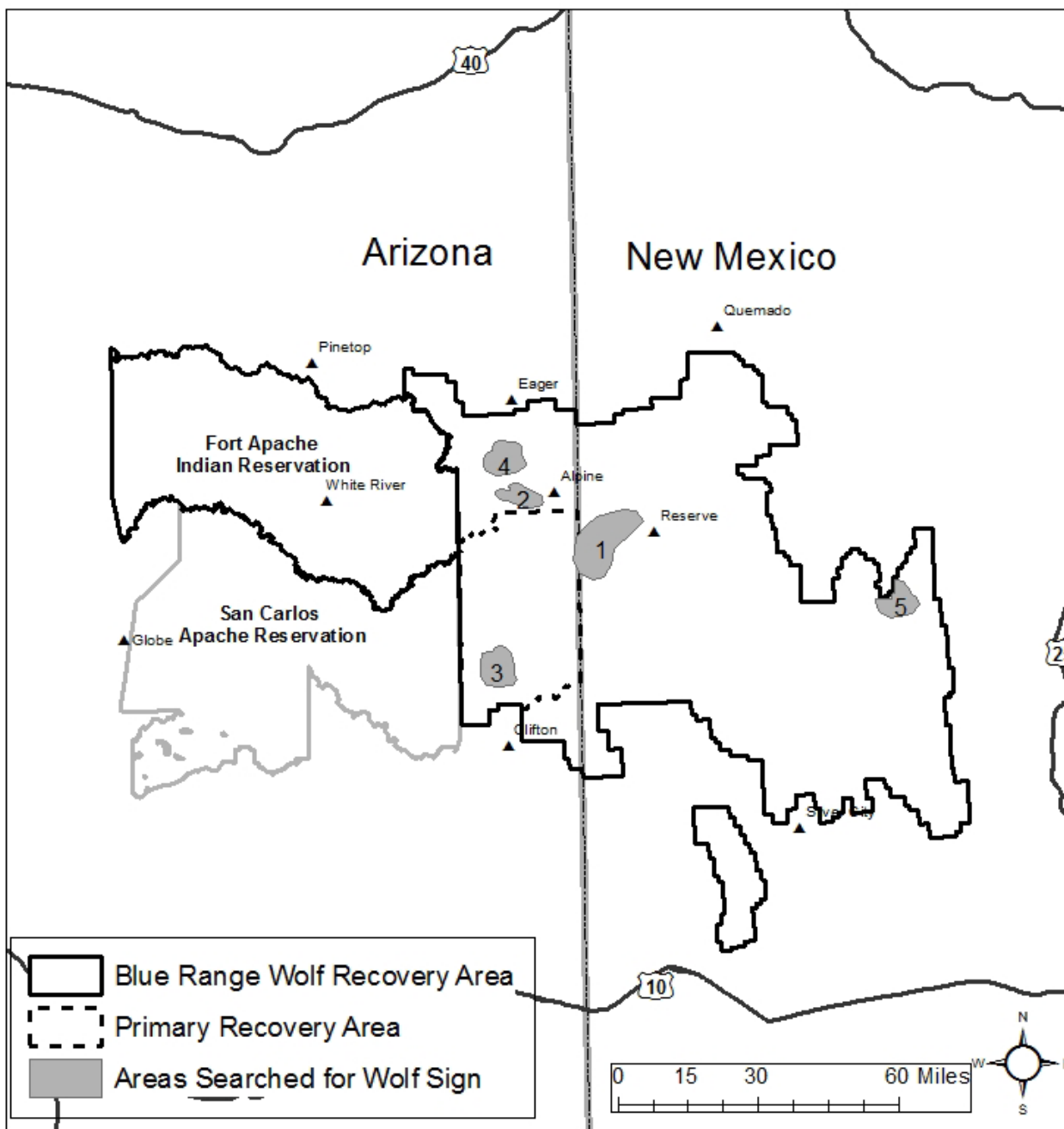


Figure 6. Areas searched and corresponding miles searched (driven or hiked) for uncollared wolf sign in Arizona and New Mexico during 2013. Search areas correspond to “map numbers” as follows:

Map Numbers	Search Area	Miles Searched in AZ	Miles Search in NM
1	San Francisco Mountains	136	160
2	Coyote Creek	122	0
3	4 Bar Mesa	60	0
4	OD Ridge	360	0
5	Beaverhead	0	60
	Total	678	220
	Grand Total for AZ and NM	898	

