DRAFT
ENVIRONMENTAL ASSESSMENT
FOR THE SAN LUIS VALLEY REGIONAL HABITAT CONSERVATION PLAN

July 2012

Prepared for:
U.S. Fish and Wildlife Service
Ecological Services
764 Horizon Drive, Building B
Grand Junction, Colorado 81506-3946

Prepared by:
ERO Resources Corporation
1842 Clarkson Street
Denver, Colorado 80218

Hill & Robbins, P.C.
100 Blake Street Building
1441 18th Street
Denver, Colorado 80202-5932

Table of Contents

1.0 Introduction, Purpose of and Need for Action 5
1.1 Introduction 5
1.2 Purpose and Need 7
1.3 Legal and Policy Guidance 8
1.4 HCP Scope 8
1.5 Goals and Objectives 11
1.6 Public Participation 11

2.0 Alternatives Including the Proposed Alternative 13
2.1 Overview of Alternatives Considered 13
2.2 No Action Alternative 13
2.3 Public Land Mitigation HCP Alternative 14
2.4 San Luis Valley Regional HCP – Proposed Alternative 15
2.5 Alternatives and Concepts Considered and Eliminated from Analysis 17

3.0 Affected Environment and Environmental Consequences 19
3.1 Introduction 19
3.2 Water Resources 19
3.3 Vegetation 22
3.4 HCP Covered Species 26
3.5 Other Wildlife 29
3.6 Cultural Resources 34
3.7 Socioeconomic Setting 36
3.8 Land Use and Infrastructure 38
3.9 Land Ownership and Management 40
3.10 Habitat Conservation Efforts 44
3.11 Cumulative Effects 49

4.0 List of Preparers 55

5.0 Consultation and Coordination 56

Figures

Figure 1. HCP Location 6
Figure 2. Water Resources 20
Figure 3. Riparian Habitat and Covered Species 23
Figure 4. Land Management Designations 41
Figure 5. Existing Conservation Easements 46

Tables

Table 1. Comparative Summary of the Alternatives Evaluated. 16
Table 2. Riparian Habitat Mapping Elements.....22
Table 3. Wildlife Species of Concern in the San Luis Valley Plan Area. 30
Table 4. Socioeconomic and Demographic Statistics in the San Luis Valley. 37
Table 5. CNHP-Designated Potential Conservation Areas. This table only includes PCAs that are located within the HCP plan area and contain riparian shrub habitat. 42
Table 6. Summary of Effects. 47

1.0 INTRODUCTION, PURPOSE OF AND NEED FOR ACTION

1.1 Introduction

The San Luis Valley (Valley) is a large intermountain basin in southern Colorado (Figure 1). The riparian communities[1] along the Rio Grande, Conejos River, and smaller tributaries in the Valley provide habitat for two bird species addressed in the draft San Luis Valley Regional Habitat Conservation Plan (HCP): the southwestern willow flycatcher (*Empidonax traillii extimus*) (flycatcher), listed as endangered under the Endangered Species Act of 1973, as amended (ESA), and the western U.S. distinct population segment of the yellow-billed cuckoo (*Coccyzus americanus*) (cuckoo), a candidate for listing under the ESA. These species are referred to as the covered species. Flycatchers and cuckoos generally occur in various types of woody riparian vegetation containing dense willow thickets adjacent to wet meadow habitat.

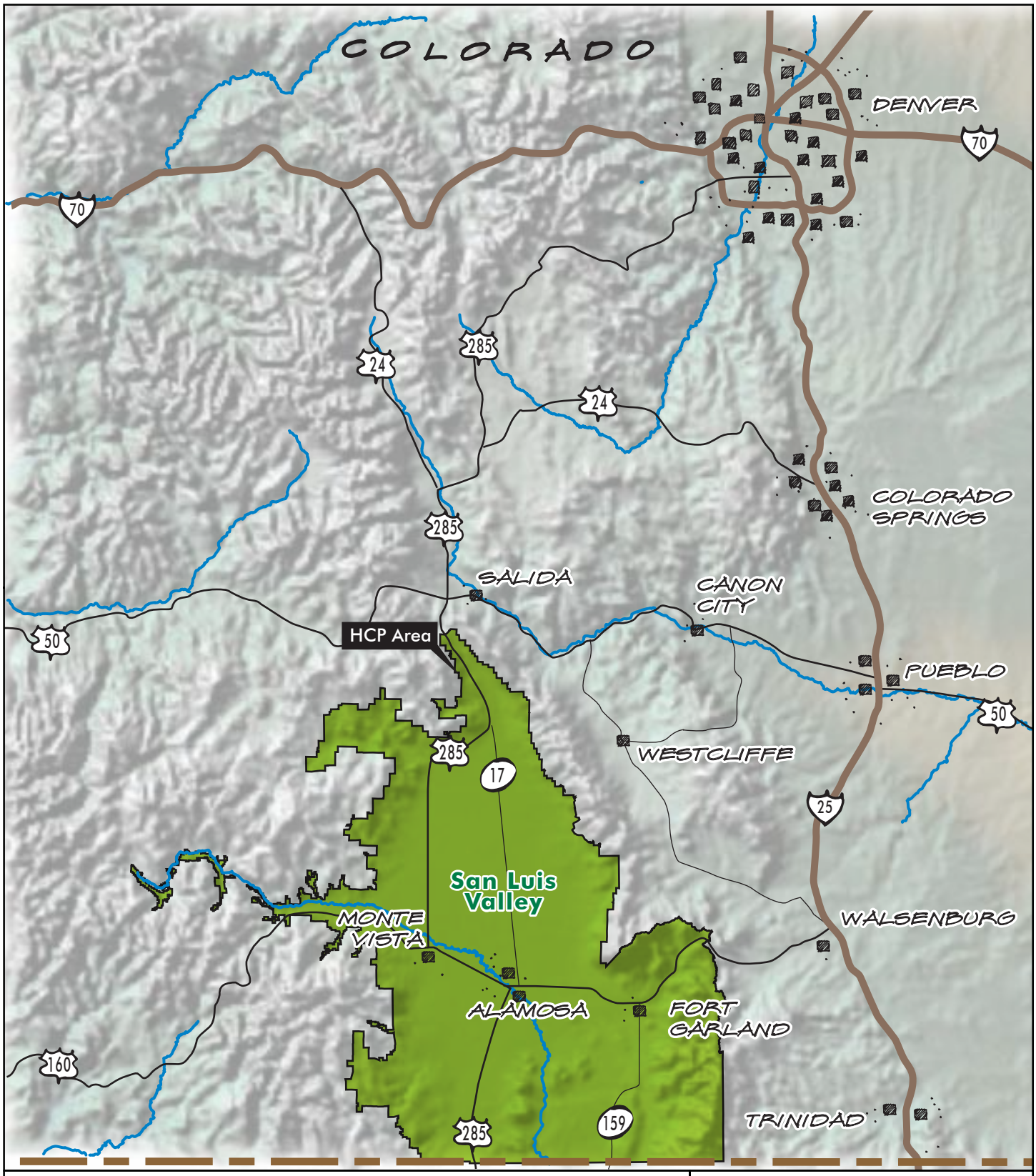
The Rio Grande Water Conservation District (District), working with the U.S. Fish and Wildlife Service (Service) and other partners, has developed a draft regional Habitat Conservation Plan (HCP) for the San Luis Valley. The District proposes to administer the HCP on behalf of the six counties[2] that comprise the San Luis Valley floor (Alamosa, Conejos, Costilla, Mineral, Rio Grande, and Saguache (Counties)) and municipalities of Alamosa, Monte Vista, Del Norte, and South Fork in cooperation with the State of Colorado (State). The HCP provides for the long-term protection and conservation of the covered species while allowing for the continuation of ongoing and routine agriculture, community infrastructure, and riparian conservation and restoration activities (covered activities). The District and the State applied for and received grants from the Service's Cooperative Endangered Species Conservation Fund in 2004, 2005, and 2009 to complete the HCP and associated National Environmental Policy Act (NEPA) documentation.

This Environmental Assessment (EA) is a companion document to the HCP to fulfill the Service's obligations under NEPA. The proposed federal action is the issuance of an incidental take permit (ITP) for the covered activities described in the HCP. The HCP is part of the application package supporting issuance of an ITP under Section 10 of the ESA (16 U.S.C. § 1539), while the EA evaluates the impacts of the ITP issuance in accordance with NEPA.

---

[1] Riparian habitat is generally defined as the plant communities found near streams and other bodies of water. In the Valley, riparian habitat is characterized by clusters of cottonwood and willow trees and shrubs surrounded by open water, wet meadows, and wetland areas (see Section 3.3).

[2] While there are nine counties within the watershed basin, only the six on the Valley floor are parties to this HCP.



San Luis Valley HCP

Figure 1
HCP Location

0 10 20 Miles

N

File: FIG1_Location.pdf
April 2011

ERO
ERO Resources Corp.

1.2 Purpose and Need

Purpose

The purpose of the proposed HCP/ITP is to provide incidental take coverage for ongoing, typical, and routine agricultural, infrastructure, and conservation activities that are critical to the social and economic well-being of the Valley. To achieve this purpose, the HCP must satisfy the issuance criteria for incidental take coverage that are outlined in Section 10(a)(2)(B) of the ESA. The purposes of the draft HCP/ITP also include the following:

- Provide ESA coverage and regulatory assurances for a variety of agricultural, infrastructure, and restoration activities that are critical to the Valley's economy
- Provide ESA coverage for Counties, State Department of Natural Resources (DNR) agencies[3], quasi-municipal corporations (A public entity created by law to deliver limited public services; includes water conservation districts and other special districts), municipalities, and all private landowners in the Valley when they conduct the covered activities
- Provide ESA coverage and regulatory assurances for activities related to the delivery and administration of water resources in the Valley
- Provide for a long-term, holistic conservation strategy for the covered species and their habitat that emphasizes the protection and enhancement of high-quality habitat
- Provide a cost-effective approach to integrating listed species protection, ESA compliance, and habitat conservation in a rural setting

Need

The flycatcher and cuckoo inhabit riparian areas that occur throughout the Valley. A variety of routine agricultural, infrastructure, and conservation activities (covered activities) that have been conducted in the Valley for generations have the potential to incidentally take[4] the covered species or their habitat. These covered activities are conducted on public and private lands throughout the Valley by the Counties, local municipalities, special districts, utilities, state agencies, and private landowners. Federal law requires the Service to review activities on both public and private lands that take the species or their habitat. Without Service authorization, individuals may be subject to civil or criminal penalties under the ESA.

The proposed regional HCP provides Valley-wide coverage for routine activities in a manner that mitigates impacts to the covered species while promoting the conservation of high-quality riparian habitat. In the San Luis Valley, a single HCP is a more efficient and

[3] State agency coverage is limited to divisions of the DNR, including the Colorado Parks and Wildlife and Division of Water Resources.

[4] The term "take" under the ESA means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in such conduct (16 U.S.C. § 1531(18)). Take does not apply to the cuckoo unless the species becomes listed under the ESA, at which point take authorization identified in the ITP would become effective.

effective way to provide comprehensive ESA coverage for certain activities, while also taking a regional approach to mitigation and overall habitat conservation. Without a Valley-wide HCP, these landowners and entities would be required to obtain ESA coverage on a case-by-case basis as they conduct activities that may result in take.

1.3 Legal and Policy Guidance

The draft HCP has been completed and submitted to the Service as part of the application package for an incidental take permit (ITP) under Section 10 of the ESA (16 U.S.C. § 1539). An HCP submitted in support of an ITP must detail the following information:

- Impacts likely to result from the proposed taking of the species for which permit coverage is requested
- Measures the Applicants will undertake to monitor, minimize, and mitigate such impacts; the funding that will be made available to undertake such measures; and the procedures to deal with unforeseen circumstances
- Alternative actions the Applicants considered that would not result in take, and the reasons why such alternatives are not being utilized
- Additional measures the Service may require as necessary or appropriate for purposes of the plan (Service and NMFS 1996)

This EA has been completed in accordance with NEPA (42 U.S.C. 4321 et seq.), Council on Environmental Quality (CEQ) guidelines (40 CFR Parts 1500-1508), and Service policies (Fish and Wildlife Service Manual, Part 550, 73 FR 61292).

1.4 HCP Scope

Applicants and Beneficiaries

The Applicants for an ITP pursuant to the draft HCP are:

- Rio Grande Water Conservation District
- State of Colorado, Department of Natural Resources
- Alamosa County
- Conejos County
- Costilla County
- Mineral County
- Rio Grande County
- Saguache County
- City of Alamosa
- City of Monte Vista
- Town of Del Norte
- Town of South Fork

The State DNR seeks ITP coverage for the activities conducted by the Colorado Parks and Wildlife, Division of Water Resources and other DNR divisions as they conduct the covered activities. The Counties and municipalities seek coverage on behalf of their activities and the activities of their citizens (described as covered activities). While each entity shares the responsibility of implementing and enforcing the provisions contained within this HCP, the District will play a central role in coordinating HCP administration.

The beneficiaries of the draft HCP are the State DNR agencies, individual landowners, Counties, municipalities, and other entities within the Valley who will have better regulatory assurances as they conduct the covered activities that could affect the covered species and their habitat.

Species Covered

The species covered by the draft HCP are the southwestern willow flycatcher and yellow-billed cuckoo. The flycatcher is listed under the ESA as endangered, while the cuckoo is a candidate for ESA listing.

Geographic Area Covered

The draft HCP covers the San Luis Valley floor in portions of Alamosa, Conejos, Costilla, Mineral, Rio Grande, and Saguache counties (see figures). The HCP boundary follows the U.S. Forest Service boundary in most places, or county lines.[5] This area is referred to as the "HCP plan area" or "plan area" and is the same for both the plan and incidental take coverage. The size of the plan area is about 2.8 million acres and includes about 250 miles of streams.

Time Period Covered

The Applicants seek an ITP for a period of 30 years extending from the date a permit is issued.

Activities Covered by Permit

The Applicants, District members, State DNR agencies, quasi-municipal corporations, private landowners, and others may utilize the HCP for ESA compliance to conduct a specified set of covered activities that have the potential to result in the incidental take of the covered species or their habitat. The covered activities are routine agriculture, community infrastructure, and riparian conservation and restoration, as described below. Detailed descriptions of the covered activities are found in Section 3.0 of the HCP.

Routine Agriculture

Routine agriculture includes common agricultural and irrigation management activities conducted by farmers, ranchers, and water managers as part of the Valley's longstanding agricultural economy:

- Grazing
- Fence construction and maintenance

[5] The Forest Service boundary was chosen because it is a locatable property boundary that demarcates the limit of lower-elevation lands with mixed ownership (private, state, and Bureau of Land Management), and is generally at about 8,500 feet in elevation (see section 2.1 of the HCP for additional information on elevational limits for the covered species).

- Ditch clearing and maintenance
- Water facility maintenance
- New small-scale water facility construction
- Water management and administration[6]

Community Infrastructure

Community infrastructure includes common activities and facilities conducted or maintained by public and private entities to support the health, safety, economic capacity, mobility, and overall livability of the Valley:

- Vegetation removal from floodway
- Levee construction and maintenance
- Sediment removal
- Infrastructure construction
- Infrastructure maintenance
- Road and bridge maintenance

Riparian Conservation and Restoration

Riparian conservation and restoration includes common activities conducted by public and private entities to improve the structure, function, and value of riparian habitat in the Valley:

- Channel shaping and stabilization
- Habitat creation and restoration
- Weed management
- Wetland creation and management

Activities Not Covered by the HCP

The following types of activities are not covered by the HCP:

- Development-related activities
- Construction of large-scale water projects or impoundments
- Construction or maintenance of sanitation or industrial water impoundments
- Highway construction
- Activities conducted, funded, or authorized by federal agencies

These activities, and the rationale for not including them in the HCP, are further discussed in Section 1.3 of the HCP.

[6] Activities needed to ensure Rio Grande Compact administration and sustain the State system of water administration (surface water storage and diversions, ground water pumping, water distribution, and water depletions).

1.5 Goals and Objectives

The District and Applicants have developed goals that will provide the framework for the draft HCP and a basis for its implementation. The overall goals as outlined in the draft HCP are presented below, while additional detail can be found in Section 1.4 of the HCP.

Goal 1. Incidental Take Coverage

The HCP provides incidental take coverage for landowners and units of government in a manner that allows them to continue to conduct routine agricultural, infrastructure, and conservation activities unencumbered by concerns about ESA liability for the covered species.

Goal 2. Species Conservation

The HCP protects the nesting, breeding, roosting, and foraging habitat for the covered species and contributes to the long-term recovery of those species.

Goal 3. Riparian Habitat Conservation

The HCP provides a framework for and contributes to the long-term conservation and management of functional riparian habitat in the Valley, beyond what is necessary to meet mitigation requirements.

Goal 4. Landowner and Community Outreach

The HCP education and outreach efforts provide landowners with the tools and information they need to manage and protect riparian habitat on private lands while also meeting economic and land management needs.

Goal 5. Interagency Coordination

The District and Applicants work closely with other federal, state, and local agencies to protect and enhance core habitat and primary conservation areas and provide additional resources to riparian habitat conservation.

