

Mexican Wolf
RECOVERY IMPLEMENTATION STRATEGY
Second Revision
September 2022

U.S. Fish and Wildlife Service
Southwest Region (Region 2)
Albuquerque, New Mexico

Original Recovery Implementation Strategy Approved:
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PURPOSE AND DISCLAIMER

This revised Recovery Implementation Strategy (RIS) supplements the Mexican Wolf Recovery Plan, Second Revision (*Canis lupus baileyi*; U.S. Fish and Wildlife Service [Service] 2022) and reflects the near-term implementation strategy at the time of the 2022 Recovery Plan publication. The RIS provides guidance for implementing the near term, stepped-down activities needed to carry out the prioritized, site-specific recovery actions identified in the Recovery Plan.

The RIS is the third part of the Service's 3-part recovery planning framework for threatened and endangered species, and it consists of an easily updateable operational plan that is separate and complimentary to the recovery plan. The RIS includes recovery activities, which detail the on-the-ground information about who, what, when, and how recovery efforts will be implemented by the Service and our recovery partners to complete the recovery actions contained in a recovery plan. The RIS also identifies the Endangered Species Act (Act) statutorily required recovery actions (actions) from the recovery plan that are implemented by the recovery activities (activities). Recovery actions cannot be added or revised in the RIS; these can only be modified through a recovery plan revision.

This RIS is an advisory document, not a regulatory document. It does not obligate parties to implement the recommended activities contained within it and may not represent the views nor the official positions or approval of any individuals or agencies identified in the document, other than the Service. Identification of an activity that can be implemented by any public or private party does not create a legal obligation beyond existing legal requirements. Nothing in this RIS should be construed as a commitment or requirement that any Federal agency obligate or pay funds in any fiscal year in excess of appropriations made by Congress for that fiscal year in contravention of the Anti-Deficiency Act, 31 U.S.C. 1341, or any other law or regulation.

This revision includes updated time and cost estimates for the activities included in the 2017 RIS (Service 2017a), and the conversion of several activities to recovery actions now included in the Recovery Plan. The conversion of these activities is in response to the District Court of Arizona's October 14, 2021, ruling that the Mexican Wolf Recovery Plan, First Revision (Service 2017b), did not contain site-specific management actions to address the recognized threat of illegal killing of Mexican wolves or explain why it would be impracticable or unnecessary to do so (*Center for Biological Diversity, et al., v. Haaland, et al.*, (Case No. 4:18-CV-00047-TUCJGZ) (lead) and *WildEarth Guardians, et al., v. Haaland, et al.*, (Case No. 4:18-CV-00048-TUCJGZ) (member).

ACKNOWLEDGEMENTS

We updated this RIS from the 2017 RIS which was developed in cooperation with Federal and State agencies, counties, and Tribes in the United States; Comisión Nacional de Áreas Naturales Protegidas (CONANP), a Federal agency in Mexico; and non-governmental organizations in both countries, to which we express our gratitude for their participation in Mexican wolf recovery.

LITERATURE CITATION AND AVAILABILITY

Literature citation should read as follows:

U.S. Fish and Wildlife Service. 2022. Mexican Wolf Recovery Implementation Strategy. Region 2, Albuquerque, New Mexico, USA.

Copies of the document can be requested from:

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Copies are also available online at:
<http://www.fws.gov/southwest/es/mexicanwolf>

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I. INTRODUCTION

This Recovery Implementation Strategy (RIS) describes the near term, stepped-down activities needed to carry out the recovery actions identified in the Mexican Wolf Recovery Plan, Second Revision (*Canis lupus baileyi*; U.S. Fish and Wildlife Service [Service] 2022). The RIS is designed to provide more focused detail than the broad recovery actions identified in the Recovery Plan and includes estimates of time and cost for activity implementation through Fiscal Year (FY) 2027. Additionally, the RIS summarizes the Mexican wolf recovery strategy; restates the recovery goal, objectives, and criteria; restates the evaluation of the recovery strategy and progress toward recovery; and reiterates the estimated cost and timing for recovery included in the Recovery Plan. The Recovery Plan and RIS are supported by a separate Biological Report for the Mexican Wolf (Service 2017c), which provides background, life-history, and threat assessment information for the Mexican wolf. The full Recovery Plan and Biological Report are available at <https://www.fws.gov/southwest/es/mexicanwolf/>.

This RIS may be revised at any time during the recovery process, whenever experience and information gained call for a change in tactics, therefore maximizing flexibility of recovery implementation. In general, implementation of the recovery actions and activities will involve participation from State and Federal agencies, Tribes, counties, local communities, non-federal landowners, nongovernmental organizations, academia, and the public. In recognition of the importance of the perspectives of Tribes and Pueblos in Mexican wolf recovery, we recognize the Tribal Perspectives on Mexican Wolf Recovery report (Mexican Wolf Tribal Working-Group 2017) as part of this implementation strategy. We also recognize Secretarial Order 3206, which clarifies the responsibilities of the Service when taking actions under the Endangered Species Act (ESA) that may affect Tribal lands.

II. RECOVERY STRATEGY SUMMARY

The recovery strategy for the Mexican wolf is fully described in the Recovery Plan (Service 2022). In summary, our recovery strategy is to establish and maintain a minimum of two resilient, genetically diverse Mexican wolf populations distributed across ecologically and geographically diverse areas in the subspecies' historical range in the United States and Mexico. Our recovery strategy for the Mexican wolf addresses the threats of human-caused mortality, extinction risk associated with small population size, and loss of gene diversity. It also ensures that Mexican wolf populations can achieve the resiliency, representation, and redundancy needed to downlist and delist the Mexican wolf. At the time of recovery, we expect viable Mexican wolf populations that are stable or increasing in abundance, well-distributed geographically within their range, and genetically diverse.

III. RECOVERY GOAL, OBJECTIVES, and CRITERIA

Recovery Goal

The recovery goal is to conserve and protect the Mexican wolf and its habitat so that its long-term survival is secured, populations are capable of enduring threats, and it can be removed from the list of threatened and endangered species.

Recovery Objective

Recovery objectives identify outcomes that will lead to achieving the goal of recovery and delisting. Recovery objectives for the Mexican wolf are:

1. Increase the size of two Mexican wolf populations;
2. Improve gene diversity and maintain the health of Mexican wolves;
3. Ensure adequate habitat availability to support viable Mexican wolf populations;
4. Maintain the Mexican Wolf Species Survival Plan (SSP) captive breeding program to improve the status of wild populations;
5. Promote Mexican wolf conservation through education and outreach programs; and
6. Ensure recovery success.

Recovery Criteria

Recovery criteria serve as objective, measurable guidelines to assist in determining when an endangered species has recovered to the point that it may be downlisted to threatened, or that the protections afforded by the ESA are no longer necessary and the Mexican wolf may be delisted. Delisting is the removal of a species from the Federal Lists of Endangered and Threatened Wildlife and Plants. Downlisting is the reclassification of a species from Endangered to Threatened. The term “endangered species” means any species (species, sub-species, or Distinct Population Segment) which is in danger of extinction throughout all or a significant portion of its range. The term “threatened species” means any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. As when species are listed, in determining whether to downlist or delist a species the decision would consider the following five factors: 1) is there a present or threatened destruction, modification, or curtailment of the species’ habitat or range; 2) is the species subject to overutilization for commercial, recreational scientific or educational purposes; 3) is disease or predation a factor; 4) are there inadequate existing regulatory mechanisms in place outside the ESA (taking into account the efforts by the states and other organizations to protect the species or habitat; and 5) are other natural or manmade factors affecting its continued existence. When delisting or downlisting a species, we first propose the action in the *Federal Register* and seek public comment and peer review. Our final decision is announced in the *Federal Register*.

We provide both downlisting and delisting criteria for the Mexican wolf as follows:

Downlisting Recovery Criteria

Option 1:

The Mexican wolf will be considered for downlisting when:

- a) The United States population average over a 4-year period is greater than or equal to 320 Mexican wolves; and
- b) Gene diversity available from the captive population has been incorporated in the United States population through the scheduled releases of wolves surviving to breeding age as identified in delisting criteria.