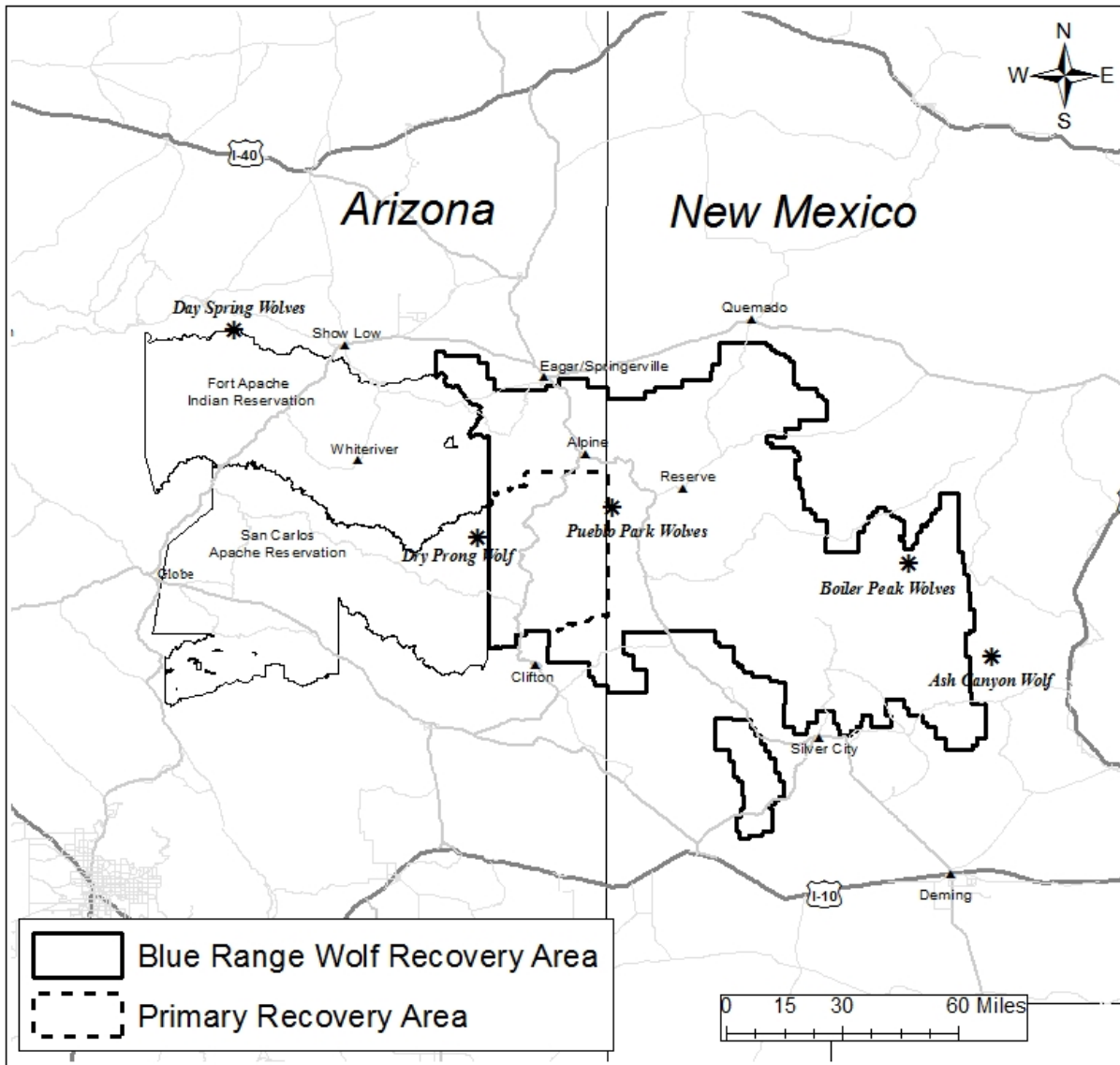


Figure 7. Uncollared wolves documented and counted in the 2013 wolf population in Arizona and New Mexico.

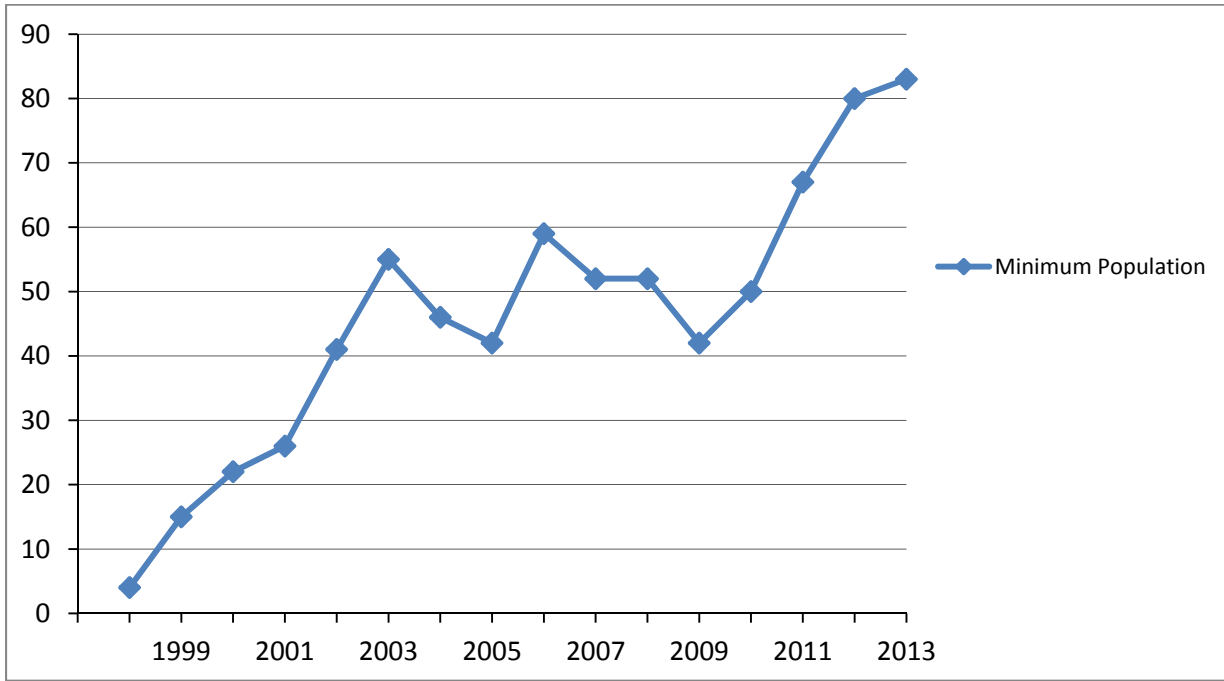


Figure 8. Mexican wolf minimum population estimates from 1998 through 2013 in Arizona and New Mexico.

