

**Draft Addendum to the Wildlife and  
Wildlife Habitat Restoration Plan and  
Environmental Assessment for the  
Chino, Cobre, and Tyrone Mine  
Facilities**



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**DRAFT**

**November 2016**

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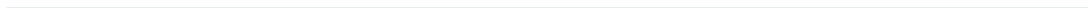
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## EXECUTIVE SUMMARY

The New Mexico Office of Natural Resources Trustee (ONRT) and the United States Fish and Wildlife Service (Service) (collectively, the “Trustees”) reached a settlement with Freeport-McMoRan Copper & Gold Inc. and its associated companies (hereafter referred to as FMI) for wildlife and wildlife habitat injuries caused by hazardous substances released from the three copper mining facilities owned by FMI near Silver City, New Mexico (Chino, Tyrone, and Cobre Mines). The Trustees completed a *Wildlife and Wildlife Habitat Restoration Plan and Environmental Assessment for the Chino, Cobre, and Tyrone Mine Facilities* (RP/EA) in 2013 (ONRT and Service 2013), which described the Trustees’ evaluation of proposed restoration projects and the Trustees’ preferred alternative for compensating the public for injuries to wildlife and wildlife habitat resources.

The proposed restoration projects evaluated as part of the RP/EA were categorized into three tiers based on funding priority. Seven projects from the preferred alternative were categorized as Tier 1 for funding in the RP/EA, and the Trustees are in the process of implementing these projects. In addition, the Trustees also set aside funding for the implementation of one of the Tier 2 projects. Upon completion of these eight restoration projects, the Trustees anticipate that funding will still remain for the implementation of additional restoration actions. However, based on the evaluation of the remaining Tier 2 and all of the Tier 3 projects described in the RP/EA, the Trustees believe that new project proposals are needed to provide sufficient wildlife benefits, particularly to waterfowl and other bird species. To accomplish this, the Trustees reopened the restoration project selection process in late 2015 and encouraged stakeholders and the public to submit more restoration project ideas to the Trustees. This Draft Addendum to the RP/EA (Addendum), prepared by the Trustees, presents additional proposed restoration projects, an evaluation of the projects, and identifies the projects the Trustees determined would best compensate the public for the remaining injuries to wildlife and wildlife habitat resources.

A total of ten restoration project proposals were submitted by stakeholders and the public and seven of those are recommended for funding in this Addendum. The projects were evaluated using the same screening and evaluation criteria described in the RP/EA and listed below. To be considered for further evaluation, a project must satisfy the following criteria:

- Is technically and administratively feasible
- Benefits wildlife or wildlife habitat affected by hazardous substance releases at the Chino, Tyrone, or Cobre mines
- Provides an overall net environmental benefit
- Complies with applicable and relevant Federal, State, local, and Tribal laws and regulations
- Is subject to Trustee management, control, and monitoring.

Projects that passed the screening criteria were assessed using the following set of evaluation criteria:

- Is likely to directly benefit birds that were affected by hazardous substance releases at the Chino, Tyrone, or Cobre mines
- Has a high potential for long-term success
- Has a low risk of failure
- Has feasible and cost-effective provisions for operations, maintenance, and monitoring
- Needs NRDAR funding
- Is located close to where the injuries occurred at the Chino, Tyrone, or Cobre mines
- Is cost-effective compared with other projects that provide similar benefits
- Is likely to benefit multiple wildlife resources and services
- Is consistent with regional planning and Federal and State policies
- Is likely to provide benefits quickly after project implementation
- Allows for appropriate public access
- Leverages funding to enable projects to be larger or more comprehensive in scope.

The remaining funding available to the Trustees is insufficient to fund all of the projects that passed the screening criteria. Therefore, the Trustees assessed the projects using the evaluation criteria to determine which projects best met the criteria. The Trustees' preferred restoration alternative includes seven of the ten projects that would be implemented depending on sufficient funding. Additional details on the projects and the Trustees' evaluation are presented in Chapter 3. In general, the projects recommended for funding by the Trustees include either active restoration of riparian and wetland habitat or preservation of unique habitats through conservation easements. A brief description of each of the ten projects considered in this Addendum is provided in Table ES-1.

Additional information on the project review can be requested by contacting:

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Albuquerque, NM 87113

An electronic version of the RP/EA and this Addendum are posted on the New Mexico Office of Natural Resources Trustee website ([www.onrt.state.nm.us](http://www.onrt.state.nm.us)).

**TABLE ES-1 RESTORATION PROJECTS RECOMMENDED FOR FUNDING AND THOSE CONSIDERED BUT NOT RECOMMENDED FOR FUNDING**

PROJECT NAME*	PROJECT CATEGORY	BRIEF PROJECT DESCRIPTION
<b>PROJECTS RECOMMENDED FOR FUNDING</b>		
Barmore-West Fork Gila Property Conservation Easement	Habitat protection	Protect wildlife habitat by creating a conservation easement on two private property parcels (total of approximately 14 hectares (ha) (35 acres)), bisected by a 0.4 kilometers (km) (0.25 mile (mi)) reach of the West Fork of the Gila River. 1.5 ha (3.8 acres) are riverine and marsh wetlands with an additional 1.4 ha (3.4 acres) of riparian habitat.
City of Rocks (CoR) State Park Wildlife Habitat Restoration	Riparian/ watershed habitat restoration	Enhance and restore existing water resources to benefit wildlife and wildlife habitat, including invasive species removal, wetland habitat creation, native plantings, and erosion control measures. This project also includes an opportunity to educate the public.
Gila River Farm Riparian Preserve	Riparian habitat restoration	Construct a shallow seasonal wetland habitat for wintering waterfowl and migratory birds, including mowing berms to prevent riparian vegetation in the wetland area. This project would also benefit the hydrology of the area and includes educational outreach.
Headwaters Burro Ciénega Watershed: Habitat Enhancement and Treatment of Nonnative Plants	Riparian/ watershed habitat restoration	Enhance and restore existing habitat by planting riparian shrub and tree buffers on suitable streambanks in the headwaters portion of the Ciénega's watershed; identifying, locating, and treating undesirable nonnative plants species that prevent or slow the establishment of desirable native species.
Prevost Ranch Conservation Easement	Habitat protection	Protect wildlife habitat by creating a conservation easement for a working ranch currently under private ownership, including a 4.7 km (2.9 mi) stretch of the Burro Ciénega, over 11 km (7 mi) of seasonal drainages, 1 ha (2.7 acres) of freshwater ponds, and 13 ha (32 acres) of riverine wetlands.
Southwest Sufi-Bear Creek Conservation Easement & Habitat Improvement	Habitat protection	Protect wildlife habitat by creating a conservation easement and conducting riparian restoration on privately owned property, including 4.2 km (2.6 mi) of Bear Creek, 13.8 ha (34 acres) of riverine and marsh wetlands as part of about 28 ha (70 acres) of riparian floodplain habitat.
Upper Whiskey Creek Restoration	Riparian/ watershed habitat restoration	Enhance and restore wildlife habitat by restoring three existing dirt tanks, creating three wetland ponds, and restoring surface water hydrology.
<b>PROJECTS CONSIDERED BUT NOT RECOMMENDED FOR FUNDING</b>		
Headwaters Burro Ciénega Watershed: Habitat Enhancement, Erosion Control, and Forest Service Road Relocations	Riparian/ watershed habitat restoration	Enhance the Headwaters Burro Ciénega Watershed habitat through the construction of earthen erosion control structures, relocation of Forest Service roads, and the treatment of invading piñon/juniper in the Gila National Forest.
Mangas Valley Restoration	Riparian/ watershed habitat restoration	Restore habitat by lifting the stream bed of the Mangas Valley, restoring the deeply incised Mangas Creek, creating wetlands, and creating a shallow channel that allows floodwater to communicate with its historical floodplain.
Permanent Structures for Irrigation Ditches in the Gila Basin	Riparian/ watershed habitat restoration	Enhance habitat by constructing permanent diversion structures in the Gila River to divert water into acequias, which are used to irrigate pasture and cropland, ensuring more consistent water flow through the ditches for irrigation and improving riparian areas.
*Projects are listed alphabetically by funding category.		

## CHAPTER 1 | INTRODUCTION

### 1.1 INTRODUCTION AND PURPOSE OF THIS DOCUMENT

The New Mexico Office of Natural Resources Trustee (ONRT) and the United States Fish and Wildlife Service (Service; together “the Trustees”) conducted a cooperative Natural Resource Damage Assessment and Restoration (NRDAR) process for Freeport-McMoRan Copper & Gold Inc. (hereafter referred to as FMI) and its associated mine sites located near Silver City, New Mexico. Wildlife and wildlife habitat resources have been injured by hazardous substances released from three copper mining facilities owned by FMI near Silver City: the Chino, Cobre, and Tyrone Mines. The Trustees and FMI reached a settlement for injury to wildlife and wildlife habitats caused by operations at the three mines. The consent decree was approved by the United States (U.S.) District Court on February 21, 2012.<sup>1</sup>

The Trustees finalized a *Wildlife and Wildlife Habitat Restoration Plan and Environmental Assessment for the Chino, Cobre, and Tyrone Mine Facilities* (RP/EA) in October 2013 (ONRT and Service 2013). The RP/EA summarized natural resource injuries that occurred as a result of site-related releases of hazardous substances from the Chino, Cobre, and Tyrone Mines, provided an evaluation of proposed restoration projects, and described the Trustees’ preferred restoration alternative to compensate the public for injuries to wildlife and wildlife habitat resources. The Trustees are implementing eight of the restoration projects identified in the RP/EA. However, the Trustees determined that after these eight projects are implemented, funding will remain and additional restoration project ideas would be needed to provide sufficient wildlife benefits, particularly to waterfowl and other bird species. This document represents an addendum to the RP/EA developed by the Trustees. The Trustees are publishing this Addendum to the RP/EA (Addendum) to provide a description and evaluation of the additional proposed restoration projects, including those recommended for inclusion in a new preferred restoration alternative, and to seek public comments on these projects. Additional information on restoration planning completed to-date is provided below.

### 1.2 RESTORATION PLANNING TO-DATE

As noted above, the Trustees and FMI reached a settlement for wildlife and wildlife habitat injuries in 2012. The agreement between the Trustees and FMI included reimbursement of \$59,750 of past assessment costs, \$5.5 million for terrestrial and wildlife damages, and the transfer of 290 ha (716 acres) of land owned by FMI to New Mexico’s City of Rocks State Park. The land transfer within the City of Rocks State Park includes high desert grassland habitat in the Chihuahuan desert, and compensates the public for a portion of the FMI-related natural resource

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<sup>1</sup> The consent decree is available at: <https://onrt.env.nm.gov/wp-content/uploads/ConsentDecreesignedbyJudge2-21-2012FMIWildlife.pdf>

injuries to terrestrial and wildlife resources. The Trustees are using the \$5.5 million to fund restoration actions that will provide additional benefits to wildlife and wildlife habitat in the general vicinity of Silver City, New Mexico. Prior to this land and wildlife settlement, FMI and ONRT reached a \$13 million settlement for damages to groundwater resources. Groundwater restoration projects were identified and evaluated in a separate restoration plan (ONRT 2012).

Upon approval of the consent decree in February 2012, the Trustees held a public meeting in Silver City, New Mexico on May 30, 2012 to inform the public of the wildlife and wildlife habitat restoration planning process and to request that information about potential restoration projects be provided to the Trustees for consideration. The Trustees also contacted relevant agencies, organizations, and stakeholder groups. Based on the input received, the Trustees developed a *Draft Wildlife and Wildlife Habitat Restoration Plan and Environmental Assessment for the Chino, Cobre, and Tyrone Mine Facilities* (Draft RP/EA), which was released on January 16, 2013 along with a press release on its availability and a request for public comment. The public comment period was 48 days and included a public meeting on January 30, 2013 in Silver City, New Mexico. The final RP/EA, which incorporated an additional project and comments from the public, was then released in October 2013 (ONRT and Service 2013).

As described in the RP/EA, 17 restoration projects were evaluated using screening and evaluation criteria developed by the Trustees that are consistent with Federal regulations. The Trustees developed a preferred restoration alternative, which included all of the proposed projects that met the screening criteria. Since the funding available was not enough to fund all of the projects in the preferred alternative, the Trustees divided the projects into three Tiers based on how well each project met the Trustees' evaluation criteria and on how they would best compensate the public for injuries to wildlife and wildlife habitat resources resulting from the releases of hazardous substances from the FMI mine facilities. Tier 1 included those projects that ranked highest and were prioritized for funding by the Trustees. Tier 2 projects ranked the next highest in the project evaluation and would be implemented if funds remained upon completion of Tier 1 projects. Projects proposed under Tier 3 met the Trustees' screening criteria, but ranked lower than the projects in Tier 2 with respect to waterfowl benefits. Tier 3 projects would be considered only if sufficient funds remained and if the projects provided sufficient waterfowl benefits.

Seven projects from the Trustees' preferred alternative were categorized as Tier 1 for funding in the RP/EA, and the Trustees are currently implementing all of these projects. Tier 2 consisted of four projects and the Trustees have set aside funding for the implementation of one of these projects. For the three remaining Tier 2 projects, two projects are no longer available and a land management entity meeting the Trustees' requirements could not be found for the third project. Six projects were included under Tier 3; however, these projects do not provide sufficient waterfowl benefits and were far from or outside the injured watersheds. Therefore, none of the Tier 3 projects are recommended for funding at this time. See Table 1-1 for the status of projects described in the RP/EA.

As the Trustees implement the eight restoration projects described in Table 1-1 (all seven projects from Tier 1 and one from Tier 2), it has become evident that enough funding will still remain for the implementation of additional restoration actions. The Trustees determined that additional projects will provide added wildlife benefits, particularly to waterfowl. To achieve this, the

Trustees reopened the project proposal process in September 2015 and reached out to the public to solicit additional project proposals with a stronger nexus to the relevant natural resource injuries. On October 21, 2015, the Trustees held a public meeting to discuss and solicit additional restoration project proposals from the public. This Addendum provides a description of the project proposals received from the public, information on the project evaluation completed by the Trustees, and the Trustees' new preferred restoration alternative.

Additional information on the responsibilities and legal authority of the Trustees to develop the RP/EA and this Addendum, the settlement between FMI and the Trustees, and the Administrative Record can be found in Chapter 1 of the RP/EA. The next three chapters of this document provide information on the role of public involvement in developing this Addendum, the responsible party's involvement, and information on the organization of the remainder of the document.

### **1.3 PUBLIC INVOLVEMENT**

As noted above, the Trustees reopened the restoration project selection process in late 2015 and encouraged stakeholders and the public to submit more restoration project ideas to the Trustees. The outreach process consisted of e-mail notifications to stakeholders on September 16, 2015 and the issuance of a press release and a legal notice in mid-October 2015 in the Silver City Sun News.

The Trustees held an informational public meeting in Silver City, New Mexico on October 21, 2015 to inform the public about the restoration planning process and to request that information about potential additional restoration projects be provided to the Trustees for consideration. The Trustees also contacted relevant agencies, organizations, and stakeholder groups to learn more about potential restoration project opportunities. A list of the stakeholders consulted during this process is provided in Chapter 5.

Public review of the proposed restoration actions presented in this Addendum is an integral part of the restoration planning process. The Trustees seek public comment on the new projects being proposed to restore injured wildlife and wildlife habitat resources with an emphasis on benefits to waterfowl. This Addendum will be available for public comment for 30 days, starting on November 29, 2016 and ending on December 28, 2016. The Trustees will consider comments received during the public comment period before developing the final Addendum to the RP/EA. The final Addendum will include a summary of comments received and the Trustee's responses to those comments.

Written comments should be provided to:

Ms. Trais Kliphuis  
Executive Director  
New Mexico Office of Natural Resources Trustee  
121 Tijeras Avenue NE, Ste. 1000  
Albuquerque, NM 87102

Comments can also be submitted via e-mail to: [trais.kliphuis@state.nm.us](mailto:trais.kliphuis@state.nm.us)

An electronic version of the Draft Addendum is on the ONRT website at the following link:  
<https://onrt.env.nm.gov/wp-content/uploads/fmidraftaddendum.pdf>.

#### **1.4 RESPONSIBLE PARTY INVOLVEMENT**

The assessment process for the Chino, Cobre, and Tyrone Mines was conducted as a cooperative assessment with FMI, and the Trustees coordinated with the responsible parties while undertaking the NRDAR. Cooperative assessments (such as this one) can increase the cost effectiveness of the process by facilitating the sharing of information and avoiding the duplication of study efforts. Input from FMI was sought and considered throughout the assessment process.

FMI chose not to participate in the restoration planning and implementation process. The Trustees have the final authority to make determinations regarding restoration actions for wildlife and wildlife habitat resources.

#### **1.5 DOCUMENT ORGANIZATION**

The remainder of this Addendum is organized as follows. Chapter 2 provides information on the restoration project evaluation approach. Chapter 3 presents the proposed restoration projects, preferred alternative, and the no-action alternative. Chapter 4 evaluates the compliance of the preferred alternative with the National Environmental Policy Act (NEPA).