-or-

Option 2:

The Mexican wolf will be considered for downlisting when a minimum of two populations (one in the United States and one in Mexico) meet abundance and genetic criteria as follows:

- a) Each population average over the same 4-year period is greater than or equal to 150 wolves with an annual positive population growth rate; and
- b) Gene diversity available from the captive population has been incorporated into both the United States and Mexico populations through the scheduled releases of wolves surviving to breeding age as identified in delisting criteria.

Delisting Recovery Criteria

The Mexican wolf will be considered for delisting when:

1. A minimum of two populations meet all abundance and genetic criteria as follows:

United States

- a) The population average over an 8-year period is greater than or equal to 320 wolves (e.g., annual wolf abundance of 200, 240, 288, 344, 412, 380, 355, and 342 averages 320 wolves);
- b) The population must exceed 320 wolves each of the last 3 years of the 8-year period;
- c) The annual population growth rate averaged over the 8-year period is stable or increasing (e.g., annual averages of 1.2, 1.2, 1.2, 1.2, 1.2, 0.9, 0.9, and 1.0 averages 1.1); and
- d) Gene diversity available from the captive population has been incorporated into the United States population through scheduled releases of a sufficient number of wolves to result in 22 released Mexican wolves surviving to breeding age in the United States population. “Surviving to breeding age” means a pup that lives 2 years to the age of breeding or an adult or subadult that lives for a year following its release. “Scheduled releases” means captive releases and translocations that achieve genetic representation, as described in Rationale for Recovery Criteria.

Mexico

- a) The population average over an 8-year period is greater than or equal to 200 wolves;
- b) The population must exceed 200 wolves each of the last 3 years of the 8-year period;
- c) The annual population growth rate averaged over the 8-year period is stable or increasing; and
- d) Gene diversity available from the captive population has been incorporated into the Mexico population through scheduled releases of a sufficient number of wolves that results in 37 released Mexican wolves surviving to breeding age in the Mexico population. “Surviving to breeding age” means a pup that lives 2 years to the age of breeding or an adult or subadult that lives for a year following its release. “Scheduled releases” means captive releases and translocations that achieve genetic representation, as described in Rationale for Recovery Criteria.

-and-

2. States and Tribes will ensure regulatory mechanisms are in place to prohibit or regulate human-caused mortality of Mexican wolves in those areas necessary for recovery such that the Service determines at least 320 Mexican wolves are likely to be maintained in the U.S. in the absence of Federal ESA protections. In addition, Mexico will ensure regulatory mechanisms are in place to protect Mexican wolves from human-caused mortality, such that the Service determines at least 200 Mexican wolves are likely to be maintained in Mexico.

IV. EVALUATION OF THE RECOVERY STRATEGY AND PROGRESS TOWARD RECOVERY

Due to the intensive logistical, economic, and socio-political nature of the Mexican wolf recovery effort, it is critical to ensure that progress toward recovery is advancing in a timely manner. Therefore, to determine whether the recovery strategy is proving effective we will evaluate its efficacy and the progress of the Mexican wolf population toward recovery 5 years and 10 years after implementation of the Recovery Plan. In addition, we will conduct 5-year species status reviews required under the Section 4(c)(2) of the ESA.

The timing of the 5- and 10-year evaluations is based on calendar years following the signing of the 2017 Recovery Plan. The population viability assessment model was initiated using data through December 2015 (Miller 2017). The interim abundance and release and translocation targets to be used in the 5- and 10-year evaluations are derived from Vortex model years 7 and 12. This reflects the 2-year difference between the start of the Vortex model (end of 2015) and the signing of the Recovery Plan (end of 2017).

5-Year Evaluation (based on data through 2022):

In the first 5-year evaluation of recovery efforts, we will assess the status of each population contributing to recovery. The purpose of the assessment will be to identify each population's progress toward recovery criteria, as measured by:

- Interim abundance targets of approximately 145 wolves in the United States and 100 wolves in Mexico;
- Interim release and translocation targets of a sufficient number of wolves to result in approximately 9 released wolves surviving to breeding age in the United States and 25 released and translocated wolves surviving to breeding age in Mexico.

Based on this information, we will identify aspects of population performance needing improvement and will determine what actions are necessary to address identified needs. Our evaluation will include the feasibility of the needed actions, including timelines, cost, and other relevant considerations. To complete the review, we will update the RIS as needed.

10-Year Evaluation (based on data through 2027):

In the second 5-year evaluation of the Recovery Plan, we will assess the status of each population contributing to recovery. The purpose of the assessment will be to identify each population's progress toward recovery criteria and determine whether the recovery strategy is proving effective/feasible. Progress toward recovery will be measured by:

- Interim abundance targets of approximately 210 wolves in the United States and 167 wolves in Mexico;
- Interim release and translocation targets of a sufficient number of wolves to result in approximately 16 released wolves surviving to breeding age in the United States and 37 released and translocated wolves surviving to breeding age in Mexico.

Based on this information, in addition to findings of the 5-year evaluation, we will make a determination that the recovery strategy is proving effective/feasible or needs to be revised. If we determine the recovery strategy is effective but some elements of recovery implementation need improvement, we will identify what needs to be improved, including actions to address identified needs and the feasibility of conducting such actions such as timelines and costs. If we determine the recovery strategy is not proving effective and the expected recovery level is not achieved, we will identify the reasons for such finding and, if necessary, revisit the recovery strategy and work with States and others to identify other areas with suitable habitat and adequate prey to achieve recovery; change techniques used to address gene diversity; or implement other substantive change. Any such revised strategy should include revised time/cost estimates necessary to achieve recovery based on necessary actions. We will revise the Recovery Plan or RIS as necessary.

V. ESTIMATED COST AND TIMING OF RECOVERY

We expect the status of the Mexican wolf to improve such that we can achieve downlisting criteria around 2034-2038, approximately 16-20 years after implementation of the Mexican Wolf Recovery Plan, First Revision (Service 2017b) began at the end of 2017. We expect to achieve recovery in approximately 2043-2053, approximately 25-35 years after implementation of the Mexican Wolf Recovery Plan, First Revision began, for a total estimated cost of \$202,959,000. This cost includes those borne by governmental agencies and nongovernmental organizations in the United States and Mexico.

While recovery may take an estimated 25-35 years, we anticipate successfully implementing the recovery actions and activities such that we can achieve recovery in 25 years (i.e., 2043); therefore, the total estimated cost to recovery is based on this 25-year timeframe. These timeframes are based on expectation of full funding, implementation as provided for in the Recovery Plan and RIS, and full cooperation of binational partners.

The estimated cost to implement the first 5 years of recovery actions and activities (i.e., intermediate steps toward the goal of recovery) is \$41,585,000. Annual cost estimates to implement recovery actions and activities for the first 5 years are as follows:

Year 1 = \$7,749,000
Year 2 = \$8,117,000
Year 3 = \$8,397,000
Year 4 = \$8,631,000
Year 5 = \$8,691,000

Actual expenditures by agencies and other partners are contingent upon appropriations and other budgetary constraints.

VI. RECOVERY ACTIONS AND ACTIVITIES

Per the Recovery Plan, each recovery action is prioritized as follows: Priority 1 actions must be taken to prevent extinction or to prevent the species from declining irreversibly in the foreseeable future. Priority 2 actions must be taken to prevent a significant decline in population size or habitat quality, or some other significant negative impact. Priority 3 actions are all other actions that are necessary for the species' full recovery. The assignment of priorities does not imply that some recovery actions are of low importance, but instead implies that lower priority items may be deferred while higher priority items are being implemented. We also indicate the primary threats to the species that are addressed by each recovery action and activity. These threats include the following listing factors under the Endangered Species Act: A) the present or threatened destruction, modification, or curtailment of the species' habitat or range; B) overutilization for commercial, recreational, scientific, or educational purposes; C) disease or predation; D) the inadequacy of existing regulatory mechanisms; and E) other natural or manmade factors affecting its continued existence (e.g., loss of genetic diversity, demographic stochasticity, excessive mortality).