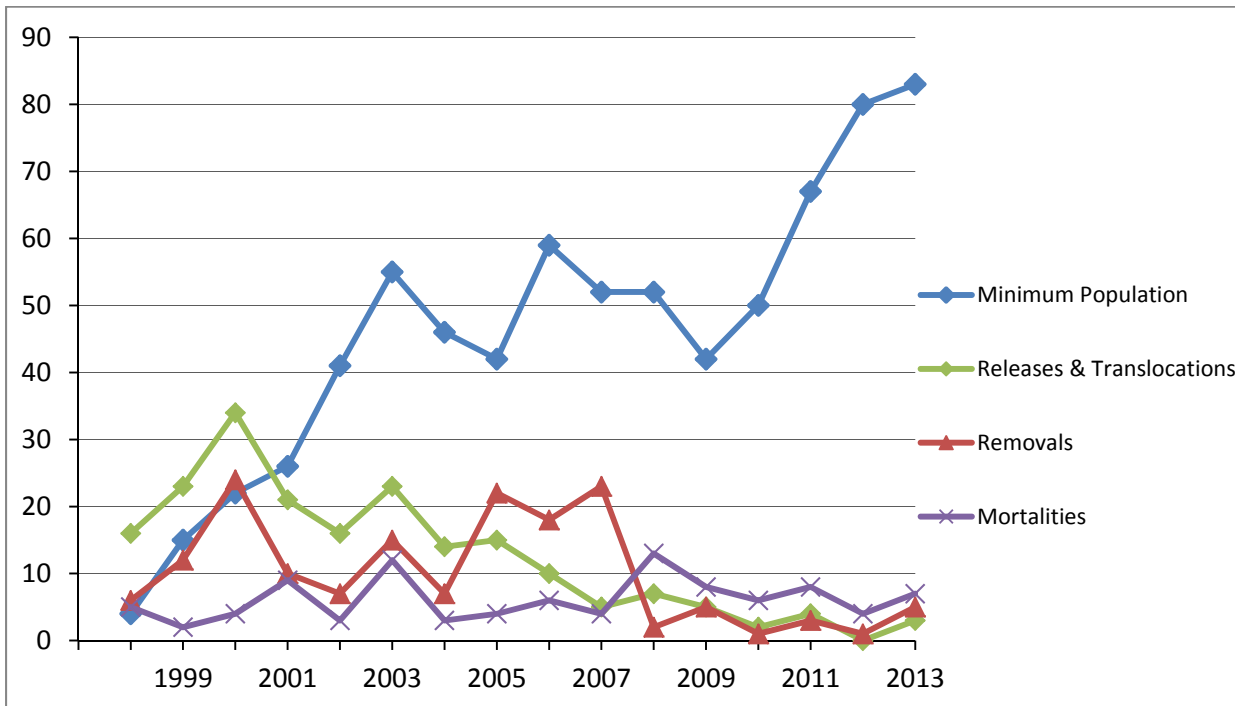


Figure 9. Mexican wolf minimum population estimates and associated population parameters (1998-2013). Releases and translocations included: initial releases (wolves released with no wild experience), translocations (wolves re-released from captivity back into the wild, and free-ranging wolves that were captured and re-released back into the wild for management purposes such as but not limited to boundary issues without having been placed temporarily into captivity). Removals included: wolves permanently removed from the wild (including wolves lethally controlled because they are associated with management actions), wolves temporarily removed from the wild and available for future translocation, and free-ranging wolves temporarily removed for management purposes such as boundary issues but without having been placed temporarily into captivity.

Appendix A. 2013 Pack and Single Wolf Summaries

7. Pack Summaries

Bluestem pack (AF1042, M1340, m1275, f1280, mp1330, mp1331, fp1332, fp1333, fp1339, fp1340)