1.6 Public Participation

The HCP was developed with considerable input from, and collaboration with, the public and stakeholder organizations. The public participation process included a public scoping meeting, stakeholder consultation meetings, discussions and meetings with individual stakeholders and organizations, presentations to community groups and elected officials, and the dissemination of outreach materials. A list of organizations that have been involved in the development of the draft HCP is included in this EA's Section 5.0 *Consultation and Coordination*.

The formal public scoping process was initiated on January 7, 2005. Public comments and concerns were solicited through public notice in the Federal Register (70 FR 1457), and a press release was sent to the *Alamosa Valley Courier* and *The Pueblo Chieftain* (an out-of-Valley paper with local distribution). A public scoping meeting, sponsored by the Service, was held on January 13, 2005 from 6:30 to 8:30 p.m. at the Alamosa County Services Center. The information and feedback gathered at this meeting and through the comment period was considered in the development of the HCP.

Several other methods have been used to keep the public and stakeholders informed and solicit feedback about the HCP process. On several occasions, District representatives met or talked with individuals from stakeholder organizations, local government staff, and private individuals. The purpose of these discussions was to further explain particular elements of the HCP process, solicit feedback on sections of the draft HCP, and/or gather more specific information about a certain topic area. We initiated formal consultation by letter dated June 1, 2012 with interested tribal governments (in this case the Southern Ute Tribe), per Executive Order 13175, Secretarial Order 3206, and the Department of the Interior Policy on Consultation with Indian Tribes. Background information and project updates, along with information on the draft HCP and EA, are posted to the project website at www.slvhcp.com.

2.0 ALTERNATIVES INCLUDING THE PROPOSED ALTERNATIVE

2.1 Overview of Alternatives Considered

During the development of the draft HCP, the District and Applicants considered alternative actions that meet the needs of the Valley and the purposes of the HCP. Based on the integrated dynamics of riparian habitat in the Valley, the collaborative nature of the Valley as a large community, and the role of the District as a Valley-wide entity, a No Action alternative, the Public Land Mitigation HCP alternative, and the Proposed Regional HCP alternative were evaluated. These alternatives are generally described below.

- **No Action.** This alternative would maintain the "status quo," whereby the Service would not issue ITPs to the Applicants. Thus, individual projects and ongoing activities may be subject to ESA compliance requirements on a case-by-case basis.
- **Public Land Mitigation HCP.** This alternative HCP provides incidental take coverage for a range of routine agriculture, community infrastructure, and riparian habitat conservation and restoration activities that could potentially affect the covered species and their habitat. This alternative emphasizes an increased commitment to habitat restoration and enhancement on public lands coupled with voluntary measures to minimize impacts on private lands.
- **San Luis Valley Regional HCP.** This is the Proposed Alternative. The Regional HCP proposes to provide incidental take coverage for a range of routine agriculture, community infrastructure, and riparian habitat conservation and restoration activities that could potentially affect the covered species and their habitat. This alternative includes measures to mitigate the habitat impacts of the covered activities through habitat conservation, enhancement, and management measures. Habitat monitoring is proposed to ensure the habitat quality of mitigation lands is sufficient and would track long-term trends.

The distinctions between these alternatives are described in Table 1 at the end of this chapter. Other alternative concepts that were considered and eliminated from analysis are described in Section 2.5.

2.2 No Action Alternative

This is a status quo alternative that would maintain the current ESA compliance setting for activities affecting the covered species and their associated habitat in the Valley. This alternative would likely continue the current situation requiring individual HCPs to address impacts to habitat. Mitigation measures would be prescribed on a case-by-case basis.

Implementation of a No Action alternative does not mean there would be no impacts or fewer impacts to riparian habitat than the HCP alternatives. Instead, activities with potential impacts to riparian habitat would continue to occur in the Valley but would not be covered by a HCP. However, in the absence of the coordinated approaches for mitigation measures provided in the HCP alternatives, the impacts to riparian habitat under the No Action alternative would continue at or above current levels for the long term without strategic landscape-scale conservation. Furthermore, without a regional ITP, landowners would spend additional time and resources on individual ESA compliance.

In the absence of a regional HCP, options available to the Applicants or others to address riparian habitat conservation and ESA compliance include:

- Development of multiple individual or local HCPs.
- Grouping or "bundling" similar activities for multiple HCPs.
- Development of Safe Harbor Agreements (SHA), which provide individual landowners with assurances that no additional ESA restrictions would be imposed as a result of voluntary actions providing a net conservation benefit to the species. SHAs apply only to listed species, so this option is not currently available for the cuckoo.

The cost of implementing other ESA compliance options would vary depending on the number and types of efforts that are pursued. Individual HCPs can cost a landowner between $10,000 and $25,000 to complete,[7] as well as costs due to project delays.

2.3 Public Land Mitigation HCP Alternative

The Service, District, and Applicants considered an alternative HCP and ITP approach that emphasizes habitat restoration and enhancement on public lands, along with voluntary measures to minimize impacts and promote ongoing habitat conservation on private lands. The Applicants and the covered activities under this alternative would be the same as the Regional HCP alternative described below.

Habitat restoration and enhancement on State Wildlife Areas would occur to directly offset the impacts of the covered activities and increase the amount and quality of suitable habitat for the covered species. Additionally, voluntary measures to minimize or reduce the impacts of the covered activities for private lands would include habitat avoidance, seasonal restrictions, clearance surveys, and habitat protection and enhancement. Outreach and education efforts would be used to promote these minimization measures. Other voluntary efforts to improve the conservation and management of riparian habitat in the Valley would include recommendations for management of Federal lands, conservation funding and grant administration, water management efforts, and county land use policies.

Habitat and species monitoring would be used to ensure the adequacy of this HCP approach. Habitat monitoring would consist of repeat mapping of riparian habitat, while

[7] Individual HCP cost estimates include biological consultants and other necessary professional assistance, based on individual HCPs prepared for landowners on the Colorado Front Range.

species monitoring would entail additional flycatcher surveys on federal and state lands. If habitat monitoring shows a decline in aerial extent of habitat of greater than 10 percent (compared to baseline), and it is determined that those declines are a result of the covered activities, additional and more stringent mitigation measures would be pursued, such as required habitat conservation, required impact minimization on private lands, county land use policies protecting riparian habitat, or additional monitoring.

2.4 San Luis Valley Regional HCP – Proposed Alternative

The Proposed Alternative is the issuance of ITPs to each of the Applicants, supported by the proposed regional HCP, which contains a conservation strategy designed to minimize and offset the impacts of the covered activities through habitat mitigation and monitoring and other commitments. The draft Regional HCP alternative would provide ESA coverage for non-Federal entities and landowners in the Valley as they conduct the covered activities. The proposed HCP is intended to be consistent with existing water delivery and administration policies and practices, including the administration of the Rio Grande Compact and the State system of water rights administration. In addition to water administration activities, this draft HCP was developed to provide regulatory coverage to other activities that are essential to the Valley's economic and conservation infrastructure.

The draft HCP proposes a mitigation approach that is intended to protect and improve riparian habitat while providing incidental take coverage for activities that have coexisted with habitat for the flycatcher and cuckoo for generations. In addition to measures to mitigate impacts to marginal habitat with the conservation and enhancement of higher quality habitat areas, the Regional HCP provides a framework to support ongoing habitat conservation activities in the Valley. The Regional HCP outlines the following specific mitigation commitments and additional habitat conservation measures that will be used to implement the HCP:

- ***Impact Mitigation –*** conservation easements on private lands, restoration and enhancement efforts, and habitat management agreements
- ***HCP Administration –*** education and outreach efforts, staff support, steering committee coordination, and landowner notification
- ***Monitoring –*** habitat quality monitoring on mitigation lands, covered species population monitoring, and long-term tracking of riparian habitat trends and impact assumptions
- ***Adaptive Management –*** habitat management, enhancement, or replacement to maintain mitigation lands of sufficient quality
- ***Additional Conservation Measures –*** voluntary measures to promote riparian habitat conservation beyond what is required for HCP implementation

These commitments and actions are described in detail in Section 5.0 of the HCP (*HCP Implementation*).

Table 1. Comparative Summary of the Alternatives Evaluated.

Topic	No Action	Public Land Mitigation HCP Alternative	San Luis Valley Regional HCP *(Proposed Alternative)*
Type of Activities Covered	None, or determined on a project-by-project basis if individual landowner HCPs are developed.	Routine agriculture, community infrastructure, and conservation and restoration activities	Routine agriculture, community infrastructure, and conservation and restoration activities
Participants	Non-federal entities, potentially including but not limited to the District, Counties, principal municipalities, state agencies, private landowners, and developers, on an individual basis	District, Counties, principal municipalities, and State DNR, with coverage extended to private landowners	District, Counties, principal municipalities, and State DNR, with coverage extended to private landowners
Covered Species	Based upon individual project	Flycatcher and cuckoo	Flycatcher and cuckoo
Permit Area/ Duration	Based upon individual project	San Luis Valley floor within Alamosa, Conejos, Costilla, Mineral, Rio Grande, and Saguache counties; 30-year permit	San Luis Valley floor within Alamosa, Conejos, Costilla, Mineral, Rio Grande, and Saguache counties; 30-year permit
Mitigation	Determined on a project-by-project basis	• Habitat restoration and enhancement on State Wildlife Areas • Voluntary impact minimization measures • Education and outreach efforts • Other voluntary conservation measures	• Habitat mitigation credits through conservation easements on private lands, restoration and enhancement projects, or habitat management agreements • State and Federal land management commitments • Education and outreach efforts • Other voluntary conservation measures
Monitoring	Determined on a project-by-project basis	• Repeat Valley-wide habitat mapping • Flycatcher surveys on public lands	• Habitat quality monitoring on mitigation lands and federal/state reference sites • Repeat Valleywide habitat mapping • Flycatcher surveys on public lands
Adaptive Management	Determined on a project-by-project basis	• Additional measures if greater than 10 percent of habitat is lost due to the covered activities • Additional measures could include required habitat conservation, required impact minimization, county land use policies, or additional monitoring	• Monitoring evaluation to ensure sufficiency of mitigation lands • Change or substitute mitigation credits as needed to maintain mitigation balance • Evaluate impact assumptions based on long-term habitat trends and changes and adjust implementation accordingly
Administration	Determined on a project-by-project basis	• District HCP Coordinator and steering committee	• District HCP administrator and steering committee

2.5 Alternatives and Concepts Considered and Eliminated from Analysis

Rio Grande Water Conservation District HCP

An HCP that would cover only water management activities conducted or directly supported by the District was considered. The covered activities would have been those related to the maintenance, construction, and administration of facilities necessary to convey water and support the State system of water administration and the Rio Grande Compact. Overall, fewer activities would have been covered by this alternative relative to the analyzed HCP alternatives because it would not include agriculture, infrastructure, and conservation activities not related to the delivery and administration of water.

A District-only HCP would have covered the District, private landowners, quasi-governmental water districts, the State Engineer's Office, and other non-Federal parties who conduct activities related to the delivery and administration of water under the authority of the District. The HCP coverage would not have included Costilla County because is not part of the District. The District would have administered the HCP with input from an informal advisory committee consisting of representatives from federal and state agencies, water districts, local industry groups, and local conservation organizations.

Reasons the District HCP Alternative Was Not Analyzed Further

The District HCP was not selected for further analysis because it:

1) Fails to meet the legal sufficiency requirements under the ESA – neither the District nor the State Engineer's Office has the legal authority to regulate ditch clearing practices on private lands,
2) Does not provide ESA coverage for other agricultural, infrastructure, and conservation activities that are not directly related to water delivery and administration,
3) Would not provide regulatory coverage to water users in Costilla County, resulting in a fragmented regulatory environment for water users in the Valley,
4) Does not provide a framework for strategic riparian habitat conservation in the Valley, and
5) Provides a reactive approach that focuses on individual impacts rather than a proactive approach that focuses on strategic habitat conservation.

For these reasons, the District HCP alternative was eliminated from consideration and was not included in the NEPA analysis.

Other Potential Alternatives Considered but Eliminated

Single-Activity HCP Coverage

During the planning process, the District and the Service considered the feasibility of smaller HCPs that cover individual activity areas such as the water management-only concept ("District HCP") described above. Other groupings could include a HCP that covers only agricultural activities or a HCP that covers only infrastructure activities.

A HCP that covers only agricultural activities, such as grazing, was not pursued because it would result in a confusing patchwork of regulatory coverage for individual landowners and would not have a clear

entity (such as the District) to administer the HCP. Similarly, a HCP that covers only county, state, and private infrastructure activities would result in a more confusing regulatory environment and would not have a clear entity to provide Valley-wide HCP administration.

Development Coverage

Early in the HCP process, the District determined it would not seek incidental take coverage for development-related activities. This includes grading or clearing riparian habitat areas for the purposes of residential, commercial, energy, or industrial development, as well as the development of golf courses and other public or private facilities.

This concept of a development-related HCP was eliminated from consideration for the following reasons:

1) Coverage of development-related activities is not consistent with the District's purpose and need, including the long-term conservation of the covered species and their habitat.
2) Development in riparian habitat areas is occurring in a few local areas and does not necessitate Valley-wide coverage and subsequent mitigation.
3) Coverage of development activities would result in greater habitat impacts that would require greater mitigation commitments on a Valley-wide scale. This would place an inequitable burden on the Applicants and hundreds of individual landowners who would need to collectively take on the responsibility for mitigating the impacts of a few project proponents.
4) The localized nature of development impacts in the Valley would shift the emphasis of the HCP from a proactive, landscape-scale conservation strategy to a more reactive approach to mitigate the impacts of individual development proposals.

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 Introduction

This section provides a summary of the environmental and community resources that may be affected by the proposed alternatives, and an analysis of the potential effects of the proposed alternatives on those resources. Information on the affected environment for each resource is presented at a summary level of detail that is sufficient to understand and disclose the effects of the proposed alternatives. Additional information on many resources can be found in Section 2 of the HCP. The proposed alternatives (the No Action alternative, Public Land Mitigation HCP alternative, and San Luis Valley Regional HCP (Proposed Alternative)) are described in detail in Section 2.0 of this EA. The environmental consequences of the proposed alternatives are described under each resource topic and are summarized in Table 6 at the end of this section. Cumulative effects are discussed separately in Section 3.11.

HCP Setting

The San Luis Valley is a high mountain desert valley in south-central Colorado. The Valley is about 125 miles long and 65 miles wide, and is located between the Sangre de Cristo Mountains (to the east) and the San Juan Mountains (to the west), extending into the upper Rio Grande headwaters area of Mineral County. Most of the Valley is relatively flat, at an elevation of about 7,500 feet above sea level, while the upper portion in Mineral County reaches about 9,000 feet. This arid Valley receives an average of 7 inches of precipitation a year, most of which is in the form of mid-summer rain. The growing season averages about 90 days (Service 2003).

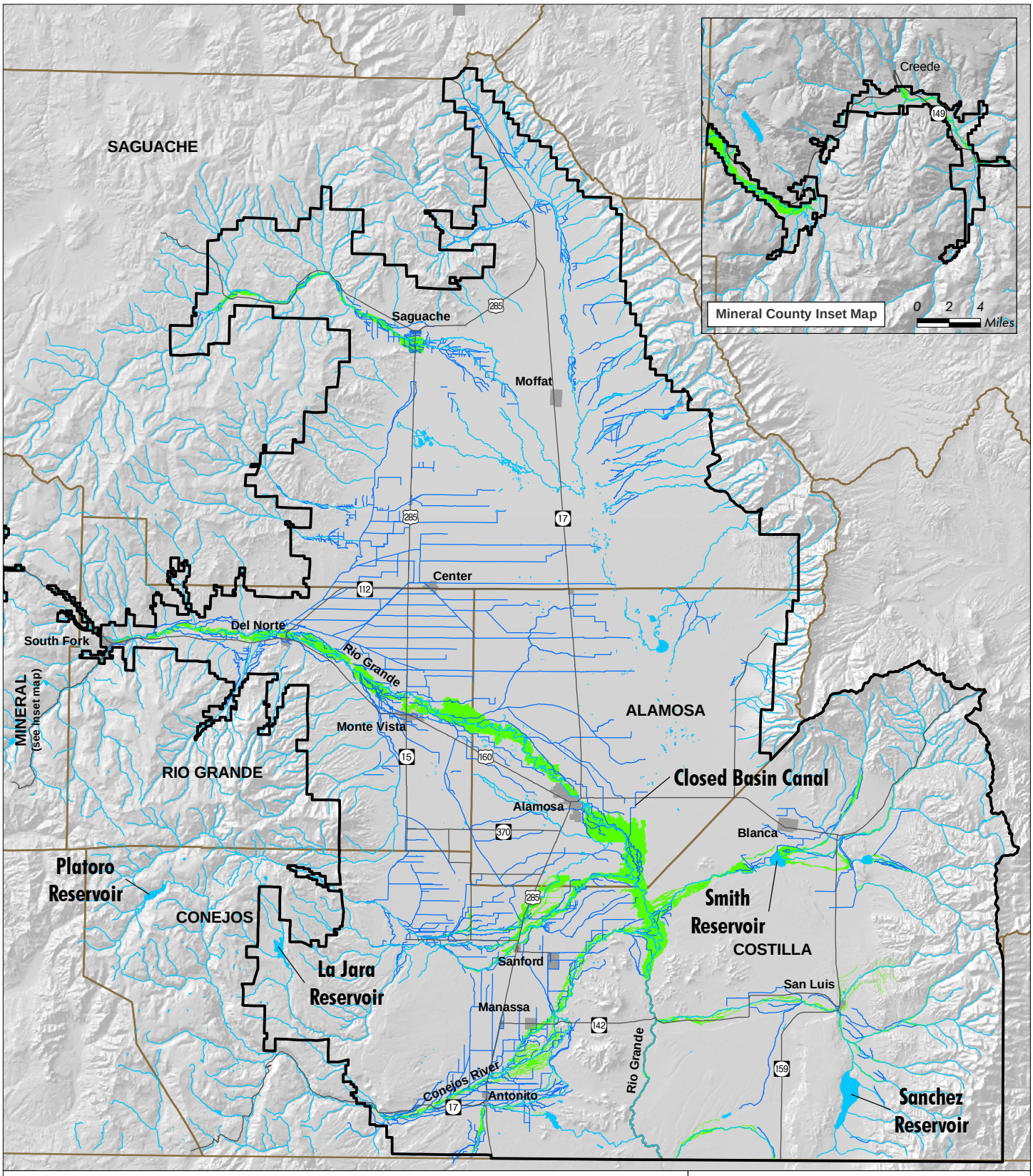
3.2 Water Resources

Affected Environment

Surface Water

Major streams and rivers in the Valley include the Rio Grande, the Conejos River, the Alamosa River, Trinchera Creek, Saguache Creek, San Luis Creek, and other tributary streams (Figure 2). Surface water in the northern half of the Valley is confined by a closed basin (water is retained within the basin with no outflows to other bodies of water such as rivers), while streams in the southern half of the Valley join the mainstem Rio Grande as it flows south into New Mexico.