RIS Implementation Schedule

Below we provide a stepped-down RIS implementation schedule (Tables 1.1-1.6) and cost estimate table (Table 2) for activities needed to carry out the prioritized, site-specific recovery actions identified for the Mexican wolf. The schedule and cost estimates are intended to assist the Service and other stakeholders in planning and implementing activities to carry out the recovery actions in the Mexican Wolf Recovery Plan (Service 2022, Table 1). The RIS implementation schedule is organized by recovery objective and includes the associated recovery actions and activities, descriptions, duration, and responsible parties. An "NA" for activity number and activity descriptor indicates the recovery action does not have any stepped-down activities. A separate table identifies the estimated costs for carrying out FY 22 through FY 27 activities. All Estimated costs are shown in \$1,000 units. In many cases, the costs for implementing activities are already included in the total cost estimates for recovery actions, and therefore an "NA" appears within the cost column. An "X" within the cost column indicates the cost is unknown currently.

While the ESA assigns a strong leadership role to the Service for the recovery of listed species, it also recognizes the importance of other Federal agencies, States, and other stakeholders in the recovery process. The "Responsible Agency" column of the RIS implementation schedule identifies partners who can make significant contributions to specific recovery actions and activities. The identification of responsible parties within the RIS implementation schedule does not constitute any additional legal responsibilities beyond existing authorities (e.g., ESA).

Key to acronyms used in the RIS Implementation Schedule

AZGFD	Arizona Game and Fish and Department
AZLLB	Arizona Livestock Loss Board
BLM	Bureau of Land Management
CBP	U.S. Customs and Border Protection
CONAFOR	Comisión Nacional Forestal
CONANP	Comisión Nacional de Áreas Naturales Protegidas
CNOG	Confederación Nacional de Organizaciones Ganaderas
DOT	Department of Transportation
DOW	Defenders of Wildlife
FS	U.S. Forest Service
FSA	U.S. Department of Agriculture Farm Services Agency
FWS	U.S. Fish and Wildlife Service
GM	Grupo México-Unidad de manejo para la conservación de la vida silvestre (UMA) Buenavista del Cobre
GN	Gendarmería Nacional
INECOL	Instituto de Ecología, A.C.-Estación Biológica Piedra Herrada
MFS	Mexican Field Staff
MWF	Mexican Wolf Fund
MWLC	Mexican Wolf/Livestock Council
NMDGF	New Mexico Department of Game and Fish
NPS	National Park Service
NRCS	Natural Resources Conservation Service
OVIS	Organización Vida Silvestre, A.C.-UMA La Mesa
PGR	Procuraduría General de la Republica
PROFEPA	Procuraduría Federal de Protección al Ambiente
SAGARPA	Secretaría de Agricultura, Ganadería, Desarrollo Rural, Pesca y Alimentación
SCT	La Secretaría de Comunicaciones y Transportes
SEMARNAT	Secretaría del Medio Ambiente y Recursos Naturales
SSP	Species Survival Plan
TESF	Turner Endangered Species Fund
UI	University of Idaho
UNAM-FMVZ	Facultad de Medicina Veterinaria y Zootecnia, Universidad Nacional Autónoma de México
UNAM-IB	Instituto de Biología, Universidad Nacional Autónoma de México
UNM	University of New Mexico
USDA-WS	U.S. Department of Agriculture - Wildlife Services
WMAT	White Mountain Apache Tribe

RIS IMPLEMENTATION SCHEDULE:**Table 1.1. RIS Implementation Schedule for Actions and Activities under Objective 1: Increase the size of two Mexican wolf populations**

Priority Number	Recovery Action #	Recovery Action	Activity ID	Activity	Narrative/Threats Addressed	Duration (Years)	Responsible Party
1	1.1	Survey and monitor Mexican wolves to determine population status in the U.S.	1.1a	Conduct aerial/ground telemetry and GPS monitoring of wolves	Aerial and ground telemetry are conducted to determine location and status of Mexican wolves in the wild and to gather demographic information. Aerial and ground telemetry will decrease as the number of GPS collars to monitor wolves is increased. Threats addressed include: extinction risk/demographic stochasticity and exceeding threshold mortality rate.	25	FWS, AZGFD, NMDGF
1	1.1.1	Document U.S. wolf population parameters	NA	NA	Threats addressed include: extinction risk/demographic stochasticity and exceeding threshold mortality rate.	25	FWS, AZGFD, NMDGF
1	1.1.2	Determine whether annual mortality rate identified in 1.1.1. is consistent with meeting demographic and genetic criteria; adjust removal rate for upcoming year to support stable/growing population and adjust other pertinent management interventions (e.g., diversionary feeding) as necessary	NA	NA	Threats addressed include: extinction risk/demographic stochasticity and exceeding threshold mortality rate.	25	FWS, AZGFD, NMDGF
1	1.2	Survey and monitor Mexican wolves to determine population status in Mexico	1.2a	Conduct satellite ground and aerial telemetry monitoring of wolves	Mexico currently uses high quality GPS collars; however, the use of less expensive models to monitor dispersing wolves are being pursued. Threats addressed include: Extinction risk/demographic stochasticity and exceeding threshold mortality rate	25	CONANP, MFS
1	1.2.1	Document Mexico wolf population parameters	NA	NA	Threats addressed include: Extinction risk/demographic stochasticity and exceeding threshold mortality rate.	25	CONANP, MFS
1	1.2.2	Determine whether annual mortality rate identified in 1.2.1 is consistent with meeting demographic criteria; adjust removal rate or other pertinent management interventions (e.g., diversionary feeding) for upcoming year to support stable/growing population.	NA	NA	Threats addressed include: Exceeding threshold mortality rate.	25	CONANP, MFS

Priority Number	Recovery Action #	Recovery Action	Activity ID	Activity	Narrative/Threats Addressed	Duration (Years)	Responsible Party
1	1.3	Monitor Mexican wolves on Fort Apache Indian Reservation	1.3a	Capture and collar wolves	Capture and collar wolves annually with a goal of having 2 collared wolves per pack. All adult wolves released from captivity will be collared. Threats addressed include: Extinction risk/demographic stochasticity and exceeding threshold mortality rate.	25	WMAT, FWS
1	1.3	Monitor Mexican wolves on Fort Apache Indian Reservation	1.3b	Assist with annual count in the U.S.	The annual count occurs from November through January each year in AZ, NM, and on the Fort Apache Indian Reservation to determine the minimum number of wolves in the wild. Threats addressed include: Extinction risk/demographic stochasticity and exceeding threshold mortality rate.	25	WMAT, FWS
1	1.3	Monitor Mexican wolves on Fort Apache Indian Reservation	1.3c	Conduct telemetry monitoring of wolves	Aerial and ground telemetry are conducted to determine location and status of Mexican wolves in the wild and to gather demographic information. Aerial and ground telemetry will decrease as the number of GPS collars to monitor wolves is increased. Threats addressed include: Extinction risk/demographic stochasticity and exceeding threshold mortality rate.	25	WMAT, FWS
2	1.4	Monitor Mexican wolves on other Tribal lands	1.4a	Capture and collar wolves	Funding to assist tribes that choose to participate in Mexican wolf recovery program. Threats addressed include: Extinction risk/demographic stochasticity and exceeding threshold mortality rate	25	Tribes, FWS
2	1.4	Monitor Mexican wolves on other Tribal lands	1.4b	Assist with annual count in the U.S.	Threats addressed include: Extinction risk/demographic stochasticity and exceeding threshold mortality rate	25	Tribes, FWS
2	1.4	Monitor Mexican wolves on other Tribal lands	1.4c	Conduct telemetry monitoring of wolves	Threats addressed include: Extinction risk/demographic stochasticity and exceeding threshold mortality rate.	25	Tribes, FWS
2	1.5	Conduct Mexican wolf releases to increase population size in Mexico	1.5a	See activities under Action 2.2. to grow population size in Mexico	Threats addressed include: Loss of gene diversity and extinction risk/demographic stochasticity.	25	SSP, CONANP, MFS, SEMARNAT, OVIS, GM, INECOL, FWS
2	1.6	Reduce human-caused mortality of Mexican wolves in the U.S.	NA	NA	Threats addressed include: Exceeding threshold mortality rate.	25	FWS, AGFD, NMDGF, FS, WMAT