In January, the Bluestem pack consisted of seven wolves (AF1042, mp1275, mp1277, fp1280, fp1289, one uncollared yearling and one uncollared pup of the year). Prior to helicopter operations in January, a captive wolf (M1133) was released within close proximity to the Bluestem pack's recent location in an attempt to pair the animal with AF1042. M1133 briefly remained in Bluestem territory after being released; however, M1133 did not associate with the pack and dispersed to New Mexico where it was eventually removed for nuisance behavior. Throughout 2013, Bluestem utilized their traditional territory in the central portion of the ASNF. In late April, the IFT located a den associated with AF1042 and was able to confirm the production of 3-5 pups. Following confirmation of pup production, the IFT established a food cache for the Bluestem pack to identify the male with AF1042 and localize the pack to reduce conflict on adjacent cattle pastures. The IFT was able to confirm the presence of an uncollared wolf with the Bluestem pack at the food cache in early May. The food cache was maintained through early August when the pack moved to a different area within their territory. In mid-July, m1277 dispersed from the pack and entered New Mexico. On August 18, f1289 was trapped by the IFT while attempting to trap for uncollared pups; f1289 died of unknown capture related causes. On August 28, m1275 was trapped and equipped with a new radio-collar. On September 5, a pup was trapped, collared and assigned studbook number mp1330. On September 6, two pups were trapped, collared and assigned studbook numbers mp1331 and fp1332. On September 8, a pup was trapped, collared and assigned studbook number fp1333. Throughout the fall, the IFT documented the presence of 10 animals within the pack, including three uncollared animals. On November 15, a depredation was confirmed and assigned to AF1042 and m1275. On January 21, during the annual population count, three uncollared wolves were captured, collared and assigned studbook numbers fp1339, fp1340 and M1341. It is unknown at this time if M1341 is the alpha male of the Bluestem pack. As of January, 2014, the Bluestem pack consisted of 10 animals (AF1042, M1340, m1275, mp1330, mp1331, fp1332, fp1333, fp1339, fp1340 and 1 uncollared wolf). Per the definition of the final rule Bluestem is a breeding pair in 2013. The Bluestem pack had one confirmed depredation, no removals, no translocations, and one associated initial wolf release in 2013.

Canyon Creek pack (AF1246, AM1248, AM1252)

In January, AM1248 was considered fate unknown and M1252 was considered part of the Canyon Creek pack; the IFT had not located AM1248 for three months and M1252 had been located with F1246 for three months. The IFT did not document denning behavior in this pack; however, during the January 2014 annual population count the IFT documented a pup traveling with AF1246 and AM1252. As of December 31, the Canyon Creek pack consisted of AF1246, AM1252, and an uncollared pup; therefore, this pack was not considered a "Breeding Pair" in 2013, per the definition in the Final Rule. The Canyon Creek pack had no confirmed depredations, removals, translocations, or documented mortalities in 2013.

Dark Canyon pack (AF923, AM992, M1293)

In January, the Dark Canyon pack consisted of AM992, AF923, m1293, and fp1278. Throughout the year, the IFT located the Dark Canyon pack within its traditional territory in the west-central portion of the GNF. In late-April, the IFT documented denning behavior in the Dark Canyon pack. On June 3, the IFT documented the production of at least 4 pups. From late-April through the remainder of 2013, f1278 was typically, but not always located with single dispersing wolf m1244; occasionally f1278 located with its natal pack. In October, f1278 was considered a single dispersing wolf. On November 20, AF923 was captured and recollared. On December 7, the IFT documented 5 sets of tracks with the Dark Canyon pack; AM992, AF923, m1293 and 2 uncollared pups. As of December 31, the Dark Canyon pack consisted of five animals, AM992, AF923, m1293

and two uncollared pups; therefore, this pack was considered a “Breeding Pair” in 2013, per the definition in the Final Rule. The Dark Canyon pack had no confirmed depredations, removals, translocations, or documented mortalities in 2013.

Elk Horn pack (AM1287, f1294)

In January, the Elk Horn pack consisted of AM1287 and f1294. Throughout the year the IFT documented the Elk Horn pack in the northeastern portion of the ASNF in Arizona and the northwestern portion of the GNF in New Mexico. The IFT did not document any denning behavior with the Elk Horn pack in 2013. On January 21, 2014, during the annual population count, f1294 was captured and recollared. As of January, 2014, the Elk Horn pack consists of AM1287 and f1294. Because the IFT did not document any pup production the Elk Horn pack was not considered a “Breeding Pair” in 2013, per the definition in the Final Rule (USFWS 1998). The Elk Horn pack had no confirmed depredations, removals, translocations or documented mortalities in 2013.

Fox Mountain pack (AM1158, F1212, M1276)