For additional information on the NRDAR process and for more background information, the reader is encouraged to review the 2013 RP/EA. In particular, information on the responsibilities and legal authority of the Trustees to develop the RP/EA, the settlement between FMI and the Trustees, public and responsible party involvement, and the Administrative Record can be found in Chapter 1 of the RP/EA; purpose and need for restoration, including an overview of injuries to wildlife and wildlife habitat in the area of the three mine sites is provided in Chapter 2 of the RP/EA; additional information on the process for evaluating restoration projects is provided in Chapter 3 of the RP/EA; and, information on the affected environment is provided in Chapter 5 of the RP/EA.

TABLE 1-1 STATUS OF PROJECTS FROM THE RP/EA (ONRT AND SERVICE 2013)

SECTION OF RP/EA	PROJECT NAME	PROJECT CATEGORY	STATUS
<b>TIER 1</b>			
4.3.1	Ancheta Springs Ranch Conservation Easement	Habitat protection and improvement	Easement has been acquired
4.3.2	Burro Cienaga Side Channel, Floodplain, and Low Terrace Restoration	Watershed habitat restoration	In progress
4.3.3	Burro Cienaga Watershed Restoration	Watershed habitat restoration	In progress
4.3.4	Double E Ranch Habitat Protection and Improvement	Habitat protection and improvement	Land has been acquired
4.3.5	Mimbres River Wildlife and Habitat Restoration	Riparian habitat restoration	In progress
4.3.6	Redrock Property Habitat Protection and Improvement	Habitat protection and improvement	In progress
4.3.7	River Ranch Habitat Protection and Improvement	Habitat protection and improvement	Land has been acquired
<b>TIER 2</b>			
4.4.1	Ancheta Springs Ranch Restoration	Riparian habitat restoration	In progress
4.4.2	Davis Property Habitat Protection and Improvement	Habitat protection and improvement	No longer available
4.4.3	Porter Property Habitat Protection and Improvement	Habitat protection and improvement	No longer available
4.4.4	Upper Bear Creek Habitat Protection and Improvement	Habitat protection and improvement	No state management entity could be found
<b>TIER 3</b>			
4.5.1	Burro Cienaga Grassland Restoration	Grassland habitat restoration	Does not provide sufficient waterfowl benefits
4.5.2	Grassland Restoration through Aerial Treatment of Mesquite	Grassland habitat restoration	Does not provide sufficient waterfowl benefits
4.5.3	Meadow Creek Restoration	Riparian habitat restoration	Does not provide sufficient waterfowl benefits
4.5.4	Migratory Bird Grassland Restoration	Grassland habitat restoration	Not in injured watershed
4.5.5	Swan Pond Habitat Restoration	Riparian habitat restoration	Not in injured watershed
4.5.6	York Canyon Rehabilitation	Riparian habitat restoration	Not in injured watershed

## CHAPTER 2 | RESTORATION PROJECT EVALUATION

The Trustees' goal under this NRDAR is to compensate the public for the loss of wildlife, especially waterfowl and other bird species, and the loss of wildlife habitat that resulted from releases of hazardous substances at the Chino, Cobre, and Tyrone Mines. According to the NRDAR regulations developed for Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) [43 C.F.R. § 11.82(a)], the Trustees are required to develop restoration alternatives that either (1) restore or rehabilitate injured natural resources to a condition in which they can provide the level of services available at baseline (conditions that would have occurred but for the release of hazardous substances), or (2) replace or acquire equivalent natural resources capable of providing such services.

The Trustees prefer a diverse portfolio of wildlife-focused restoration projects that would provide the maximum benefit to regional wildlife resources; this includes a mix of projects that focus on wildlife habitat protection and wildlife habitat restoration. Because migratory birds and waterfowl have been identified as the primary wildlife resource injured (described in more detail in Chapter 2 of the RP/EA), preferred projects will benefit migratory birds and waterfowl habitat, or protect land that provides riparian and wetland habitat that benefits these bird species. This is consistent with current approaches to regional planning in the area and will meet the Trustees' goal of replacing or acquiring natural resources that are equivalent to those lost.

The Trustees developed criteria for screening and evaluating proposed restoration projects (summarized below and described in more detail in Chapter 3.1 of the RP/EA), and then they applied these criteria to proposed restoration projects to develop a preferred restoration alternative (described in Section 2.2 below).

### **2.1 SCREENING AND EVALUATION CRITERIA FOR PROPOSED RESTORATION PROJECTS**

The Trustees evaluated the suite of additional proposed restoration projects described in this Addendum using the same screening and evaluation criteria used to evaluate the projects described in the RP/EA. As described in the RP/EA, the criteria reflect the guidance for restoration project selection provided by the NRDAR regulations developed for CERCLA [43 C.F.R. § 11.82], but also the guidance for restoration project selection in the regulations developed by the National Oceanic and Atmospheric Administration (NOAA) for restoration planning under the Oil Pollution Act [15 C.F.R. § 990.54].

The screening and evaluation criteria are described in Chapter 3.1 of the RP/EA and below. The Trustees used screening criteria (Table 2-1) to determine whether the proposed projects met minimum standards of acceptability. To be deemed acceptable, a project had to comply with all of the screening criteria. If a project did not meet the screening criteria, it was not given further

consideration by the Trustees. Table 2-1 lists the screening criteria and explanations of how the Trustees interpreted and applied the criteria.

The Trustees applied the evaluation criteria used in the original RP/EA (Table 2-2) to each of the potential restoration projects that successfully passed the project screening process. These criteria were grouped into three categories (high-priority, medium-priority, or low-priority) according to their importance to the Trustees. Ratings were weighted more heavily for high-priority criteria and less heavily for low-priority criteria. Proposed projects were evaluated for each criterion and assigned a rating of below average, average, or above average. A list of evaluation criteria is provided in Table 2-2 with an explanation of how the Trustees interpreted and applied the criteria.

**TABLE 2-1 SCREENING CRITERIA FOR PROPOSED RESTORATION PROJECTS**

SCREENING CRITERIA	EXPLANATION
Be technically and administratively feasible	Proposed projects must be able to be implemented using reliable technical approaches and by entities with the capacity to effectively complete and manage the project.
Benefit wildlife or wildlife habitat affected by hazardous substance releases at and from the Chino, Tyrone, and Cobre Mines	Proposed projects must restore, rehabilitate, replace, or acquire wildlife or wildlife habitat, particularly birds or bird habitat, which was injured by the release of hazardous substances at and from the Chino, Tyrone, and Cobre Mines.
Provide an overall net environmental benefit	Proposed projects must provide a net gain in environmental services. For example, a project that is solely a research study would not meet this criterion.
Comply with applicable and relevant Federal, State, local, and Tribal laws and regulations	Proposed projects must be legal, likely to receive required permits, and must consider public health, welfare, and the environment.
Be subject to a reasonable degree of Trustee management, control, and monitoring	Proposed projects must be managed, controlled, and monitored in a way that is consistent with Trustee restoration goals and subject to a reasonable degree of Trustee oversight.

TABLE 2-2 EVALUATION CRITERIA FOR PROPOSED RESTORATION PROJECTS

EVALUATION CRITERIA	EXPLANATION	PRIORITY
Is likely to directly benefit birds that were affected by hazardous substance releases at and from the Chino, Tyrone, and Cobre Mines	Birds have been identified as the primary wildlife resource injured. Proposed projects that directly benefit birds will be evaluated more favorably. Factors to be considered include how the proposed project will benefit birds, particularly migratory birds and waterfowl, and whether the project specifically improves high-priority bird habitats, such as riparian and floodplain habitats.	High
Has a high potential for long-term success	Proposed projects that use proven technologies and have mechanisms in place to ensure long-term success will be evaluated more favorably. Factors to be considered include whether the project includes provisions that promote project longevity, such as a conservation easement, a contract that requires at least 10 years of operations and maintenance for restoration work, or a management commitment by a public agency or conservation organization; whether the proposed restoration technique is appropriate for the project; whether these preservation mechanisms or restoration techniques have been used before with success; and whether the entity proposing to implement the project has the capacity to undertake it.	High
Has a low risk of failure	Proposed projects that have addressed and limited potential risks will be evaluated more favorably. Factors to be considered include all potential risks that may be faced during project implementation, such as the need for long-term protection, the need for high-quality management by a public entity or qualified organization, the need to coordinate with multiple outside parties, the need for regulatory permits, the complexity of design and engineering, and the lack of public support.	High
Has feasible and cost-effective provisions for operations, maintenance, and monitoring	Proposed projects that have sufficient provisions or less need for operations, maintenance, and monitoring will be evaluated more favorably. Factors to be considered include whether operations, maintenance, and monitoring costs are reasonable and cost-effective given the project's scope; whether funding is sufficient to support operations, maintenance, and monitoring activities over an appropriate time frame; and whether the proposed duration of operations, maintenance, and monitoring activities is appropriate.	High
Needs NRDAR funding	Projects that would not likely be implemented unless they receive funding from the NRDAR settlement will be evaluated more favorably. Factors to be considered for land protection projects include whether NRDAR settlement funding will prevent risk of land development and habitat degradation that is otherwise at a high risk of occurring. A secondary priority will be projects for which NRDAR funding would enable earlier implementation.	High
Is located close to where the injuries occurred at the Chino, Tyrone, and Cobre Mines	Proposed projects that are located in areas that have a positive impact on wildlife injured at the Chino, Tyrone, and Cobre Mines (e.g., projects that are in the same migratory flyway) will be evaluated more favorably. A secondary geographic priority will be projects located within the Gila or Mimbres River watersheds, where the injuries occurred.	Medium

EVALUATION CRITERIA	EXPLANATION	PRIORITY
Is cost-effective compared with other projects that provide similar benefits	Proposed projects that are more cost-effective relative to other projects that provide similar benefits will be evaluated more favorably. Factors to be considered include the estimated costs of a proposed project compared to the likely benefits to wildlife and wildlife habitat, especially birds.	Medium
Is likely to benefit multiple wildlife resources and services	Proposed projects that provide multiple benefits will be evaluated more favorably. Factors to be considered include the rarity or uniqueness of wildlife species that benefit from the project; the extent to which proposed projects directly benefit multiple wildlife resources; and the extent to which projects provide additional services that indirectly benefit wildlife, such as improvements in water quality, biodiversity, and open space.	Medium
Is consistent with regional planning and Federal and State policies	Proposed projects that are consistent with regional planning, Federal and State policies, or conservation organization priorities will be evaluated more favorably. Factors to be considered include consistency with Federal and State regional planning documents, policies, and strategies; and consistency with national, State, and regional conservation priorities. For example, projects that increase or improve habitat that is contiguous with other protected areas will be evaluated more favorably. Similarly, project sites that have been identified by a public agency or conservation organization as priority sites for wetland or riparian habitat and bird management will be evaluated more favorably.	Medium
Is likely to provide benefits quickly after project implementation	Proposed projects that provide benefits sooner will be evaluated more favorably. Factors to be considered include how quickly after project implementation the benefits to birds are realized.	Low
Allows for appropriate public access	Proposed projects that allow regular public access will be evaluated more favorably than projects that allow occasional public access or that do not allow any public access. Factors to be considered include the level and timing of access the public will have to the protected or restored project site.	Low
Leverages funding to enable projects to be larger or more comprehensive in scope	Proposed projects that leverage funding from other sources will be evaluated more favorably. Although matching funds are not required for a project to be eligible for NRDAR funding, the Trustees encourage proposals that leverage additional funding and in-kind services because it expands the scope of projects and benefits supported with NRDAR funds.	Low

## 2.2 DEVELOPMENT OF A PREFERRED RESTORATION ALTERNATIVE

The Trustees determined that all of the proposed restoration projects passed the screening criteria, and therefore all of the projects were evaluated further. After conducting the screening and evaluation process, the Trustees developed a preferred restoration alternative that included seven of the projects. The no-action alternative, preferred alternative, and the projects the Trustees considered but are not recommending for funding are described in Chapter 3.

## CHAPTER 3 | WILDLIFE AND WILDLIFE HABITAT RESTORATION ALTERNATIVES

This chapter provides information on the restoration projects considered as part of this Addendum. Specifically, this chapter describes two potential restoration alternatives to compensate the public for the remaining wildlife injuries: a no-action/natural recovery alternative (as required under NEPA; Section 3.1) and the Trustees' preferred restoration alternative (Section 3.2). This chapter also provides information regarding the projects that the Trustees considered, but do not recommend for funding (Section 3.3).

The additional restoration projects described in this Addendum were identified through outreach to stakeholders as described in Chapter 1 of this Addendum. A list of stakeholders consulted is provided in Chapter 5. Through these efforts, the Trustees identified an additional ten potential restoration projects. Table 3-1 provides information on each of the ten projects, including the project name, a summary of the Trustees' evaluation results, and the relative project cost. Specific costs for individual projects are not provided in this Addendum because costs have not yet been negotiated with the project proponents.

These ten restoration projects were evaluated against the screening criteria described in Chapter 2 to determine whether each project met minimum standards of acceptability. All of the projects met the minimum standards of acceptability. However, the remaining funding available to the Trustees is insufficient to fund all of the projects that passed the screening process. Therefore, the Trustees evaluated each project further using the evaluation criteria described in Chapter 2. Based on the results of the evaluation, projects were ranked as "Above Average", "Average", or "Below Average" for the high-priority, medium-priority, and low-priority evaluation criteria and then also assigned an overall rating (Table 3-1). The Trustees developed the preferred alternative by identifying those projects that best met the Trustee evaluation criteria. The Trustees preferred alternative includes all of the projects that ranked "Above Average" overall as well as the two projects that ranked "Average" overall, but "Above Average" in the high-priority evaluation criteria. The preferred alternative includes a suite of restoration projects that together compensate for injuries to wildlife and wildlife habitat resources, with an emphasis on benefits to waterfowl, caused by the releases of hazardous substances from the Chino, Tyrone, and Cobre Mines.

### 3.1 NO-ACTION / NATURAL RECOVERY ALTERNATIVE

Evaluation of a no-action alternative is required under NEPA [40 C.F.R. § 1502.14(d)]. The selection of this alternative by the Trustees would mean that these proposed restoration activities would not be completed at this time, and the Trustees would be required to reassess appropriate restoration options. Specifically, no additional actions would be taken by the Trustees to restore injured wildlife and wildlife habitat resources at this time, and the public would not receive

compensation for the remaining losses that occurred in the past or that are ongoing. This alternative may be used as a benchmark to evaluate the comparative benefit of other actions. Because no action is taken, this alternative also has no cost.

### **3.2 PREFERRED RESTORATION ALTERNATIVE**

The Trustees' preferred restoration alternative consists of a suite of restoration projects that work to enhance or protect riparian and wetland habitats, which are valuable to birds and other wildlife. Projects evaluated and recommended for funding are presented in Tables 3-1 and 3-2 and described below. Several proposed projects are easements, which would protect unique and valuable habitat areas in perpetuity. The remaining proposed projects under the preferred alternative involve active restoration of wetland and riparian habitat areas as well as enhancement of watershed health.

The Trustees expect to use a variety of mechanisms for project implementation, and will select the most appropriate mechanism for each project. The details and agreements would be determined between the Trustees and individual project proponent after the public comment period and the finalization of this Addendum. The following mechanisms may be used for project implementation:

- Cooperative and grant agreement that would be executed between a Federal agency and the designated implementing partner. Projects proposed for this funding mechanism are those that can be successfully completed only by the entity already associated with the project.
- Request for Proposals (RFP) issued by a State agency. An RFP is a competitive process that is open to all qualified bidders. The Trustees will establish the selection criteria for evaluating all proposals that are submitted in response to the RFPs. The selection of a contractor would result in a professional services contract.
- Interagency service agreement executed by a State agency or inter- or intra-agency agreement between Federal agencies.