Priority Number	Recovery Action #	Recovery Action	Activity ID	Activity	Narrative/Threats Addressed	Duration (Years)	Responsible Party
2	1.6.1	Conduct education and outreach in local communities within occupied Mexican wolf range in the MWEPA and other areas where wolves disperse, including areas outside of the MWEPA where Mexican wolves have endangered status such as the I-40 corridor, in order to improve hunter, trapper, rancher, trade organization, and general public awareness and tolerance of wolves' presence, including materials with biological and legal information and conflict reduction techniques.	NA	NA	Threats addressed include: Exceeding threshold mortality rate.	25	FWS, AZGFD, NMDGF, FS, WMAT, NPS, BLM
2	1.6.2	Increase law enforcement presence in areas identified as mortality hot spots to assist in public education, deter illegal killing, investigate wolf mortalities, and coordinate with law enforcement from other agencies.	NA	NA	Threats addressed include: Exceeding threshold mortality rate.	25	FWS, AZGFD, NMDGF, WMAT, Other Tribes
2	1.6.3	Install enhancements to facilitate Mexican wolf movement across existing and new roads and reduce vehicle collisions with Mexican wolves in occupied range, especially in areas likely to serve as corridors (see Recovery Action 3.3.1).	NA	NA	Threats addressed include: Exceeding threshold mortality rate.	15, or as needed	FWS, AZGFD, NMDGF, CBP, Local, State, and Federal DOT
2	1.7	Reduce human-caused mortality of Mexican wolves in Mexico	NA	NA	Threats addressed include: Exceeding threshold mortality rate.	25	CONANP, MFS

Priority Number	Recovery Action #	Recovery Action	Activity ID	Activity	Narrative/Threats Addressed	Duration (Years)	Responsible Party
2	1.7.1	Conduct education and outreach to improve public tolerance and awareness of wolves' presence in areas occupied by wolves and other areas where wolves disperse, including materials with biological and legal information and conflict reduction techniques.	NA	NA	Threats addressed include: Exceeding threshold mortality rate.	25	CONANP, SADER
2	1.7.2	Further efforts to increase law enforcement presence in the reintroduction/release areas and occupied range in Mexico, especially in areas identified as mortality hot spots, to deter illegal killing.	NA	NA	Threats addressed include: Exceeding threshold mortality rate.	25	FGR
2	1.7.3	Investigate wolf mortalities	NA	NA	Threats addressed include: Exceeding threshold mortality rate.	25	MFS, CONANP, PROFEPA
2	1.7.4	Install enhancements to facilitate Mexican wolf movement across existing and new roads, including Highway 2 between Cananea and Janos, and reduce the likelihood of vehicular collisions with Mexican wolves in areas likely to serve as corridors (see Recovery Action 3.3.1).	NA	NA	Threats addressed include: Exceeding threshold mortality rate.	15, or as needed	CONANP
2	1.8	Reduce Mexican wolf-livestock conflicts in the U.S. (MWEPA)	1.8a	Manage and remove problem wolves	Livestock-wolf conflicts, such as nuisance behaviors and excessive depredations, are addressed with proactive measures; increased monitoring, hazing; and if necessary translocations and possible removal of problem wolves. Threats addressed include: Exceeding threshold mortality rate.	25	FWS, USDA-WS
2	1.8	Reduce Mexican wolf-livestock conflicts in the U.S. (MWEPA)	1.8b	Investigate depredations	Threats addressed include: Exceeding threshold mortality rate.	25	USDA-WS

Priority Number	Recovery Action #	Recovery Action	Activity ID	Activity	Narrative/Threats Addressed	Duration (Years)	Responsible Party
2	1.8.1	Implement livestock conflict avoidance measures in hotspots of depredation activity and areas with an increased risk of depredation activity, including on National Forests within the MWEPA, to reduce depredation-related wolf removals in the U.S.	1.8.1a	Provide non-federal match funding for 1.8.2.	Threats addressed include: Exceeding threshold mortality rate.	25	FWS, AZGFD, NMDGF, USFS, DOW, MWF, livestock operators
2	1.8.1	Implement livestock conflict avoidance measures in hotspots of depredation activity and areas with an increased risk of depredation activity, including on National Forests within the MWEPA, to reduce depredation-related wolf removals in the U.S.	1.8.1b	Implement programs associated with 1.8.1a and 1.8.2	Threats addressed include: Exceeding threshold mortality rate.	25	FWS, AZGFD, NMDGF, USFS, DOW, MWF, livestock operators
2	1.8.2	Provide funding for wolf-livestock conflict avoidance measures to reduce depredation-related wolf removals in the MWEPA.	1.8.2a	Compensate livestock producers for losses due to wolves	Threats addressed include: Exceeding threshold mortality rate.	25	FWS, MWF, DOW, AZGFD, NMDA, USDA-WS, NMDGF
2	1.8.2	Provide funding for wolf-livestock conflict avoidance measures to reduce depredation-related wolf removals in the MWEPA.	1.8.2b	Provide funding for livestock conflict-avoidance measures	Threats addressed include: Exceeding threshold mortality rate.	25	FWS, MWF, DOW, AZGFD, NMDA, USDA-WS, NMDGF
2	1.9	Reduce Mexican wolf-livestock conflicts in Mexico	1.9a	Manage and remove problem wolves	Livestock-wolf conflicts, such as nuisance behaviors and excessive depredations, are addressed with proactive measures; increased monitoring, hazing; and if necessary translocations and possible removal of problem wolves. Threats addressed include: Exceeding threshold mortality rate.	25	MFS, SEMARNAT
2	1.9	Reduce Mexican wolf-livestock conflicts in Mexico	1.9b	Investigate depredations		25	MFS, CNOG
2	1.9	Reduce Mexican wolf-livestock conflicts in Mexico	1.9c	Compensate livestock producers for losses due to wolves		25	CNOG

Priority Number	Recovery Action #	Recovery Action	Activity ID	Activity	Narrative/Threats Addressed	Duration (Years)	Responsible Party
2	1.9	Reduce Mexican wolf-livestock conflicts in Mexico	1.9d	Implement the Ecosystem Services Payments Program (Pago por Servicios Ambientales)	CONANP will promote the inclusion of Mexican wolf recovery areas in the program.	25	CONAFOR, CONANP
2	1.9.1	Implement livestock conflict avoidance measures in hotspots of depredation activity in Mexico to reduce depredation-related wolf removals.	NA	NA	Threats addressed include: Exceeding threshold mortality rate.	25	CONANP, MFS, livestock operators

Table 1.2. RIS Implementation Schedule for Actions and Activities under Objective 2: Improve Gene Diversity and Maintain the Health of Mexican Wolves

Priority Number	Recovery Action #	Recovery Action	Activity ID	Activity	Narrative	Duration (Years)	Responsible Party
1	2.1	Develop and implement an annual plan for Mexican wolf releases, cross-fostering, and translocations in the U.S.	2.1a	Develop annual release, cross-foster, and translocation plan	The annual plan provides the target number of wolves to be released, cross-fostered, and translocated and the location and timing. Threats addressed include: Loss of gene diversity.	16	FWS, AZGFD, NMDGF, FS, SSP, WMAT, TESF
1	2.1	Develop and implement an annual plan for Mexican wolf releases, cross-fostering, and translocations in the U.S.	2.1b	Cross-foster 12 wolf pups/year	With current staff levels, we expect to be able to cross-foster up to 12 pups/year. This number may change in response to fluctuations in staffing levels or adjustments to logistics in transporting young pups. Threats addressed include: Loss of gene diversity.	16	FWS, AZGFD, NMDGF, FS, WMAT, TESF
1	2.1	Develop and implement an annual plan for Mexican wolf releases, cross-fostering, and translocations in the U.S.	2.1c	Release pairs with pups if cross-fostering is deemed unsuccessful	The most successful releases of adult wolves from captivity are pairs with pups released when pups are very young. The cost of releases is included in action 2.1.; however, the cost may decrease if cross-fostering is deemed successful. Threats addressed include: Loss of gene diversity.	5	FWS, AZGFD, NMDGF, FS, WMAT, TESF