In January, the Fox Mountain pack consisted of AM1158, m1276, mp1274, fp1281, three uncollared pups, and AF1212 of the Elk Horn pack was also documented with the Fox Mountain pack. Throughout the year, the IFT located the Fox Mountain pack within the northeastern portion of the ASNF in New Mexico. In March, after being consistently located with the pack for three months, AF1212 was considered a member of the Fox Mountain pack. On March 28, Wildlife Services incidentally captured an uncollared female pup while trapping for coyotes; it was processed, collared and assigned studbook number fp1295. On April 6, a dead cow was investigated and a depredation was assigned to AM1158 and at least one other wolf, either M1276 or AF1212. In early-April, the IFT established two food caches in response to a depredation and to reduce the potential for additional depredations during denning. In mid-April, the IFT documented denning behavior in the Fox Mountain pack. On April 24, a dead calf was investigated and a depredation was assigned to an uncollared yearling of the Fox Mountain pack; an uncollared wolf was seen leaving the carcass. In response to the April 24 depredation, the IFT discontinued the original two food caches (Fox Mountain never located the original caches) after the establishment of a different diversionary food cache closer to the den site. In early-May, the IFT documented that the Fox Mountain pack moved to a secondary den. On May 2, two dead calves were investigated and a depredation was assigned to M1276. On May 5, remote cameras revealed two uncollared yearling wolves with the Fox Mountain pack. In July, f1295 was involved in nuisance behavior; the IFT investigated and assessed its response to human presence and its behavior appeared normal. On July 14, two dead calves were investigated and a depredation was assigned to at least two wolves; either AM1158, AF1212, M1276 or m1274. On July 18 and 30, the IFT documented a minimum of four pups with the Fox Mountain pack via remote cameras. On August 6, an injured calf that was later euthanized due to the extent of the injuries sustained was investigated and a depredation was assigned to a member of the Fox Mountain pack. On August 11, remote cameras revealed five pups with the Fox Mountain pack. In September, f1295 and f1281 were considered single dispersing wolves. On September 15, AF1212 was captured, revaccinated and released. By November, remote cameras suggested only two pups had survived. Beginning in October, the IFT documented the Fox Mountain pack making movements into the San Mateo pack territory and often located in proximity to the San Mateo pack; this was documented throughout the remainder of 2013. In November, the IFT documented 8 individuals (AM1158, AF1212, M1276, m1274 and four uncollared wolves) in the Fox Mountain pack via track counts and telemetry. On November 21, m1274 was captured and removed to captivity; completing the USFWS removal order for multiple depredations in a 365 day period. As of December 31, the Fox Mountain pack consisted of seven animals (AM1158, AF1212, m1276, two uncollared yearlings, and two uncollared pups); therefore, the Fox Mountain pack was considered a Breeding Pair in 2013, per the definition in the Final Rule. The Fox Mountain pack had no translocations or documented mortalities in 2013.

Halfmoon pack (AM1133, AF1108)

On April 27, the IFT placed AM1133 and AF1108 (pregnant at time of release) in a soft release mesh pen at the McKenna release-site in the Gila Wilderness. On May 3, the Halfmoon pack self-released from the pen. AM1133 was documented traveling away from the release-site to the east. AF1108 remained near the release-site and began displaying denning behavior. AM1133 was documented traveling outside the BRWRA and not making movements suggesting a possible return to the BRWRA; thus, the IFT initiated efforts to capture AM1133. On May 11, a dead calf was investigated and a depredation was assigned to AM1133; AM1133 was captured that evening and removed to captivity for boundary issues. AF1108 displayed behavior consistent with denning until late-June when it traveled to the Aldo Leopold Wilderness. On June 25, AF1108 was legally shot in the act of biting livestock on private property.

Hawks Nest pack (AM1038, F1280)

In January, the Hawks Nest pack consisted of a single wolf, AM1038, with a non-functioning radio collar. This wolf continued to occupy traditional Hawks Nest territory throughout 2013. Regular monitoring during the spring showed that AM1038 was alone and therefore did not suggest any reproduction within the Hawks Nest territory. On November 26, the IFT documented AM1038 traveling with Bluestem yearling f1280. The pair continued to associate with one-another through the end of 2013. During helicopter operations on January 20, 2014, AM1038 was captured, recollared and released on the ASNF. As of January, 2014, the Hawks Nest pack consisted of AM1038 and f1280. The Hawks Nest pack had no confirmed depredations, removals, translocations, or documented mortalities in 2013.

Luna pack (AM1155, AF1115, m1284, m1285, m1286, m1337)

Throughout the year, the IFT located the Luna pack within its traditional territory in the north-central portion of the GNF. In January, the Luna pack consisted of AF1115, AM1155, mp1284, mp1285, mp1286, an uncollared yearling, and an uncollared pup. On February 1, during the 2012 annual population count, AF1115 was captured and recollared. In April, the IFT received a report of an injured wolf in the Luna pack territory. The IFT made efforts to determine if a Luna wolf was injured, but was unable to identify an injured animal. In late-April, the IFT documented denning behavior in the Luna pack and the production of six pups. On April 25, the IFT located tracks of Luna pack members, including pup tracks. In October, m1284, m1285, and m1286 began displaying dispersal behavior but were occasionally located with the alpha pair. On November 12, remote cameras revealed two pups; indicating at least two pups had survived. On November 20, the IFT observed three uncollared wolves with AM1155 and AF1115. On December 28, a private trapper incidentally captured an uncollared yearling wolf; it was processed, collared and assigned studbook number m1337. As of December 31, the Luna pack consisted of eight animals (AF1115, AM1155, m1284, m1285, m1286, m1337 and two uncollared pups); therefore, this pack was considered a "Breeding Pair" in 2013, per the definition in the Final Rule. The Luna pack had no confirmed depredations, removals, translocations, or documented mortalities in 2013.

Maverick pack (AM1183, AF1291, m1290, f1335, mp1336, m1342)

In January, the Maverick pack consisted of five wolves (AM1183, AF1291, mp1290, one uncollared adult and one uncollared pup). Throughout 2013 the Maverick pack was located within their traditional territory on the FAIR as well as the central portion of the ASNF. Data collected from monitoring and management of the pack on the FAIR will be withheld from this report. Beginning in late August, the Maverick pack began occupying the ASNF with more regularity and trapping efforts were implemented to verify pup production and pack size. On October 12, a young female wolf was trapped, collared and assigned studbook number f1335. On October 22, during a helicopter operation, a male pup was captured, collared and assigned studbook number mp1336. During these capture operations the IFT counted 6 wolves associated with the Maverick pack and verified the production of pups in 2013. During helicopter operations on January 21, 2014, a male subadult was captured, collared and assigned studbook number m1342. Also on January 21, 2014, AM1183 was captured and

recollared. As of January, 2014, the Maverick pack consisted of 6 wolves (AM1183, AF1291, m1290, f1335, mp1336 and m1342); therefore the Maverick pack was not classified as a Breeding Pair per the Final Rule (USFWS 1998). The Maverick pack had no confirmed depredations, removals, translocations, or documented mortalities in 2013.