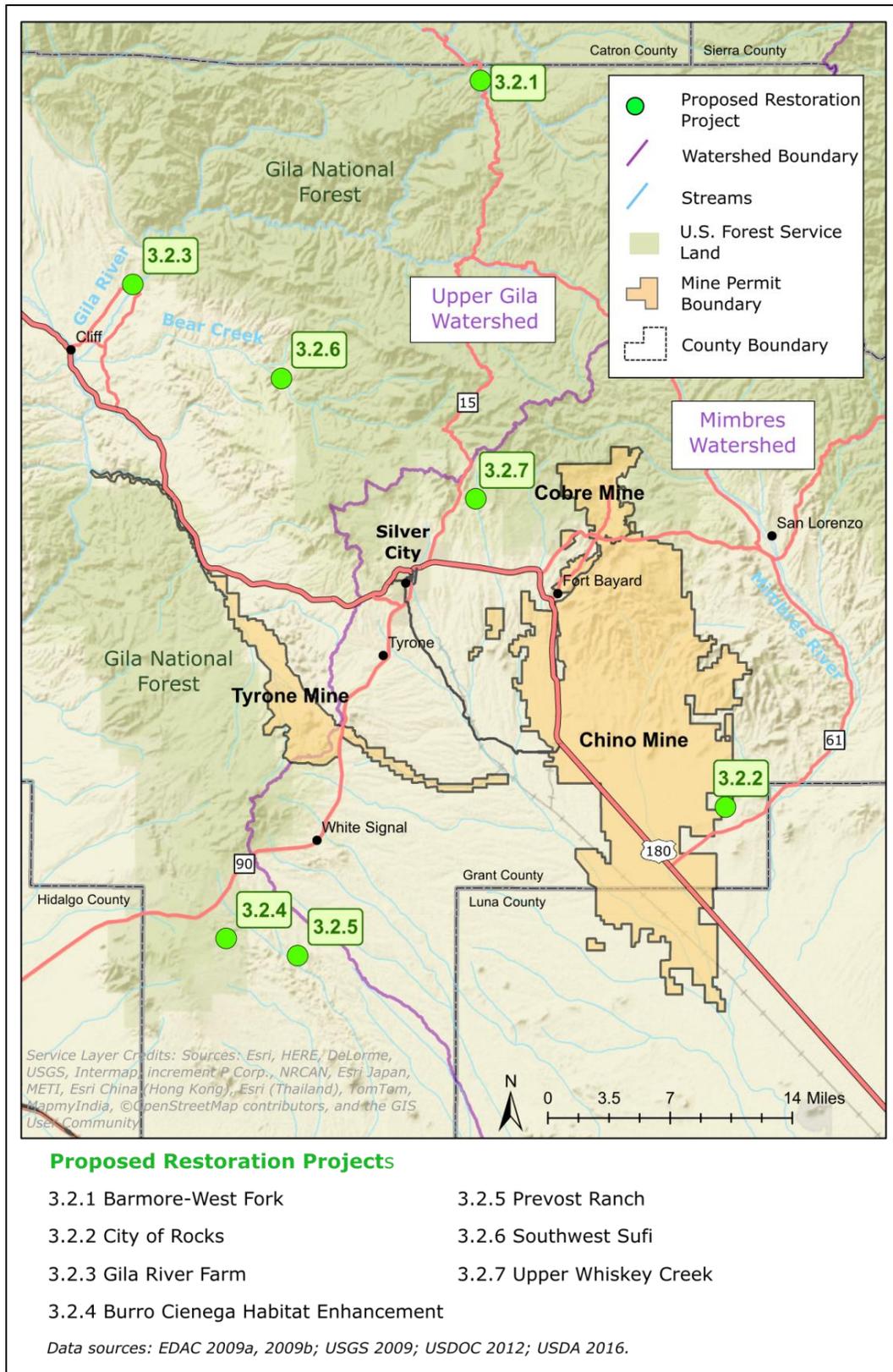
TABLE 3-1 RESULTS OF THE TRUSTEES' RESTORATION PROJECT EVALUATION

PROJECT NAME*	SUMMARY OF EVALUATION			OVERALL RATING	RELATIVE PROJECT COST**
	HIGH-PRIORITY	MEDIUM-PRIORITY	LOW-PRIORITY		
<b>PROJECTS RECOMMENDED FOR FUNDING</b>					
Barmore-West Fork Gila Property Conservation Easement	Above Average	Below Average	Average	Above Average	\$
City of Rocks (CoR) State Park Wildlife Habitat Restoration	Above Average	Above Average	Above Average	Above Average	\$
Gila River Farm Riparian Preserve	Above Average	Above Average	Above Average	Above Average	\$
Headwaters Burro Ciénega Watershed: Habitat Enhancement and Treatment of Nonnative Plants	Above Average	Average	Below Average	Average	\$
Prevost Ranch Conservation Easement	Above Average	Above Average	Average	Above Average	\$\$
Southwest Sufi-Bear Creek Conservation Easement & Habitat Improvement	Above Average	Average	Average	Above Average	\$\$
Upper Whiskey Creek Restoration	Above Average	Below Average	Average	Average	\$
<b>PROJECTS CONSIDERED BUT NOT RECOMMENDED FOR FUNDING</b>					
Headwaters Burro Ciénega Watershed: Habitat Enhancement, Erosion Control, and Forest Service Road Relocations	Below Average	Average	Above Average	Average	\$\$
Mangas Valley Restoration	Below Average	Average	Below Average	Below Average	\$\$\$
Permanent Structures for Irrigation Ditches in the Gila Basin	Below Average	Average	Average	Below Average	\$\$\$
*Projects are listed alphabetically by funding category.					
**Projects associated with the \$ symbol are low-cost projects below \$200,000; projects associated with the \$\$ symbol are medium-cost projects between \$200,000 and \$500,000; and projects associated with the \$\$\$ symbol are high-cost projects over \$500,000.					

A summary of the projects included in the preferred alternative is provided in Table 3-2. The table provides the name of each project, the project category, and a brief description of the project. Figure 3-1 provides a map of approximate project locations for all projects in the preferred alternative. Detailed descriptions of each of the projects are provided below (Sections 3.2.1 through 3.2.7), including a description of the project location, an explanation of the benefits from the project and the timeframe for the benefits, an overview of the maintenance and monitoring requirements, and an explanation of how the project was evaluated by the Trustees. Each project in the preferred alternative would be held to a 10-year monitoring and maintenance agreement to ensure the success and longevity of the project, and thus to ensure the benefits provided to birds and other wildlife through implementation of the project.

**TABLE 3-2 SUMMARY OF RESTORATION PROJECTS IN PREFERRED ALTERNATIVE**

PROJECT NAME	PROJECT CATEGORY	BRIEF PROJECT DESCRIPTION
Barmore-West Fork Gila Property Conservation Easement	Habitat protection	Protect wildlife habitat by creating a conservation easement on two private property parcels (total of approximately 14 hectares (ha) (35 acres)), bisected by a 0.4 kilometers (km) (0.25 mile (mi)) reach of the West Fork of the Gila River. 1.5 ha (3.8 acres) are riverine and marsh wetlands with an additional 1.4 ha (3.4 acres) of riparian habitat.
City of Rocks (CoR) State Park Wildlife Habitat Restoration	Riparian/watershed habitat restoration	Enhance and restore existing water resources to benefit wildlife and wildlife habitat, including invasive species removal, wetland habitat creation, native plantings, and erosion control measures. This project also includes an opportunity to educate the public.
Gila River Farm Riparian Preserve	Riparian habitat restoration	Construct a shallow seasonal wetland habitat for wintering waterfowl and migratory birds, including mowing berms to prevent riparian vegetation in the wetland area. This project would also benefit the hydrology of the area and includes educational outreach.
Headwaters Burro Ciénege Watershed: Habitat Enhancement and Treatment of Nonnative Plants	Riparian/watershed habitat restoration	Enhance and restore existing habitat by planting riparian shrub and tree buffers on suitable streambanks in the headwaters portion of the Ciénege's watershed; identifying, locating, and treating undesirable nonnative plants species that prevent or slow the establishment of desirable native species.
Prevost Ranch Conservation Easement	Habitat protection	Protect wildlife habitat by creating a conservation easement for a working ranch currently under private ownership, including a 4.7 km (2.9 mi) stretch of the Burro Ciénege, over 11 km (7 mi) of seasonal drainages, 1 ha (2.7 acres) of freshwater ponds, and 13 ha (32 acres) of riverine wetlands.
Southwest Sufi-Bear Creek Conservation Easement & Habitat Improvement	Habitat protection	Protect wildlife habitat by creating a conservation easement and conducting riparian restoration on privately owned property, including 4.2 km (2.6 mi) of Bear Creek, 13.8 ha (34 acres) of riverine and marsh wetlands as part of about 28 ha (70 acres) of riparian floodplain habitat.
Upper Whiskey Creek Restoration	Riparian/watershed habitat restoration	Enhance and restore wildlife habitat by restoring three existing dirt tanks, creating three wetland ponds, and restoring surface water hydrology.



**FIGURE 3-1 LOCATION OF PROPOSED RESTORATION PROJECTS INCLUDED IN THE PREFERRED ALTERNATIVE**

### 3.2.1 BARMORE-WEST FORK GILA PROPERTY CONSERVATION EASEMENT

This project would set aside approximately 15 ha (36 acres) of the Barmore-West Fork Gila property under a conservation easement to protect valuable wildlife habitat from the threat of subdivision and development.

#### Project Location

The Barmore-West Fork Gila property is located approximately 47 km (29 mi; straight line estimate) north of Silver City, New Mexico and approximately 59 km (37 mi) from the Chino Mine, 60 km (37 mi) from the Tyrone Mine, and 40 km (25 mi) from the Cobre Mine (Figure 3-1).<sup>2</sup>

#### Project Description

The property is located in a unique area of the Mogollon Mountains and exists as part of a larger inholding within the Gila National Forest. This area is at an elevation of approximately 1,676 to 1,792 meters (m) (5,500 to 5,880 feet (ft)) and is within the Arizona/New Mexico Mountain ecoregion, which is characterized by a mix of Madrean Lower Montane woodland and upper Gila River riparian communities. The Gila watershed hosts a large concentration of Species of Greatest Conservation Need (SGCN) for New Mexico (New Mexico Department of Game and Fish (NMDGF) 2006). Species included under this designation cover a wide range of wildlife such as birds, amphibians, reptiles, and fish.

The West Fork of the Gila River flows through the Barmore-West Fork property just before its confluence with the East Fork, and gives rise to approximately 1.6 ha (4 acres) of riverine and marsh wetlands and an additional 1.4 ha (3.4 acres) of riparian habitat within the stream braids and floodplain of the river within the property boundaries. Due to the bisecting river, the property consists of two parcels; one 12.3 ha (30.3 acre) parcel and one 2.2 ha (5.4 acre) parcel. The south and west boundaries of the property abut the Gila National Forest while the adjacent north and east properties are privately owned.

This property is part of a larger 121 ha (300 acre) inholding within the Gila National Forest, which is occupied by the village of Gila Hot Springs. Subdivision of the properties within the inholding continues to increase over time due to the front-door access to hunting, fishing, and wilderness activities that these properties provide. In addition, the Barmore-West Fork property is the largest stream-front parcel within the private lands, making it especially desirable for subdivision and mountain home development. Placing the property under a conservation easement would protect wildlife and wildlife habitat in a vital headwaters area.

In addition, the residents of the 2.2 ha (5.4 acre) parcel currently ford the river to access that part of the property. Under this easement, all of the owner's residential structures would be removed from the smaller parcel thereby eliminating the need for river crossings. A small building envelope would remain on the larger parcel, but would be subject to building restrictions under the terms of the easement.

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<sup>2</sup> All project locations measured in Arc GIS using a central point within each mine area.

#### Expected Benefits and Timeframe of Benefits

A conservation easement on this property would provide benefits to wildlife and wildlife habitat in perpetuity. The West Fork is a major headwater stream of the Gila River, which ultimately drains to the Colorado River. As a perennial reach, it provides generally continuous habitat for a wide variety of Federal and State listed species as well as stopover habitat for migratory species. The surrounding area is generally protected by Federal ownership and managed by the Gila National Forest, which is a vast haven for many species of wildlife that undoubtedly frequent the inholding.

The riparian corridor in this area hosts a diverse canopy of ponderosa pine (*Pinus ponderosa*), narrowleaf cottonwood (*Populus angustifolia*), grey alder (*Alnus incana*), box elder (*Acer negundo*), and bluestem willow (*Salix irrorata*) while the upland and floodplain is characterized by piñon pine (*Pinus edulis*), alligator (*Juniperus deppeana*), rocky mountain (*Juniperus scopulorum*), and one-seed junipers (*Juniperus monosperma*), mountain mahogany (*Cercocarpus montanus*) and scrub oak (*Quercus gambelii*). The property's upland area also supports elk (*Cervus canadensis*), javelina (*Pecari tajacu*), black bear (*Ursus americanus*), mule deer (*Odocoileus hemionus*), bighorn sheep (*Ovis canadensis*), Mexican grey wolf (*Canis lupus baileyi*), coyote (*Canis latrans*), grey fox (*Urocyon cinereoargenteus*), red fox (*Vulpes vulpes*), skunk (*Mephitis mephitis*), bobcat (*Lynx rufus*), cougar (*Puma concolor*), numerous birds of prey, wild turkey (*Meleagris gallopavo*), and Montezuma quail (*Cyrtonyx montezumae*).

The Barmore-West Fork property may host the Chiricahua Leopard Frog (*Rana chiricahuensis*; Federally threatened), Gila Chub (*Gila intermedia*; Federally endangered), Loach Minnow (*Rhinichthys cobitis*; Federally endangered), Spikedace (*Meda fulgida*; Federally endangered), Southwestern Willow Flycatcher (*Empidonax traillii extimus*; Federally endangered), and Yellow-billed Cuckoo (*Coccyzus americanus*; Federally threatened), among other species of concern. The Gila River at this location is designated critical habitat for Loach Minnow and Spikedace and proposed critical habitat for Narrow-headed Gartersnake (*Thamnophis rufipunctatus*; Federally threatened). In fact, the upper Gila River is the only river system in New Mexico that still retains its entire inventory of native fish species. The wetland habitat areas are also used as foraging and feeding grounds by the Narrow-headed Gartersnake, Great Blue Heron (*Ardea herodias*), Mallard (*Anas platyrhynchos*), Gadwall (*Anas strepera*), American Widgeon (*Anas americana*), Common Merganser (*Mergus merganser*), Rails (*Rallidae*), Sandpipers (*Scolopacidae*), Bald Eagle (*Haliaeetus leucocephalus*), Osprey (*Pandion haliaetus*), Pied-billed Grebe (*Podilymbus podiceps*), and Cinnamon Teal (*Anas cyanoptera*). Migratory birds such as Virginia's (*Oreothlypis virginiae*), Orange-Crowned (*Oreothlypis celata*), Black-Throated Gray (*Setophaga nigrescens*), and Townsend's (*Setophaga townsendi*) Warblers also use the riparian forest habitats. The property provides important habitat for SGCN (NMDGF 2006). Once the easement is in place, benefits to wildlife and wildlife habitat would be immediate.

#### Overview of Maintenance and Monitoring

The New Mexico Land Conservancy (NMLC) would negotiate and draft the terms of the easement, including a mineral assessment, environmental assessment, title and insurance review, and a property appraisal. After working with the landowner to place the property under an easement, NMLC would be responsible for long-term stewardship. These responsibilities include

annual compliance monitoring and legal defense associated with any potential violations of the terms of the easement.

#### Trustee Evaluation

Overall, the Barmore-West Fork easement was evaluated favorably (“Above Average”) in the habitat protection restoration category. The proposed project would provide long-term protection for riparian, wetland, and upland habitat, which would directly benefit birds and wildlife resources and services.

This project scored above average for all five high-priority criteria: “likely to directly benefit birds that were affected by hazardous substance releases at and from the Sites,” “high potential for long-term success,” “low risk of failure,” “feasible and cost-effective provisions for operations, maintenance, and monitoring,” and “needs NRDAR funding.” The project area is inclusive of a portion of the perennial West Fork of the Gila River within the Gila National Forest, which is desirable habitat for birds. The easement would be managed by the NMLC, which is a well-known conservation entity. Therefore, the project has a low risk of failure and high potential for long term success. Additionally, since easements do not require land improvements, rather they constitute changes to land management; the risk of failure is low compared to active restoration projects. The terms of the easement would be in perpetuity, which also improves the potential for long-term success.

The project ranked below average for the medium-priority criteria overall. Specifically, the project ranked above average for “likely to benefit multiple wildlife resources and services,” average for “located close to where the injuries occurred” and “consistent with regional planning and Federal and State policies,” and below average for “cost-effective compared to other projects that provide similar benefits.” The project includes instream, riparian and upland habitat areas, including important habitat for SGCN, and is expected to benefit multiple wildlife resources. However, it ranked below average for cost-effectiveness because its cost for the size of the easement is high in comparison to other habitat protection projects such as the Prevost Ranch easement.

Overall, the project ranked average for the low-priority criteria. Specifically, it ranked above average for “likely to provide benefits quickly after project implementation,” above average for “leverages funding,” and below average for “allows for appropriate public access.” Benefits are likely to be provided instantaneously once the land protection agreement is in place. This project was also evaluated as having a high degree of leveraged funding, because the landowner intends to donate the conservation easement. However, this is private property and therefore is considered to have low public access.

#### 3.2.2 CITY OF ROCKS STATE PARK WILDLIFE HABITAT RESTORATION

This project aims to enhance and restore existing water resources in the City of Rocks State Park to benefit wildlife and wildlife habitat. The proposed project includes restoration of the hydrology at Faywood Ciénega, habitat improvement at two stock tanks fed by springs, and erosion control measures at the main campground in the park.

### Project Location

The City of Rocks State Park is located approximately 36 km (22 mi; straight line estimate) southeast of Silver City, New Mexico and approximately 13 km (8 mi) from the Chino Mine, 41 km (26 mi) from the Tyrone Mine, and 31 km (19 mi) from the Cobre Mine (Figure 3-1).