Priority Number	Recovery Action #	Recovery Action	Activity ID	Activity	Narrative	Duration (Years)	Responsible Party
1	2.1	Develop and implement an annual plan for Mexican wolf releases, cross-fostering, and translocations in the U.S.	2.1d	Translocate wolves, as necessary due to exigent circumstances	<p>Translocation of wolves may be necessary each year for management purposes, including to address boundary issues, problem behaviors, or to facilitate breeding.</p> <p>Threats addressed include: Loss of gene diversity.</p>	25	FWS, AZGFD, NMDGF, FS, WMAT, TESH
1	2.1	Develop and implement an annual plan for Mexican wolf releases, cross-fostering, and translocations in the U.S.	2.1e	Manage wolves at Sevilleta and Ladder Ranch pre-release facilities	<p>The Sevilleta and Ladder Ranch Wolf Management Facilities serve as pre-release facilities to acclimate Mexican wolves prior to release to the wild. These facilities are designed to house wolves in a manner that fosters wild characteristics and behaviors by minimizing human contact in order to promote avoidance behavior and to maximize pair bonding, breeding, pup rearing, and healthy pack structure development. Wolves are then evaluated and selected for release to the wild based on their genetic makeup, reproductive performance, behavior, physical suitability, and their overall response to the adaptation process. The management facilities are also used to breed wolves to enable cross-fostering of pups into the wild.</p> <p>Threats addressed include: Loss of gene diversity.</p>	16	FWS, TESH
1	2.1	Develop and implement an annual plan for Mexican wolf releases, cross-fostering, and translocations in the U.S.	2.1f	Monitor survival of wolves released (including cross-fosters) from captivity	<p>A released animal successfully incorporated into the population is an adult that survives for at least 1 year from release, or a pup that survives 2 years from release.</p> <p>Threats addressed include: Loss of gene diversity.</p>	18	FWS, AZGFD, NMDGF, WMAT
1	2.2	Develop and implement an annual plan for Mexican wolf releases, cross-fostering, and translocations in Mexico	2.2a	Develop annual plan for releases and translocations	<p>Based on annual SSP breeding and transfer plan to achieve Mexican wolf gene diversity and population growth in Mexico.</p> <p>Threats addressed include: Loss of gene diversity and extinction risk/demographic stochasticity.</p>	8	SSP, CONANP, MFS

Priority Number	Recovery Action #	Recovery Action	Activity ID	Activity	Narrative	Duration (Years)	Responsible Party
1	2.2	Develop and implement an annual plan for Mexican wolf releases, cross-fostering, and translocations in Mexico	2.2b	Survey for new release sites, including prey availability	Threats addressed include: Loss of gene diversity and extinction risk/demographic stochasticity.	8	MFS
1	2.2	Develop and implement an annual plan for Mexican wolf releases, cross-fostering, and translocations in Mexico	2.2c	Develop landowner agreements for releases	Threats addressed include: Loss of gene diversity and extinction risk/demographic stochasticity.	8	MFS, CONANP
1	2.2	Develop and implement an annual plan for Mexican wolf releases, cross-fostering, and translocations in Mexico	2.2d	Release pairs with pups	Mexico anticipates releasing wolves to accomplish releases prescribed in the PVA, at a minimum; they may continue releases into the future to further improve gene diversity in the wild. Threats addressed include: Loss of gene diversity and extinction risk/demographic stochasticity.	4	MFS, CONANP, SEMARNAT
1	2.2	Develop and implement an annual plan for Mexican wolf releases, cross-fostering, and translocations in Mexico	2.2e	Translocate wolves	Currently, no translocations are planned within Mexico or to the U.S. Translocations may occur in the future from SMOCC-N to SMOCC-S or from Mexico to the U.S. Threats addressed include: Loss of gene diversity and extinction risk/demographic stochasticity.	4	MFS, CONANP, SEMARNAT, FWS
1	2.2	Develop and implement an annual plan for Mexican wolf releases, cross-fostering, and translocations in Mexico	2.2f	Manage wolves at pre-release facilities	Threats addressed include: Loss of gene diversity and extinction risk/demographic stochasticity.	8	CONANP, OVIS, GM, INECOL

Priority Number	Recovery Action #	Recovery Action	Activity ID	Activity	Narrative	Duration (Years)	Responsible Party
1	2.2	Develop and implement an annual plan for Mexican wolf releases, cross-fostering, and translocations in Mexico	2.2g	Monitor survival of released and translocated wolves	Threats addressed include: Loss of gene diversity and extinction risk/demographic stochasticity.	10	MFS
2	2.3	Monitor and manage Mexican wolf genetic health in the wild	2.3a	Monitor gene diversity of wild population	Monitoring to determine if wild Mexican wolf populations are achieving 90% of the gene diversity in the captive population. Threats addressed include: Loss of gene diversity.	25	AZGFD, FWS, NMDGF, MFS, CONANP
2	2.3	Monitor and manage Mexican wolf genetic health in the wild	2.3b	Conduct genetic analyses	This includes analyzing blood and scat samples collected from the wild population to determine parentage of Mexican wolves. Threats addressed include: Loss of gene diversity.	25	UI, FWS
2	2.3	Monitor and manage Mexican wolf genetic health in the wild	2.3c	Create and work with genetic management team	The team will develop recommendations for genetic management of Mexican wolves, including addressing the most effective approaches to increase gene diversity in the wild populations and providing recommendations to guide the release schedule to meet genetic recovery criteria. Threats addressed include: Loss of gene diversity.	16	FWS
2	2.3	Monitor and manage Mexican wolf genetic health in the wild	2.3d	Curate wolf remains (for research purposes)	Curation is primarily to maintain genetic samples for future research; however, curation may provide samples for other research as well. Threats addressed include: Loss of gene diversity.	25	UNM, FWS

Priority Number	Recovery Action #	Recovery Action	Activity ID	Activity	Narrative	Duration (Years)	Responsible Party
2	2.4	Monitor and manage Mexican wolf health in the wild	2.4a	Monitor disease and other health parameters	<p>All captive wolves and all wolves that are captured in the wild receive a comprehensive vaccination with canine distemper, parvo, adeno 2, parainfluenza viruses (DA2PP) vaccine. Killed rabies vaccine is also administered. Boosters are administered annually in captivity, and opportunistically as captured in the wild. Captive and wild wolves (when captured) are also preventatively dewormed for a wide range of intestinal and external parasites. Prior to release from Pre-release facilities to the wild, Mexican wolves are screened with laboratory evaluations of feces and blood, boosted as appropriate with vaccines, and given antiparasitics and dewormed. Blood is drawn from wolves captured in the wild for surveillance of canine distemper virus, canine parvovirus, plague, tularemia, and leptospirosis (multiple types), and feces are obtained (if available) for fecal floatation. In the event of any (captive or wild) Mexican wolf mortality, recovered carcasses undergo extensive necropsy (animal autopsy) procedures to inform managers about the cause of death and acquire medical data. Mexico currently conducts screening, however, improved access to laboratory services is needed.</p> <p>Threats addressed include: Extinction risk/demographic stochasticity.</p>	25	IFT, MFS
2	2.4	Monitor and manage Mexican wolf health in the wild	2.4b	Implement disease response and control measures	<p>Threats addressed include: Extinction risk/demographic stochasticity.</p>	as needed	IFT, MFS
2	2.4	Monitor and manage Mexican wolf health in the wild	2.4c	Conduct research and monitor diseases that affect wolf populations	<p>USDS-Wildlife Services monitors for rabies in the U.S. and Mexico. Future funding may be required for research if new diseases emerge that affect Mexican wolves.</p> <p>Threats addressed include: Extinction risk/demographic stochasticity.</p>	as needed	USDA-WS, UNAM-FMVZ

Table 1.3. RIS Implementation Schedule for Actions and Activities under Objective 3: Ensure Adequate Habitat Availability to Support Viable Mexican Wolf Populations

Priority Number	Recovery Action #	Recovery Action	Activity ID	Activity	Narrative	Duration (Years)	Responsible Party
2	3.1	Maintain habitat for Mexican wolves in the U.S. in the MWEPA	3.1a	Collaborate with land management agencies to maintain habitat protections currently in place	<p>Coordinate with FS, BLM, NPS and other Federal agencies with suitable habitat.</p> <p>Threats addressed include Extinction risk/demographic stochasticity and exceeding threshold mortality rate.</p>	25	FWS, AZGFD, NMDGF, FS, BLM, NPS