The management and delivery of water is a fundamental element of the human and natural history of the Valley. The construction and management of diversions and ditches began in the 1850s with substantial developments in the early 1900s (see Section 3.6 *Cultural Resources*). Over the past century, the ongoing management and



San Luis Valley HCP

- River or Stream
- Ditch/Canal
- 100-year Floodplain
- Proposed HCP Boundary

0 6 12 Miles

N

Figure 2
Water Resources

File: 2445 - Fig2_water_resources.mxd (WH)
May 2011

ERO
ERO Resources Corp.

maintenance of these facilities, coupled with the transmission and administration of surface water, has created the economic and biological conditions that are currently present in the Valley.

There are about 606 miles of mapped ditches and canals in the Valley, along with an unknown length of lateral ditches that serve individual fields. About 335 miles of ditches and canals are within the floodplain or the general riparian corridor. Diversion structures are another part of this irrigation infrastructure. The Valley contains more than 1,600 diversion structures that are used to manage water delivery. These facilities contribute to the ground water hydrology and subsequent riparian habitat structure in the Valley.

While these diversions have altered the location and extent of native riparian habitat and have resulted in a historic loss of wetlands in the Valley, the current irrigation infrastructure now provides surface and ground water flows that help sustain the current mosaic of riparian habitat. For example, the development of an extensive network of canals and irrigation agriculture has created irrigation-induced wetlands where none previously existed (Colorado Natural Heritage Program (CNHP) 2004).

Ground Water

The subsurface geology of the Rio Grande Basin, which lies beneath the Valley, supports aquifers from which numerous wells draw water. This complex aquifer system includes a shallow unconfined aquifer and a series of deeper, confined aquifers; which are interconnected and hydrologically connected with the surface water system. This system of ground water is described in greater detail in Section 2.3 of the HCP.

Water Resource Administration

Water rights administration in the Valley is based on Colorado's Doctrine of Prior Appropriation where the available water is allocated and delivered to the calling priorities. This system has been in place for more than 100 years. Within the Valley, the administration of the Rio Grande and Conejos River is governed by the 1938 Rio Grande Compact. More information on water rights administration, including the Rio Grande Compact, the Closed Basin Project, Platoro Dam and Reservoir, and related issues are described in detail in Section 2.3 of the HCP.

Environmental Consequences

No Action Alternative. No direct or indirect adverse effects to surface or ground water resources or their management are expected from this alternative, since existing hydrology, water management, and administration would not change.

Public Land Mitigation HCP Alternative. This alternative would have no direct or indirect adverse effects to surface or ground water resources or their management, as the covered activities and HCP implementation measures do not include any changes to hydrology or water resource management. This alternative would allow ongoing water management practices to proceed.

Regional HCP Alternative. *Same as Public Land Mitigation HCP Alternative.*

3.3 Vegetation

Affected Environment

General Vegetation

Upland vegetation on the Valley floor generally consists of irrigated cropland, rangeland, and scrubland. The uncultivated, upland portions of the Valley are dominated by greasewood and rabbitbrush scrubland with a sparse understory of native and introduced grasses. The lower slopes of the surrounding mountains are vegetated by piñon-juniper communities, transitioning to pine, fir, and spruce forests at higher elevations. Riparian habitat communities, which are the focus of the HCP alternatives, are described below.

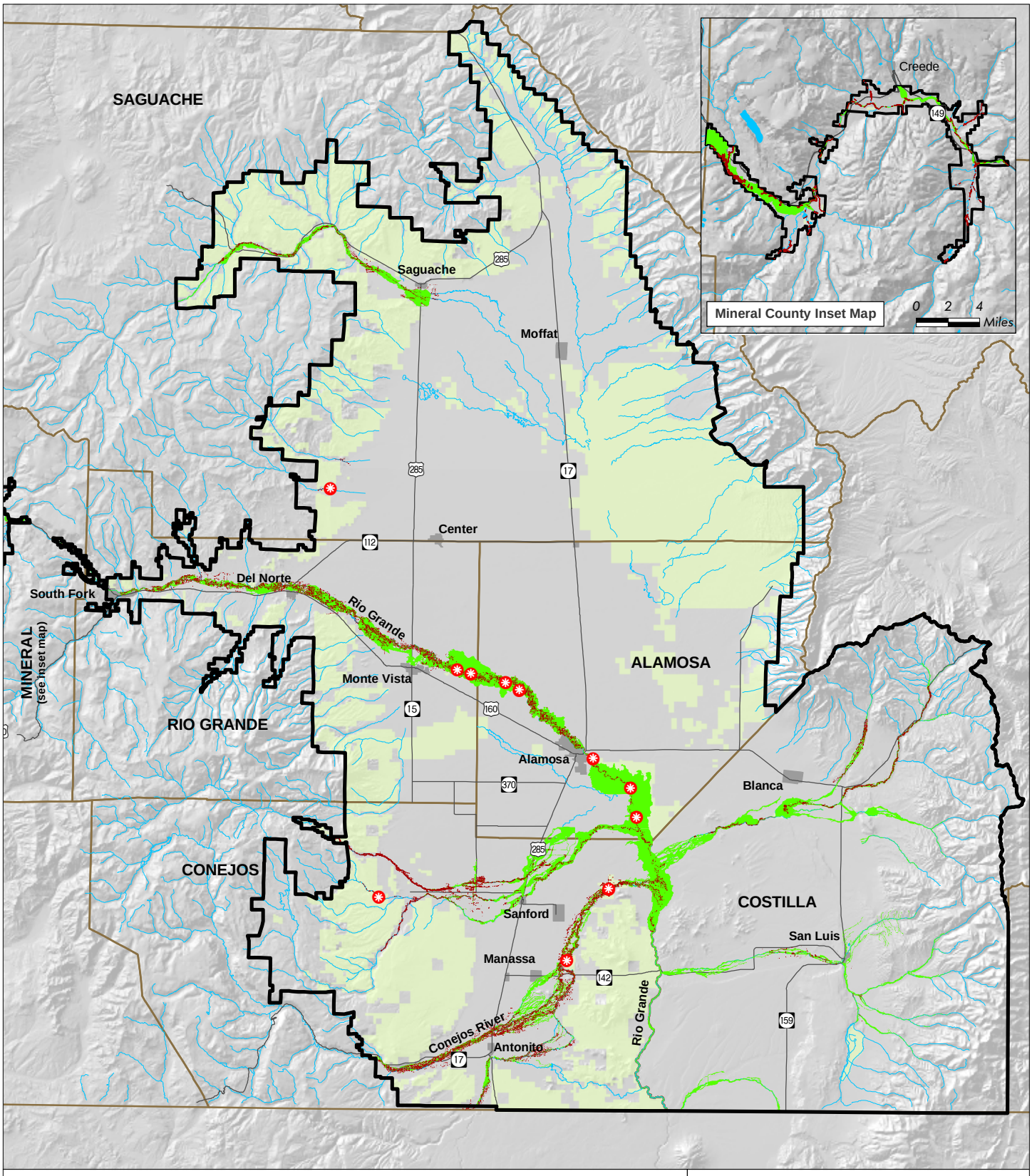
Riparian Habitat

Riparian habitat in the Valley generally consists of a mosaic of woody trees and shrubs, wetlands, grasslands, and open water. The woody canopy includes stands of coyote willow, peachleaf willow, crack willow, and broad-leafed and narrow-leaf cottonwood. In some areas, riparian vegetation is dominated by monotypic stands of either willow or cottonwood, while other areas support mixed stands of trees and shrubs (Stone 2005; Lucero 2005; Service 2003). In addition to woody trees and shrubs, the general riparian corridors in the Valley typically include wetlands and open water associated with irrigation and old oxbows, as well as wet meadows and grasslands that are often supported by irrigation and used for pasture. These ancillary habitat areas are generally found within the 100-year floodplain of major streams and rivers.

For the purposes of the HCP, existing woody willow and cottonwood components of riparian habitat was mapped along key drainages (Figure 3). Native woody riparian vegetation represents suitable nesting habitat for flycatchers and cuckoos. Mapping of the native woody riparian vegetation serves as an index to the overall riparian habitat that includes the associated wet meadow, slow-moving water, and herbaceous understory that are important components of the covered species habitat. This mapping is summarized in Table 2 and is described in greater detail in Section 2.2 of the HCP.

Table 2. Riparian Habitat Mapping Elements.

Map Element	Area (acres)
HCP Plan Area	2,904,639
100-year floodplain mapping	101,247
Riparian Habitat Mapping	
Total riparian mapping	15,128
Willow-dominated habitat component	5,109 (34%)
Cottonwood-dominated habitat component	10,019 (66%)



San Luis Valley HCP

- Known Flycatcher/Cuckoo Detections
- Woody Riparian Habitat
- State and Federal Lands
- 100-year Floodplain
- Proposed HCP Boundary

0 6 12 Miles

N

Figure 3
Riparian Habitat and Covered Species

File: 2445 - Fig3_Riparian_Hab.mxd (WH)
May 2011

ERO
ERO Resources Corp.

Environmental Consequences

General Vegetation

All Alternatives. No effects to the composition, structure, or health of general upland vegetation communities in the Valley would occur, because the covered activities and implementation measures are focused on riparian habitat rather than upland areas.

Riparian Habitat

All of the alternatives (including No Action) would result in minor impacts to riparian habitat in the Valley due to the ongoing effects of the covered activities.

No Action Alternative. This alternative would result in short-term minor adverse impacts to riparian habitat in the Valley due to ongoing effects of the covered activities, temporarily affecting about 270 acres of riparian habitat in any given year. Ongoing impacts would persist, resulting in negative localized impacts to riparian habitat in the Valley, because it would not entail any coordinated effort to implement conservation measures in a comprehensive manner. These impacts amount to the temporary loss of 1.8 percent of the total mapped habitat area (15,128 acres), resulting in minor effects to the Valley-wide mosaic riparian habitat (see Section 4.0 of the HCP). Besides the small proportion of riparian habitat that is impacted, this determination of minor effects is further substantiated by the temporary nature of most of the impacts, and the fact that most of the impacts have historically occurred at similar levels without substantial long-term consequences.

A key dynamic influencing the effects of the covered activities is their "rotating matrix" of localized small individual impacts of each activity that are scattered among hundreds of landowners and thousands of acres of habitat each year. In subsequent years, vegetation in impacted areas regenerates as other localized areas are impacted. This pattern of impacts and regeneration has taken place for generations, has shaped the present state of habitat in the Valley, and will continue into the future. (This concept is described in greater detail in Section 3.0 of the HCP).

These impacts of the covered activities are more specifically described in Section 4.0 of the HCP, and are summarized as follows:

Agricultural Activities – These include livestock grazing, ditch clearing and maintenance, fence construction and maintenance, water facility construction, maintenance and operations, and water facility management:

- Livestock grazing along the margins of existing pasture and in riparian areas can impact riparian habitat due to overgrazing, elimination or alteration of woody vegetation, and a reduction in new growth, impacting up to an estimated 59 acres of habitat in any given year.
- Ditch clearing and maintenance includes the periodic removal of all willows and woody vegetation along a segment of ditch to maintain its function integrity. Ongoing ditch clearing is estimated to impact up to 162 acres of riparian habitat in any given year.

- Construction and maintenance of facilities such as fences and water facilities may result in the short-term removal of woody vegetation in the immediate work area, and long-term habitat loss in the location of new facilities. These activities are estimated to impact up to about 17 acres of habitat in any given year.
- Water facility management includes ongoing changes to water diversions, deliveries, and use in a complex system of streams, ditches, and diversions that sustains much of the existing mosaic of riparian habitat in the Valley. As some riparian areas are lost due to water management, others are gained. On balance, the impacts of water management on riparian habitat are negligible.

Community Infrastructure Activities – These include vegetation removal from the Rio Grande floodway, levee improvement and maintenance, and infrastructure (e.g., road and bridge) construction and maintenance.

- Vegetation removal from the floodway for the purposes of flood control typically results in the physical removal of between 7 and 10 acres of willows from the Rio Grande floodway through Alamosa, and may also include sediment removal and spoils disposal.
- Levee improvement and maintenance may include the removal of riparian vegetation along flood control levees, resulting in up to 0.02 acres of impacts in any given year.
- Construction and maintenance of roads, bridges, sewer lines, and other community infrastructure could entail the temporary removal of riparian vegetation in the immediate work area, or long-term habitat loss in the location of new facilities. These activities are estimated to impact about 0.9 acres in any given year.

Riparian Conservation and Restoration – These activities include habitat creation or restoration efforts, weed management, and wetland creation and management. All of these activities may entail short-term removal of existing riparian vegetation in the immediate work area to promote long-term conservation and enhancement of native riparian habitat. The impacts of these activities are expected to be negligible.

Public Land Mitigation HCP. *Same short-term minor adverse impacts as No Action (270 acres/year).* This alternative would result in minor long-term benefits by offsetting 270 acres of dispersed temporary impacts with concentrated habitat restoration at core habitat locations, as well as general habitat conservation and enhancement efforts and voluntary measures to reduce impacts over time.

Regional HCP Alternative. *Same short-term minor adverse impacts as No Action (270 acres/year).* This alternative would result in moderate long-term benefits by mitigation efforts that not only offset the 270 acres of annual temporary impacts with habitat conservation, but also emphasize the conservation, restoration, and management of high-quality habitat.

3.4 HCP Covered Species

Affected Environment

This section provides a brief overview of the two bird species covered by the HCP the southwestern willow flycatcher and yellow-billed cuckoo. For a more detailed description of these species, including their listing status and history, physical description, breeding biology, and local habitat conditions, see Section 2.1 of the HCP. General locations of known detections of the covered species are shown on Figure 3.

Southwestern Willow Flycatcher

The southwestern willow flycatcher is a migratory bird that breeds in riparian habitat in the southwestern U.S. The flycatcher was listed as endangered on March 29, 1995 (Service 1995). In general, flycatchers breed in tall dense riparian habitat with low gradient streams and wetlands (or saturated soils usually nearby) at least early in the breeding season (Bent 1940; Stafford and Valentine 1985; Harris et al. 1987; Spencer et al. 1996). Flycatchers are found in riparian areas of the Valley, primarily along the Rio Grande and Conejos River (Hawks Aloft 2003, 2004, 2005). These riparian areas in the Valley are dominated by cottonwood and willow shrub habitat that provide resources to support flycatcher migration, breeding, brood rearing, and foraging.

Based on Valley-wide survey data through 2003 compiled by the USGS, Durst et al. (2005) estimated the Valley flycatcher population at 73 territories. The Southwestern Willow Flycatcher Recovery Plan (Recovery Plan) (Service 2002) set a goal of 50 territories for the San Luis Valley Management Unit.[8] While subsequent surveys in limited areas have resulted in smaller estimates, it is commonly understood that flycatcher populations in the Valley are at or above their recovery goals outlined in the Recovery Plan.

Yellow-billed Cuckoo

In 1998, a petition was filed with the Service to list the western subspecies of yellow-billed cuckoo as a threatened subspecies or a distinct population segment. In 2001, the Service noted that listing was warranted as a distinct vertebrate population segment west of the Continental Divide, but precluded the listing due to higher priority listing actions (66 FR 38611, July 25, 2001). The Service is currently evaluating this species for potential listing under the ESA, with a decision on whether or not to propose for listing due October 2012.