### Project Description

The City of Rocks State Park is located off of State Highway 61, approximately 36 km (22 mi) southeast of Silver City. The main attraction of the park is a geologic formation of sculptured rock columns that reach as high as 12 m (40 ft). Paths among the rocks give the appearance of city streets, thus giving rise to the name of the park. In addition to the geologic formation, the park offers camping sites, hiking trails, mountain biking, wildlife viewing, birding, stargazing, picnic areas, and the desert viewshed.

The park encompasses approximately 1,188 ha (2,935 acres), which includes 290 ha (716 acres) of land recently acquired from the settlement reached between the Trustees and FMI in 2012. Habitat in the park falls under the Madrean Lower Montane and Chihuahuan Desert Grasslands ecoregions. The former includes piñon, one-seed juniper, alligator juniper, gray oak (*Quercus grisea*), emory oak (*Quercus emoryi*), manzanita (*Arctostaphylos* spp.), mixed grasses, species of three-awn (*Aristida* spp.), and a variety of shrubs. The latter ecoregion includes black (*Bouteloua eriopoda*), blue (*Bouteloua gracilis*), and sideoats grama (*Bouteloua curtipendula*), dropseed species, beargrass (*Xerophyllum tenax*), tobosa grass (*Pleuraphis mutica*), bluestem species (*Schizachyrium* spp.), three-awn species, and bush muhly (*Muhlenbergia porteri*). Other plant species include cacti, yucca, shrubs, and trees.

This proposed project includes restoration actions at four locations within the park. These include two former stock tanks (the Northeast Tank and the Windmill Tank), the Faywood Ciénega habitat area, and the main campsite area.

Stock tanks typically include in-ground or above-ground ponds used for livestock watering. The Northeast Tank and the Windmill Tank provide surface water resources to wildlife residing in and transiting the park. The historical use of these tanks for watering livestock has prevented native vegetation from taking root and thriving. Truant cattle have been removed from public lands; fences are in place and the area is monitored to limit the impacts of grazing. Proposed restoration actions at the Northeast Tank include reducing access road erosion and reducing sediment contribution to the tank from the nearby tributary and arroyo. This would help create stable soils and increase grassland habitat. Plantings of native vegetation would also occur along the edges of the tank to create foraging opportunities and habitat for birds and other wildlife. The planted vegetation would serve as a sediment buffer during runoff events, function as a wind break, and provide shade to the pond to reduce evaporation. Restoration actions at the Windmill Tank include reducing access road and parking area erosion, adjusting the float valve in the large tank to create an escape route in the small tank for stranded organisms, and creating a pond habitat from the tank overflow, planted with native vegetation, including riparian and grassland species. This project area may also include interpretive signage for visitor education.

The Faywood Ciénega is one of two ciénegas left in the area, and it supports wildlife that do not exist anywhere else in the park. Other ciénegas in the area have fallen victim to lowering

groundwater tables associated with poor land management practices (e.g., over-grazing, lack of erosion control, lack of head-cutting prevention) (Hendrickson and Minckley 1984). Unique species that can be viewed at the Ciénega include Goodding's willow (*Salix gooddingii*), *Baccharis*, alkali sacaton (*Sporobolus airoides*), salt grass species (including the State endangered Parish's alkali grass (*Puccinellia parishii*)), and several species of wildflowers, sedges, and rushes. Restoration actions at this location include removing invasive species and implementing erosion control structures in surrounding gullies. Improvements would be made to the natural hydrology of the watershed by increasing sheet flow which would benefit the Ciénega by increasing shallow groundwater infiltration, on which the Ciénega depends for its existence. Due to the popularity of birding, this project area may also include a visitor education component.

The main campsite area has been negatively affected by high vehicle and human traffic coupled with poor road drainage strategies. These negative effects have caused the loss of native vegetation in the area and have adversely affected the surrounding hydrology. Restoration actions at this location include designing and implementing an erosion control plan for the park roadways and campgrounds to improve the surrounding hydrology. This includes installing water harvesting features, vegetation, and earthworks in the area to reduce runoff and help rehabilitate the landscape and planting native grasses that have been lost due to the compaction of soils. Due to the popularity of the campground area, this project area may also include a visitor education component.

#### Expected Benefits and Timeframe of Benefits

Implementing the proposed restoration actions at the City of Rocks State Park would provide benefits to a wide range of species. Wetland and riparian vegetation would provide habitat and foraging opportunities to wildlife utilizing the surface water areas, while erosion control and water harvesting improvements would reduce sediment load, improve water quality, and positively affect the groundwater table in the area. This would result in positive feedback to the surface water resources at the park.

The proposed project is located in the Mimbres Basin, which has been identified as a key watershed by the State of New Mexico's Comprehensive Wildlife Conservation Strategy Plan (NMDGF 2006), and is home to rare habitat types like the Ciénega and Chihuahuan Desert Grasslands. The Ciénega hosts a variety of species including Goodding's willow, *Baccharis*, alkali sacaton, salt grass species (including the Federally endangered Parish's alkali grass), and several species of wildflowers, sedges, and rushes. Several threatened or endangered species also occur in the vicinity of the park. For example, Abert's Towhee (*Melospiza aberti*), Peregrine Falcon (*Falco peregrinus*), Bald Eagle, Bell's Vireo (*Vireo bellii*, SGCN), Common Black-hawk (*Buteogallus anthracinus*), Gila Woodpecker, Southwestern Willow Flycatcher, Arizona shrew (*Sorex arizonae*), Chiricahua Leopard Frog, Lowland Leopard Frog (*Lithobates yavapaiensis*), Northern Mexican Gartersnake (*Thamnophis eques megalops*), and Narrow-headed Gartersnake (*Thamnophis eques megalops*). Restoring these areas would also create habitat for the reintroduction of the Federally threatened Chiricahua Leopard Frog. Other species of wildlife that have been seen at the park include chipmunk, kangaroo rat (*Dipodomys* spp.), mule deer, pronghorn antelope (*Antilocapra americana*), elk, coyotes, bobcat, javelina, porcupine (*Erethizon dorsatum*), and bear. Reptiles include three species of rattlesnakes and numerous lizards, which

may include the Gila Monster (*Heloderma suspectum*). Bird species include Red-tailed Hawk (*Buteo jamaicensis*), Northern Harrier (*Circus cyaneus*), Golden Eagle (*Aquila chrysaetos*), Great Horned Owl (*Bubo virginianus*), Barn Owl (*Tyto alba*), Turkey Vulture (*Cathartes aura*), Raven (*Corvus* spp.), Purple Finch (*Haemorhous purpureus*), Canyon Towhee (*Melospiza fusca*), Cactus Wren (*Campylorhynchus brunneicapillus*), Canyon Wren (*Catherpes mexicanus*), Northern Mockingbird (*Mimus polyglottos*), Curve-billed Thrasher (*Toxostoma curvirostre*), Gambel's Quail (*Callipepla gambelii*), Scaled Quail (*Callipepla squamata*), Rufous (*Selasphorus rufus*) and Black-chinned Hummingbirds (*Archilochus alexandri*), the Greater Roadrunner (*Geococcyx californianus*), and over 25 species of migratory songbirds.

The wetland and riparian areas of the park naturally function as an incubator for insects, which serve as the base of the food chain for many higher trophic level organisms, such as birds, reptiles, and amphibians. Improving these areas would provide cascading benefits to surrounding wildlife. Due to the persistent presence of surface water at each project location (not including the campground), planted vegetation is expected to take root and thrive. As such, the restoration project is expected to provide the majority of its benefits quickly (i.e., within 1 to 5 years) post-construction. Erosion control and water harvesting features would help as soon as the first storm event, but tend to provide increasing benefits over time as sediment deposition is redistributed across the landscape.

#### Overview of Maintenance and Monitoring

The project proponent, Stream Dynamics, would conduct monitoring and maintenance efforts for the first 3 years following construction while educating the landowner on proper monitoring and maintenance needs. New Mexico State Parks is considering incorporating a variety of tasks into their monitoring and maintenance of the park, which would fall under an action plan from the current 2015 City of Rocks State Park Management Plan. The tasks include hosting a workshop for staff on rainwater harvesting and stormwater management for habitat restoration at the park, thinning and removal of invasive vegetation, monitoring establishment and success of native vegetation, monitoring water quality at water harvesting features and maintaining those features, and involving local youth groups and volunteers who actively donate their time and services to the park.

#### Trustee Evaluation

Overall, the City of Rocks Restoration project was evaluated favorably (“Above Average”) within the riparian/watershed habitat restoration category. The proposed project would provide long-term protection for riparian, wetland, and upland habitat, which would directly benefit birds and wildlife resources and services.

This project ranked average for all five high-priority criteria: “likely to directly benefit birds that were affected by hazardous substance releases at and from the Sites,” “high potential for long-term success,” “low risk of failure,” “feasible and cost-effective provisions for operations, maintenance, and monitoring,” and “needs NRDAR funding.” This is partially because the proposed project would be implemented on state park land, which provides added benefits since the park has existing management responsibilities and is a well-established institution for overseeing improvements. Thus, the proposed project is likely to be successful and have long-

term benefits. The proposed work involves relatively standard approaches that are known to provide benefits to wildlife, and the project components focus on riparian and watershed habitat areas that provide important bird and other wildlife services.

This project ranked above average overall for the medium-priority criteria. It ranked average for two medium-priority criteria (“located close to where the injuries occurred” and “consistent with regional planning and Federal and State policies”) and above average for the other two (“likely to benefit multiple wildlife resources and services” and “cost-effective compared to other projects that provide similar benefits”). All proposed restoration actions are close to where the injuries occurred. The state park also has a management plan, and the proposed restoration actions are consistent with the management plan and overall state conservation planning. All wildlife requires water to survive, even well-adapted desert species. Improvements to these rare sources of water would provide shade, forage opportunities, and other services that attract a diverse range of species. Associated improvements to erosional gullies and access roads would also work to provide cascading benefits to multiple wildlife resources.

This project ranked above average for the low-priority criteria overall. Specifically, the project ranked above average for “likely to provide benefits quickly after project implementation” and “allows for appropriate public access,” and average for “leverages funding.” The persistent presence of water would help establish plantings quickly, even while erosion controls are beginning to trap sediment more slowly, thus benefits would likely be provided quickly after implementation. Due to the campground and hiking trails, public access is high at this site. The addition of informational signage also serves to educate the public on the importance of these unique habitat areas.

### **3.2.3 GILA RIVER FARM RIPARIAN PRESERVE**

This project would construct a shallow, seasonal wetland for wintering waterfowl and migratory birds along the Gila River.

#### **Project Location**

The wetland would be constructed in the Gila River Farm, which is located approximately 37 km (23 mi; straight line estimate) northwest of Silver City, New Mexico and approximately 60 km (37 mi) from the Chino Mine, 41 km (26 mi) from the Tyrone Mine, and 47 km (29 mi) from the Cobre Mine (Figure 3-1).

#### **Project Description**

The Gila River Farm is a tract of land within The Nature Conservancy’s (TNC) Gila Riparian Preserve. The Preserve covers an area of 526 ha (1,300 acres) and spans 8 km (5 mi) of the 23-km (14-mi) long Cliff-Gila Valley. Over 250 bird species use the Cliff-Gila Valley as stopover habitat during their annual migrations. This area represents one of the last major water sources for birds flying north before they reach higher elevations where water is scarcer.

The proposed project would involve creating a 1.2 ha (3 acre) shallow seasonal wetland adjacent to an already existing 2.4 ha (6 acre) wetland. The 2.4 ha (6 acre) wetland was created through NMED funding in 2000 and included construction of shallow wetland, floodplain meadows, riparian channels, a sycamore slough, and a small perennial pool. This wetland is maintained

through perennial watering from the Upper Gila Irrigation Association ditch, mostly during the growing season. Native riparian and wetland species have successfully colonized the site, attracting a diversity of birds. This existing wetland demonstrates that projects such as this have a high potential for long-term success and a low risk of failure.

For the proposed wetland:

- Low berms would be constructed in order to hold water in the designated basin area, which is currently comprised entirely of weeds.
- The basin would need to be mowed periodically to prevent the growth of riparian species throughout the wetland area. This is in contrast to the 2.4 ha (6 acre) wetland, which was allowed to grow riparian vegetation.
- A purchase of additional water rights associated with 0.8 ha (2 acres) to 2 ha (5 acres) of land in the Cliff-Gila Valley would also be needed to provide the required irrigation.

#### Expected Benefits and Timeframe of Benefits

Implementing this project would provide additional off-channel wetland habitat areas, which are an underrepresented and valuable habitat in the Cliff-Gila Valley. Wherever they occur, these habitats support large numbers of waterfowl and other wildlife.

Both wintering waterfowl and migrants have been observed utilizing the existing 2.4 ha (6 acre) wetland area, and serve as an indicator for the species that would likely utilize the proposed 1.2 ha (3 acre) wetland. For example, bird species that utilize the area include Pied-billed Grebe, Great Blue Heron, Canada Geese (*Branta canadensis*), Gadwall, American Wigeon, Mallard, Northern Shoveler (*Anas clypeata*), Northern Pintail (*Anas acuta*) (SGCN), Green-Winged Teal (*Anas carolinensis*), Canvasback (*Aythya valisineria*), Lesser Scaup (*Aythya affinis*), Bufflehead (*Bucephala albeola*), Hooded Merganser, Common Merganser, Ruddy Duck (*Oxyura jamaicensis*), Osprey, Northern Harrier, American Coot, and Sandhill Crane (*Grus canadensis*; SGCN), Yellow-billed Cuckoo (SGCN, Federally threatened species, listed as sensitive by other agencies), and Bell's Vireo (SGCN, listed as sensitive by other agencies).

The wetland would also benefit groundwater resources through the recharge of alluvial groundwater levels. It would provide additional benefits through spring discharge, which is a time when the river flows are low or absent due to seasonal irrigation diversion. It is expected that this project would provide full benefits within 5 years post-construction.

#### Overview of Maintenance and Monitoring

The primary maintenance need for this project would be the seasonal irrigation of the wetland. The project proponent, TNC, would oversee a contract for weekly, seasonal (winter) irrigation. Another important maintenance need would be mowing the interior of the basin annually to ensure that open water habitat would persist and that riparian vegetation does not encroach on the wetland area. A contractor would conduct this work for 2 years post-construction, after which TNC would cover the modest cost associated with maintaining the wetland in perpetuity under their stewardship endowment.

#### Trustee Evaluation

Overall, the Gila River Farm project was evaluated favorably (“Above Average”) within the riparian habitat restoration category. The proposed project would provide desirable wetland habitat in a critical stopover area for birds using the Central and Pacific Flyways. As such, this project would directly benefit birds and wildlife resources and services. It would also supplement previous NMED funding efforts by expanding habitat in the area adjacent to the existing 2.4 ha (6 acre) wetland.

This project ranked above average for all five high-priority criteria: “likely to directly benefit birds that were affected by hazardous substance releases at and from the Sites,” “high potential for long-term success,” “low risk of failure,” “feasible and cost-effective provisions for operations, maintenance, and monitoring,” and “needs NRDAR funding.” This is partly due to TNC’s well-known reputation and the existence of their stewardship endowment, which reduces project risks and helps ensure the success of this project in the long-term. It is also located in the Gila River Basin, which is frequented by large numbers of migratory birds that would benefit from the existence of additional wetland areas.

Overall, this project ranked above average for the medium-priority criteria. Specifically, the project ranked above average for “cost-effective compared to other projects that provide similar benefits;” average for “located close to where the injuries occurred” and “consistent with regional planning and Federal and State policies;” and below average for “likely to benefit multiple wildlife resources and services.” This proposed project area includes a small wetland habitat area, adjacent to but separate from the existing wetland. The area would need to be mowed periodically to ensure that riparian species do not take root in the constructed basin. Although the proposed project would provide an important water source and habitat for wildlife in the area, the project is fairly small, and does not include unique or rare habitats. For these reasons, the proposed project ranked lower for benefiting multiple wildlife resources and services compared to other riparian habitat restoration projects.

This project ranked above average for the low-priority criteria. Specifically, this project ranked above average for “likely to provide benefits quickly after project implementation” and “allows for appropriate public access,” and ranked average for “leverages funding.” Through the use of the irrigation ditch to maintain water in the basin, wetland plant species are expected to establish themselves relatively quickly. The wetland tract in the Riparian Preserve is open to the public and already frequented by hikers, birders, and visiting school groups. As such, this wetland area is expected to have high public access. Additionally, this project leverages funding and resources from TNC.

#### **3.2.4 HEADWATERS BURRO CIÉNEGA WATERSHED: HABITAT ENHANCEMENT AND TREATMENT OF NONNATIVE PLANTS**

This project would restore riparian, wetland, and associated upland habitat areas in the headwaters of the Burro Ciénega through native plantings and the treatment of nonnative plant species.

