# APPENDIX E: BIOLOGICAL ASSESSMENT

# United States Department of the Interior

FISH AND WILDLIFE SERVICE
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IN REPLY REFER TO:
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JUN 2 2 2009

Memorandum

To: Deputy State Director, Division of Energy, Lands and Mineral

From: Colorado Field Office Supervisor, U.S. Fish and Wildlife Service

Subject: Section 7 Concurrence on Baca Land Exchange

This responds to your updated biological assessment received April 17, 2009, regarding the proposed Baca Land Exchange in Saguache, Alamosa, Conejos, and Fremont counties, Colorado. The original letter and biological assessment were provided on August 8, 2007. You requested concurrence with your determination that the land exchange may affect, but is not likely to adversely affect the Mexican spotted owl (*Strix occidentalis lucida*) (threatened) and Mexican spotted owl critical habitat, southwestern willow flycatcher (*Empidonax traillii extimus*) (endangered), Canada lynx (*Lynx canadensis)* (threatened), yellow-billed cuckoo (*Coccyzus americanus*) (candidate), and Gunnison's prairie dog (*Cynomys gunnisoni*) (candidate). The United States Fish and Wildlife Service (Service) is concerned about the protection of threatened and endangered species, as well as species that are candidates or proposed for official listing as threatened or endangered (Federal Register, Vol. 69, No. 62, March 31, 2004). These comments have been prepared under the provisions of the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. 1531 et. seq.).

The proposed action consists of a land exchange that is designed to acquire State of Colorado lands (State Land Board lands) within the legal perimeters of the Baca National Wildlife Refuge and the Great Sand Dunes National Park. For ease of land management, it is the preference of both the state and federal governments to exchange land parcels to create greater continuity of both surface and subsurface management. As a result of the exchange, the State Land Board (SLB) would acquire 20,870.03 acres of Bureau of Land Management (BLM) land (surface and mineral estate) and the federal government would acquire 57,056.11 acres of SLB land (51,245 acres of surface and mineral estate and 5,810 acres of mineral estate). While the U.S. Fish and Wildlife Service (FWS) and National Park Service (NPS) are the federal beneficiaries of this land exchange, the BLM is the lead federal agency coordinating for the land exchange. The federal lands being considered for exchange to the State are currently under the management of the BLM, yet the land that would be acquired by

the federal government will almost entirely be managed by either the FWS or the NPS. Only a small portion of the current SLB acreage would go into BLM management. BLM parcels that will be transferred to the State include the following sites: Table Mountain (Fremont County), Gribbles Park (Fremont County), Biedell Creek (Saguache County), and La Jara (Conejos County).

The biological assessment provided an analysis of effects to federally-listed species that was based on: 1) the potential for the species to occur within an exchange parcel, based on either known occurrences or habitat suitability; and 2) the effects on the species that may result from changed management following the land exchange. Of particular interest are those land parcels that will no longer be under federal management, since federally-managed lands provide additional conservation of species through Section 7 of the Act, which directs Federal interagency cooperation to conserve federally-listed species and designated critical habitats. Section 7 (a)(1) of the Act directs that all federal agencies review programs administered by them and utilize such programs to further the purposes of the ESA, and Section 7 (a)(2) states that each federal agency shall insure that any action they authorize, fund, or carry out it not likely to jeopardized the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat.

The anticipated activities on lands transferred to the SLB will primarily include livestock grazing, timber harvest, mineral extraction, and access for wildlife-dependent recreation. The SLB will enter all parcels at the Biedell Creek site and La Jara site into the Stewardship Trust program, which will provide additional management towards conserving the natural values of the land.

A summary of the analysis of effects is provided in the following text:

Mexican Spotted Owl

- Gribbles Park, Biedell, Refuge, Park, and BLM sites are dominated by vegetation types and terrain unsuitable for Mexican spotted owls.
- The Table Mountain site does not provide breeding habitat for Mexican spotted owls, but could provide wintering habitat, based on presence of lower elevation ponderosa and pinyon-juniper trees and its proximity to known owl sites. Wintering habitat is not considered to be a limiting factor for Mexican spotted owl conservation, as compared to breeding habitat.
- The expected future State management of the Table Mountain site would largely retain the vegetation cover used by wintering owls.
- While the Table Mountain site is within the boundary of designated critical habitat for Mexican spotted owl, it does not contain the primary constituent elements of critical habitat, namely dense mixed conifer forests, and, as such, is not considered critical habitat. Therefore, the proposed land exchange will not result in adverse effects to Mexican spotted owl critical habitat.
- The La Jara site does not contain mixed conifer types (Douglas-fir and ponderosa forests) that typically support Mexican spotted owls, as opposed to the spruce-fir

forests that are present at the site. Also, the open canyon configuration at the site is not likely to support Mexican spotted owls. The expected future management of the State at the La Jara site would largely retain the vegetation cover used by owls, if present.