In general, the western population of the cuckoo nests in cottonwood and willow woodlands with a dense understory and large blocks of riparian habitat (Carter 1998; Franzreb and Laymon 1993). There is approximately 10,019 acres of cottonwood or tree dominated habitat that could support breeding cuckoos within the Valley. Cuckoos were only recently recorded in the Valley and little is known about the specific habitat affinities or productivity of the few individuals observed along the Conejos River. Detections of cuckoos along the Conejos River occur in mature cottonwood forests with dense, large-saturated, willow understory with pools of standing stagnant water (Lucero and Cariveau 2004). Breeding (active nests) in the Valley has never been confirmed, but

[8] Comprehensive Valley-wide surveys have not been conducted since 2005.

the behavior and frequency of sightings indicate the birds are nesting (Lucero and Cariveau 2004; Lucero, pers. comm. 2009). Population trends/estimates and distribution of cuckoos in the Valley are currently not known.

Environmental Consequences

Very little data on the home range or territory size of the covered species within the Valley exist outside of federal and state lands where surveys have been conducted. For this reason, this analysis of the effects to covered species from the HCP alternatives primarily focuses on quantifying impacts to riparian habitat that support the covered species over the long term, rather than direct effects to individual birds, nests, or territories.[9] However, following recent Service guidance, quantification of take of individuals is necessary to state in the ITP. Thus, effects to the covered species are evaluated in this section at two levels; a quantifiable and predictable effect on riparian habitat, and an extrapolation of those habitat effects to individuals or territories of covered species.

All Alternatives.

As stated in the vegetation section, all of the alternatives (including No Action) would result in minor impacts to riparian habitat in the Valley due to the ongoing effects of the covered activities. In general, most of the covered activities will result in temporary impacts to small areas of habitat as part of the Valley's historic "rotating matrix" of localized impacts. However, individual, localized impacts still have the potential to result in the take of individual birds or their nesting habitat through the temporary and permanent displacement (harassment) of individual covered species from suitable habitat or harm of individuals through accidental killing or the destruction of active nests.

Effects on Riparian Habitat

As described in the HCP, up to 270 acres of riparian habitat would be temporarily impacted in any given year and up 34.2 acres permanently impacted over the 30-year permit term. The total effect on 304.2 acres of riparian habitat represents a minor percentage (1.8 percent) of the 15,128 acres of existing riparian habitat available.

Effects to Covered Species

Information in the Southwestern Willow Flycatcher Recovery Plan (Service 2002) provides information on territory size as stated below but is inconclusive:

> "Territory size varies greatly, probably due to differences in population density, habitat quality, and nesting stage. Estimated breeding territory sizes generally range from approximately 0.1 ha to 2.3 ha (0.25-5.7 ac), with most in the range of approximately 0.2 - 0.5 ha (0.5-1.2 ac) (Sogge 1995, Whitfield and Enos 1996, Skaggs 1996, Sogge et al. 1997b).

[9] This approach is supported by the HCP Handbook, which states that proposed incidental take levels can be expressed "in terms of habitat acres…to be affected generally or because of a specified activity, in cases where the specific number of individuals is unknown or indeterminable" (Service and NMFS 1996). See also Section 4.5 in the HCP: *Relationship of Habitat Impacts to Potential Flycatcher Territories*.

> Territories of polygynous males are often larger than those of monogamous males. Whitfield (unpubl. data) observed instances of individual polygynous males using multiple singing perches several hundred meters (>600 ft) apart. Flycatchers may use a larger area than their initial territory after their young are fledged, and use non-riparian habitats adjacent to the breeding area. Even during the nesting stage, adult flycatchers sometimes fly outside of their territory, often through an adjacent flycatcher territory, to gather food for their nestlings".

Section 2.1, under subheading "Site Fidelity, Movement, and Territory Size," of the HCP also references inconclusive but more recent information on territory size. Consequently, for the purposes of estimating take of individuals we will use an average territory size of 4.5 ha (11 acres) as stated in the HCP. This size territory is also close to the size ("…about 10 acres…") recently communicated by a Service staff person in charge of recovery actions for the flycatcher (Beatty, 2012, pers. comm.). Therefore, the total of 123 ha (304.2 acres) of impact (109 ha (270 acres) temporary impacts in a given year and 14 ha (34.2 acres) permanent impacts over 30 years) is equivalent to 28 territories being taken as a result of the covered activities. If all territories are occupied by a nesting pair, as is assumed for section 7 consultation purposes under the ESA, then 56 individual flycatchers would be taken over the 30-year permit term or an average of just under 1.9 flycatchers per year. However, caution should be used in extrapolating take of flycatchers based on habitat impacts for the following reasons:

1. Known flycatcher occurrences are based on surveys on select State and Federal lands, which encompass a very small proportion (less than 8 percent) of the total riparian habitat in the valley.
2. Impact estimates likely represent a very high-end estimate of the take of individuals as many of the individual habitat impacts of the covered activities occur in habitat that may not be of sufficient width, height, or overall patch size to truly support a breeding pair of flycatchers.
3. Many of the covered activities (e.g., ditch clearing) occurs during the non-breeding season reducing the potential of harassment or harm of individuals.

Nonetheless, without comprehensive flycatcher and habitat quality surveys on non-federal land (which would take years and/or an enormous amount of personnel and money), and inconclusive territory size information, this is the best estimate of the level of take that can be derived.

Estimating take of yellow-billed cuckoo is even more difficult than for flycatchers. No breeding or territories of cuckoos have been confirmed within the valley and the species was historically uncommon in Colorado. Additionally, yellow-billed cuckoo breeding is opportunistic and unpredictable with breeding pairs taking advantage of irruptive abundances of local prey resources. Making very broad (worse-case) assumptions that all cottonwood dominated riparian in the Valley is suitable habitat and an average territory size of 54.4 acres (22 hectares) (NatureServe 2012) there could be a maximum of 184 suitable yellow-billed cuckoo territories within the Valley. Applying 1.8 percent of this habitat that would be affected by covered activities over the 30-year permit term results in 3.3 total territories taken. Again, if all territories are occupied by a nesting pair, as is

assumed for section 7 consultation purposes under the ESA, then up to 7 individual cuckoos would be taken over the 30-year permit term or an average of one cuckoo taken every 4 to 5 years.

No Action Alternative. Minor short-term adverse impacts to the covered species (up to an estimated 56 individual flycatchers and 7 individual cuckoos) would occur due to the ongoing effects of the covered activities on habitat. No coordinated, regional habitat conservation or enhancement would occur.

Public Land Mitigation HCP Alternative. *Same short-term minor adverse impacts as the No Action alternative*. This alternative would result in minor long-term benefits to the covered species due to the concentrated habitat restoration at core habitat locations, as well as general habitat conservation and enhancement efforts and voluntary measures to reduce impacts over time. These improvements to habitat quality at core locations likely to improve local population stability and possibly increase the number of overall territories and individuals within these core habitats..

Regional HCP Alternative. *Same short-term minor adverse impacts as the No Action alternative.* This alternative would result in moderate long-term benefits by mitigation efforts that emphasize the conservation, restoration, and management of high-quality habitat (see Section 5.0 of the HCP). Regional habitat restoration and conservation efforts are likely to buffer, conserve, and enhance individual territories or expand habitat to support additional territories. These improvements to both habitat quality and quantity are likely to improve population stability within the Valley and possibly increase the number of overall territories and individuals within the Valley.

3.5 Other Wildlife

Affected Environment

General Wildlife

The HCP plan area supports a broad range of birds, mammals, and other wildlife species that are typical of agricultural lands, rangeland, scrubland, and riparian habitat in Colorado. Most wildlife species are likely concentrated along riparian corridors. Riparian habitat in the Valley supports an abundance of birds including waterfowl, shorebirds, songbirds, water birds, and raptors. Common mammals range from elk and deer to coyote, porcupine, rabbit, beaver, muskrat, weasel, and other rodents. Reptiles and amphibians are limited, but include tiger salamanders, bullsnakes, garter snakes, toads, and chorus frogs (Service 2003).

Wildlife Species of Concern

In addition to the covered species, the Valley provides habitat for several ESA-listed and other species of concern, and bird species covered by the Migratory Bird Treaty Act (MBTA). All of these species are generally described below and in Table 3, while the covered species are described in Section 3.4 *HCP Covered Species* in this EA.

Table 3. Wildlife Species of Concern in the San Luis Valley Plan Area.

Common Name	Scientific Name	Status	Notes
Southwestern willow flycatcher*	*Empidonax traillii extimus*	Federal endangered; State endangered	HCP covered species
Yellow-billed cuckoo*	*Coccyzus americanus*	Federal candidate; State special concern	HCP covered species
Gunnison's prairie dog	*Cynomys gunnisoni*	Federal candidate	Upland species – may occur in plan area, but does not occur in riparian areas.
Bald eagle	*Haliaeetus leucocephalus*	State special concern; Bald and Golden Eagle Protection Act and MBTA	Seasonal migrant
Greater sandhill crane	*Grus canadensis tabida*	State special concern; MBTA	Seasonal migrant
Western burrowing owl	*Athene cunicularia*	State threatened; MBTA	Upland species – may occur in plan area, but does not occur in riparian areas.
Northern leopard frog	*Rana pipiens*	State special concern	Petitioned for ESA listing; determined not warranted
Rio Grande sucker	*Catostomus plebeius*	State endangered	Found in Hot Creek, McIntyre Springs (only native population in Colorado)
Rio Grande cutthroat trout	*Oncorhynchus clarki virginalis*	Federal candidate; State special concern	Found on Sangre de Cristo Creek and Carnero Creek
Rio Grande chub	*Gila pandora*	State special concern	Found on Conejos River, Rio San Antonio, and San Luis Creek
MBTA-protected species	*n/a*	MBTA	Found in all habitats

* Species covered by the Public Land Mitigation HCP and San Luis Valley Regional HCP alternatives.

Gunnison's prairie dog. In 2008 the Gunnison's prairie dog within the montane portion of its range was listed as a candidate species under the ESA. On September 30, 2010, the Court set aside the 2008 finding and remanded the matter back to the Service for further action. However, until further action the montane portion of the Gunnison's prairie dog is still considered a candidate species (76 FR 66389). The prairie dogs inhabit shortgrass and mid-grass prairies, grass-shrub habitats in low valleys, and mountain meadows, and are known to occur within the Valley (Fitzgerald et al. 1994; Seglund and Schnurr 2010). Gunnison's prairie dogs do not generally occur in riparian or irrigated areas because of the dense vegetation that provides cover for predators and high water tables or irrigation that flood burrows.

Bald eagle. The bald eagle was listed as an endangered species in 1978 (Buehler 2000; 43 FR 6233 [February 14, 1978]). After years of recovery, the bald eagle was removed

from the ESA list in 2007 (72 FR 37346). Bald eagles are still protected by two other major federal laws: the Bald and Golden Eagle Protection Act and the MBTA.

Eagles feed primarily on fish and waterbirds but also feed on small mammals, mammal carcasses, and prey stolen from other raptors (Buehler 2000). Typical bald eagle nesting habitat consists of forests or wooded areas that contain many tall, aged, dying, and dead trees (Martell 1992). While bald eagles are found throughout the Valley in winter, they are generally concentrated along the Rio Grande and Conejos River and are not known to nest in the Valley. Bald eagles are opportunistic feeders and any temporary or predictable abundance of prey will attract large concentrations of wintering eagles. Winter roost sites within the Valley vary from dispersed roost sites used by one to a few individual eagles that are typically transient in nature to more predictable communal roost sites used by several eagles over extended periods.

Greater sandhill crane. The greater sandhill crane is a Colorado species of special concern due to a loss of nesting habitat resulting from human settlement and is federally protected under the MBTA. This species breeds in northwest Colorado, but only migrates through the Valley in spring and fall (Kingery 1998; Service 2003). Sandhill cranes migrating through the Valley roost in shallow pools and ponds or open sandbars on rivers and streams and forage in mudflats around reservoirs, moist meadows, and agricultural areas (Kingery 1998, Tacha et al, 1992, Service 2003). Migrating cranes prefer open habitats for sighting human and predator encroachment (Tacha et al, 1992). Cranes in the Valley may roost in open streams and rivers, but typically avoid tall and dense riparian vegetation.

Western burrowing owl. The western burrowing owl is a neotropical migrant listed by the State as a threatened species and is federally protected under the MBTA. Burrowing owls are grassland specialists depending on the burrows of fossorial mammals for nesting (primarily prairie dogs); however, the owls can excavate their own burrows in sandy soils (Kingery 1998). In Colorado, burrowing owls breed mostly on the eastern plains, but are found on the west slope, and scattered breeding was documented in North Park and the Valley (Kingery 1998; Andrews and Righter 1992). Burrowing owls do not generally occur in riparian or irrigated areas because of the dense vegetation that provides cover for predators and high water tables or irrigation that can flood burrows.

Northern leopard frog. The northern leopard frog is a State species of special concern . The frog is a wide-ranging species that prefers the banks and shallow portions of marshes, wet meadows, ponds, lakes, and streams particularly where rooted aquatic vegetation is present (Hammerson 1999). Northern leopard frogs can range up to 5 kilometers (3 miles) and feed on insects, spiders, and worms. Northern leopard frog tadpoles are herbivorous scavengers (USFS 1997). Worldwide and locally in Colorado, amphibian populations have declined for reasons not well known.

Rio Grande sucker. The Rio Grande sucker is listed as endangered by the State of Colorado. This species prefers backwaters and pools near rapidly flowing water. In Colorado, the sucker is limited to small creeks and springs within the Valley such as Hot Creek and McIntyre Springs (Rees and Miller 2005; Woodling 1985) and is also known to occur in Crestone Creek (CNHP 2006), all of which are located within the HCP Plan Area.

Rio Grande cutthroat trout. The Rio Grande cutthroat trout is a State species of special concern and a candidate for listing under the ESA. The trout occurs in the high-elevation headwaters of the Rio Grande. This species prefers clear, cold streams and lakes and shallow riffles for runs and spawning. The Rio Grande cutthroat trout is known to occur in several headwater streams in the Valley, including the Carnero and Saguache Creek drainages and the Trinchera and Culebra Creek drainages (Pritchard and Cowley 2006), which are located within the HCP Plan Area.

Rio Grande chub. The Rio Grande chub is a State species of special concern. In Colorado, the chub is found in pools of small creeks and streams in the Valley. This species prefers streams with undercut banks, overhanging bank vegetation, and aquatic vegetation (Woodling 1985). This species is likely extirpated from the mainstem Rio Grande, but is known to occur in small tributary streams (Rees et al. 2005) in the HCP Plan Area.

Migratory Bird Treaty Act-covered species. The MBTA makes it illegal for anyone to take, possess, import, export, transport, sell, purchase, barter, or offer for sale, purchase, or barter, any migratory bird, or the parts, nests, or eggs of such a bird except under the terms of a valid permit. The MBTA applies to over 800 species of birds, including most native bird species, and allows for game bird hunting. Most of the bird species that are found in riparian habitats in the Valley, including waterfowl, raptors, and songbirds, are protected by the MBTA.

Environmental Consequences

General Wildlife

No Action Alternative. The effects of the covered activities would be negligible and would not result in long-term negative impacts to wildlife populations. The covered activities could impact general wildlife species due to human disturbance, displacement, and habitat alteration or fragmentation. These impacts, however, would be individually small and dispersed.

Public Land Mitigation HCP Alternative. *Same negligible effects to general wildlife populations as the No Action Alternative.* This alternative would result in minor long-term indirect benefits to general wildlife species that depend on riparian habitat by minimizing impacts and implementing long-term habitat conservation and enhancement measures.

Regional HCP Alternative. *Same negligible effects and minor long-term indirect benefits to general wildlife species as the Public Land Mitigation HCP Alternative.*

Wildlife Species of Concern

All Alternatives. Under all alternatives, no effects to the greater sandhill crane would occur, because they generally do not use woody riparian habitats in the Valley and would not be adversely affected by the covered activities.

Under all alternatives, the covered activities related to routine agriculture could impact Gunnison's prairie dog colonies or burrows that are within or adjacent to ditches or other agricultural facilities, and may be removed or covered as part of routine ditch maintenance and agricultural operations. While such impacts to prairie dog colonies may

occur, they are rare and infrequent and would result in negligible impacts. Secondary impacts to burrowing owl are unlikely as the owl rarely occurs in the Valley and avoids riparian areas (Kingery 1998, COBBA II 2012). Furthermore, the HCP's mitigation measures for the flycatcher and cuckoo are likely to also benefit other riparian species in the plan area.

Impacts to bald eagles would be negligible under all alternatives. Bald eagles do not breed in the Valley and breeding birds would not be affected. The covered activities (such as human activity or equipment noise resulting from the covered activities) could disturb wintering or migrating bald eagles causing them to flush from roosting or foraging sites. However, bald eagles typically become habituated to the covered activities, which are common practices within and adjacent to riparian habitat in the Valley. Likewise, the impacts to riparian habitat are individually small and dispersed, and would not result in long-term effects to the overall habitat availability or population dynamics of the bald eagle. Each alternative has the potential to result in minor adverse impacts on the Northern leopard frog. The covered activities could impact wetland and riparian habitat for the northern leopard frog from vegetation removal or trampling, ditch or channel excavation, or general human activity in habitat areas. Some of these activities also could result in reductions of small localized frog populations. Long-term adverse effects to frog populations would not occur because these impacts would be small, mostly temporary, and dispersed through the Valley. Furthermore, temporary impacts to leopard frog habitat would continually be regenerating as habitat is disturbed and restored within the rotating matrix concept.