#### Project Location

The headwaters of the Burro Ciénega are located on Gila National Forest and private lands approximately 37 km (23 mi; straight line estimate) southwest of Silver City, New Mexico and approximately 43 km (27 mi) from the Chino Mine, 23 km (14 mi) from the Tyrone Mine, and 53 km (33 mi) from the Cobre Mine (Figure 3-1).

#### Project Description

The Burro Ciénega watershed is comprised of 44,215 ha (109,257 acres) of land owned by the Gila National Forest, New Mexico State Land Office, Bureau of Land Management, and private individuals (SNEM 2012). The majority of land is owned by State and Federal agencies, but much of it is leased to local ranchers. Ranchers in this area have grouped together to form the Upper Burro Ciénega Watershed Association, which works to restore and enhance habitat conditions and overall watershed health.

This area is relatively unique in that a portion of the drainage is perennial (fed by local springs) and it sits within an otherwise dry Chihuahuan desert landscape. The perennial portion of the drainage is known as Burro Ciénega, and is home to fish, birds, and other wildlife. Indeed, ciénegas are one of the rarest habitat types in the semiarid southwest and provide important functions to migratory bird species.

The work proposed under this project includes planting riparian shrub and tree buffers on suitable streambanks in the headwater portion of the Ciénega and identifying, locating, and treating undesirable nonnative State listed noxious plant species that prevent or slow the establishment of desirable native riparian and wetland species. These species mainly include saltcedar (*Tamarix* spp.) and Siberian elm (*Ulmus pumila*), which would require follow-up treatments in subsequent years.

#### Expected Benefits and Timeframe of Benefits

The Burro Ciénega is a unique habitat area that provides valuable and diverse ecosystem services to a variety of wildlife. Wetlands in the ciénega function to store water, filter water, cycle nutrients, provide habitat to wildlife, attenuate flood events, enhance vegetation productivity, and have inherent aesthetic value. These services are even more valuable when placed into context, considering the semiarid nature of the region.

However, due to historical grazing practices, habitat in the watershed is generally degraded. This is characterized by downcutting and erosion of upland and inchannel drainage ditches, relocation of downstream drainage channels due to high rates of sediment deposition, existence of invasive species, and a lack of vegetative diversity.

Though heavy grazing has been eliminated, only some natural recovery of the Burro Ciénega Watershed has occurred, except for where restoration projects have been completed. As such, improving streambank and hillslope conditions through habitat enhancement and invasive species removal would lead to a variety of benefits. For example, terrestrial wildlife likely to be in this area include several bat species, Mexican grey wolf (Federally endangered), several species of skunk, ring-tailed cat (*Bassariscus astutus*), white-nosed coati (*Nasua narica*), black-tailed prairie dog (*Cynomys ludovicianus*), yellow-nosed cotton rat (*Sigmodon ochrognathus*), Southwestern

Fence Lizard (*Sceloporus cowlesi*), Northern Mexican and Narrow-headed Gartersnakes (both Federally threatened), Arizona Toad (*Anaxyrus microscaphus*), Chiricahua Leopard Frog (Federally threatened), and Lowland Leopard Frog. A wide range of bird species have been observed on or in the vicinity of Pitchfork Ranch, which is in the central portion of the watershed, such as Great Blue Heron, Turkey Vulture, American Widgeon, Mallard, Cinnamon Teal, a variety of birds of prey (including Bald Eagle), Quail, Plovers, Sandpipers and allies, Pigeons, Doves, Greater Roadrunner, Owls, Nightjars, Belted Kingfisher (*Megaceryle alcyon*), Hummingbirds, Woodpecker, a variety of Flycatchers, Loggerhead Shrike (*Lanius ludovicianus*), Corvids (Corvidae), and Vireos. Furthermore, an on-going restoration project (unrelated to this NRDAR) is being conducted on the Pitchfork Ranch to reintroduce Gila Topminnow (*Poeciliopsis occidentalis*) and Chiricahua Leopard Frog, both of which are Federally threatened or endangered species. The presence of vegetation on the banks of active stream channels would also help slow fast-moving water during flood events, allowing sediment loads to be deposited closer to the upland areas from which it came. These benefits cascade to improved water quality and better hydrogeologic conditions for the Ciénega overall.

Since this project would be conducted partially within the Gila National Forest, the Forest Service has the long-term responsibility for management. Additionally, the existence of the Upper Burro Ciénega Watershed Association indicates that there are invested private parties who are likely to help maintain the enhancements and invasive species removal conducted under this work, even on private lands. For these reasons, benefits from this project are expected to be realized relatively quickly and persist in the long-term.

#### Overview of Maintenance and Monitoring

Depending on the property ownership of the various locations for the proposed improvements, a combination of private landowners, the Upper Burro Ciénega Watershed Association, and the Gila National Forest would be responsible for implementation, operation, monitoring, and maintenance of this project. Efforts may include monitoring of invasive species removal and native planting areas and potentially follow-up treatments as necessary.

#### Trustee Evaluation

Overall, the Headwaters Burro Ciénega Watershed: Habitat Enhancement and Treatment of Nonnative Plants project was evaluated favorably (“Average”) in the riparian/watershed habitat protection restoration category. Enhancing shrub and tree buffer zones, and treating nonnative State listed noxious plants in the headwaters of the Burro Ciénega would enhance riparian, wetland, and associated upland habitat areas that are frequently use by birds and other wildlife.

This project ranked above average overall, and specifically for four of the five high-priority criteria, but below average for “feasible and cost-effective provisions for operations, maintenance, and monitoring.” Ciénegas are rare and important habitat areas in the semiarid southwest, particularly for migratory birds (Hendrickson and Minckley 1984). Thus, improving habitat in the Burro Ciénega watershed would likely provide benefits to birds. Additionally improvement of riparian and wetland buffers and associated upland areas would provide desirable and contiguous habitat for foraging, nesting, and other wildlife services. Since the project would be managed by the Gila National Forest and a dedicated group of private landowners (the Upper

Burro Ciénega Watershed Association), the proposed improvements are expected to have a high potential for long-term success and a low risk of failure. That being said, the specific activities and frequency of maintenance on the private lands included in this proposed project are less well-established.

This project ranked average for the medium-priority criteria overall. It ranked above average for “cost-effective compared to other projects that provide similar benefits,” average for “located close to where the injuries occurred” and “consistent with regional planning and Federal and State policies,” and below average for “likely to benefit multiple wildlife resources and services.” Though projects within the Burro Ciénega watershed would undoubtedly benefit the Burro Ciénega itself, the habitat within the specific boundaries of this proposed restoration project are not unique or rare, and are generally characterized by the presence of trees and shrubs. For example, there are oak, piñon, alligator juniper, one-seed juniper, and deciduous shrubs.

This project ranked below average for the low-priority criteria overall, ranking average for “leverages funding,” but below average for “likely to provide benefits quickly after project implementation” and “allows for appropriate public access.” Since this project would be conducted in the headwaters area of the Burro Ciénega, a persistent presence of water is not expected, which would otherwise help establish new plantings. Thus, benefits from this project may not be realized as quickly as similar projects that have a persistent presence of water. Additionally, the project area is expected to span both Gila National Forest and private lands. Thus, public access would likely be relatively high on Gila National Forest property, but would be low on private lands.

### 3.2.5 PREVOST RANCH CONSERVATION EASEMENT

This project involves setting aside approximately 1,117 ha (2,760 acres) of the Prevost Ranch property as a conservation easement to protect valuable wildlife habitat.

#### Project Location

Prevost Ranch conservation easement project is located on private land in the Burro Mountains, south of the town of White Signal. The project is located approximately 36 km (22 mi; straight line estimate) south-southwest of Silver City, New Mexico and approximately 39 km (24 mi) from the Chino Mine, 24 km (15 mi) from the Tyrone Mine, and 50 km (31 mi) from the Cobre Mine (Figure 3-1).

#### Project Description

The Prevost Ranch is a working ranch located in Grant County, New Mexico, approximately 10 km (6 mi) south of the town of White Signal. The property is located within the Burro Mountains and consists of approximately 121 ha (299 acres) of riparian habitat, one acre of freshwater ponds, and a mix of upland habitat including Chihuahuan desert grassland and montane shrub habitat. The project area covers important wildlife habitat, including 14 ha (35 acres) of wetlands (including riverine wetland and freshwater pond habitat) within the riparian/floodplain habitat, a 4.8 km (3 mi) stretch of the Burro Ciénega in the Chihuahuan Desert, and more than 11 km (7 mi) of smaller, seasonal drainages. Elevation of the property ranges from 1,631 m (5,350 ft) at the southeastern property boundary to approximately 1,800 m (6,000 ft) at the western border.

The Prevost Ranch is privately owned and has been managed for livestock grazing and wildlife habitat and restoration. Recent restoration efforts have included actions to restore the active floodplain and reduce erosion within the Ciénege streambed and tributary arroyos. The landowners have expressed a desire to permanently protect the entire property (1,117 ha (2,760 acres)) from subdivision and ranchette development through a conservation easement with NMLC. The easement would include a building envelope and all development would be prohibited outside of the envelope with the exception of minor agricultural structures such as loafing sheds and fencing. This project would provide the financial support needed to purchase the easement and cover the associated transactional and stewardship costs.

#### Expected Benefits and Timeframe of Benefits

Conserving the property and protecting it from future risk of development would benefit wildlife and wildlife habitat. The property is surrounded by several other private parcels such as the C Bar Ranch to the east, south and west and represents a relatively undeveloped area of the landscape. Further, a number of investments have been made to-date in the Burro Ciénege watershed including the protection of the Pitchfork Ranch (downstream of Prevost), reintroduction of threatened and endangered species, and riparian restoration. This project would increase the total conserved area in the watershed and protect all surface water of the Ciénege.

The Prevost Ranch property contains a number of different habitats, including wetlands, ponds, and a diverse vegetative community that includes riparian habitat, Chihuahuan grassland, and savanna. The corridor of riparian habitat consists of a rich diversity of vegetation such as mature Goodding's willow, Fremont cottonwood (*Populus fremontii*), emory oak, velvet ash (*Fraxinus velutina*), walnut hackberry, scrub oak, juniper species, honey mesquite (*Prosopis glandulosa*), barrel and cholla cactus (*Cylindropuntia* spp.), soaptree (*Yucca elata*) and banana yucca (*Yucca baccata*), extensive bear grass and a number of species of grasses, sedges and rushes. The Burro Ciénege that flows through the property creates intermittent areas of wetlands and ponds. These rare pockets of water provide essential habitat for various aquatic plant species such as the candidate Wright's marsh thistle (*Cirsium wrightii*), and also provide habitat and feeding grounds for fish, amphibians (including the Federally threatened Chiricahua Leopard Frog), reptiles, and birds.

Of particular relevance to the injury caused by the mine sites, the riparian habitat and permanent water sources on the property are used by numerous migratory waterfowl such as Great Blue Heron, Mallard, Northern Pintail, Gadwall, Canvasback, Rails, and others. There are also several Federally threatened and endangered species and New Mexico Species of Conservation Need that utilize portions of the property, including the Northern Aplomado Falcon (*Falco femoralis septentrionalis*), endangered Mexican long-nosed bat (*Leptonycteris nivalis*), Bell's Vireo, Bendire's Thrasher (*Toxostoma bendirei*), Burrowing Owl (*Athene cunicularia*), Grace's Warbler (*Setophaga gracia*), Sage Thrasher (*Oreoscoptes montanus*), and Sonoran Yellow Warbler, among others.

A conservation easement on the Prevost Ranch would also provide protection for the cultural and historical resources on the property, which include early settler, Spanish, and Native American archeological sites found throughout the property. The protection of this ranch in perpetuity

would provide opportunities to better understand the Mimbres Culture and would ensure that knowledge of the regions' history is accessible into the future.

Overall, this project would avoid the risk of habitat loss, degradation, and fragmentation that would result from further subdivision and development of the property. Additionally, this project would avoid the risk of impacts to current hydrology and drainage patterns that could result from development on the site. When placed into context with neighboring public lands (e.g., NM State Trust and Bureau of Land Management lands), the Gila National Forest managed lands, and the downstream Pitchfork Ranch easement (2,088 ha (5,160 acres) and 12.2 km (7.6 mi) of the Burro Ciénega), protecting the Ciénega on the Prevost property would help preserve the hydrologic integrity of the watershed overall. In addition, the Trustees implemented restoration projects at the Prevost property and on the Pitchfork Ranch property (as part of the Tier 1 projects described in the RP/EA), and this project would provide added protection for these previous efforts.

#### Overview of Maintenance and Monitoring

The NMLC would work with the landowner to place the property under a permanent conservation easement. Once the easement is in place, the NMLC would be responsible for providing maintenance support and long-term stewardship and monitoring of the easement to ensure compliance with the terms of the easement and long-term legal defense as necessary (e.g., insurance and legal costs associated with any potential violations of the terms of the easement).

#### Trustee Evaluation

Overall, the Prevost Ranch Conservation Easement project was evaluated favorably (“Above Average”) in the habitat protection restoration category. The proposed project would provide long-term protection for riparian, wetland, and upland habitat in the Burro Mountains, which would directly benefit birds and wildlife resources and services.

This project ranked above average for all five high-priority criteria: “likely to directly benefit birds that were affected by hazardous substance releases at and from the Sites,” “high potential for long-term success,” “low risk of failure,” “feasible and cost-effective provisions for operations, maintenance, and monitoring,” and “needs NRDAR funding.” The proposed project area encompasses rare habitat types that are unique and valuable to a variety of bird species, including migratory birds. In addition, this project would be managed by the NMLC, which is a well-known nonprofit dedicated to conserving New Mexico’s land heritage, and the agreement would provide benefits in perpetuity. Management and stewardship from the NMLC and the lack of active restoration reduces the risk of failure and increases the potential for long-term success.

Overall, this project ranked above average for the medium-priority criteria. Specifically, it ranked average for “located close to where the injuries occurred” and “consistent with regional planning and Federal and State policies,” and above average for “cost-effective compared to other projects that provide similar benefits” and “likely to benefit multiple wildlife resources and services.” The proposed project encompasses a large area, and includes valuable ciénega and Chihuahuan grassland habitat. Additionally, the land owner intends to donate a portion of the easement. As such, this project is more cost-effective than other habitat protection projects and is likely to benefit many wildlife resources and services.

Overall, this project ranked average for the low-priority criteria. Specifically, it ranked above average for “likely to provide benefits quickly after project implementation,” average for “leverages funding,” and below average for “allows for appropriate public access.” Once an agreement is drafted and in place, the land protections associated with the terms of that agreement would be active instantaneously. Thus, benefits would be provided quickly after project implementation. However, since this is private property, public access is low.

### **3.2.6 SOUTHWEST SUFI-BEAR CREEK CONSERVATION EASEMENT AND HABITAT IMPROVEMENT**

This project involves protecting approximately 588 ha (1,453 acres) of the Southwest Sufi-Bear Creek property under a conservation easement. Additional work to repair fencing on the property would help to protect valuable wildlife habitat from trespassing cattle.

#### **Project Location**

The property is located approximately 22 km (14 mi; straight line estimate) northwest of Silver City, New Mexico and approximately 44 km (27 mi) from the Chino Mine, 30 km (19 mi) from the Tyrone Mine, and 31 km (19 mi) from the Cobre Mine (Figure 3-1).

#### **Project Description**

The Southwest Sufi-Bear Creek property includes 4.2 ha (2.6 mi) of Bear Creek, which bisects the property, and abuts the Gila National Forest. It is in a relatively high elevation area at 1,570 to 1,798 m (5,150 to 5,900 ft). Adjacent landowners include the Gila National Forest to the east, New Mexico State Lands to the north and south, Bureau of Land Management in the southeast corner, and private lands to the west. There is also a state land inholding on the property and a 2 ha (5 acre) agricultural and retreat center building envelope, the latter of which is used by members of the Southwest Sufi Community and would remain in place under the easement. Upstream lands are primarily Federal with a few private inholdings, while the Double E Ranch lies downstream (2,388 ha (5,900 acre)) recently acquired by the Trustees and placed under ownership and permanent protection and management by the NMDGF.

The Southwest Sufi property is located in the Madrean Lower Montane Woodlands ecoregion, which is characterized by the existence of juniper, piñon pine, and oak. However, the inclusion of Bear Creek would provide approximately 28 ha (70 acres) of riparian floodplain habitat, which encompasses 14 ha (34 acres) of riverine and marsh wetlands. Bear Creek ultimately joins the Gila River, which is one of the few major river systems of the southwest and supports one of the highest levels of aquatic and riparian biodiversity in the Lower Colorado River Basin. The landowners are interested in permanently protecting the property, which would prevent further fragmentation of the critical riparian habitat in this area.