Middle Fork pack (AM871, AF861)

In January, the Middle Fork pack consisted of AM871, AF861 and one uncollared pup. The IFT last located the Middle Fork pack on January 31, 2013 during the 2012 annual population count. Despite extensive efforts to locate AM871 and AF861 via telemetry, tracks and remote cameras, in April, the Middle Fork pack was considered fate unknown.

Paradise pack (AM795, AF1056, M1249)

In January, the Paradise Pack consisted of AF1056 and AM795. Throughout the year, the Paradise pack occupied their traditional territory in the northern portions of the ASNF and FAIR. The IFT did not document denning behavior with the Paradise pack in 2013. On June 4, a confirmed cattle depredation was assigned to the Paradise pack. Throughout the summer, IFT personnel employed various hazing techniques to attempt to reduce livestock conflicts with wolves in allotments associated with the Paradise pack's territory. Despite this, on July 31, a confirmed cattle depredation was assigned to the Paradise pack. Confirmed cattle depredations on August 19 and August 23 were also assigned to the Paradise pack resulting in a removal order for both pack members being issued by the USFWS. Trapping and ground darting efforts were initiated to remove the animals without success. In September, the IFT documented the displacement of AM795 from the pack by M1249. On October 22, during a helicopter capture operation, AM795 was removed from the wild population. Attempts to capture AF1056 during the same operation were unsuccessful. For the remainder of 2013, AF1056 and M1249 continued to occupy the Paradise pack territory. As of December 31, the Paradise pack consisted of two animals, AF1056 and M1249; therefore, the Paradise pack was not considered a "Breeding Pair" per the definition in the Final Rule (USFWS 1998). The Paradise pack (AF1056 and AM795) had four confirmed depredations, one removal, no translocations, and no documented mortalities in 2013.

Prieto pack (AF1251)

In January f1251 was located travelling with a male uncollared wolf. In April, f1251 and the uncollared wolf were designated the Prieto pack. In early-May, the IFT documented denning behavior in this pack. On May 12 and May 14, two injured calves (one each day) were investigated and a depredation was assigned to AF1251; the injuries were within 24 hours of one-another and both calves were euthanized due to the severity of their injuries. The IFT established a food cache in response to the depredation and to reduce the potential for additional depredations during denning. Despite efforts, the IFT was unable to document pup production in the Prieto pack; however, behavior indicated that at least one pup may have survived into the summer/fall. On November 27, the IFT observed AF1251 with an uncollared wolf. As of January 2014, the Prieto pack consisted of two animals (AF1251 and an uncollared male wolf); therefore, this pack was not considered a "Breeding Pair" per the definition in the Final Rule. The Prieto pack had no removals, translocations, or documented mortalities in 2013.

Rim pack (AF858, AM1107, f1305)

In January, the Rim pack consisted of AM1107 and AF858. On January 21, during the annual count, AF858 was removed from the wild population due to a lack of pup production over several years attributed to old age, and the potential for oocyte harvesting for captive breeding operations. Throughout 2013, the IFT documented AM1107 occupying traditional Rim pack territory in the center of the ASNF. In May, the IFT documented the presence of one uncollared animal associated with AM1107. On June 3, a yearling was trapped, collared and assigned studbook number f1305. The IFT continued to document AM1107 and f1305 associating with one another throughout 2013. As of January, 2014, the Rim pack consisted of two animals, AM1107 and f1305;

therefore, this pack was not considered a “Breeding Pair” per the definition in the Final Rule (USFWS 1998). The Rim pack had no confirmed depredations, one removal, no translocations, and no documented mortalities in 2013.

San Mateo pack (AF903, AM1157, m1282, f1327)

In January, the San Mateo pack consisted of AF903, AM1157, m1249, mp1282, four uncollared pups, and one uncollared yearling. Throughout the year the San Mateo pack was located within its traditional territory in the north-central portion of the GNF. From January through summer, m1249 was displaying some dispersal behavior; but spent portions of time with its pack. On January 16, the IFT documented 5-6 sets of tracks associated with the San Mateo pack. On January 18, the IFT received a report of a sighting of ten wolves near a residence; the IFT documented tracks traveling through the rancher’s pasture and located members of the San Mateo pack approximately three miles away on an elk kill. On January 20, an uncollared pup, later assigned studbook number fp1288, was located dead and was determined to be an illegal mortality. On January 23, during the 2012 annual population count, an uncollared pup was captured, collared and assigned studbook number fp1292. On April 6, fp1292 was located dead and was determined to be an illegal mortality. The IFT did not document denning behavior in the San Mateo pack. During the spring the IFT lost contact with AF903’s radio collar. On June 27, the IFT documented seven wolves in the San Mateo pack; four collared, three uncollared. On July 1, an uncollared female wolf was captured and assigned studbook number f1327. Following its capture, the IFT often documented f1327 away from other pack members but still within the San Mateo pack territory. On October 23, M1249 was captured and recollared in Arizona; M1249 was traveling with AF1056 of the Paradise pack. Beginning in October, the Fox Mountain pack was occasionally located within the San Mateo pack territory; often in proximity to the San Mateo pack. On November 21, AM1157 and AF903 were captured and recollared; AM1157 had wounds consistent with intraspecific conflict. In December, m1282 began displaying dispersal behavior and f1327 was located traveling with single wolf M1296. As of January 2014, the San Mateo pack consisted of six animals (AF903, AM1157, m1282, f1327, and two uncollared yearlings); therefore, this pack was not considered a “Breeding Pair” per the definition in the Final Rule. The San Mateo pack had no confirmed depredations, removals, or translocations in 2013.