Priority Number	Recovery Action #	Recovery Action	Activity ID	Activity	Narrative	Duration (Years)	Responsible Party
2	3.1	Maintain habitat for Mexican wolves in the U.S. in the MWEPA	3.1b	Assist livestock producers in implementing voluntary range and habitat improvements	Coordinate with NRCS and livestock producers to implement voluntary range and habitat improvements. Threats addressed include Extinction risk/demographic stochasticity and exceeding threshold mortality rate.	25	FWS, AZGFD, NMDGF, NRCS
2	3.2	Maintain and protect habitat for Mexican wolves in Mexico in occupied areas or areas expected to be occupied in the near future	3.2a	Conduct habitat suitability survey	This will be a field habitat suitability survey to determine the accuracy of the habitat suitability model. Threats addressed include Extinction risk/demographic stochasticity and exceeding threshold mortality rate.	2	CONANP, UNAM IB
2	3.2	Maintain and protect habitat for Mexican wolves in Mexico in occupied areas or areas expected to be occupied in the near future	3.2b	Develop management plans for Natural Protected Areas in Mexican wolf recovery areas	Janos Biosphere Reserve in Chihuahua has a management plan, but this plan is currently under revision. CONANP is working to enlarge Área de Protección de Flora y Fauna Campo Verde, which will require an amended management plan. The management plans will promote conservation. Threats addressed include Extinction risk/demographic stochasticity and exceeding threshold mortality rate.	5	CONANP
2	3.2	Maintain and protect habitat for Mexican wolves in Mexico in occupied areas or areas expected to be occupied in the near future	3.2c	Assist livestock producers in implementing voluntary range and habitat improvements	Coordinate with livestock producers to implement voluntary range and habitat improvements. Threats addressed include Extinction risk/demographic stochasticity and exceeding threshold mortality rate.	25	MFS
2	3.2	Maintain and protect habitat for Mexican wolves in Mexico in occupied areas or areas expected to be occupied in the near future	3.2d	Establish additional protected areas south of Papigochic to La Michilia or around the current reintroduction area	A number of areas are being considered for protection in Mexican wolf habitat. These include 1) an area east of Campo Verde, which would cover the Sierra del Nido and Namiquipa area, located to the southeast from the current reintroduction area; 2) an area between Campo Verde and Tutuaca; and 3) other areas to the south (between Papigochic and La Michilia). Threats addressed include Extinction risk/demographic stochasticity and exceeding threshold mortality rate.	9	CONANP
2	3.3	Maintain and enhance connectivity within and between Mexican wolf populations in the MWEPA and Mexico	3.3a	Monitor the effectiveness of enhancements post-construction	Threats addressed include Loss of gene diversity.	As needed	FWS, CONANP, SCT, AZGFD, NMDGF, Local, State, and Federal DOT

Priority Number	Recovery Action #	Recovery Action	Activity ID	Activity	Narrative	Duration (Years)	Responsible Party
2	3.3	Maintain and enhance connectivity within and between Mexican wolf populations in the MWEPA and Mexico	3.3b	Work with CBP to explore options to maintain cross-border connectivity	FWS will work with CBP to explore options for continued connectivity between Mexican wolf populations in the U.S. and Mexico. Threats addressed include: Loss of gene diversity.	As needed	FWS, CBP
2	3.3	Maintain and enhance connectivity within and between Mexican wolf populations in the MWEPA and Mexico	3.3c	Assess, avoid, minimize, and mitigate the impacts of other human development on Mexican wolves	Recovery in the U.S. is focused on Forest Service lands; therefore, this activity is more relevant to Mexico. Other human development may include mines, dams, border infrastructure, housing and urban development, energy projects, railroads, large scale agriculture, etc. Threats addressed include: Loss of gene diversity.	As needed	CONANP
2	3.3.1	Identify areas where enhancements (e.g., underpasses, overpasses, guiding fences) would improve the passage of Mexican wolves across road corridors in occupied range in the U.S. and Mexico to reduce the potential for wolf mortality from vehicular collision	NA	NA	Threats addressed include: Exceeding threshold mortality rate.	5-15	FWS, CONANP, AZGFD, NMDGF, Local, State, and Federal DOT, NGOs
2	3.3.2	Monitor the effectiveness of enhancements post-construction	NA	NA	Threats addressed include: Extinction risk/demographic stochasticity and exceeding threshold mortality rate	25	FWS, CONANP, AZGFD, NMDGF, Local, State, and Federal DOT, NGOs
2	3.4	Maintain or improve the status of native prey populations of Mexican wolves in occupied areas or areas expected to be occupied in the near future	3.4a	Monitor status of native prey populations	States, Tribes, and Mexico will monitor native prey populations to ensure that there is sufficient prey for wolf recovery and that Mexican wolves are not having unacceptable impacts on native ungulate herds. Threats addressed include: Extinction risk/demographic stochasticity.	25	AZGFD, NMDGF, WMAT, CONANP, MFS

Priority Number	Recovery Action #	Recovery Action	Activity ID	Activity	Narrative	Duration (Years)	Responsible Party
2	3.4	Maintain or improve the status of native prey populations of Mexican wolves in occupied areas or areas expected to be occupied in the near future	3.4b	Conduct wolf-ungulate research	States, Tribes, and Mexico will coordinate on research to determine the most effective methods to measure effects of Mexican wolves on native ungulate herds. Threats addressed include: Extinction risk/demographic stochasticity.	5	IFT, MFS
2	3.4	Maintain or improve the status of native prey populations of Mexican wolves in occupied areas or areas expected to be occupied in the near future	3.4c	Conduct research on other predators in areas with wolves	Threats addressed include: Extinction risk/demographic stochasticity.	5	MFS

Table 1.4. RIS Implementation Schedule for Actions and Activities under Objective 4: Maintain the Mexican Wolf Species Survival Plan (SSP) Captive Breeding Program to Improve the Status of Wild Populations

Priority Number	Recovery Action #	Recovery Action	Activity ID	Activity	Narrative	Duration (Years)	Responsible Party
2	4.1	Manage the Mexican Wolf captive breeding population	4.1a	Coordinate SSP breeding facilities and maintain Mexican wolf studbook	All Mexican wolves in the captive breeding program in the U.S. and Mexico are managed under the Mexican Wolf Species Survival Plan. The SSP provides Mexican wolves for reintroduction into the wild in the U.S. and Mexico. Threats addressed include: Loss of gene diversity and extinction risk/demographic stochasticity.	16	FWS
2	4.1	Manage the Mexican Wolf captive breeding population	4.1b	Manage and care for Mexican wolves in individual SSP captive breeding facilities (Mexico and U.S.)	The Mexican Wolf SSP breeding facilities house and care for the Mexican wolves pro bono. The cost estimates for the Mexico portion of the SSP may be overestimated. Threats addressed include: Loss of gene diversity and extinction risk/demographic stochasticity.	25	NGOs
2	4.1	Manage the Mexican Wolf captive breeding population	4.1c	Manage and monitor wolves at the Sevilleta Wolf Management Facility	The FWS manages and cares for Mexican wolves in the Sevilleta Wolf Management Facility, which is one of the pre-release facilities. Threats addressed include: Loss of gene diversity and extinction risk/demographic stochasticity.	16	FWS

Priority Number	Recovery Action #	Recovery Action	Activity ID	Activity	Narrative	Duration (Years)	Responsible Party
2	4.1	Manage the Mexican Wolf captive breeding population	4.1d	Manage the Ladder Ranch Wolf Management Facility	Turner Endangered Species Fund staff manage and care for Mexican wolves at the Ladder Ranch Wolf Management Facility. Threats addressed include: Loss of gene diversity and extinction risk/demographic stochasticity.	25	TESF, FWS

Table 1.5. RIS Implementation Schedule for Actions and Activities under Objective 5: Promote Mexican Wolf Conservation through Education and Outreach Programs