#### **Expected Benefits and Timeframe of Benefits**

The riparian corridor along Bear Creek includes Arizona sycamore, Fremont and narrowleaf cottonwood, grey alder, box elder, and Goodding’s and bluestem willow. The portion of the creek that is on the Southwest Sufi property is perennial. As such, it supports a variety of aquatic and semi-aquatic organisms like the Federally threatened Chiricahua Leopard Frog, Federally threatened Narrow-headed Gartersnake, Federally endangered Loach Minnow, Speckled Dace

(*Rhinichthys osculus*), Longfin Dace (*Agosia chrysogaster*), Tiger Salamander (*Ambystoma tigrinum*), Woodhouse's Toad (*Anaxyrus woodhousii*), and Sonora Mud Turtle (*Kinosternon sonoriense*). The riparian and upland areas provide habitat for the Federally endangered Southwestern Willow Flycatcher, Federally threatened Yellow-billed Cuckoo, Great Blue Heron, Mallard, Gadwall, American Widgeon, Common Merganser, Rails, Sandpipers, bald Eagle, Osprey, Pied-billed Grebe, and Cinnamon Teal. These areas are vital for neotropical migrants like Virginia's, Orange-crowned, Black-throated Gray, and Townsend's Warblers. Species such as the Common Black-hawk and Peregrine Falcon have been observed in the area, and designated critical habitat for the Federally threatened Mexican Spotted Owl (*Strix occidentalis*) is nearby. Other animals have been observed in the wider upland area, such as javelina, black bear, mule deer, bighorn sheep, Mexican grey wolf, coyote, grey and red fox, skunk, bobcat, cougar, birds of prey, wild turkey, Montezuma and Gambel's Quail, among others.

Placing this property under a conservation easement would provide benefits to wildlife by protecting wildlife habitat, preventing habitat fragmentation, and would also preserve scenic open space in perpetuity. Protecting the area from trespass cattle by installing and repairing fencing would provide added benefit through improvement in water quality and enhanced riparian vegetation. This easement would also protect water quality for the downstream, Double E ranch thereby supplementing other New Mexico State conservation efforts. Once the easement is in place, benefits to wildlife and wildlife habitat would be effectively instantaneous. The fencing is expected to be in place within a year, and would provide additional benefits beginning at the time of completion.

#### Overview of Maintenance and Monitoring

The NMLC would work with the landowner to place the property under a permanent conservation easement. This includes easement negotiation and drafting, minerals assessment, title and insurance review, administrative costs, and valuing the easement. Once the easement is in place, NMLC would provide long-term stewardship services, which include annual compliance monitoring and long-term legal defense.

#### Trustee Evaluation

Overall, Southwest Sufi-Bear Creek Conservation Easement project was evaluated favorably ("Above Average") in the habitat protection restoration category. The proposed project would provide long-term protection for riparian, wetland, and upland habitat, which would directly benefit birds and wildlife resources and services.

This project ranked above average for all five high-priority criteria: "likely to directly benefit birds that were affected by hazardous substance releases at and from the Sites," "high potential for long-term success," "low risk of failure," "feasible and cost-effective provisions for operations, maintenance, and monitoring," and "needs NRDAR funding." Similar to the proposed Prevost easement, described above, the NMLC would manage the easement. The NMLC is a well-known conservation entity and has the capacity to manage the easement effectively. Therefore, the project has a low risk of failure and high potential for long-term success. It is also located in the Gila River basin, which is desirable stopover habitat for migratory birds.

This project ranked average overall for the medium-priority criteria. Specifically, the project ranked above average for “likely to benefit multiple wildlife resources and services,” average for “located close to where the injuries occurred” and “consistent with regional planning and Federal and State policies,” and below average for “cost-effective compared to other projects that provide similar benefits.” The property includes a perennial portion of Bear Creek and upland habitat areas, which would provide benefits to multiple wildlife resources. However, it is not as cost-effective compared to other habitat protection projects evaluated as part of this Addendum due to a higher cost per acre for the easement.

The project ranked average overall for the low-priority criteria. Specifically, it ranked above average for “likely to provide benefits quickly after project implementation,” average for “leverages funding,” and below average for “allows for appropriate public access.” As with the Prevost easement, once the agreement is in place the benefits associated with the protection of this land would be instantaneous. However, it is private property and typically the only visitors are retreat groups associated with the Southwest Sufi Community. Thus, public access is considered low.

### 3.2.7 UPPER WHISKEY CREEK RESTORATION

This project would create wetland ponds and restore surface water hydrology to benefit wildlife and wildlife habitat.

#### Project Location

The Upper Whiskey Creek property is located approximately 10 km (6 mi; straight line estimate) northeast of Silver City, New Mexico and approximately 24 km (15 mi) from the Chino Mine, 25 km (16 mi) from the Tyrone Mine, and 11 km (7 mi) from the Cobre Mine (Figure 3-1).

#### Project Description

The project area is approximately 17 ha (42 acres) with 0.3 ha (0.82 acre) of ponds and tanks, which encompasses private properties at two addresses, owned by the same landowner. This property is within the 809 ha (2,000 acre) Whiskey Creek watershed. The creek itself has been diverted into a system of dirt tanks and no longer follows its channel at the valley bottom. Most surface water is solely present as runoff with some shallow groundwater existing where deeper alluvium captures the surface water (e.g., in the area of the dirt tanks). This alteration of flow path, coupled with land use change transitioning from historic ranchlands to private homes and mini-farms, has caused erosion issues and increased sediment loads that have filled-in the dirt tanks over the last 50 years.

The proposed project would:

- Clean out and excavate three dirt tanks on the property, remove invasive vegetation, and plant native riparian vegetation at those locations.
- Create three wetland ponds, where invasive vegetation would be removed, and native riparian/wetland vegetation would be planted. The wetlands would be constructed as deep pools to minimize surface area, which would help reduce evaporation, keep water temperature low, and ensure water quality and quantity.

- Stabilize driveways and associated ditches on the property and install earthworks to prevent erosion, reduce sediment yield, and create clean surface water for the restored habitat areas.

This project would interface with a wider watershed restoration effort under the Service's Partners for Fish and Wildlife Program in collaboration with Stream Dynamics, the project proponent. Two additional landowners in the watershed have already been identified who are interested in collaborating in watershed improvement efforts utilizing similar methods.

#### Expected Benefits and Timeframe of Benefits

Implementing this project would provide open water habitat with native riparian and wetland plant species, which would likely result in the use of these areas by birds and other wildlife. The existing vegetation provides evidence of a previously higher groundwater table. For instance, most of the existing riparian vegetation is over 30 years old, though appears to be dying or dead, while there is new understory growth of uplands brush and trees, which include invasive elms and tamarisk. The current vegetation would be replaced with Fremont cottonwoods and Goodding's willows. Native grasses, such as giant sacaton (*Sporobolus wrightii*), and a variety of reeds and sedges would also be planted.

The 2012 Southwest New Mexico Audubon Society bird count reported over 20 species of permanent resident birds and at least six migratory species of birds living in the Whiskey Creek watershed. These and other species would likely be drawn to the area with the creation of the riparian and wetland habitat. Many other types of wildlife would also benefit. For example, suitable habitat for the Chiricahua Leopard Frog would be created and the landowner has expressed interest in possibly reintroducing this species to the property. Wildlife such as amphibians and reptiles also use wetland areas for breeding, foraging, and cover. Wetlands serve as incubators for insect production, which function as the base of the food chain for many higher trophic level organisms.

In addition, the restoration of the tanks and ponds would likely benefit groundwater through infiltration. This relationship also benefits the surface water resource by raising the groundwater table. The wetland areas may help protect downstream properties from flooding since wetlands are efficient at trapping sediments and slow down surface water to allow for infiltration. It is expected that benefits from this project would reach full value within 5 years post-construction.

#### Overview of Maintenance and Monitoring

After securing water rights for the tanks and ponds during the design phase, construction would be initiated. Post-construction, the project proponent, Stream Dynamics, would provide monitoring and maintenance services for the first 3 years. During that time, they would work closely with the landowners to educate them on the required monitoring and maintenance needs, which include maintaining grade control structures along the driveway; maintaining rolling dips; thinning and removal of invasive vegetation; monitoring the establishment and success of native vegetation; monitoring the water quality and quantity of the ponds; monitoring wildlife use through the use of cameras; and coordinating with the Southwest New Mexico Audubon Society to collect data for the Upper Whiskey Creek Watershed during their local Christmas Bird Count.

Additionally, travel by and use of motorized vehicles around the restored ponds and tanks, and livestock use of the restored ponds and tanks would be prohibited.

#### Trustee Evaluation

Overall, the Upper Whiskey Creek Restoration project was evaluated favorably (“Average”) within the riparian/watershed habitat restoration category. The proposed project would provide wetland habitat, which would directly benefit birds and wildlife resources and services.

This project ranked above average for all five high-priority criteria: “likely to directly benefit birds that were affected by hazardous substance releases at and from the Sites,” “high potential for long-term success,” “low risk of failure,” “feasible and cost-effective provisions for operations, maintenance, and monitoring,” and “needs NRDAR funding.” The property owners associated with this proposed project are committed to monitoring and maintenance of the habitat improvements, which would reduce the risk of failure and increase the likelihood of long-term success. The proposed improvements would create wetland habitat pools and benefit adjacent riparian habitat, which are areas frequented by birds.

The project ranked below average for the medium-priority criteria overall. Specifically, the project ranked average for “located close to where the injuries occurred” and “consistent with regional planning and Federal and State policies,” and below average for “cost-effective compared to other projects that provide similar benefits” and “likely to benefit multiple wildlife resources and services.” The property is located close to the mines, thus has a close nexus to birds and other wildlife injured as a result of previous mine activities. This project is within the Upper Whiskey Creek watershed, which would potentially be a project area for the Service’s Partners for Fish and Wildlife Program project. However, due to the relatively small size of the wetland areas compared to other, similar projects, it ranked below average for cost-effectiveness.

The project ranked average for the low-priority criteria overall. Specifically, the project ranked above average for “likely to provide benefits quickly after project implementation,” average for “leverages funding,” and below average for “allows for appropriate public access.” Since the constructed pools and tanks would hold a persistent source of water, wetland plantings would likely establish themselves relatively quickly. However, since this project would be conducted on private property, public access is low.

### 3.3 PROJECTS CONSIDERED BUT NOT RECOMMENDED FOR FUNDING

The remaining three proposed restoration projects were considered, but are not recommended for funding by the Trustees. Funding is insufficient to implement all of the proposed projects considered in this Addendum. Though these three projects may provide benefits to birds and other wildlife, their nexus to birds injured by the mines was not as strong as the other proposed restoration projects, their risk of failure was relatively high, and/or benefits would not be realized as quickly when compared to the other projects. A summary of the projects considered but not recommended for funding is provided in Table 3-4. A description of each of the projects is provided below (Sections 3.3.1 through 3.3.3), including a description of the project location, an explanation of the benefits from the project and the timeframe for the benefits, an overview of the

maintenance and monitoring requirements, and an explanation of how the project was evaluated by the Trustees.

**TABLE 3-4 SUMMARY OF RESTORATION PROJECTS CONSIDERED BUT NOT RECOMMENDED FOR FUNDING**

PROJECT NAME	PROJECT CATEGORY	BRIEF PROJECT DESCRIPTION
Headwaters Burro Ciénega Watershed: Habitat Enhancement, Erosion Control, and Forest Service Road Relocations	Riparian/watershed habitat restoration	Enhance the Headwaters Burro Ciénega Watershed habitat through the construction of earthen erosion control structures, relocating Forest Service roads, and treating invading piñon/juniper in the Gila National Forest.
Mangas Valley Restoration	Riparian/watershed habitat restoration	Restore habitat by lifting stream bed of the Mangas Valley, restoring deeply incised Mangas gully, creating wetlands, and creating a shallow channel that allows floodwater to communicate with its historic floodplain.
Permanent Structures for Irrigation Ditches in the Gila Basin	Riparian/watershed habitat restoration	Enhance habitat by constructing permanent diversion structures in the Gila River to divert water into acequias used to irrigate pasture and cropland, assuring more consistent water flow through the ditches for irrigation and improving riparian areas.

### **3.3.1 HEADWATERS BURRO CIÉNEGA WATERSHED: HABITAT ENHANCEMENT, EROSION CONTROL, AND FOREST SERVICE ROAD RELOCATIONS**

This project would construct erosion control structures, relocate two Forest Service roads, and treat invading piñon/juniper within the Gila National Forest and adjacent private lands.

#### **Project Location**

The Burro Ciénega watershed project would be located in the Gila National Forest and on adjacent private land approximately 35 km (22 mi; straight line estimate) southwest of Silver City, New Mexico. Approximately 42 km (26 mi) from the Chino Mine, 20 km (13 mi) from the Tyrone Mine, and 51 km (32 mi) from the Cobre Mine.

#### **Project Description**

The Burro Ciénega Watershed straddles State, Federal, and private lands, much of which is used for the purposes of livestock grazing. A group of local ranchers have formed the Upper Burro Ciénega Watershed Association, which works toward restoring and enhancing habitat conditions and watershed health in the area. A portion of the Burro Ciénega drainage is perennial, fed by springs, and is uniquely situated within a dry, Chihuahuan desert landscape. As such, it provides many useful services to fish, birds, and other wildlife that depend on such habitat in the semiarid southwest.

The work proposed under this project includes:

- *Erosion control structures* – Actively eroding head cuts and gullies are contributing a significant sediment load to the local drainages. Installation of small, medium, and large earthen erosion control structures in these erosive areas would help to reduce erosion and sediment loads. This would have cascading benefits to downstream watershed health.
- *Relocating Forest Service roads* – Two Forest Service roads (each 1.9 km (1.2 mi) long) are currently located within active stream channels at the upper end of the Walking X Canyon (North and South forks). This work would construct new roads that are not within the stream channels and seed the disturbed areas.
- *Invasive species removal* – Three areas were proposed for treating invading piñon/juniper by mechanical treatment. This would involve the use of heavy equipment to push the trees down and then the pushed trees would be sold in a commercial fuelwood sale. Revenue from this sale would be used on the treatment area for additional watershed stabilization work. Disturbed areas would also be seeded.

#### Expected Benefits and Timeframe of Benefits

The erosion control structures proposed as part of this project would slow erosion and increase sediment deposition, which would benefit the hydrology of the watershed on the whole. This would also benefit the Ciénega and the organisms that utilize the habitat by improving water quality, particularly during storm events. Relocating the Forest Service roads would eliminate a major cause of erosion and sediment transport in this watershed. The existing roads were often created by people driving in sand-filled stream channels since they were relatively easy routes for travel. As such, they were not constructed using best management practices or properly located. These existing roads collect and concentrate runoff through the diversion of natural waterways, which increases erosion. Finally, invasive species removal would strengthen the ability for native vegetation to take root and thrive. Native vegetation would provide habitat for native wildlife species that would use the area for forage, refuge, and breeding.

Since this project would be conducted partially within the Gila National Forest, the Forest Service has the long-term responsibility for managing their lands. Additionally, the existence of the Upper Burro Ciénega Watershed Association indicates that there are invested private parties who would be more likely to maintain the enhancements and invasive species removal conducted under this work, even on private lands. However, some components of this project would likely provide benefits longer than others. For example, erosion control structures are known to wash out during flood events and invasive species often grow back after some time. For these reasons, benefits from this project would likely be long-term, but may not last as long as for other proposed restoration projects and are unlikely to be realized as quickly as other projects.

#### Overview of Maintenance and Monitoring

Depending on the property ownership of the various locations for the proposed improvements, a combination of private landowners, the Upper Burro Ciénega Watershed Association, and the Gila National Forest would be responsible for implementation, operation, monitoring, and maintenance.

#### Trustee Evaluation

The Trustees have determined that some components of the Headwaters Burro Ciénege Watershed Project do not provide sufficiently direct benefits to wildlife, specifically birds, resulting in a below average ranking for the high-priority evaluation criteria and an average ranking overall. Constructing erosion control structures and relocating Forest Service roads would likely provide benefits to wildlife, but these projects are not specifically tailored to providing direct benefits to birds in comparison to the other proposed riparian/watershed habitat restoration projects in the area. In addition, benefits from the erosion control structures would not be realized quickly, are not as cost-effective as other proposed restoration projects, and provide only tangential benefits to birds through the improvement of the watershed as a whole.

The available funding to the Trustees is insufficient to fund all of the proposed projects considered in this Addendum. Based on the Trustees' evaluation, this project is not recommended for funding due to its lower, indirect wildlife benefits; timeframe for benefits; and lower cost-effectiveness compared to the other proposed projects.

#### 3.3.2 MANGAS VALLEY RESTORATION

This project would enhance Mangas Creek by reversing headcutting, reducing erosion, and raising the streambed. This effort would be coupled with habitat restoration techniques.

#### Project Location

The Mangas Valley Restoration project is located approximately 20 km (12 mi; straight line estimate) west-northwest of Silver City, New Mexico and approximately 42 km (26 mi) from the Chino Mine, 16 km (10 mi) from the Tyrone Mine, and 37 km (23 mi) from the Cobre Mine.

#### Project Description

Grant County Soil and Water Conservation District (District) is involved in extensive and ongoing restoration efforts in the Mangas Valley watershed, which encompasses approximately 64,750 ha (160,000 acres). The proposed project is centered on a section of Mangas Creek, which includes remnants of the historical Mangas Spring. Tyrone Mine sits at the headwaters of Mangas Creek, which then flows north out of the operations area, eventually joining the Gila River. The creek is generally ephemeral and incised along its length, except in the area of the historical Ciénege, which has perennial pools and some portions of continuous flow.