Tsay-O-Ah pack (AM1253, f1283, m1343)

Throughout 2013, the Tsay-O-Ah pack occupied a territory almost exclusively located on the FAIR. For this reason most management activities related to the Tsay-O-Ah pack have been withheld from this report. On August 2, a confirmed cattle depredation in the northwest portion of the ASNF was assigned to the Tsay-O-Ah pack. The IFT monitored the area following the depredation and determined that the Tsay-O-Ah pack did not return to the ASNF. At the beginning of January, 2014, the Tsay-O-Ah pack consisted of AM1253 and f1283. During January f1283 began displaying dispersal movements away from the Tsay-O-Ah pack, traveling separately from AM1253. On January 22, 2014 the IFT caught and collared a wolf associated with f1283. The wolf was designated M1343 and released on site. The Tsay-O-Ah pack had one confirmed depredation, no removals, translocations, or documented mortalities in 2013.

Willow Springs pack (AM1185, AF1279, mp1329, mp1338)

In January, the Willow Springs pack consisted of AM1185 and AF1279. Throughout the year the Willow Springs pack was located in the north-central portion of the GNF. On January 8, a remote camera revealed both AM1185 and AF1279; AM1185’s radio collar had malfunctioned. On January 24, AM1185 was captured and recollared. In mid-April, the IFT documented denning behavior in the Willow Springs pack. In mid-May, the IFT documented five pups with the Willow Springs pack. On June 26, the IFT documented pup tracks with adult tracks. On August 7, the IFT documented six pups with the Willow Springs pack. On August 23, an uncollared male pup was captured, collared and assigned studbook number mp1329. Following its capture, the IFT only rarely located mp1329 with the alpha animals; it was typically documented travelling alone or with other uncollared pups of the year. On September 10, mp1329 was captured, revaccinated and released. As of

December 31, the Willow Springs pack consisted of AM1185, AF1279, mp1329, mp1338 (uncollared at the end of 2013) and one uncollared pup; therefore, the Willow Springs pack was considered a “Breeding Pair” in 2013 per the Final Rule definition. The Willow Springs pack had no confirmed depredations, removals, translocations, or documented mortalities in 2013.

8. Individual Wolf Summaries

M1133

In early-January, M1133 was released in the Campbell Blue near the Bluestem pack in an attempt to facilitate a pair-bond with AF1042. The IFT documented M1133 in close proximity to members of the Bluestem pack, however, M1133 was not accepted into the pack. M1133 moved east into New Mexico. By the end of January, M1133 was located south of Reserve along the San Francisco River. On January 29, M1133 was captured and returned to captivity for nuisance behavior. In April 2013, AM1133 was translocated as part of the Halfmoon pack.

M1240

During 2013, M1240 was located traveling widely throughout the BRWRA; mostly within New Mexico. On November 20, M1240 was captured and recollared. On occasion, M1240 was located with or near f1278.

M1243

From January to April, m1243 was located traveling throughout the BRWRA in New Mexico. On June 17, M1243 had not been located for three months and was considered fate-unknown.

M1244

During 2013 M1244, originally of the Hawks Nest pack, was displaying dispersal behavior and was often located in New Mexico. On April 18, M1244 was located with f1278 of the Dark Canyon pack. For most of 2013, M1244 was located with f1278; however, f1278 occasionally was located either alone or with its natal pack.

m1245

From January to March, m1245 was located traveling alone throughout the BRWRA in New Mexico. On March 7, m1245 was located dead, and was determined to be an illegal mortality.

m1277

In May, 2013, Bluestem subadult m1277, began exhibiting dispersal behavior and was located occasionally traveling outside the BRWRA in New Mexico. In July, m1277 had been located away from its natal pack for three months and was considered a single dispersing wolf. On October 23, one confirmed cattle depredation was assigned to m1277. On December 21, m1277 was located dead outside the BRWRA, and was determined to be an illegal mortality.

f1278

In April, f1278 of the Dark Canyon pack was located with m1244. Throughout the remainder of 2013, f1278 was repeatedly located with m1244; however, f1278 was occasionally located alone, with its natal pack, or with other dispersing wolves. In October, f1278 was considered to be a dispersing wolf from the Dark Canyon pack.

f1281

In summer 2013, f1281 of the Fox Mountain pack began displaying dispersal behavior. In November, f1281 had not been located for three months and was considered fate-unknown.

f1295

On March 28, Wildlife Services incidentally captured a female wolf while coyote trapping; it was processed, collared and assigned studbook number f1295; f1295 was considered a member of the Fox Mountain pack. In July, f1295 was involved in nuisance behavior; the IFT investigated and assessed its response to human presence and determined its behavior appeared normal. In September, f1295 was considered a single dispersing wolf; it had been located separate from the Fox Mountain pack for three months. Throughout the remainder of 2013, f1295 was occasionally documented traveling outside the BRWRA in New Mexico.