Each alternative could result in negligible to minor adverse effects to localized populations of the Rio Grande sucker, Rio Grande cutthroat trout, and Rio Grande chub. Some of the covered activities, including livestock grazing and floodway maintenance, may result in short-term localized effects to aquatic habitat due to riparian vegetation removal, trampling, channel excavation and sedimentation. Changes to instream flows due to water management activities would not deviate from historic and typical ongoing practices, and therefore the alternatives would not affect fish species of concern, which continue to survive in these areas. Instream habitat improvements such as channel shaping and riparian revegetation may result in temporary and localized aquatic habitat impacts due to channel excavation, vegetation removal, and sedimentation. These impacts from the covered activities would be minor and are not expected to result in long-term adverse effects to aquatic habitat or fish populations because they are temporary in nature. Furthermore, some of the covered activities (e.g., habitat creation and restoration) will result in long-term instream habitat improvements that improve the quality and diversity of aquatic habitat in restored streams.

No impacts would occur for MBTA-protected species which do not use riparian habitat. Impacts to MBTA-protected species that do rely on riparian habitat would be negligible in all alternatives. The covered activities could impact wetland and riparian habitat, resulting in the loss of nesting or foraging habitat. Additionally, human disturbance could displace individual birds from active nests, or disrupt bird behavior causing nest abandonment or reduced productivity. Individual birds or nests could accidentally be killed or destroyed by covered activities conducted during the breeding season.. While

these impacts do occur, they are individually small, are mostly temporary, are dispersed and therefore would not result in long-term adverse effects to bird populations.

Public Land Mitigation HCP Alternative and Regional HCP Alternative. Each of the HCP alternatives would result in minor long-term benefits to species of concern that rely on riparian habitat by implementing coordinated conservation and enhancement of high-quality riparian habitat. These efforts would benefit bald eagle, Northern leopard frog, fish species of concern, and MBTA-protected species by maintaining or improving the availability of necessary habitats for these species.

3.6 Cultural Resources

Affected Environment

Cultural resources, both documented and undocumented, are found throughout the 2.8-million-acre plan area. Although cultural resource inventories have been conducted within the plan area, the State Historic Preservation Office (SHPO) considers their database to be incomplete due to the assumption that undocumented resources remain within the plan area. The resulting assessment focused primarily on canals, ditches, and the 100-year floodplain of major drainages (ERO 2005), which is where most of the covered activities and associated impacts occur.

ERO Resources Corporation (ERO) conducted a file and literature review that summarizes the previous cultural resource inventories and documented sites within the HCP plan area (ERO 2005). The file search was conducted through the Office of Archaeology and Historic Preservation (OAHP) and the results transmitted to ERO as Excel files. Because of the sheer size of the plan area, the supporting file and literature review document provides only a coarse-grained synthesis based on component type (prehistoric or historic resource), site type, and National Register of Historic Places (NRHP) eligibility. Emphasis is placed on those sites officially eligible, recommended field eligible, need data, or listed on the NRHP. Many sites (primarily canals and ditches) within the area of potential effect (APE) have not been assessed for eligibility. No cultural resources within the boundary of the Great Sand Dunes National Park and Preserve were included in the review since activities within the Park would not be covered by the HCP alternatives.

We initiated formal government-to-government consultation by letter dated June 1, 2012with interested tribal governments (in this case the Southern Ute Tribe), per Executive Order 13175, Secretarial Order 3206, and the Department of the Interior Policy on Consultation with Indian Tribes.

Historical Context

The Valley was the first area of Colorado to be settled by European descendants beginning in the 1840s. The Valley is notable for the earliest irrigation ditch built in Colorado (San Luis Peoples Ditch – 1852) (King 1984). Other notable early water conveyance systems include the San Pedro acequia (1852), Newton Ditch (1867), and the Llano acequia (1855). Early irrigation systems were related to subsistence agriculture, which in turn transformed the Valley toward a more market-based agricultural system (Holleran 2005). All of the canal systems were initiated in the early 1880s and completed

by the turn of the century, e.g., Rio Grande (1881), Empire (1885), Taos Valley (1900), San Luis Valley (1883–1885), and Farmer's Union (1884–1890). At the time of initial completion (1881), the Rio Grande Canal was the largest water conveyance system in the country. Canals such as San Luis Valley also contributed to agricultural booms, including the Hooper Mosca wheat boom of the 1880s and 1890s.

Historic Significance

Documented water conveyance systems in the Valley include five canals and nine ditches out of the estimated 477 canals, ditches, and laterals (a combined 2,044 miles) on the Valley floor. The majority of these systems are privately owned irrigation ditches. The major canal systems include the Rio Grande Canal (5SH1033/5RN63), the Taos Valley Canal No. 2 (5CN508), the Empire Canal (5RN510), the San Luis Valley Canal (5AL141/5RN544), and the Farmer's Union Canal (5RN711/5SH1920). The SHPO now considers all intact systems to be eligible for the NRHP unless documentation demonstrates that the system does not date to the period of significance for early water conveyance systems in the Valley or have lost physical or historical integrity through abandonment and/or modern alteration. Since the SHPO has recently changed its approach to linear resources and towards canals/ditches, in particular, previous documentation for the above referenced resources may be outdated and may require reevaluation for the NRHP. ERO did not conduct fieldwork to evaluate undocumented resources or reevaluate or assess a previously documented resource.

Environmental Consequences

All Alternatives. None of the alternatives would adversely affect known or unknown historic and prehistoric cultural resources. To comply with Section 106 of the NHPA, the responsible Federal agency official determines if the proposed action may affect historic properties within the APE by applying the criteria of effect in 36 CFR 800.5. Effects can be determined as either 'adverse' if the undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register, or 'no adverse effect' if the agency official finds that the undertaking will not alter characteristics of historic properties that qualify them for the National Register. For each alternative, we find that routine maintenance work on canals and ditches and vegetation clearing within riparian corridors do not constitute an adverse effect to known historic properties.

Routine maintenance of water conveyance systems, including systems listed or eligible for listing on the NRHP, would continue under each alternative. These activities, including dredging and vegetation removal, maintain the intended and historic purpose of systems – that of water conveyance – and are considered beneficial to the systems. Discontinuing routine maintenance would constitute, in the long term, an adverse effect to their physical integrity as systems silt in, become choked with vegetation, and/or fall into general disrepair. If typical maintenance activities did not occur, continued deterioration could lead to long-term effects to the water conveyance systems, eventually requiring more intensive rehabilitation efforts to return the systems to their historic functioning parameters. Similarly, while the replacement of headgates has the potential to affect an historic element of canal and ditch systems, headgate replacement is also a necessity for maintaining the intended and historic purpose of the systems. None of these

maintenance activities would alter the historic integrity of water conveyance systems or change the character of the systems that contribute to their significance.

The routine maintenance activities that would occur under each alternative would not adversely affect the water conveyance systems of the Valley. Future ditch maintenance activities under all alternatives would benefit water conveyance systems, by maintaining integrity of location, setting, feeling, and association, and physical integrity.

Unknown historic and prehistoric cultural resources may be within the 100-year floodplain of affected drainages. However, it is unlikely that significant cultural resources are located within floodplains. Generally speaking, neither Native Americans nor historic settlers occupied or constructed within active floodplains due to the potential for floods. Proposed activities along major drainages would be similar to those that have been ongoing and have occurred historically. No new direct, indirect, or cumulative effects are anticipated to unknown cultural resources.

3.7 Socioeconomic Setting

Affected Environment

Demographics

The community dynamics of the Valley consist of a mix of ethnic and cultural groups who have settled in the area over the last 150 years. Descendants of many of the original Hispanic settlers are generally concentrated in the southern half of the Valley, along with the descendants of Mormon settlers in the towns of Manassa, Sanford, and Romeo. The northern half of the Valley is generally dominated by Anglo farming communities. Although the Valley is part of the Southern Ute's aboriginal lands, very few tribal members live in the Valley.

Economics

While local government is the largest employer in the Valley, agriculture is the dominant industry. The Valley produces a variety of crops including potatoes, barley, oats, alfalfa, wheat, and legumes. Alamosa, Rio Grande, and Saguache counties have among the highest value of crop sales in the state (USDA 2002). Livestock grazing is also prominent in the Valley. Most of the crop production in the Valley is dependent on irrigation provided by the complex network of surface water diversions, ground water wells, ditches, and canals described in Section 2.0 of the HCP.

The Valley is one of the most economically depressed regions in Colorado (Table 4). According to the Bureau of Economic Analysis, the average per capita personal income for the Valley is estimated to be $28,030, compared to a statewide average of $41,344. The population and economic indicators of the region lag behind most other regions in the State. The average poverty rate in 2009 was well above the State average, and Costilla County was almost double the State average.

Table 4. Socioeconomic and Demographic Statistics in the San Luis Valley.

	Alamosa	Conejos	Costilla	Mineral	Rio Grande	Saguache	SLV Average	State of Colorado
Population (2010)	15,445	8,256	3,524	712	11,982	6,108	–	5,011,390
Minority population* (2000)	50%	58%	69%	5%	45%	45%	45%	30%
Poverty rate (2009)	28%	20%	25%	4%	18%	27%	20%	13%
Unemployment (2011)	9.6%	12.5%	15.9%	6.8%	10.7%	13.9%	11.6%	9.7%
Per capita personal income (2005)**	$30,650	$24,180	$29,095	$31,017	$33,742	$19,496	$28,030	$41,344

* As defined by Council on Environmental Quality's Environmental Justice guidance (CEQ 1997).

** Colorado Department of Labor and Employment (2011).

Sources: Colorado Demography Office (2011); Colorado Economic and Demographic Information System (2011).

Environmental Justice Considerations

Based on the socioeconomic and demographic data presented in Table 4, about 20 percent of individuals in the Valley were considered to live in poverty in 2009, and both Costilla and Conejos counties are considered to be minority communities (CEQ 1997).

Environmental Consequences

All Alternatives. The adverse and beneficial socioeconomic effects of the alternatives would be shared by all landowners and residents of the Valley, regardless of ethnic background or economic status. None of the alternatives would result in disproportionately high and adverse human health or environmental effects on a minority population, low-income population, or Native American tribe because the activities covered are dispersed throughout the Valley and are typical of agricultural and infrastructure activities in small rural communities. Therefore, no negative effects would occur to minority and/or low-income populations.

No Action Alternative. The financial cost of the No Action alternative is not certain, as it would be borne by each individual landowner and government entity that choose to seek ESA compliance on a case-by-case basis. However, such landowners and government entities would bear costs associated with developing and implementing individual HCPs.

Public Land Mitigation HCP Alternative and Regional HCP Alternative. Each HCP alternative would result in minor long-term economic benefits to the Valley. The District, Counties, and State would incur costs associated with staff time dedicated to HCP administration, mitigation (e.g., landowner agreements, conservation easements, or restoration projects), monitoring, and coordination for each HCP alternative. These

implementation costs are expected to be less than the collective cost of the No Action alternative where each entity and landowner develops their own HCP case-by-case, and would not affect the overall economic stability of the Valley. In addition, the HCP alternatives would provide land managers, business owners, and local governments with long-term regulatory certainty under the ESA, which may contribute to economic benefits in the Valley. Overall, the economic benefits of HCP implementation are expected to be minor over the permit term.

3.8 Land Use and Infrastructure

Affected Environment

Land Use

Land use in the Valley is rural in character and is dominated by irrigated agriculture in the center of the Valley and limited activity in the arid scrubland areas. Urban and suburban land uses are generally clustered around the cities of Alamosa and Monte Vista and in the small towns throughout the Valley. Rural subdivisions dominate the forested eastern slopes of Costilla County and in the areas around Crestone, and are increasing along the Rio Grande corridor west of Monte Vista. Anticipated future development is discussed in Section 3.11 *Cumulative Effects*.

All of the Applicant Counties in the Valley have general guidance and/or development stipulations that are used to limit development in wildlife habitat areas on a case-by-case basis.

Ongoing conservation efforts are discussed in this EA in Section 3.10 *Habitat Conservation Efforts*.

Community Infrastructure

The existing community infrastructure in the Valley is typical of any agricultural community, including flood-control facilities, transportation systems, and basic utilities.

The City of Alamosa maintains an existing system of levees along about 3.5 miles of the Rio Grande in the city. Additional levees have been proposed along the Rio Grande near U.S. Highway 285 to the north of Monte Vista and in the town of Del Norte (SLVWCD 2001). Other flood-control facilities, including small dams and levees, reinforced streambanks, and other structures are located on various streams and rivers throughout the Valley.

The HCP plan area includes about 5,000 miles of state and local roads, about 90 percent of which are maintained by the Counties or other local entities (SLVRPC 2004), and numerous bridges crossing rivers, small streams, canals, and ditches. The HCP plan area also includes about 100 miles of active railroad lines.

General utilities in the Valley include electrical lines, telephone lines, cable television, and other common communication and power facilities. Most communications lines are co-located with power line corridors or road rights-of-way.

Prime and Unique Farmlands

The U.S. Department of Agriculture defines prime farmlands as lands that have the best combination of physical and chemical characteristics for producing food, feed, forage, and oilseed crops, and is also available for those uses. Unique farmland is defined as land other than prime farmland that is used for the production of high value food and fiber crops. Farmlands of statewide importance are those that are nearly prime farmland and economically produce high yields of crops (16 U.S.C. 590).

Within the Valley, most of the irrigated cropland is designated as farmland of statewide importance and includes pockets of prime and unique farmland (NRCS 2011). A large extent of the prime and unique farmland in the Valley is near or adjacent to riparian habitat areas. This adjacency appears to be a result of the suitability of soils in these areas and the availability of water for irrigation.

Floodplains

The Federal Emergency Management Agency has designated 100-year floodplains along most of the major streams and rivers in the Valley, with the exception of San Luis Creek and other closed basin streams. Many of the mapped floodplain areas generally correspond with the riparian habitat that supports the covered species. All six Counties have land use regulations that restrict or place conditions on the development of structures within the 100-year floodplain.

Environmental Consequences

Land Use

No Action Alternative. This alternative would have no effect on land use and administration within the Valley.

Public Land Mitigation HCP Alternative. This alternative would result in long-term benefits to land use and administration. Agricultural land uses would benefit from increased regulatory certainty for landowners, and local governments would benefit as they administer local land use and development regulations due to a clear definition of riparian habitat and a regional framework for habitat protection.

Regional HCP Alternative. This alternative would have similar long-term benefits to land use and administration as the Public Land Mitigation HCP Alternative. It would also result in additional benefits to local governments and landowners due to the enabling land use policies that clearly delineate the covered activities, and establishes clear guidance for activities with impacts that are not covered.

Community Infrastructure

All Alternatives. The alternatives would not affect the development and maintenance of flood-control facilities in the Valley, or the development of transportation and utility facilities.

Public Land Mitigation HCP Alternative and Regional HCP Alternative. By providing regulatory certainty under the ESA, each HCP alternative would result in minor long-term benefits to community infrastructure and local units of government as they maintain their facilities. However, the HCP alternatives may also complicate the

maintenance of flood-control facilities (including the removal of vegetation in the floodway) by limiting coverage to the clearing of a certain amount of vegetation in any given year.

Prime and Unique Farmlands

All Alternatives. The alternatives would not affect the extent, function, or physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed that are the basis for designating prime and unique farmlands in the Valley. The alternatives only affect the way the ESA is administered on those lands.

Floodplains

All Alternatives. The alternatives would not affect the extent or hydraulic function, of designated floodplains in the Valley. All alternatives provide a process for obtaining ESA compliance for ongoing, typical, and routine agricultural, infrastructure, and conservation activities. These are small, isolated, and short-term activities that would not change the overall extent or function of floodplains.

Public Land Mitigation HCP Alternative and Regional HCP Alternative. The HCP alternatives may benefit the biological integrity of floodplains by reducing impacts to riparian habitat and promoting long-term habitat conservation within floodplains. The extent of the habitat benefits on floodplain extent and function is not certain.