The Ciénege has lost nearly all of its tall grasses and instead, Russian thistle (*Salsola* spp.), tansymustard (*Descurainia* spp.), lambsquarters (*Chenopodium album*), and amaranths (*Amaranthus* spp.) exist in the area. Additionally, a severe head cut has adversely affected the hydrology of the area and has resulted in the formation of a deep arroyo that currently conveys the Mangas Creek. The proposed project would correct these conditions through work completed in two phases. The current funding request is only for the first phase, and thus is the only phase described here.

The technical approach involves the construction of eight to ten grade control structures that would work to build up sediment during storm events by slowing fast moving water, thereby allowing deposition of the waters' sediment load. Over time, the deposited sediment would raise the bottom of the arroyo. The resulting gentler grade would also work to slow water, allow the

deposition of sediment, and increase infiltration of stormwater to the groundwater table. Native willows and other riparian and wetland plant species would then be planted to provide habitat and further reduce sediment transport. The ultimate goal would be to raise the bottom of the arroyo so that Mangas Creek can once again flow across the land surface, thus mimicking the remnant Ciénega.

Once the gully is raised to the historical floodplain, invasive plant species would be removed using a variety of methods (e.g., mechanical removal, herbicide, burning, and concentrated livestock grazing). Native willows and grass rows would be planted and drip irrigated, fed by a water source donated by FMI. Two dirt tanks in the area would also be cleared of sediment, excess vegetation, and filled with water and kept wet during the monsoon season to mimic the historical Ciénega.

#### Expected Benefits and Timeframe of Benefits

Implementing this project is expected to result in the partial fill of eight to ten areas of the arroyo; enhancement of upland habitat downgradient of each grade control structure (estimated 1.6 to 2 ha (4 to 5 acres)); 2.0 to 2.8 ha (5 to 7 acres) of willow thickets; vegetation restoration to restore native species on the historical floodplain; the creation of two riparian/wetland areas (approximately 1.6 ha (4 acres)); an increase in groundwater discharge to Mangas Spring and the perennial stretch of Mangas Creek; and a reduction in sediment load to downstream reaches.

Despite its diminished size, the remnant ciénega is still home to the Federally endangered Spikedace and Loach Minnow. Additionally, a 2015 international spring migratory bird count identified 175 different bird species in Grant County, nearly all of which can be found in the Ciénega. For example, species such as Common Black-hawk, Vermilion Flycatcher (*Pyrocephalus rubinus*), Yellow-billed Cuckoo, White-faced Ibis (*Plegadis chihi*), Virginia Rail (*Rallus limicola*), Mallard, and Sandhill Crane, among others, have been sighted in the Ciénega.

The proposed project is estimated to take 1 to 2 years of planning, design, and permitting. The construction of the grade control structures would take an additional 2 years and are expected to take 2 more years post-construction to build up sufficient sediment. The average depth of the wash is 6 m (20 ft). Bearing in mind that the proposed grade control structures are estimated to each be 3 m (10 ft) tall, the District plans on two cycles of construction and sediment trapping to raise the incised channel to the desired elevation. Thus, resulting benefits from this project would likely not be realized for 10 to 20 years, particularly when considering the time required for vegetative plantings and habitat restoration.

#### Overview of Maintenance and Monitoring

Monitoring and maintenance would be performed by the District. First, the grade control structures would be topographically surveyed and logged after construction and visually inspected after every major flood event. The visual inspections may trigger a topographic survey of the impounded sediment behind each structure, which would allow for documentation of sediment accumulation and the reduction of sediment loading to downstream areas. Grade control drains would be maintained as needed (e.g., in the event they become clogged with debris or sediment).

Depth to groundwater would be monitored quarterly. Mangas Spring and the downgradient portion of Mangas Creek would be monitored at the same frequency, and a gauging station outfitted with a continuous recording device would be established with the goal of determining changes in base flow from upgradient groundwater. Vegetation head control structures and plantings would be monitored yearly for establishment, success, and overall health. This would include a count in designated test sections for plant species' density and diversity. If monitoring indicates that performance criteria (identified during the planning phase) are not being met then the area would be replanted or otherwise maintained. Population monitoring of the floodplain and restored areas would be conducted for bird species.

#### Trustee Evaluation

The Mangas Valley Restoration project does not meet some of the evaluation criteria, resulting in an overall below average ranking for the project. In particular, the proposed work is complex and construction would be spread over many years, which increases the risk of failure. The potential for wildlife and wildlife habitat benefits and long-term success of the project is low. In addition, preliminary evaluations conducted by the Trustees during the first round of restoration planning indicated that it is unlikely that the groundwater table in this area can be raised to the extent that the proposal suggests.

The available funding to the Trustees is insufficient to fund all of the proposed projects considered in this Addendum. Based on the Trustees' evaluation, this project is not recommended for funding due to its lower potential for long-term success as compared to the recommended projects.

### 3.3.3 PERMANENT STRUCTURES FOR IRRIGATION DITCHES IN THE GILA BASIN

This project would construct permanent irrigation structures to divert water from the Gila River into irrigated pasture and cropland.

#### Project Location

The irrigation ditches would be located in the Gila Basin. For context, the Gila River is approximately 37 km (23 mi; straight line estimate) northwest of Silver City, New Mexico. Approximately 60 km (37 mi) from the Chino Mine, 37 km (23 mi) from the Tyrone Mine, and 50 km (31 mi) from the Cobre Mine.

#### Project Description

The Gila Basin Irrigation Commission (GBIC) currently diverts water from the Gila River into various acequias, which are used to irrigate pasture and cropland. The proposed project includes replacing the current earthen diversion structures, which commonly need to be repaired or replaced after a high water event, with more permanent structures. The current interruption in flow limits irrigation of the land and forces birds that use this habitat to find equivalent habitat elsewhere. Replacing the ditches would ensure that water is available continuously during the crop production year, as well as through the late fall and winter months.

The ditches would be constructed along a 13 km (8 mi) stretch of the Gila River, which would provide about 688 ha (1,700 acres) of irrigated cropland. The project would provide a more

dependable supply of water to irrigators and help ensure that water is available in the ditches and farm ponds throughout the year.

#### Expected Benefits and Timeframe of Benefits

The proposed replacement of the earthen diversion structures with more permanent structures would ensure that water is available throughout the year, and would help maintain the primary economic activity in the Gila Basin (i.e., agriculture). The more stable water source would also likely benefit the riparian vegetation that typically exists along the irrigation ditches, providing wetland and riparian habitat to birds and other wildlife. Ducks, geese, and cranes have been observed in the irrigated fields and swimming in the ditches. Ducks, geese, and other waterfowl have also been observed in the farm ponds throughout the year. For example, Southwestern Willow Flycatcher (Federally endangered), Common Black-hawk, Yellow-billed Cuckoo (Federally threatened), Bell's Vireo, and Sandhill Cranes are commonly associated with the ditches and adjacent habitat. The upland area also supports mule deer, Coues deer (*Odocoileus virginianus couesi*), turkey, elk, and javelina.

#### Overview of Maintenance and Monitoring

The GBIC would be responsible for operating and maintaining the structures as well as the diversion of water from the Gila River. The permanent irrigation structures would reportedly provide wildlife and wildlife habitat benefits for 10 to 20 years, barring a major flood.

#### Trustee Evaluation

The Permanent Structures for Irrigating Ditches in the Gila Basin project ranked lower compared to the other proposed riparian/watershed habitat restoration projects, resulting in an overall below average ranking for the project. Specifically, the project would likely provide indirect benefits to wildlife and wildlife habitat. The primary goal of this project is irrigating cropland and pastureland, which provides tangential benefits to birds and other wildlife rather than direct benefits. The benefits of this project are likely to be lower than those of the projects described in the preferred alternative; the project area does not include rare or important wildlife habitat. Partial funding for this project has already been authorized by the New Mexico Interstate Stream Commission. Additionally, the scale and scope of monitoring and maintenance for this project is unclear.

The available funding to the Trustees is insufficient to fund all of the proposed projects considered in this Addendum. Based on the Trustees' evaluation, this project is not recommended for funding due to its lower, indirect wildlife benefits; the availability of other projects that are more in need of NRDAR funding close to where the injuries occurred; and, the uncertainty related to the level of monitoring and maintenance required to ensure benefits are realized from the project.

## CHAPTER 4 | COMPLIANCE WITH THE NATIONAL ENVIRONMENTAL POLICY ACT

### 4.1 OVERVIEW AND BACKGROUND

Under CERLCA, Trustees shall recover damages for natural resource injuries and develop and implement a plan to restore, rehabilitate, replace, and/or acquire the equivalent of the injured natural resources under their trusteeship (43 C.F.R. § 11.93). The restoration activities are also subject to the requirements of the National Environmental Policy Act of 1969 (NEPA) when Federal trustees are involved (42 USC §§ 4321 *et seq.*). Therefore, the Trustees conducted an environmental assessment (EA) for the preferred restoration alternative to evaluate the potential environmental, socioeconomic, and cultural impacts associated with the proposed restoration activities.

The preferred alternative described in the RP/EA included restoration projects that were located in the Gila and Mimbres watersheds, and primarily in Grant County. They also lie within the Arizona/New Mexico Mountain and Chihuahuan Desert ecoregions. The preferred alternative included restoration actions with erosion control, riparian revegetation, and wetland and surface pond enhancement components as well as habitat protection projects. The Trustees determined that the cumulative environmental and socioeconomic impacts of the preferred alternative would be positive for the general vicinity of Silver City, New Mexico.

In this Addendum to the 2013 RP/EA, the projects included in the preferred restoration alternative include similar actions to those evaluated as part of the RP/EA, such as habitat protection, erosion control, riparian wetland revegetation, and surface pond enhancement components. Furthermore, the recommended restoration projects are all within the same watersheds, ecoregions, and County as the projects covered under the previous NEPA analysis. As such, this EA tiers from the RP/EA prepared by the Trustees in 2013, both of which have been prepared in accordance with NEPA, Council on Environmental Quality (CEQ) NEPA regulations, and all applicable agency NEPA regulations and guidance.

### 4.2 AFFECTED ENVIRONMENT

The conditions and environmental effects described in the NEPA analysis included in the RP/EA are applicable to this Addendum. Further, this Addendum incorporates by reference the affected environment information and associated discussion related to the ecological, socioeconomic, and cultural environment provided in Chapter 5 of the RP/EA.

### 4.3 RESTORATION ALTERNATIVES AND SCOPE OF THE ENVIRONMENTAL ASSESSMENT

CEQ NEPA regulations require that the environmental effects of the proposed actions and a reasonable range of alternatives, including a no-action alternative, are considered (40 C.F.R. § 1502.14). This EA analyzes the proposed/preferred action and a no-action alternative.

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The proposed restoration actions in the preferred alternative include a suite of projects that work to restore, rehabilitate, replace, and protect the same types of natural resources that have been injured by hazardous substance releases associated with the FMI mining facilities. This action would be selected because it would result in more efficient recovery of natural resources, particularly migratory and native birds, compared to the no-action alternative. The restoration and protection of riparian and wetland (including ciénega) habitat areas would provide necessary and appropriate stopover, breeding, and nesting habitat to a wide variety of bird species. Other wildlife would also benefit, such as terrestrial species, amphibians, and reptiles (among others), some of which are Federal and State listed species. Specifically, State listed species within Grant County include 24 birds, eight fish, three reptiles, one amphibian, two springsnails, and three mammals (NMDGF 2016).

Under the no-action alternative, the Trustees would not restore or protect the habitat areas considered under the preferred alternative. Rare and unique habitats may disappear with the sale of a property or with further fragmentation of inholdings and the creation of ranchette-style properties. Riparian and wetland (including ciénega) habitat areas could continue to degrade due to erosion control issues, overgrazing, and invasive plants and may eventually no longer provide the valuable and unique ecosystem services that they currently do.

This EA tiers from the analysis provided in Chapter 6 of the RP/EA and the information and analysis in this document supplements that provided in the RP/EA. Specifically, this EA provides a NEPA analysis for potential impacts for site specific issues and concerns that are anticipated as a result of the preferred alternative and the no-action alternative. The specific benefits associated with each individual restoration project in the preferred restoration alternative were identified in Chapter 3. This chapter provides additional information on the potential impacts of the preferred alternative and no-action alternatives, as well as a description of the cumulative impacts. Further, this chapter describes the Federal, State, and local laws, regulations, and policies that may affect completion of the restoration projects. All project proponents that receive NRDAR funding will be responsible for obtaining necessary permits and complying with relevant local and Federal laws, policies, and ordinances.

Over the long term, the restoration projects that together form the preferred restoration alternative identified in this Addendum to the RP/EA would provide positive environmental and socioeconomic benefits for the general vicinity of Silver City, New Mexico. The analysis of impacts assumes that all of the restoration projects in the preferred alternative would be implemented. If funding is insufficient for implementation of any of the projects, then the cumulative impacts of restoration (both positive and negative) would be lessened.

#### **4.4 IMPACTS OF THE NO-ACTION ALTERNATIVE**

Under the no-action alternative, no habitats would be preserved, restored, or enhanced beyond what agencies, organizations, and private citizens are already doing in the area with limited existing resources. Riparian and wetland habitat and water quality in the area would not be improved through erosion control measures, wetland creation and restoration, native vegetation planting, and invasive species removal. Land within the Barmore-West Fork Gila property,

Prevost Rach property, and Southwest Sufi-Bear Creek property would continue to be at risk for potential future development, continued livestock grazing, and would not be subject to any restoration actions. Water resources and hydrology in the City of Rocks State Park would remain degraded, the old stock tanks would continue to provide little benefit as wildlife habitat or as a source of water for wildlife use, and erosion would continue to negatively impact habitat.

Local populations would not have the benefits of improved habitat or increased opportunities for wildlife viewing and recreation. Public access to large areas of land would remain limited, and future generations would not have access to an improved environment.

#### **4.5 IMPACTS OF THE PREFERRED ALTERNATIVE**

Overall, the cumulative environmental impacts of the preferred alternative would be positive because natural resources would benefit from the preferred restoration actions. The impacts on specific categories of environmental resources are described below.

##### **4.5.1 ENVIRONMENTAL IMPACTS OF THE PREFERRED ALTERNATIVE**

###### **Water Resources**

Over the long term, the preferred alternative would have a net positive impact on water resources in portions of the Gila River, Bear Creek, and Whiskey Creek, to surface water portions of the Faywood Ciénega and Burro Ciénega, and overall to the Upper Gila and Mimbres watersheds. During implementation of restoration actions, including wetland creation and restoration, erosion control, native vegetation planting, invasive species control, and pond enhancement projects, there would be temporary, minor increases in sediment transport and in surface water turbidity caused by the use of heavy equipment and during excavation. For example, during erosion control work for the roadways and campgrounds in the City of Rock State Park (described in Section 3.2.2) and during the proposed wetland creation and revegetation work under the Gila River Farm (Section 3.2.3) and Upper Whiskey Creek (Section 3.2.7) projects, sediments and surface water are likely to be disturbed. However, these impacts would be temporary.

The recommended restoration activities would employ best management practices and would ultimately restore native vegetation, stabilize and revegetate areas, leading to long-term decreases in erosion from upland and riparian areas and overall improvements in hydrology and water quality. Erosion control components, such as those proposed under the City of Rocks State Park and Upper Whiskey Creek Restoration projects, would restore hydrologic function to degraded habitat areas.

Temporary impacts would be minimized by appropriately adhering to all Federal, State, and local laws, regulations, and policies and following Best Management Practices (BMPs) for erosion control work. The preferred restoration alternative may require compliance with the Clean Water Act 33 USC § 1251 *et seq.* (CWA). The CWA is intended to protect surface water quality and regulate the discharge of pollutants into waters of the United States. Preferred restoration projects that are subject to the CWA must obtain any necessary permits for proposed restoration actions through the U.S. Army Corps of Engineers. Restoration projects that move material in or out of waterways and wetlands, or result in alterations to a stream channel will typically require CWA

Section 404 permits. Project proponents will be required to obtain the appropriate permits before restoration work begins.

If sufficient water is diverted or impounded by a project, consultation under the Fish and Wildlife Coordination Act, 16 USC § 661 *et seq.*, may be necessary as part of the Section 404 permitting process. This act requires that Federal agencies consult with the Service and State wildlife agencies to minimize and mitigate the adverse impacts of stream modifications on fish and wildlife habitat and resources.

#### Habitat and Vegetation

The recommended restoration projects in this Addendum would increase the area and quality of habitats used by birds and other wildlife. The preferred alternative would enhance vegetation resources in riparian, floodplain, wetland, and upland habitats. The habitat protection and improvement projects, including the Barmore-West Fork Gila property conservation easement, Prevost Ranch conservation easement, and Southwest Sufi-Bear Creek conservation easement, would ensure that protected riverine and marsh wetlands, riparian and floodplain habitat, and upland habitats are not at risk from further development.