M1296

On April 21, a private trapper incidentally captured an uncollared male wolf outside the BRWRA in New Mexico; the IFT processed, collared and assigned it studbook number m1296; m1296 was translocated and released within the BRWRA in New Mexico. Throughout the remainder of 2013 M1296 was occasionally located travelling outside the BRWRA in New Mexico. In mid- to late-December, M1296 was located with f1327 of the San Mateo pack.

Appendix B. Summary of sighting reports received from the public from January 1 through December 31, 2013.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total
No. AZ Reports	2	5	6	3	2	4	3	3	4	2	4	4	42
Known Wolf Reports	0	0	0	0	0	1	0	1	0	1	2	0	5
Unknown/Uncollared Reports	0	1	1	1	0	0	0	0	0	0	0	0	3
Non-wolf Reports	2	1	3	1	0	1	2	1	1	0	2	3	17
Probable Wolf Reports	0	1	1	0	1	0	0	0	0	1	0	0	4
Not Enough Information	0	2	1	1	1	2	1	1	3	0	0	1	13
No. NM Reports	3	4	2	4	1	4	0	1	1	1	0	1	22
Known Wolf Reports	1	0	1	1	0	1	0	1	1	0	0	1	7
Unknown/Uncollared Reports	1	0	0	0	0	0	0	0	0	0	0	0	1
Non-wolf Reports	0	2	0	0	0	1	0	0	0	0	0	0	3
Probable Wolf Reports	1	0	0	0	0	0	0	0	0	0	0	0	1
Not Enough Information	0	2	1	3	1	2	0	0	0	1	0	0	10
No. TX Reports: Non-wolf		1	1										2
Total Sightings per Month	5	10	9	7	3	8	3	4	5	3	4	5	66

9. Personnel

Arizona Game and Fish Department

Chris Bagnoli, Field Team Leader/Regional Supervisor
Jeff Dolphin, Wolf Biologist/Field Team Leader
Beth Wojcik, Wolf Technician
Quinn Harrison, Wolf Technician
Allison Greenleaf, Wolf Technician
Mike Godwin, Wildlife Manager Supervisor
Joel Weiss, Wildlife Manager
Aaron Hartzell, Wildlife Manager
Tyler Richins, Wildlife Manager
Jason Capps, Wildlife Manager
Dave Cagle, Wildlife Program Manager
John Hervert, Wildlife Program Manager
Bill David, Chief Pilot
Basil Coffman, Pilot
Pete Applegate, Pilot
Steve Sunde, Pilot
Steve Dubois, Pilot

New Mexico Department of Game and Fish

Agency cooperation ceased July 1, 2011; however, District officers remain involved in law enforcement issues.

Bobby Griego, Colonel – Field Operations Division
Mike Matthews, Lieutenant – Southwest area
K.C. Gehrt, Sargent – Reserve/Socorro district
Andrew Teaschner, Corporal – Socorro
Jordan Ducnan, District Officer – Reserve
Amos Smith, District Officer – Quemado
Justin Winter, District Officer – Datil
Derek Theobald, Sargent – Silver City
Matt Pengelly, Corporal – Cliff/Glenwood
Adan Jacques, District Officer – Silver City

USDA-APHIS Wildlife Services

Sterling Simpson, Field Team Leader/Wolf Management Specialist
Bill Nelson, Wolf Depredation Specialist
Armando Orona, Wolf Management Specialist
Chris Carrillo, District Supervisor
Keel Price, District Supervisor
Mike Kelly, Wildlife Biological Science Technician
Jedediah Murphy, Wildlife Biological Science Technician
Phillip Hopper, Wildlife Biological Science Technician

U.S. Forest Service

Cathy Taylor – Forest Service Liaison to the Wolf Project

U.S. Fish and Wildlife Service

Sherry Barrett, Mexican Wolf Recovery Coordinator

Maggie Dwire, Assistant Mexican Wolf Recovery Coordinator
John Oakleaf, Senior Wolf Biologist/Interagency Field Projects Coordinator
Elizabeth Jozwiak, Interagency Field Projects Coordinator/Wildlife Biologist
Melissa Kreutzian, Fish and Wildlife Biologist
Colby Gardner, Fish and Wildlife Biologist
Susan Dicks, Fish and Wildlife Biologist
Janess Vartanian, Wildlife Biologist
Dewey Wesley, Biological Technician
Peter Fitzpatrick, Biological Technician

USFWS Interns

Trevor Smith
Graham Goodman
Kaija Klauder
Ben Betterly
Crissy Guimaraes
Lily Glidden
Anthony Saner
Melissa Ruszczyk
Julia Smith
Chelsea Vosburgh
Yuki Nonaka
Brandon Tritsch
Adam Mohr
Ed Davis

White Mountain Apache Tribe

Deon Hinton, Wolf Technician
Bobby Tobin, Wolf Technician
Joseph Perez, Wolf Technician
Manualita Canty, Wolf Technician

Project Veterinarians

Dr. Ole Alcumbrac
Dr. Susan Dicks