3.9 Land Ownership and Management

Affected Environment

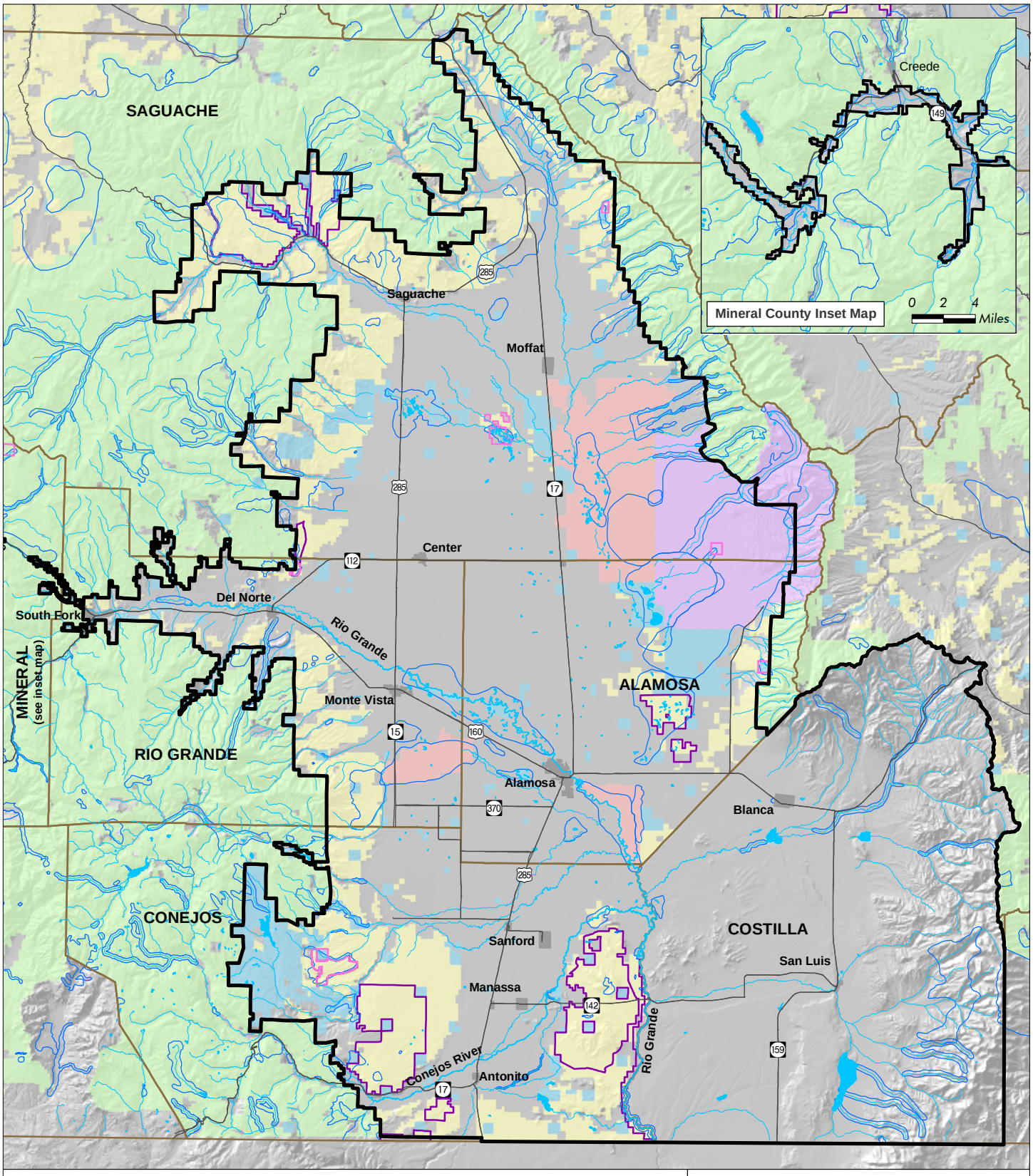
Land Ownership

The Valley consists of a mix of land uses and ownership. The different land ownership types and management designations are shown on Figure 4. Private lands comprise about 69 percent of the Valley. While most of the central Valley floor is privately owned, the outer areas, especially the northeast and southwest corners, are a mosaic of Federal and State lands. The various land ownership and management types that occur in the Valley are described in detail in Section 2.5 of the HCP.

Federal Land Management Designations

Rio Grande Natural Area. On October 12, 1996, the Rio Grande Natural Area Act was signed into law (P.L. 109-337; 16 U.S.C. 460). This act established the Rio Grande Natural Area along a 33-mile stretch of the Rio Grande River from the southern boundary of the Alamosa National Wildlife Refuge (NWR) to the New Mexico state line, extending ¼ mile on either side of the river. The purpose of the Natural Area is to conserve, restore, and protect the natural, historic, cultural, scientific, scenic, wildlife, and recreational resources along the Rio Grande. The newly established Natural Area includes about 10,000 acres of both BLM and private land.

Wild and Scenic Rivers. There are no federally designated Wild and Scenic Rivers (WSR) in the HCP plan area. Most of the Conejos River and the portion of the Rio Grande south of Alamosa NWR were determined eligible for WSR designation in 1993, but have not been designated (NPS 2011).



San Luis Valley HCP

- Bureau of Land Management
- US Forest Service
- National Park Sevice
- US Fish and Wildlife Service
- State of Colorado
- CNHP Potential Conservation Area
- Colorado Natural Area
- BLM Area of Critical and Environmental Concern
- Proposed HCP Boundary

0 6 12 Miles

N

Figure 4
Land Management Designations

File: 2445 - Fig4_ero_ownership.mxd (WH)
May 2011

ERO
ERO Resources Corp.

Wilderness. The only designated Wilderness within the HCP plan area is the Great Sand Dunes Wilderness within the Great Sand Dunes National Park and Preserve. Two additional areas have been proposed for wilderness designation: the San Luis Hills area in Conejos County (currently a Wilderness Study Area) and the lower Rio Grande canyon near the New Mexico border.

BLM Areas of Critical Environmental Concern (ACEC). As part of its land use planning process, the BLM has designated nine ACECs in the HCP plan area. An ACEC is an area "within the public lands where special management attention is required to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources, or other natural systems or processes, or to protect life and safety from natural hazards" (43 CRF 1610). An ACEC designation, by itself, does not automatically prohibit or restrict other uses in the area. A Plan of Operation is required for any proposed mining activity within an ACEC. Two of these areas, the Rio Grande ACEC and the Blanca Wildlife Habitat ACEC, contain riparian habitat that could potentially support the covered species.

Other Special Management Designations

Colorado Natural Heritage Program (CNHP) Designations. The CNHP tracks the locations of rare or imperiled wildlife populations, plant communities, and plants that contribute to the biological diversity of the state. Areas that contain and support these rare biological occurrences are delineated by the CNHP into Potential Conservation Areas (PCAs) and are ranked in terms of importance. While they are an important indicator for land management and conservation efforts, PCAs have no regulatory protections or requirements.

The HCP plan area fully or partially contains a total of 78 PCAs identified by the CNHP. Sixteen of these PCAs contain or correspond with the types of riparian habitat that support the covered species (CNHP 1998, 2000, 2004) (Table 5 and Figure 4).

State Designated Natural Areas. Colorado Natural Areas are designated areas that contain at least one unique or high-quality natural feature of statewide significance. These may be designated on private lands with the landowner's permission. The HCP plan area contains four designated Natural Areas: Zapata Falls (Alamosa County), Elephant Rocks (Rio Grande County), Indian Springs (Saguache County), and Mishak Lakes (Saguache County) (Figure 4). None of these Natural Areas contain the types of riparian habitat that are the focus of the HCP (CNAP 2011).

Table 5. CNHP-Designated Potential Conservation Areas. This table only includes PCAs that are located within the HCP plan area and contain riparian shrub habitat.

PCA Name	Rank*	Location	Rationale
Alamosa County			
Rio Grande	B2	Rio Grande between Alamosa and Monte Vista	Known flycatcher habitat; rare plants and plant communities
Rio Grande at ANWR	B2	Rio Grande between Alamosa and Conejos River confluence	Known flycatcher habitat; rare plants and plant communities
Conejos County			
Rio San Antonio	B4	East of Antonito	Rio Grande chub populations
Sego Springs	B4	Conejos River east of Manassa	Rio Grande chub population

PCA Name	Rank*	Location	Rationale
McIntire Springs	B3	Conejos River east of Sanford	Rio Grande chub populations; rare plant communities; known flycatcher habitat
Lasauses	B2	Rio Grande south of Conejos River confluence	Rare plant occurrence and wetland community
Hot Creek	B2	Area around Hot Creek SWA	Rio Grande chub; Rio Grande sucker; rare plants and animals
Hot Creek/La Jara Creek Confluence	B3	West of La Jara	Wetland and riparian communities
Costilla County			
Sangre de Cristo Creek	B2	East of Blanca and Hwy. 159 crossing	Rare montaine willow carr community; Rio Grande cutthroat trout population
Trinchera Creek below Smith Reservoir	B3	South of Blanca	Rare montaine willow carr community
Rio Grande at Trinchera Creek	B3	Rio Grande/Trinchera Creek confluence	Rare plants and riparian plant community
Rio Grande at State Line	B4	Rio Grande north of New Mexico state line	Rare plants and riparian plant community
Rio Grande County			
Rio Grande at Embargo Creek	B4	Rio Grande east of South Fork	Montane riparian shrubland
Rio Grande at Monte Vista	B3	East of Monte Vista	Known flycatcher habitat; rare plants and plant communities
Saguache County			
Villa Grove	B2	San Luis Creek east of Villa Grove	Rio Grande chub population; rare plants and wetland communities
Carnero Creek	B3	Carnero Creek drainage west of La Garita	Rare plant communities; Rio Grande cutthroat trout population

* Rank descriptions: B2 = Very high biodiversity significance, B3= High biodiversity significance, B4= Moderate biodiversity significance

Environmental Consequences

General Land Ownership and Management

All Alternatives. The alternatives would not affect general land ownership and management patterns in the Valley, since none of the alternatives propose or mandate changes in land ownership or types of land use (e.g., agricultural versus commercial).

Public Land Mitigation HCP Alternative and Regional HCP Alternative. The HCP alternatives would result in negligible overall effects on land ownership and management. The HCP alternatives could affect habitat management on State Wildlife Areas and on some Federal lands by reinforcing the importance of managing for the conservation of the covered species on those lands, but those changes would be similar to and consistent with existing conditions. While the HCP alternatives could potentially influence private land-use management practices (such as conservation or restoration of habitat associated with mitigation activities, or changes in land management practices based on landowner agreements or outreach efforts), the extent of these changes are beyond the 304 acres that are required for mitigation and are unknown at this time.

Federal Land Management Designations

All Alternatives. The alternatives would not affect Federal land management designations, because they do not propose establishment or changes to any such designations. None of the alternatives would affect the management of designated wilderness in the Valley, the management of Wilderness Study Areas, or the likelihood of designation of those areas as wilderness, since riparian habitat does not occur in those areas. None of the alternatives would adversely impact resources within or management of BLM ACECs in the Valley because they do not propose changes to management of the ACECs. Likewise, none of the alternatives would adversely impact resources within or management of National Wildlife Refuges in the Valley.

Public Land Mitigation HCP Alternative and Regional HCP Alternative. The HCP alternatives would result in minor benefits to the management of some Federal lands. The HCP alternatives would indirectly benefit the implementation and long-term management of the Rio Grande Natural Area by establishing a consistent and complementary framework for riparian habitat conservation along the Rio Grande corridor. The HCP alternatives would include increased coordination with the BLM regarding the management of the Rio Grande ACEC. This coordination would indirectly benefit the management of the ACECs for riparian habitat that supports the covered species. The HCP alternatives could also enhance the management of those refuges for the covered species through improved coordination and a continued emphasis on riparian habitat conservation.

Other Special Management Designations

All Alternatives. The alternatives would continue to result in minor impacts to CNHP-designated PCAs with a woody riparian habitat component due to the ongoing impacts of the covered activities. However, these impacts would be no greater than or different from those have occurred or are occurring with historic and ongoing practices and conditions and would not result in long-term negative effects or changes to the biological resources within or the management of PCAs.

Public Land Mitigation HCP Alternative *and* Regional HCP Alternative. The HCP alternatives may benefit CNHP-designated resources by supporting the long-term conservation of riparian habitat areas that coincide with many of the PCAs.

3.10 Habitat Conservation Efforts

Affected Environment

The communities of the Valley have a history of proactive and collaborative conservation dating back to the establishment of the Great Sand Dunes National Monument in 1932. These efforts have led to the establishment of the Alamosa and Monte Vista NWRs, local habitat protection efforts, numerous private conservation programs, and the acquisition of the Baca Ranch to allow the creation of the Baca NWR and Great Sand Dunes National Park and Preserve.

Several conservation efforts in the Valley play an important role in protecting and enhancing riparian habitat in the Valley, consistent with the goals of the HCP. Several organizations, including private land trusts and the Natural Resources Conservation

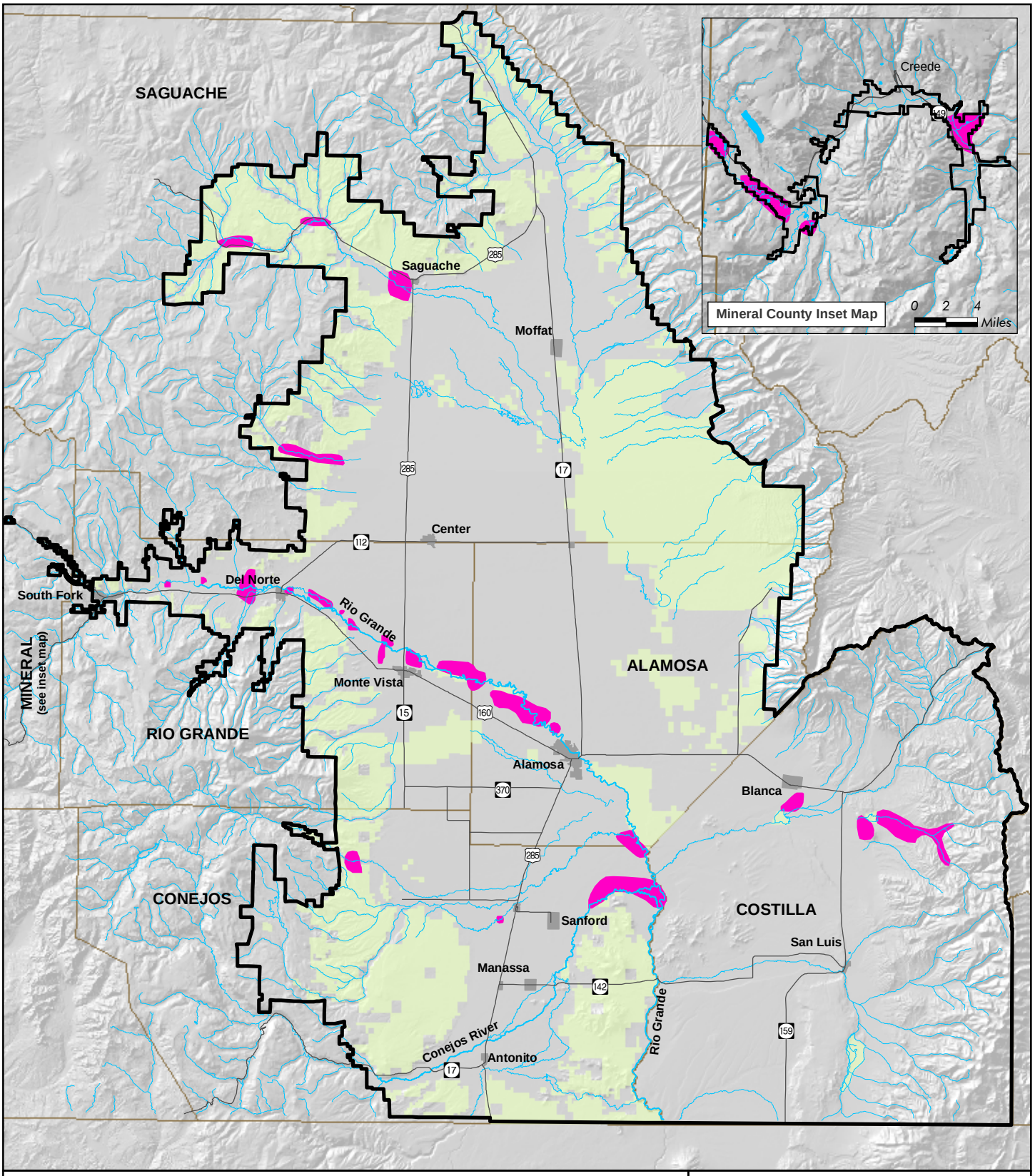
Service, have acquired conservation easements over private lands in the Valley. To date, more than 32,000 acres of private land in the Valley have been protected by conservation easements, including more than 1,700 acres of woody riparian habitat. These efforts are described in greater detail in Section 2.7 of the HCP. The general location of existing conservation easements that contain riparian habitat is shown on Figure 5.

Environmental Consequences

No Action Alternative. The No Action alternative would not affect conservation efforts in the Valley, as existing programs and efforts would continue.

Public Land Mitigation HCP Alternative. The Public Land Mitigation HCP Alternative would result in long-term benefits to overall conservation efforts in the Valley by providing additional technical and community support for conservation, and a framework for the integration of strategic land conservation with the conservation of habitat for the covered species. This alternative would also benefit conservation efforts by enhancing the ability of local governments and conservation organizations to use the HCP to garner additional funding and political support.

Regional HCP Alternative. The Regional HCP Alternative would result in long-term benefits to overall conservation efforts in the Valley. In addition to the benefits described under the Public Land Mitigation HCP Alternative (enhanced ability to generate conservation support), the Regional HCP Alternative would have additional benefits since private conservation easements are a key component of HCP implementation. This has been demonstrated in recent years by several successful conservation projects which have protected riparian habitat with conservation easements, several of which have cited support for HCP in their funding efforts.