The improvements to hydrology, water quality, and erosion control measures included in the City of Rocks State Park, Gila River Farm Riparian Preserve, Headwater Burro Ciénega, and Upper Whiskey Creek restoration projects would improve conditions that support the natural revegetation of native plant species. Riparian, pond, and stock pond restoration components would provide opportunities to remove invasive species and increase the total area of native riparian vegetation and wetland habitats in the area. Erosion control projects would restore hydrologic functions to degraded riparian and wetland habitats, allowing riparian vegetation to become reestablished in incised areas that are currently too dry to support the historical wetland and riparian communities.

There may be temporary, minor and localized impacts to existing vegetation during implementation of the restoration projects from the use of equipment during wetland and riparian habitat enhancement efforts, native plants and invasive species removal. However, these temporary impacts would be minimized through the use of BMPs for erosion control, and the overall impact would be beneficial to native vegetation, due to habitat enhancements, removal of invasive species, reduction in erosion, and overall improvements to hydrology that support the natural revegetation of native species.

#### Wildlife Resources

The restoration projects in the preferred alternative would enhance wildlife habitat and provide a wide range of benefits to numerous wildlife species, as described in more detail in Chapter 3 of this Addendum. Specifically, the projects would enhance fish and wildlife resources in the Gila River, Bear Creek, and Whiskey Creek, as well as to surface water portions of the Faywood Ciénega and Burro Ciénega. The primary aim of all of the projects in the preferred alternative is to benefit wildlife and wildlife resources, particularly bird species. The preferred alternative projects would increase the area and quality of riparian and wetland habitats used by birds and other wildlife, and provide additional sources of clean water for migratory birds and resident

wildlife. During restoration activities, there may be minor, short-term disturbances to wildlife species caused by increased noise and minor displacements in areas where equipment is being used; however, wildlife would likely be able to avoid the impacted areas.

Specifically, the three conservation easement projects (described in more detail in Sections 3.2.1, 3.2.5, and 3.2.6) would protect important wildlife habitat for a wide range of species including plants, birds, mammals, reptiles, and amphibians. For instance, the Barmore-West Fork property project would protect habitat that may host the threatened Chiricahua Leopard Frog and Yellow-billed Cuckoo, and endangered species including the Gila Chub, Loach Minnow, Spikedace, and Southwestern Willow Flycatcher, among other species of concern.

The benefits to water resources and the enhancement of riparian and wetland habitat included in the City of Rocks State Park, Gila River Farm Riparian Preserve, and Upper Whisky Creek Restoration projects will improve habitat for a wide range of wildlife resources by providing a source of fresh water and stopover habitat for migratory birds, particularly waterfowl species such as Great Blue Heron, Gadwall, Mallard, Pied-billed Grebe, Northern Shoveler, Green-Winged Teal, Mergansers, and others. The wetland and riparian areas naturally function as incubators for insects, which serve as the base of the food chain for many higher trophic level organisms, such as birds, reptiles, and amphibians. Wildlife such as amphibians and reptiles also use wetland areas for breeding, foraging, and cover. Improving habitat would provide cascading benefits to surrounding wildlife.

Improving streambank and hillslope conditions and invasive species removal as part of the Headwaters Burro Ciénega watershed project would lead to a variety of wildlife benefits by improving the habitat quality. Terrestrial wildlife including bats, skunk, ring-tailed cat, and white-nosed coati, herpetofauna such as the Southwestern Fence Lizard and Northern Mexican and Narrow-headed Gartersnakes, and Chiricahua Leopard Frog and Lowland Leopard Frog, and a wide range of bird species utilize that habitat in this area.

#### Special Status Species

Numerous state species of concern and Federally listed threatened and endangered species exist in the project area, including several species of birds (e.g., Yellow-billed Cuckoo and Southwestern Willow Flycatcher); herpetofauna (e.g., Chiricahua Leopard Frog, Lowland Leopard Frog, Southwestern Fence Lizard and Northern Mexican and Narrow-headed Gartersnakes); fish species (Loach Minnow and Spikedace); and mammals (e.g., Mexican grey wolf). For example, The Barmore-West Fork Gila Property Conservation Easement (Section 3.2.1) would protect a unique area that can host the Federally threatened Chiricahua Leopard Frog, Federally endangered fish including Gila topminnow, Gila Chub, Loach Minnow, and Spikedace, while the riparian zone provides habitat for the Federally endangered Southwestern Willow Flycatcher and the Federally threatened Yellow-billed Cuckoo. Similarly, reaches of the Ciénega on the Prevost Ranch (Section 3.2.5) property host populations of the Federally threatened Chiricahua Leopard Frog and the Federally endangered Gila Topminnow, among many other species of wildlife. The Prevost Ranch also provides critical habitat for numerous Federal and State listed plant, fish, reptile and amphibian species, as well as stopover and year-round habitat for many species of birds and mammals. The Southwest Sufi-Bear Creek (Section

3.2.6) property also hosts the Federally threatened Chiricahua Leopard Frog, the endangered Loach minnow, Speckled Dace, and Longfin Dace.

In general, disturbances resulting from construction activities at restoration sites would be short in duration (i.e., likely months to 3 years). Overall, the projects would improve not only habitat for threatened and endangered species, but would also provide long-term benefits to these species. The Endangered Species Act (ESA) of 1973, as amended, 16 USC §§ 1531 *et seq.*, was designed to protect species that are threatened with extinction. The preferred restoration projects will require compliance with the ESA through consultation with the Service. The ESA provides for the conservation of ecosystems upon which these species depend, and provides a program for the identification and conservation of these species. Federal agencies are required to ensure that no actions are likely to jeopardize the continued existence of Federally listed species. Where relevant, project proponents may be required to consult with the Endangered Species Program of the Service before project implementation. The U.S. Forest Service has a list of sensitive species requiring additional management measures (USFS 2007), and the Bureau of Land Management addresses special status species in their resource management plans (BLM 1993).

#### Air and Noise

The restoration projects in the preferred alternative would be accomplished mostly with low impact techniques and utilize BMPs wherever possible. The low-impact techniques would only temporarily contribute to air and noise pollution. Work would be short-term, would occur during daylight hours, and in limited locations, thus wildlife would likely be able to avoid significant noise and air pollution impacts. Heavy equipment may be used for some components of the restoration projects, which may generate local air pollution and noise pollution that could disturb wildlife temporarily.

#### Geology, Mineral, and Soil Resources

The recommended restoration projects are unlikely to have a negative impact on geology or mineral resources. The recommended restoration projects are not likely to result in any changes to mining activity in the area or to the use of mineral resources. The preferred alternative would have a positive impact on soils because many of the projects would result in decreased erosion and increased soil stability. Specifically, the erosion control projects and native riparian revegetation projects would improve soil management, and lead to decreased erosion and increased soil stability.

#### 4.5.2 CULTURAL AND SOCIOECONOMIC IMPACTS OF THE PREFERRED ALTERNATIVE

Overall, the cumulative cultural and socioeconomic impacts of the preferred alternative would be positive because the human population in the area affected by the preferred alternative would benefit from the preferred restoration actions. The impacts on specific categories of cultural and socioeconomic considerations are described below.

#### Land and Access

The preferred restoration projects that make up the preferred alternative would not conflict with county, State, or Federal policies for land management. Habitat protection projects would conform to the policies of the entities accepting the land. Parcels proposed for habitat protection

and enhancement are expected to be in compliance with existing management plans. The preferred alternative would have minimal impact on existing land use. The City of Rocks State Park project would enhance the campground area and habitat within the park, enhancing public experiences within the park.

Though public access may be temporarily limited in the vicinity of heavy machinery used during construction, ultimately public access and recreation would benefit from the implementation of the recommended restoration projects due to improved wilderness areas and protected viewsheds.

#### Air, Noise, and Visual Resources

Because most of the restoration work is planned for locations away from residential areas, the air, noise, and visual impacts on human populations would be minimal. During implementation of the projects, however, some temporary negative impacts would occur. The use of heavy equipment to implement some of the projects would generate local air and noise pollution and could disrupt public enjoyment of the area. Over the long term, however, protection of land parcels at risk of development would help to maintain the scenic viewshed of the region.

#### Cultural and Paleontological Resources

Under Secretarial Order 3206, Department of the Interior (DOI) agencies must consult with Tribes that might have cultural resources that may be affected by projects initiated through the DOI. Before ground disturbing activities occur, the Tribes with interest in the area will be contacted regarding any concerns about restoration implementation.

The restoration projects included in the preferred alternative would have a cumulative positive cultural impact on the region. The region has significant archeological resources, including cultural and historical resources on the Prevost Ranch property, which include early settler, Spanish, and Native American archeological sites. With opportunities to further our understanding of the Mimbres Culture, the protection of this ranch in perpetuity would ensure that knowledge of the regions' history is accessible into the future.

All projects would be required to comply with the National Historic Preservation Act (NHPA) and the Archaeological Resources Protection Act. For example, surveys would be conducted, prior to any restoration actions, for the presence of sensitivity natural or cultural resources, as necessary. The NHPA of 1966, as amended, 16 USC §§ 470 *et seq.*, is intended to preserve historical and archaeological sites. Compliance with the NHPA would be undertaken through consultation with the State Historic Preservation Officer for each project. The Archaeological Resources Protection Act of 1979, as amended, 16 USC §§ 470aa-mm, was enacted to secure the protection of archaeological resources and sites on public lands. A permit is required to excavate or remove any such archaeological resource. If such resources are identified in the areas affected by the preferred restoration projects, a permit will be obtained prior to disturbance.

#### Socioeconomic Impacts

The restoration projects included in the preferred alternative would have cumulative positive socioeconomic impacts on the region. Although there may be short-term negative impacts to public access and recreation during construction work, these impacts would be outweighed by the long-term benefits to public access and recreation. These long-term benefits would result from

increased recreational access to birding, hiking, and other nature-based recreational opportunities in the City of Rocks State Park and in the Gila National Forest. These projects would enhance or protect bird and wildlife habitats and help to preserve the natural resource base that is at the heart of the area's ranching, tourism, and recreation-based industries and quality of life. Construction projects would have a positive economic effect on the area through potential employment opportunities, either directly or indirectly through the supply chain for materials. Educational opportunities through outdoor classroom learning on the Gila River Farm as well as the educational signage that would be constructed at the City of Rocks State Park would provide socioeconomic benefits for the communities surrounding these projects.

#### Environmental Justice

The recommended restoration projects in the preferred alternative would benefit the residents of communities in the vicinity of Silver City, NM, including minority and low-income populations, through improved recreational opportunities and overall economic benefits to the region.

#### **4.6 CUMULATIVE IMPACTS OF THE PREFERRED ALTERNATIVE AND THE NO-ACTION ALTERNATIVE**

The Trustees selected the restoration projects included in the preferred alternative to improve natural resources as compensation for natural resource injuries. Thus the cumulative environmental impacts from implementing the restoration projects are expected to have a net benefit. Any impacts to air quality or water quality and any noise associated with implementation of the projects are expected to be minimal and short-term. The projects would result in long-term benefits to water quality, vegetation, and wildlife in and around the project areas. There would also be long-term socioeconomic benefits to Silver City and surrounding areas through protection and improvement of natural resources. Any negative impacts on cultural resources caused by restoration actions would be mitigated according to requirements of the New Mexico Historic Preservation Division.

Under the no-action alternative, there would be no positive changes to habitats or wildlife beyond the actions taken by other agencies, organizations, and private citizens with limited funding. Although there would be no short-term impacts associated with project implementation, there would also be no long-term benefits from implementation of the preferred alternative. In short, the public would not be compensated for the injuries to wildlife and wildlife habitat resulting from the release of hazardous substances from the Chino, Cobre, and Tyrone mining facilities owned by FMI.

The cumulative impacts of the preferred alternative and no-action alternative are summarized in Table 4-1.

**TABLE 4-1 SUMMARY OF IMPACTS BY ALTERNATIVE**

CATEGORY OF IMPACT	NO-ACTION ALTERNATIVE	PREFERRED ALTERNATIVE
HABITAT IMPACTS	No additional habitats preserved, restored, or enhanced. Continued impairment of riparian and wetlands habitats.	Riparian, wetland, and upland habitats would be preserved, restored, and enhanced (e.g., through erosion control, invasive species removal, native plantings).
BIOLOGICAL IMPACTS	No beneficial impacts to birds and other wildlife, and potential continued adverse impacts.	Improvements to birds and other wildlife through improvements to wildlife habitat and protection.
CULTURAL AND PALEONTOLOGICAL RESOURCE IMPACTS	Cultural resources at the important historic sites at Prevost Ranch may be lost or degraded.	No deleterious impacts expected.
ENVIRONMENTAL JUSTICE IMPACTS	No benefits to residents in Silver City area.	Benefits to area residents from improved habitat and enhanced recreational opportunities.
SOCIOECONOMIC IMPACTS	No positive, indirect economic impacts on the local economy.	Restoration activities would generate short-term economic benefits; improved recreational opportunities and habitat protection would generate long-term economic benefits.
INDIRECT IMPACTS	No indirect impacts.	Indirect beneficial impacts expected through improved habitat for birds and other wildlife.
CUMULATIVE IMPACTS	Cumulative impacts would be negative because of potential continued degradation of riparian and wetland habitat under current conditions.	Cumulative impacts expected to be beneficial through long-term benefits to riparian and wetland habitat, water quality, hydrology, and wildlife resources.

#### 4.7 ANALYSIS DETERMINATION

The Trustees have evaluated the potential ecological, socioeconomic, and cultural impacts of the preferred alternative and no-action alternative, including an analysis of the significance based on NEPA, CEQ NEPA regulations, and all applicable agency NEPA regulations and guidance. The analysis presented herein has determined that the recommended restoration projects included in the preferred alternative would inflict minor, short-term and long-term, adverse impacts to some resource categories and no moderate or major adverse impacts are anticipated. The analysis

suggests that resources would either not be affected by restoration activities or have minor adverse and beneficial impacts as discussed below and in the RP/EA.

In light of the information presented in this Addendum and the RP/EA, the Trustees have determined that the recommended restoration projects would not significantly impact the quality of the human or ecological environment, and would provide an overall benefit.

## **CHAPTER 5 | AGENCIES, ORGANIZATIONS, AND PARTIES CONSULTED**

The Trustees contacted relevant agencies, government entities, nonprofit organizations, and other stakeholders and private parties through an e-mail notification in September 2015 and as part of a public meeting on October 21, 2015. The Trustees informed the public that they had reopened the restoration project selection process, that they were developing an Addendum to the RP/EA that was published in 2013, and encouraged the public to submit restoration project ideas.

A list of parties consulted, either through e-mail or at the public meeting is provided in Table 5-1.

**TABLE 5-1 STAKEHOLDERS CONSULTED DURING DEVELOPMENT OF THIS ADDENDUM**

<b>FEDERAL</b>	
Bureau of Land Management	U.S. Forest Service, Gila National Forest
U.S. Fish and Wildlife Service	
U.S. Department of Agriculture, Natural Resources Conservation Service	
<b>STATE</b>	
New Mexico Department of Agriculture	New Mexico State Forestry
New Mexico Department of Game and Fish	New Mexico State Parks
New Mexico Department of Health	University of Colorado
New Mexico Energy, Minerals, and Natural Resources Department	University of Wyoming
New Mexico Environment Department	Western New Mexico University
New Mexico Interstate Stream Commission	
<b>LOCAL</b>	
City of Bayard	Southwest New Mexico Council of Governments
City of Rocks State Park	Town of Hurley
Grant County	Town of Silver City
Grant Soil and Water Conservation District	Village of Santa Clara
Hidalgo Soil and Water Conservation District	
<b>NONGOVERNMENTAL, PRIVATE, AND OTHER ENTITIES</b>	
Alternative Forestry Unlimited	New Mexico Land Conservancy
Audubon Society, New Mexico	Parametrix
Bat Conservation International	Private Ranch Owners
Bayard Public Library	Prudential
Center for Biological Diversity	Quivira Coalition
Defenders of Wildlife	Rocky Mountain Ecology LLC
Engineers, Inc.	San Francisco River Association
Esperanza Hills, LLC	Silver City Open Space (Gila National Forest)
Freeport McMoRan	Silver City Public Library
Gila Basin Irrigation Commission	Sierra Club (Rio Grande Chapter)
Gila Community News	Southwest Native Ecosystems Management, LLC
Gila Conservation Education Center	Southwest Sufi Community
Gila Valley Library	Stream Dynamics
Great Ecology	The Grant County Beat
Great Old Broads Organization	The Nature Conservancy
Hanover Mutual Domestic Water Consumer Association	The Trust for Public Land
High Desert Native Plants, LLC	Trumm Engineering
Indian Hills Property Owners Association	Upper Burro Cienega Watershed Association
Lone Mountain Natives, LLC	Upper Gila Watershed Alliance
New Mexico Association of Conservation Districts	WildEarth Guardians
New Mexico Cattle Growers' Association	

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