Priority Number	Recovery Action #	Recovery Action	Activity ID	Activity	Narrative	Duration (Years)	Responsible Party
3	5.1	Conduct education and outreach on Mexican wolf conservation in the U.S., locally (MWEPA), regionally (Southwest), and nationally (U.S.), to support the recovery effort as needed (also see 1.6.1 for education and outreach measures specific to reducing human caused mortality)	5.1a	Conduct education and outreach on Mexican wolf conservation	Provide education to local landowners, livestock producers, and local communities necessary to accomplish recovery. Develop presentations, replicate model from grizzly bear efforts (trailer), use social media, websites, etc. Threats addressed include: Loss of gene diversity, extinction risk/demographic stochasticity, and exceeding threshold mortality rate.	25	FWS, AZGFD, NMDGF, WMAT, FS, NPS, SSP, BLM
3	5.1	Conduct education and outreach on Mexican wolf conservation in the U.S., locally (MWEPA), regionally (Southwest), and nationally (U.S.), to support the recovery effort as needed (also see 1.6.1 for education and outreach measures specific to reducing human caused mortality)	5.1b	Maintain Forest Service liaison position	The Forest Service liaison coordinates with District Rangers and livestock producers on the status of the Mexican wolf and on-going activities; assist with development and implementation of proactive conflict avoidance measures. Threats addressed include: Loss of gene diversity, extinction risk/demographic stochasticity, and exceeding threshold mortality rate.	25	FS
3	5.2	Conduct education and outreach on Mexican wolf conservation in Mexico in areas of, or near, areas occupied by wolves or expected to be occupied in the near future (also see 1.7.1 for education and outreach measures specific to reducing human-caused mortality)	NA		Educate local landowners, livestock producers, and local communities necessary to accomplish recovery. Threats addressed include: Loss of gene diversity, extinction risk/demographic stochasticity, and exceeding threshold mortality rate.	25	MFS, CONANP

Table 1.6. RIS Implementation Schedule for Actions and Activities under Objective 6: Ensure Recovery Success

Priority Number	Recovery Action #	Recovery Action	Activity ID	Activity	Narrative	Duration (Years)	Responsible Party
3	6.1	Manage the Mexican Wolf Recovery Program in the U.S.	6.1a	Conduct status assessments and prepare reports	Assess status of Mexican wolf and prepare annual reports, 5-year status reviews, and 5 and 10-year evaluations per recovery plan. Threats addressed include: Loss of gene diversity, extinction risk/demographic stochasticity, and exceeding threshold mortality rate.	25	FWS
3	6.1	Manage the Mexican Wolf Recovery Program in the U.S.	6.1b	Develop and maintain partnerships	Coordinate with Mexican wolf recovery partner agencies through Memorandum of Understanding; Federal agencies in Mexico; SSP facilities; Mexican Wolf/Livestock Council; and with other affected counties, and state, Federal, and Tribal governments, and stakeholder groups. Threats addressed include: Loss of gene diversity, extinction risk/demographic stochasticity, and exceeding threshold mortality rate.	25	FWS
3	6.1	Manage the Mexican Wolf Recovery Program in the U.S.	6.1c	Manage daily recovery program activities	Respond to congressional and public inquiries, FOIA requests, and litigation; manage budget, contracts, and funding to partner agencies and universities through grants and agreements; maintain administrative records. Threats addressed include: Loss of gene diversity, extinction risk/demographic stochasticity, and exceeding threshold mortality rate.	25	FWS
3	6.2	Manage the Mexican Wolf Recovery Program in Mexico	6.2a	Secure funding	Threats addressed include: Loss of gene diversity, extinction risk/demographic stochasticity, and exceeding threshold mortality rate.	25	CONANP
3	6.2	Manage the Mexican Wolf Recovery Program in Mexico	6.2b	Develop and maintain partnerships	Threats addressed include: Loss of gene diversity, extinction risk/demographic stochasticity, and exceeding threshold mortality rate.	25	CONANP, MSF
3	6.2	Manage the Mexican Wolf Recovery Program in Mexico	6.2c	Manage daily recovery program activities	Threats addressed include: Loss of gene diversity, extinction risk/demographic stochasticity, and exceeding threshold mortality rate.	25	CONANP
3	6.2	Manage the Mexican Wolf Recovery Program in Mexico	6.2d	Coordinate captive population management	Threats addressed include: Loss of gene diversity, extinction risk/demographic stochasticity, and exceeding threshold mortality rate.	25	SEMARNAT
3	6.2	Manage the Mexican Wolf Recovery Program in Mexico	6.2e	Issue permits	Threats addressed include: Loss of gene diversity, extinction risk/demographic stochasticity, and exceeding threshold mortality rate.	25	SEMARNAT

Priority Number	Recovery Action #	Recovery Action	Activity ID	Activity	Narrative	Duration (Years)	Responsible Party
3	6.3	Coordinate binational Mexican wolf recovery efforts in the U.S. and Mexico	6.3a	Exchange information between agencies in Mexico and the U.S.	Exchange information between agencies in Mexico and the U.S. to discuss progress in implementing wolf recovery/conservation activities in Mexico and the U.S. Threats addressed include: Loss of gene diversity, extinction risk/demographic stochasticity, and exceeding threshold mortality rate.	25	FWS, CONANP
3	6.3	Coordinate binational Mexican wolf recovery efforts in the U.S. and Mexico	6.3b	Maintain commitments established in letter of intent (Mexico – U.S.)	Maintain commitments established in letter of intent (Mexico – U.S.) to implement binational recovery actions in the PACE and Mexican Wolf Recovery Plan. Threats addressed include: Loss of gene diversity, extinction risk/demographic stochasticity, and exceeding threshold mortality rate.	2	FWS, CONANP
3	6.4	Develop adequate regulations and management and monitoring plans to maintain viable Mexican wolf populations after delisting	6.4a	Analyze existing regulations	Recovery criteria require regulatory protections for delisting the Mexican wolf. Threats addressed include: Loss of gene diversity, extinction risk/demographic stochasticity, and exceeding threshold mortality rate.	5	CONANP, FWS, AZGFD, NMDGF, WMAT
3	6.4	Develop adequate regulations and management and monitoring plans to maintain viable Mexican wolf populations after delisting	6.4b	Strengthen existing or put in place new laws if needed	Threats addressed include: Loss of gene diversity, extinction risk/demographic stochasticity, and exceeding threshold mortality rate.	5	CONANP, FWS, AZGFD, NMDGF, WMAT
3	6.4	Develop adequate regulations and management and monitoring plans to maintain viable Mexican wolf populations after delisting	6.4c	Develop post-delisting management and monitoring plans	The ESA requires post delisting monitoring. Threats addressed include: Loss of gene diversity, extinction risk/demographic stochasticity, and exceeding threshold mortality rate.	5	CONANP, FWS, AZGFD, NMDGF, WMAT

COST ESTIMATES:**Table 2. Cost estimates for Mexican Wolf recovery activities identified in RIS**

Priority Number	Recovery Action #	Activity ID	Total (\$1000)	FY23 (\$1000)	FY24 (\$1000)	FY25 (\$1000)	FY26 (\$1000)	FY27 (\$1000)	Comments
1	1.1, 1.1.1, 1.1.2	1.1a	36,500	1,460	1,460	1,460	1,460	1,460	Includes costs of personnel and operations (e.g., plane, helicopter, vehicles, fuel, equipment, supplies, carnivore logs, per diem). Includes costs for all activities in Recovery Actions 1.1., 1.1.1, and 1.1.2.
1	1.2, 1.2.1, 1.2.2	1.2a	12,120	220	400	500	500	500	Includes costs of field staff, vehicles, and collars. Includes costs for all activities in Recovery Actions 1.2, 1.2.1, and 1.2.2.
1	1.3	1.3a, 1.3b, 1.3c	5,625	225	225	225	225	225	FWS provides funding to WMAT through cooperative agreement. Includes costs of field staff, vehicles, fuel, and equipment. Includes costs for all activities in Recovery Action 1.3.
2	1.4	1.4a, 1.4b, 1.4c	3,920	40	40	40	40	40	Ongoing. Estimated costs include \$20,000 for first year; \$40,000 for 10 years, and \$250,000 for 14 years, to account for increased tribal participation in the future. Includes costs for all activities in Action 1.4
2	1.5	1.5a	N/A	X	X	X	X	X	Costs included as part of Recovery Action 2.2.
2	1.6	NA	6,298	268	268	268	268	268	Some costs included in other actions.
2	1.6.1	NA	NA	X	X	X	X	X	Costs included as part of Recovery Action 5.1.
2	1.6.2	NA	NA	X	X	X	X	X	Costs included as part of Recovery Action 6.1.
2	1.6.3	NA	X	X	X	X	X	X	Fencing costs are \$100,000 per mile; Overpass costs are \$4,000,000 for 2-lane; Underpass costs are \$1,000,000 for 2-lane.
2	1.7	NA	NA	X	X	X	X	X	
2	1.7.1	NA	2,422	100	100	100	100	100	This activity includes education for school children, communities, landowners, livestock producers. Education and outreach may include educational brochures, workshops, radio outreach.
2	1.7.2	NA	250	10	10	10	10	10	
2	1.7.3	NA	NA	X	X	X	X	X	Costs included as part of Recovery Action 1.2.
2	1.7.4	NA	NA	X	X	X	X	X	Costs included as part of Recovery Actions 1.1, 1.2, and 6.1.
2	1.8	1.8a	NA	X	X	X	X	X	Costs included in Recovery Action 1.1
2	1.8	1.8b	5,000	200	200	200	200	200	Ongoing.
2	1.8.1	1.8.1a, 1.8.1b	9,550	400	400	400	400	400	NGO funding to match Federal grants for livestock compensation and wolf presence.