San Luis Valley HCP

Conservation Easement with Existing or Potential Habitat

State and Federal Lands

Proposed HCP Boundary

Note: Easement boundaries are generalized to respect the privacy of landowners.

Figure 5
Existing Conservation Easements

File: 2445 - fig5_existing_esmnt.mxd (WH)
May 2011

ERO
ERO Resources Corp.

Table 6. Summary of Effects.

Resource	No Action Alternative	Public Land Mitigation HCP Alternative	Regional HCP Alternative (Proposed Alternative)
Water Resources			
Surface Water, Ground Water, and Water Management	No effect	Minor benefits	Minor benefits
Vegetation			
General Vegetation	No effect	No effect	No effect
Riparian Habitat	Minor adverse impacts due to ongoing activities	Minor adverse impacts due to covered activities Minor benefits due to habitat conservation and enhancement measures	Minor adverse impacts due to covered activities Moderate benefits due to habitat conservation and enhancement measures
HCP Covered Species			
Southwestern Willow Flycatcher	Potential incidental take and minor indirect adverse impacts due to habitat disturbance	Potential incidental take and minor indirect adverse impacts due to habitat disturbance Minor benefits due to habitat conservation and enhancement measures	Potential incidental take and minor and minor indirect adverse impacts due to habitat disturbance Moderate benefits due to habitat conservation and enhancement measures
Yellow-billed Cuckoo	*Same as flycatcher*	*Same as flycatcher*	*Same as flycatcher*
Other Wildlife			
General Wildlife	Negligible impacts	Negligible impacts Minor benefits due to habitat conservation and enhancement measures	Negligible impacts Minor benefits due to habitat conservation and enhancement measures
Wildlife Species of Concern	Gunnison's prairie dog, and burrowing owl: Negligible impacts Bald eagle: Negligible impacts Northern leopard frog: Minor adverse impacts Fish species: Negligible to minor adverse impacts	Gunnison's prairie dog, and burrowing owl: Negligible impacts Bald eagle: Negligible impacts; minor benefits due to habitat conservation and enhancement efforts Northern leopard frog: Minor adverse impacts; minor benefits due to habitat conservation and enhancement efforts Fish species: Minor adverse impacts; minor benefits due to habitat conservation and enhancement efforts	Gunnison's prairie dog, and burrowing owl: Negligible impacts Bald eagle: Negligible impacts; minor benefits due habitat conservation and enhancement efforts Northern leopard frog: Minor adverse impacts; minor benefits due to habitat conservation and enhancement efforts

Resource	No Action Alternative	Public Land Mitigation HCP Alternative	Regional HCP Alternative (Proposed Alternative)
			Fish species: Minor adverse impacts; minor benefits due to habitat conservation and enhancement efforts
Cultural Resources			
Water Conveyance Systems	No effects	No effects	No effects
Other Unknown Historic and Prehistoric Resources	No effects	No effects	No effects
Socioeconomic Setting			
Economics	No effects/unknown cost of individual HCPs	Minor benefits due to regulatory certainty	Minor benefits due to regulatory certainty
Environmental Justice	No effects	No effects	No effects
Land Use and Infrastructure			
Land Use	No effects	Benefits due to regulatory certainty	Benefits due to regulatory certainty and land use policies
Community Infrastructure	No effects	Minor benefits due to regulatory certainty	Minor benefits due to regulatory certainty and land use policies
Prime and Unique Farmlands	No effects	No effects	No effects
Floodplains	No effects	Benefits due to riparian impact minimization and promotion of habitat conservation in floodplain	Benefits due to riparian impact minimization and promotion of habitat conservation in floodplain
Land Ownership and Management			
General Land Ownership and Management	No effects	No effects	No effects
Federal Land Management Designations	No effects to general management or wilderness/wilderness study areas	No effects to general management or wilderness/wilderness study areas Minor benefits to Rio Grande Natural Area, Rio Grande ACEC and FWS Refuges	No effects to general management or wilderness/wilderness study areas Minor benefits to Rio Grande Natural Area, Rio Grande ACEC and FWS Refuges
Other Special Management Designations	Minor adverse impacts to CNHP PCAs with riparian habitat	Minor adverse impacts to CNHP PCAs with riparian habitat Benefits from promoting riparian habitat conservation	Minor adverse impacts to CNHP PCAs with riparian habitat Benefits from promoting riparian habitat conservation
Habitat Conservation Efforts			
Private Land Conservation	No effects	Benefits by promoting riparian habitat conservation	Benefits by promoting riparian habitat conservation

3.11 Cumulative Effects

Cumulative effects are the effects on the environment that result from the incremental effects of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such actions (40 CFR 1508.7). This section analyzes cumulative effects of each of the alternatives when combined with the effects of other relevant past, present, and reasonably foreseeable future activities.

Past and Present Actions

The description of the affected environment provides existing information on the current condition of resources in the Valley that are the result of past and present actions and constitute the environmental baseline for the analysis of direct, indirect, and cumulative effects. Important past and present actions that have shaped this baseline and are considered in the cumulative effects analysis include the following:

- **Water facility construction and maintenance –** Beginning in the mid-1800s, the construction of ditches and canals to support irrigated agriculture in the Valley has shaped the current economic and ecological conditions. The ongoing management of ditches, diversions, and other water management facilities has allowed these economic and ecological conditions in the Valley to persist over time.
- **Water rights management and administration –** Under direction of the 1938 Rio Grande Compact and Colorado Water Law, the State Engineer's Office and individual landowners and entities have administered water rights and water deliveries in the Valley for nearly 100 years. These activities, which are always responding to changing runoff conditions, have shaped the current economic and ecological conditions in the Valley.
- **Agricultural management –** The management of land for both crop and livestock production, supported by the water management systems described above, have shaped the current land use, economic, and ecological context of the Valley.
- **Infrastructure development and management –** The development of towns and cities in the Valley, along with associated infrastructure, such as roads, railroads, and utilities, are part of the current conditions.
- **Conservation and restoration activities –** Public and private land and habitat conservation efforts, ranging from the establishment of NWRs to recent conservation easements and restoration projects, are important actions that have shaped the land use, ecological, and socioeconomic context of the Valley.

Reasonably Foreseeable Activities

Reasonably foreseeable future activities are actions and activities that are independent of the action alternatives, but could result in cumulative effects when combined with the effects of the alternatives. These activities are anticipated to occur regardless of which alternative is selected. "Reasonably foreseeable future actions," as defined by U.S. Environmental Protection Agency (EPA) (1999), are not speculative—they have been

approved, are included in short- to medium-term planning and budget documents prepared by government agencies or other entities, or are likely (over the permit term), given trends. Reasonably foreseeable future actions that could result in cumulative effects include the following, and are described below:

- National Wildlife Refuge management
- San Luis Valley Conservation Area Land Protection Plan implementation
- Rio Grande Natural Area implementation
- Mosquito control
- Highway and railroad clearing
- Private land development
- Climate change

National Wildlife Refuge Management

The 2003 Comprehensive Conservation Plan (CCP) for the Alamosa and Monte Vista NWRs directs the Service to provide "dense multilayered native riparian vegetation" for the flycatcher and other species, and to protect sufficient habitat for the flycatcher (Service 2003). Baca NWR is currently managed under a Conceptual Management Plan (Service 2005). The Service has recently initiated a multiyear planning process to develop an updated CCP for the three NWRs in the Valley. Until that process is completed, the Service will continue to manage the NWRs under their existing plans and directions.

San Luis Valley Conservation Area Land Protection Plan Implementation

The Service's National Wildlife Refuges program recently released a draft Land Protection Plan (LPP), and associated NEPA environmental assessment (Service 2012a), that proposed to establish the San Luis Valley Conservation Area, which included the Rio Grande watershed in Colorado and small portions of northern New Mexico. The Service proposed to use conservation easements and land purchases from willing landowners to protect wildlife habitat and maintain wildlife corridors for several identified species (including the flycatcher and cuckoo) (Service 2012b). Based on public comments, the Service is now proposing to focus such efforts on sagebrush and high elevation habitats on the west slope of the Sangre de Cristo Mountains. The Service will work with members of the local community to find common ground on and better define the objectives of the larger land protection plan which will be consolidated in the meantime with their comprehensive conservation planning effort (M. Dixon, pers. comm. July 2, 2012).

Rio Grande Natural Area Implementation

The BLM has convened a commission charged with preparing management plans for both the BLM and the private lands within the Rio Grande Natural Area. While the development of these management plans are reasonably foreseeable, the management direction that will be contained within those plans is not yet known.

Mosquito Control

The Alamosa Mosquito Control District (AMCD) conducts mosquito monitoring and control. Several smaller jurisdictions also administer mosquito control measures. While each entity has its own mosquito control program, the control methods that are used generally include monitoring with live traps and spraying from trucks or other vehicles, airplanes, and backpack units. Chemical application includes both larvacides and adulticides. The frequency of this activity varies from year to year depending on precipitation and monitoring results – in some years there is no spraying, while in others the riparian corridor is sprayed somewhat frequently. Whenever possible, the AMCD tries to avoid spraying within the Rio Grande riparian zone to avoid any potential habitat impacts. Other measures to reduce environmental impacts include the use of minimal chemical application rates, and timing applications to reduce exposure to non-target insects and wildlife (Teyler 2005, 2008).

Monitoring of mosquitoes is not expected to impact the covered species or their habitat. The application of larvacides would not likely impact the covered species or their habitat because larvacides are target-specific and mosquitoes are not a significant food source for the flycatcher. However, adulticide application may kill other insects in addition to mosquitoes, which can reduce the available food supply for flycatchers and other wildlife species. While the direct effects of mosquito control on non-target wildlife are uncertain, it is believed that adulticide use within riparian habitat could reduce the insect prey base for some wildlife in very localized, treated areas. In addition, chemical applications could indirectly harm amphibians by reducing their available food supply or combining with herbicides and other agricultural chemicals to create cumulative toxic effects on amphibians, including increased mortality, impairing development and metamorphosis, or causing behavioral and growth abnormalities (Relyea 2008; Relyea and Diecks 2008).

Highway and Railroad Clearing

The Colorado Department of Transportation periodically mows willows within the right-of-way of highways as part of routine maintenance, and also clears willows and cottonwoods as needed for bridge and culvert maintenance (Cady pers. comm. .. no date.). Railroad maintenance includes the clearing of willows and other vegetation within about 25 feet of the tracks. The Federal Rail Administration requires vegetation clearing along the tracks for safety reasons (Kissinger, pers. comm. 2005). About 10 acres of riparian habitat within 25 feet of active rail lines. Overall, these clearing activities result in very small impacts to riparian habitat, and like many of the covered activities, these impacts are temporary due to regeneration of riparian vegetation, resulting in negligible impacts.

Energy Development

The Valley is becoming an increasingly attractive location for solar energy development facilities. Several solar facilities in Alamosa County are in place or will come online in 2011, while two large projects in Saguache County are in the early stages of development (Denver Post 2011). In addition, the U.S. Department of Energy (DOE) and BLM have identified several areas on BLM lands in the Valley that would be made available for solar energy development. Alternative approaches to these designations are being analyzed in a Programmatic Environmental Impact Statement (PEIS) (BLM and DOE 2010). While the outcome of some of the current energy development proposals and the

BLM/DOE PEIS are speculative, it is clear that future development of solar energy facilities in the Valley is a trend that will continue into the foreseeable future. Since solar facilities are typically sited on open, flat terrain with sparse vegetation, it is highly unlikely that future solar energy development would occur within riparian habitat or result in cumulative effects.

Private Land Development

Over the past 10 years development pressure has increased along the Rio Grande corridor. This pressure has been driven primarily by a demand for retirement and vacation homes along the river between Del Norte and South Fork (Rio Grande County 2004). One of the purposes for the Rio Grande Initiative conservation efforts was to address the potential impacts of increasing development (RiGHT 2006). While several new subdivisions within the greater Rio Grande corridor have been developed within recent years, the development pressure has somewhat abated since the beginning of the recession in 2008. Based on population forecasts developed by the Colorado State Demography Office, the San Luis Valley population is expected to grow by 45 percent by the year 2040 (Colorado State Demography Office 2012). This level of growth will likely contribute to additional private land development.

The Rio Grande County Joint Master Plan identifies the Rio Grande corridor, outside of the floodplain, as Opportunity Areas in which "new growth or redevelopment is anticipated and can potentially be accommodated" (Rio Grande County 2004). The Alamosa County Conceptual Land Use Plan includes goals that encourage and support the conservation of key wildlife habitat areas, including riparian and wetland ecosystems. The plan also designates most of the Rio Grande corridor outside of Alamosa city limits as a "rural landscape retention area" (Alamosa County 2008).

While the timing and location of specific development projects along the Rio Grande corridor are speculative, the continued subdivision and development of private lands along this corridor, particularly west of Del Norte, is a long-term trend that will continue into the foreseeable future.

Climate Change

Changes in global climate patterns have the potential to affect habitat conditions in the Valley due to changes in precipitation patterns, irrigation practices, surface and ground water conditions, and other variables that can influence the growth, extent, and composition of riparian vegetation. A great deal of uncertainty currently exists in predicting and understanding the effects of future climate change on ecological systems (Service 2009). The terms "climate" and "climate change" are defined by the Intergovernmental Panel on Climate Change (IPCC). "Climate" refers to the mean and variability of different types of weather conditions over time, with 30 years being a typical period for such measurements, although shorter or longer periods also may be used (IPCC 2007, p. 78). The term "climate change" thus refers to a change in the mean or variability of one or more measures of climate (e.g., temperature or precipitation) that persists for an extended period, typically decades or longer, whether the change is due to natural variability, human activity, or both (IPCC 2007, p. 78). Various types of changes in climate can have direct or indirect effects on species. These effects may be positive, neutral, or negative and they may change over time, depending on the species and other

relevant considerations, such as the effects of interactions of climate with other variables (e.g., habitat fragmentation) (IPCC 2007, pp. 8–14, 18–19).

Currently reported projections[10] call for small increases in both annual average temperature and precipitation in the Valley and its watershed by 2050 (Climate Wizard 2011). While changes to precipitation and habitat are likely given trends, the timing, magnitude, and nature of those changes and their subsequent effects on riparian habitat, general wildlife, the covered species, and socioeconomic conditions in the Valley are not known.

Cumulative Effects of the Alternatives

The potential cumulative effects of the proposed alternatives, when combined with the effects of past, present, and reasonably foreseeable future actions, are described below. Resources with no cumulative effects are not discussed further.

Cumulative Effects on Riparian Vegetation, Covered Species, General Wildlife, and Riparian Species of Concern

Transportation Corridor Management. Vegetation management along highways and railroad tracks may result in localized negligible impacts to riparian vegetation, due to clearing of small amounts of vegetation on an ad hoc basis. The cumulative effect to riparian habitat when combined with the effects of clearing along transportation corridors would be negligible.

Private Land Development. Subdivision development within or adjacent to the riparian corridor could result in direct effects to riparian vegetation and habitat due to removal, trampling, fragmentation, and disturbance (by humans or domestic animals). These actions, when combined with the effects of the proposed alternatives, could result in negative localized cumulative effects to the structure and integrity of riparian vegetation, and its value to the covered species, general wildlife, and riparian species of concern. While the Valley population is expected to grow substantially over the next 30 years, and continued private land development is expected to continue, the timing, location, and magnitude of the effects of development are unknown. These potential cumulative effects would be the same for all alternatives.

Mosquito Control. Aerial adulticide applications by the AMCD could result in adverse impacts to some wildlife species within the riparian corridor, depending on the frequency of spraying (which varies by year) and the species involved. In general, bird species (including the covered species) may be adversely affected by a reduction in the prey base, while amphibians such as the northern leopard frog could be directly affected by chemical exposure. (It should be noted that the AMCD voluntarily implements multiple measures to minimize spraying within the riparian corridor and to minimize environmental effects when spraying does occur). Chemical applications do not directly affect the structure or integrity of riparian vegetation. These actions, when combined with the effects of the proposed alternatives, could result in a cumulative impact to effective habitat for the covered species, general wildlife, and species of concern

[10] Based on annual average changes by the 2050s as reported by www.climatewizard.org; Model: Ensemble Average, SRES emission scenario: A2

including the northern leopard frog and other amphibians. The frequency and magnitude of these cumulative effects are unknown.

Land Conservation and Management. Several past, present, and reasonably foreseeable conservation and land management actions, such as NWR management, LPP implementation, ongoing private land conservation, and future Rio Grande Natural Area management, are likely to benefit riparian vegetation and habitat by promoting the protection and stewardship of high-quality, diverse, native vegetation. The HCP alternatives would result in cumulative benefits by further encouraging such stewardship throughout the Valley, with the greatest cumulative benefits resulting from the Regional HCP alternative.

Climate Change. Changes in precipitation and temperature patterns and resulting changes in irrigation management due to climate change are likely to affect riparian vegetation, the covered species, general wildlife, and species of concern over the long term. The effects of these projected changes on runoff, vegetation, and wildlife remain uncertain. While the direct effects of climate change are not known, the HCP alternatives would likely result in indirect cumulative benefits to these resources by promoting Valley wide habitat conservation and management.