Priority Number	Recovery Action #	Activity ID	Total (\$1000)	FY23 (\$1000)	FY24 (\$1000)	FY25 (\$1000)	FY26 (\$1000)	FY27 (\$1000)	Comments
2	1.8.2	1.8.2a, 1.8.2b	6,000+	400	400	400	400	400	Federal Livestock Demonstration Project grants.
2	1.9	NA	4,850	200	200	200	200	200	Includes costs for all activities in Recovery Action 1.9
2	1.9.1	NA	NA	X	X	X	X	X	Costs included as part of Recovery Action 1.2.
1	2.1	2.1a	NA	X	X	X	X	X	Costs included as part of Recovery Action 1.1
1	2.1	2.1b	NA	X	X	X	X	X	Costs included as part of Recovery Action 1.1
1	2.1	2.1c	NA	-	-	X	-	-	Activity will occur every 4 years over 16 years. Costs are included as part of Recovery Action 1.1
1	2.1	2.1d	NA	X	X	X	X	X	Costs included as part of Recovery Action 1.1
1	2.1	2.1e	6,400	400	400	400	400	400	Costs include staff and operations.
1	2.1	2.1f	NA	X	X	X	X	X	Costs included as part of Recovery Action 1.1
1	2.2	2.2a	NA	X	X	X	X	X	Costs are included in other activities
1	2.2	2.2b	NA	X	X	X	X	X	Costs are included as part of Recovery Action 1.2
1	2.2	2.2c	NA	X	X	X	X	X	Costs are included as part of Recovery Action 1.2
1	2.2	2.2d	NA	X	X	X	X		Costs are included as part of Recovery Action 1.2
1	2.2	2.2e	NA	X	X	X	X	X	Activity will occur every other year for 8 years. Costs are included as part of Recovery Action 1.2
1	2.2	2.2f	560	70	70	70	70	70	Costs are estimated for managing wolves at 3 pre-release facilities in Mexico
1	2.2	2.2g	NA	X	X	X	X	X	Costs are included as part of Recovery Action 1.2
2	2.3	2.3a	NA	X	X	X	X	X	Costs are included as part of Recovery Action 1.1
2	2.3	2.3b	750	30	30	30	30	30	FWS provides funding to UI through a cooperative agreement
2	2.3	2.3c	NA	X	X	X	X	X	Costs are included as part of Recovery Action 6.1
2	2.3	2.3d	375	15	15	15	15	15	FWS provides funding to UNM through a cooperative agreement
2	2.4	2.4a	NA	X	X	X	X	X	Costs are included as parts of Recovery Actions 1.1 and 1.2; however, in future years, more funding is needed
2	2.4	2.4b	NA	X	X	X	X	X	Costs are included as parts of Recovery Actions 1.1 and 1.2
2	2.4	2.4c	NA	X	X	X	X	X	Costs would be incurred regardless of listing status of the Mexican wolf
2	3.1	3.1a	NA	X	X	X	X	X	Costs included as part of Recovery Action 6.1
2	3.1	3.1b	NA	X	X	X	X	X	Costs included as parts of Recovery Actions 1.1 and 1.2
2	3.2	3.2a	60	-	30	30	-	-	
2	3.2	3.2b	50	10	10	10	10	10	
2	3.2	3.2c	NA	X	X	X	X	X	Costs included as part of Recovery Action 1.7
2	3.2	3.2d	477	53	53	53	53	53	Estimated costs include the process to declare 3 Natural Protected Areas in Mexico. The process takes about 3 years for each area.
2	3.3	3.3a	NA	X	X	X	X	X	Costs included as part of Recovery Actions 1.1 and 1.2

Priority Number	Recovery Action #	Activity ID	Total (\$1000)	FY23 (\$1000)	FY24 (\$1000)	FY25 (\$1000)	FY26 (\$1000)	FY27 (\$1000)	Comments
2	3.3	3.3b	NA	X	X	X	X	X	Costs included as part of Recovery Action 6.1
2	3.3	3.3c	NA	X	X	X	X	X	Costs will be calculated on a case-by-case basis as needed.
2	3.3.1		NA	X	X	X	X	X	Costs will be calculated on a case-by-case basis as needed.
2	3.3.2	NA	NA	X	X	X	X	X	Costs will be calculated on a case-by-case basis as needed. These enhancements would benefit multiple species; therefore, the cost of this activity would be shared among various species programs.
2	3.4	NA	625	25	25	25	25	25	Cost estimates are for Mexico.
2	3.4	3.4a	NA	X	X	X	X	X	In the U.S., costs already incurred for state management purposes. Costs for Mexico included in action 3.4.
2	3.4	3.4b	NA	X	X	X	X	X	In the U.S., costs are incurred by States for ungulate monitoring and are included as part of Recovery Action 1.1. Costs for Mexico are included as part of Recovery Action 3.4.
2	3.4	3.4c	NA	X	X	X	X	X	Costs for Mexico are included as part of Recovery Action 3.4.
2	4.1	4.1a	480	30	30	30	30	30	Funding for research and transfers provided from FWS through cooperative agreement with SSP Coordinator.
2	4.1	4.1b	54,202	2,644	2,644	2,644	2,644	2,644	Costs based on 256 wolves in 51 facilities for 16 years. Then we anticipate the SSP will be decreased to about half of its current size from years 17 to 25.
2	4.1	4.1c	NA	X	X	X	X	X	Costs included as part of activity 2.1e.
2	4.1	4.1d	NA	X	X	X	X	X	Costs included as part of activity 2.1e. FWS provides \$45K annually to TESH through a cooperative agreement.
3	5.1	5.1a	5,250	300	300	300	300	300	Recovery activity 5.1a costs include 3 employees for 10 years, plus 1.5 employees for 15 years.
3	5.1	5.1b	3,750	150	150	150	150	150	
3	5.2	NA	NA	NA	NA	NA	NA	NA	Costs included as part of Recovery Action 1.7.
3	6.1	6.1a, 6.1b, 6.1c	8,500	500	500	500	500	500	Cost based on 4 FWS employees to manage the recovery program; costs will decrease to \$300,000 after 5 years. Includes costs for all activities in Recovery Action 6.1.
3	6.2	6.2a, 6.2b, 6.2c, 6.2d, 6.2e	875	35	35	35	35	35	Cost based on proportion of CONANP and SEMARNAT employee salaries spent on Mexican wolf recovery. Includes costs for all activities in Recovery Action 6.2.
3	6.3	6.3a, 6.3b	NA	X	X	X	X	X	Costs included as part of Recovery Actions 6.1 and 6.2.
3	6.4	6.4a, 6.4b	NA	NA	NA	NA	NA	NA	Costs included as part of Recovery Actions 6.1 and 6.2 and will occur in the latter (5) years prior to recovery and delisting.
3	6.4	6.4c	NA	NA	NA	NA	NA	NA	Costs included as part of Recovery Action 6.1 and will occur in the latter (5) years prior to recovery and delisting.

VII. LITERATURE CITED

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