Cumulative Effects on the Socioeconomic Setting

The existing water delivery has created and sustained the agricultural industry that is the foundation of the Valley's economy. Several reasonably foreseeable economic trends, including alternative energy development and long-term development of private lands, have the potential to benefit the Valley's economy through economic growth and diversification. The proposed HCP alternatives would add to these socioeconomic benefits by providing local communities and landowners additional certainty related to ESA compliance as they make long-term economic and infrastructure decisions. Conversely, the No Action alternative could detract from economic growth and stability by continuing the uncertainty related to the cost and nature of case-by-case ESA compliance. Overall, the HCP alternatives would result in minor cumulative benefits to the socioeconomic setting, while the No Action alternative would result in minor adverse cumulative effects.

Cumulative Effects on Habitat Conservation Efforts

Past and present land and habitat conservation efforts have contributed to the current mosaic of public and private lands in the Valley that are protected from development and/or are managed to sustain riparian habitat values. The proposed HCP alternatives, when combined with the benefits of past efforts, would result in minor cumulative benefits to habitat conservation efforts in the Valley by providing a framework for voluntary habitat conservation and a forum to grow and develop collaborative partnerships.

4.0 LIST OF PREPARERS

Name	Title/Role	Affiliation
HCP Planning Team		
Bill Mangle	Natural Resource Planner	ERO Resources Corporation
Ron Beane	Wildlife Biologist	ERO Resources Corporation
Steve Vandiver	Manager	Rio Grande Water Conservation District
David Robbins	Attorney/RGWCD Counsel	Hill & Robbins, P.C.
Ingrid Barrier	Attorney/RGWCD Counsel	Hill & Robbins, P.C.
U.S. Fish and Wildlife Service		
Al Pfister	Western Colorado Supervisor (retired)	Western Colorado Office
Terry Ireland	Fish and Wildlife Biologist	Western Colorado Office
Amelia Orton-Palmer	Conservation Plans and Grants Coordinator	Region 6 Regional Office
Additional Contributors		
Sean Larmore	Senior Archaeologist	ERO Resources Corporation
Wendy Hodges	GIS and Mapping Support	ERO Resources Corporation

5.0 CONSULTATION AND COORDINATION

During the development of the draft HCP and EA, District representatives met with stakeholder groups on numerous occasions to solicit information and feedback, disseminate information about the HCP, and develop partnerships to assist with the long-term implementation of the HCP. These meetings included multi-stakeholder forums, presentations to group meetings, and individual consultations and occurred from February 9, 2005 through May 14, 2012. Stakeholder groups included resource management agencies, land trusts, environmental organizations, river restoration organizations, agricultural organizations, and local jurisdictions. Tribal consultation with the Southern Ute Tribe has been initiated (see section 1.6 or 3.6) and any comments or concerns will be addressed. The following organizations were represented at the various stakeholder meetings:

- Alamosa Mosquito Control District
- Alamosa River Restoration Project
- Audubon Society
- Bureau of Land Management
- San Luis Valley Cattleman's Association
- Colorado Department of Transportation
- Colorado Division of Water Resources
- Conejos Water Conservancy District
- Colorado Parks and Wildlife
- Ducks Unlimited
- Environmental Defense
- Local and State Farm Bureaus
- Land Rights Council
- Natural Resource Conservation Service
- Rio Grande Headwaters Land Trust
- Rio Grande Water Conservation District
- Rocky Mountain Bird Observatory
- San Luis Valley Association of Conservation Districts
- San Luis Valley County Commissioners Association
- San Luis Valley Ecosystem Council
- San Luis Valley GIS/GPS Authority
- San Luis Valley Water Conservancy District
- San Luis Valley Wetland Focus Area Committee
- The Nature Conservancy
- The Trust for Public Land
- U.S. Fish and Wildlife Service

REFERENCES

Alamosa County. 2008. Alamosa County Conceptual Land Use Plan.

Andrews, R.A. and R. Righter. 1992. Colorado Birds. Denver Museum of Natural History, Denver, CO.

Bent, A.C. 1940. Life histories of North American cuckoos, goatsuckers, hummingbirds, and their allies. *In* Corman, T.E. and R.T. Magill. Western yellow-billed cuckoo in Arizona: 1998 and 1999 survey results, Nongame and Endangered Wildlife Program Tech. Rep. 150. Arizona Game and Fish Department, Phoenix, AZ.

Bureau of Land Management and U.S. Department of Energy (BLM and DOE). 2010. Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States. Revised Map of Proposed Solar Energy Zones in Colorado. December, 2010.

Buehler, D.A. 2000. Bald Eagle (*Haliaeetus leucocephalus*). *In* The Birds of North America, No. 506 (A. Poole and F. Gill, eds.). The Birds of North America, Inc., Philadelphia, PA.

Cady, Tony. (no date). Colorado Department of Transportation, Region 5. Personal communication with Ron Beane, ERO Resources Corporation.

Carter, M. 1998. Yellow Billed Cuckoo. *In* Colorado Breeding Bird Atlas. Kingery, H. (ed.). Colorado Bird Atlas Partnership and Colorado Division of Wildlife.

Climate Wizard. 2011. Change in Annual Temperature by the 2050s . Model: Ensemble Average, SRES emission scenario: A2. Available at: www.climatewizard.org. Last accessed: December 12, 2011.

Council on Environmental Quality (CEQ). 1997. Environmental Justice: Guidance Under The National Environmental Policy Act. December 10.

Colorado Breeding Bird Atlas II (COBBA II) 2012. Available at http://www.cobreedingbirdatlasii.org/. Last accessed June 11, 2012.

Colorado Demography Office. 2011. Available at: http://dola.colorado.gov/demog/Demog.cfm. Last accessed: April 20, 2011.

Colorado Economic and Demographic Information System. 2011. Available at: http://www.dola.state.co.us/is/cedishom.htm. Last accessed: April 20, 2011.

Colorado Department of Labor and Employment. 2011. Colorado LMI Gateway. http://lmigateway.coworkforce.com/lmigateway/default.asp. Last accessed: April 20, 2011.

CNAP. 2011. Colorado Natural Areas Program. Natural Areas Information. Available at: http://www.parks.state.co.us/NaturalResources/CNAP/Pages/CNAP.aspx. Last accessed May 2, 2011.

Colorado Natural Heritage Program (CNHP). 1998. Saguache County, Closed Basin Biological Inventory Volume II: A Natural Heritage Assessment of Wetlands and Riparian Areas in the Closed Basin, Colorado Final Report. Prepared for Colorado

Department of Natural Resources and the U.S. Environmental Protection Agency. Prepared by Daniel A. Starr and John Anderson. February 1998.

Colorado Natural Heritage Program (CNHP). 2000. Biological Inventory of Rio Grande and Conejos Counties, Colorado. Prepared for The Nature Conservancy. Prepared by Steve Kettler, Joe Rocchio, Robert Schorr, and Julie Burt. March 31, 2000.

Colorado Natural Heritage Program (CNHP). 2004. Survey of Critical Wetlands and Riparian Areas in Southern Alamosa and Costilla Counties, San Luis Valley, Colorado. Prepared for Colorado Department of Natural Resources. Prepared by Joe Rocchio. June 29, 2004.

Colorado Natural Heritage Program (CNHP). 2006. Baca Grande Biological Assessment 2005. Prepared for the Crestone/Baca Land Trust. Colorado Natural Heritage Program. Fort Collins, CO.

Colorado State Demography Office. 2012. Population Forecasts – 2000-2040. September, 2011.

Denver Post. 2011. Solar energy taking a shine to San Luis. By Mark Jaffe. March 6, 2011.

Durst, S.L., M.K. Sogge, A.B. Smith, S.O. Williams III, B.E. Kus, and S.J. Sferra. 2005. Southwestern Willow Flycatcher Breeding Site and Territory Summary – 2003. USGS Southwest Biological Science Center report to the U.S. Bureau of Reclamation.

ERO Resources Corporation (ERO). 2005. Summary Class 1 Cultural Resource Report. San Luis Valley Regional Habitat Conservation Plan. Prepared by Sean Larmore and Bill Mangle.

Fitzgerald, J.P., C.A. Meaney, and D.M. Armstrong. 1994. Mammals of Colorado. Denver Museum of Natural History and University Press of Colorado.

Franzreb, K.E. and S.A. Laymon. 1993. A reassessment of the taxonomic status of the yellow billed cuckoo. Western Birds 24:17-28.

Hammerson, G.A. 1999. Amphibians and Reptiles in Colorado: A Colorado Field Guide, Second Edition. University Press of Colorado and Colorado Division of Wildlife. Denver, CO.

Harris, J.H., S.D. Sanders, and M.A. Flett. 1987. The status and distribution of the willow flycatcher (Empidonax traillii) in the Sierra Nevada. California Department of Fish and Game, Wildlife Management Branch Administrative Report 87-2.

Hawks Aloft, Inc. 2003. Southwestern willow flycatcher (*Empidonax trailii extimus*) surveys in the San Luis Valley, CO. Report submitted to Alamosa National Wildlife Refuge, Alamosa, CO. October 23.

Hawks Aloft, Inc. 2004. 2004 willow flycatcher surveys in Southern Colorado; Annual Report. Report submitted to David Klute, Colorado Division of Wildlife. September 30.

Hawks Aloft, Inc. 2005. Southwestern willow flycatcher surveys in the San Luis Valley, CO. Preliminary Report submitted to David Klute, Colorado Division of Wildlife.

Holleran, M. 2005. Historic Context for Irrigation and Water Supply: Ditches and Canals in Colorado. Prepared by the Center for Preservation Research, University of Colorado at Denver and Health Sciences Center for the Colorado Historical Society State Historical Fund (Grant No. 2001-02-068).

IPCC. 2007. Climate Change 2007: Synthesis Report. Contribution of Working Groups I, II and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, Pachauri, R.K., and A. Reisinger (eds.)]. IPCC, Geneva, Switzerland, 104 pp.

King, J.E. 1984. Colorado Engineering Context. Prepared for the Office of Archaeology and Historic Preservation, Colorado Historical Society.

Kingery, H.E.. 1998. Colorado Breeding Bird Atlas. Colorado Bird Atlas Partnership and Colorado Division of Wildlife. Denver, Colorado.

Kissinger, C. 2005. San Luis and Rio Grande Railroad. Personal communication with Elaine Davinroy, Rio Grande Water Conservation District. July.

Lucero, J. 2005. Bureau of Land Management. Personal communication with Elaine Davinroy, Rio Grande Water Conservation District. August 22.

Lucero, J. 2009. Biologist, Bureau of Land Management. Personal communication with R. Beane, ERO Resources Corporation. May 27.

Lucero, J. and A. Cariveau. 2004. Yellow-billed cuckoo in the San Luis Valley. Colorado Birds. 38(2):67-68.

Martell, M. 1992. Bald Eagle Winter Management Guidelines. USFWS, Reg. 3, Minneapolis, MN.

National Park Service (NPS). 2011. Nationwide Rivers Inventory. Available at: http://www.nps.gov/ncrc/programs/rtca/nri/. Last accessed: May 11, 2011.

Natural Resources Conservation Service (NRCS). 2011. Prime Colorado Farm Land by County. Available at: http://www.co.nrcs.usda.gov/technical/soil/important-farmlands/prime-farm-lands.html. Last accessed: May 11, 2011.

NatureServe 2012. Coccyzus americanus – Yellow-Billed cuckoo. NatureServe Exployer; An online encyclopedia of life. Available at: http://www.natureserve.org/explorer/servlet/NatureServe?searchName=Coccyzus+americanus. Updated February 2012. Last accessed June 11, 2012.

Pritchard, V.L. and D.E. Cowley. 2006. Rio Grande Cutthroat Trout (*Oncorhynchus clarkii virginalis*): a technical conservation assessment. USDA Forest Service, Rocky Mountain Region. Available at: http://www.fs.fed.us/r2/projects/scp/assessments/riograndecutthroattrout.pdf. Last accessed: April 13, 2011. July 28.

Rees, D.E. and W.J. Miller. 2005. Rio Grande Sucker (*Catostomus plebeius*): a technical conservation assessment. USDA Forest Service, Rocky Mountain Region. Available at: http://www.fs.fed.us/r2/projects/scp/assessments/riograndesucker.pdf. Last accessed: April 13, 2011. May 16.

Rees, D.E., R.J. Carr, and W.J. Miller. 2005. Rio Grande Chub (*Gila pandora*): a technical conservation assessment. USDA Forest Service, Rocky Mountain Region. Available at: http://www.fs.fed.us/r2/projects/scp/assessments/riograndechub.pdf. Last accessed: April 13, 2011. May 11.

Relyea, R.A. 2008. A cocktail of contaminants: how mixtures of pesticides at low concentrations affect aquatic communities. Oecologia DOI: 10.1007/s00442-008-1213-9. November 11.

Relyea, R.A. and N. Diecks. 2008. An unforeseen chain of events: lethal effects of pesticides on frogs at sublethal concentrations. Ecological Applications 18:1728-1742.

Rio Grande County. 2004. Rio Grande County Joint Master Plan. Del Norte, Monte Vista, Rio Grande County.

Rio Grande Headwaters Land Trust (RiGHT). 2006. The Rio Grande Initiative. Protecting Colorado's Legendary Rio Grande River. Newsletter. Vol. 1. Available at: http://www.riograndelandtrust.org/rio_grande_initiative.htm. October.

Seglund, A.E. and P.M Schnurr. 2010. Colorado Gunnison's and white-tailed prairie dog conservation strategy. Colorado Division of Wildlife. Available at: http://wildlife.state.co.us/NR/rdonlyres/BDE05832-7403-42E9-B3B7-0BFB3D258954/0/ColoradoGunnisonsandWhitetailedPrairieDogConservationStrategy_070910.pdf.

Senate Bill 443, 110th Congress (S.443). Sangre de Cristo National Heritage Area Act.

San Luis Valley Regional Planning Commission (SLVRPC). 2004. Colorado Department of Transportation - San Luis Valley 2030 Regional Transportation Plan. November 1.

San Luis Valley Water Conservancy District (SLVWCD). 2001. Rio Grande Headwaters Restoration Project. Prepared for SLVWCD, RGHRP Technical Advisory Committee, and the Colorado Water Conservation Board. October.

Spencer, J.A., S.J. Sferra, T.E. Corman, J.W. Rourke, and M.W. Sumner. 1996. Arizona Partners in Flight 1995. Southwestern Willow Flycatcher survey. Arizona Game and Fish Department, Phoenix. Nongame Technical Report 97.

Stafford, M.D. and B.E. Valentine. 1985. A preliminary report on the biology of the willow flycatcher in the central Sierra Nevada. California-Nevada Wildlife Trans.

Stone, K. 2005. Refuge Biologist. U.S. Fish and Wildlife Service. Personal communication with Elaine Davinroy, Rio Grande Water Conservation District. August 22.

Tacha, T. C., S. A. Nesbitt and P. A. Vohs. 1992. Sandhill Crane (Grus canadensis), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/031doi:10.2173/bna.31

Teyler, H. 2005. Manager, Alamosa Mosquito Control District. Personal communication with Bill Mangle, ERO Resources.

Teyler, H. 2008. Manager, Alamosa Mosquito Control District. Personal communication with Bill Mangle, ERO Resources.

U.S. Department of Agriculture (USDA). 2002. Colorado Agricultural Statistics Service. 2002 Census of Agriculture, County Profiles.

U.S. Environmental Protection Agency. 1999. Consideration of Cumulative Impacts in EPA Review of NEPA Documents. EPA 315-R-99-002. May 1999.

U.S. Fish and Wildlife Service (Service). 1995. Final rule determining endangered status for the southwestern willow flycatcher (*Empidonax traillii extimus*). Federal Register 60:10694. February 27.

U.S. Fish and Wildlife Service (Service). 2002. Southwestern Willow Flycatcher Recovery Plan. Albuquerque, New Mexico. i-ix + 210 pp., Appendices A-O.

U.S. Fish and Wildlife Service (Service). 2003. Alamosa-Monte Vista National Wildlife Refuge Complex – Comprehensive Conservation Plan.

U.S. Fish and Wildlife Service (Service). 2005. Baca National Wildlife Refuge - Draft Conceptual Management Plan.

U.S. Fish and Wildlife Service (Service). 2009. Rising to the Challenge: Strategic Plan for Responding to Accelerating Climate Change. Draft. September 21.

U.S. Fish and Wildlife Service. 2012a. Draft environmental assessment and land protection plan. May 2012. 120 pp.

U.S. Fish and Wildlife Service (Service). 2012b. Land Protection Planning: San Luis Valley Conservation Area. Available at: http://www.fws.gov/mountain-prairie/planning/lpp/co/slv/slv.html. Accessed May 9, 2012.

U.S. Fish and Wildlife Service and National Marine Fisheries Service (Service and NMFS). 1996. Habitat Conservation Planning Handbook.

U.S. Forest Service (USFS). 1997. Final environmental impact statement for Arapaho and Roosevelt National Forests and Pawnee National Grasslands. Fort Collins, CO.

Woodling, J. 1985. Colorado's Little Fish: A Guide to the Minnows and Other Lesser Known Fishes in the State of Colorado. Colorado Division of Wildlife, Denver, CO.