Southwestern Willow Flycatcher

- The Table Mountain and Gribbles Park sites are outside the species range. The exchange of the Refuge, Park, BLM, and Biedell Creek sites will have no effect on the flycatcher due to the absence of flycatcher habitat on these parcels.
- There are no known records of the flycatcher presence in the remaining parcels, however, surveys have not been conducted. At the La Jara site, most of the parcels do not support vegetation capable of becoming flycatcher habitat, with the exception of parcels 21 and 23, which contain some small areas of potential flycatcher habitat (approximately 10.2 acres of riparian vegetation). The SLB has agreed to implement specific conservation measures to manage potential flycatcher habitat in these parcels. The SLB will provide monitoring reports upon request by the FWS.

Canada Lynx

- The Table Mountain, Gribbles Park, Biedell, Refuge, Park and BLM sites do not contain lynx habitat.
- None of the exchange sites are in lynx linkage areas.
- The La Jara site does contain scattered parcels with lynx habitat (i.e., spruce and fir) and is close (within approximately 1 mile) to the La Jara Lynx Analysis Unit (LAU) on U.S. Forest Service land. The amount of lynx habitat to be exchanged at the La Jara site is negligible (1% of the combined FS and BLM La Jara LAU).
- The SLB has indicated the La Jara parcels would be placed into the Stewardship Trust program, which manages for the natural values of the land. The expected future State management of the La Jara site would largely retain the vegetation cover and habitat conditions for lynx. The possibility of adverse effects from SLB management is considered discountable (unlikely to occur).
- Critical habitat for the lynx has not been designated in Colorado.

Yellow-billed Cuckoo

- The exchange of the Table Mountain and Gribbles Park sites will have no effect on the cuckoo since these sites are outside the range of the listed entity.
- The exchange of the Biedell Creek, La Jara, Refuge and BLM sites will have no effect on cuckoos due to the absence or lack of suitable habitat on these parcels.
- The net change in potential cuckoo habitat in Federal management is an increase of nearly 50 acres. The habitat in-coming to the Federal government will be managed for the benefit and recovery of cuckoos, if present.

Gunnison's Prairie Dog

- The SLB management is compatible for continued Gunnison's prairie dog occupancy on the land exchange sites to be acquired by the State.
    - The SLB management of the La Jara, Biedell and Gribble's Park parcels includes continued livestock grazing that will likely have limited impact on habitat conditions necessary for existence of Gunnison's prairie dogs.
    - The SLB has no plans to institute poisoning of any kind on these parcels.
- The Biedell Creek and La Jara Sites, which contain the majority of potential habitat for Gunnison's prairie dogs leaving the federal estate, will be placed in the Stewardship Trust Program. An inventory of habitat conditions and species use will be documented as part of the State's management of this candidate species.
- The amount of land involved in the land exchange that is considered potentially suitable habitat is a minor portion (<0.5%) of the habitat in the Southeast Individual Population Area (IPA), which is the Colorado Division of Wildlife's identification of areas where Gunnison's prairie dogs predominantly exist and where management activities should be focused.
- There is a net gain of over 41,000 acres of potentially suitable habitat coming into the federal estate through this land exchange at the refuge and Park sites. Any prairie dog populations on these acres would be managed as a candidate species on the Federal lands.

Based on the information provided in the biological assessment, the Service concurs that the proposed action may affect, but is not likely to adversely affect the Mexican spotted owl and Mexican spotted owl critical habitat, southwestern willow flycatcher, and Canada lynx. While we do not consult on candidate species, we agree that the proposed action will not negatively impact the yellow-billed cuckoo and the Gunnison's prairie dog, and is likely to contribute to the conservation of these species.

If any additional species that are Federally-listed, proposed for Federal listing, or candidate for Federal listing are found at the project site, or if project plans change, this office should be contacted to determine if further consultation will be required. If you require additional information, please contact Leslie Ellwood of this office at (303) 236-4747.

cc: FWS/ES/CFO-GJ (T. Ireland)

Ref: Projects\BLM\BLM_Baca Land Exchange_FWSconcur

# Baca Land Exchange
# Biological Assessment

Prepared by: Mike Artmann, FWS and Cay Ogden, NPS
Revised April 2009

## Table of Contents

## I. INTRODUCTION

The purpose of this biological assessment (BA) is to analyze the effects of the proposed "Baca Land Exchange" and to document whether the exchange is likely to jeopardize the continued existence of any threatened, endangered or proposed species. As required under Section 7(a) of the Endangered Species Act (Act) (16 U.S.C.1531 et seq.), federal agencies are to use their authorities to conserve threatened and endangered species, and consult with the U.S. Fish and Wildlife Service (FWS), to ensure that their actions do not jeopardize listed species or adversely modify proposed or designated critical habitat.

In a letter from U.S. Fish and Wildlife Service, dated April 12, 2005, the Service concurred with a list of candidate, threatened and endangered species and critical habitat in the vicinity of the proposed action (Saguache, Fremont, Conejos and Alamosa Counties, Colorado) (Table 1). As a result of preliminary analysis for this BA, several of the species in the list were dismissed from further analysis. Appendix 1 to this BA provides the rationale for dismissing the other species and Table 1 summarizes that rationale. In addition, this BA was substantially completed prior to the official delisting of the bald eagle (August 8, 2007); therefore it was retained in the BA.

This BA analyzes the effects of the land exchange on six federally-listed species and one critical habitat designation (Table 1). The action area for this BA is the entirety of the land parcels being considered in the land exchange (Table 2)**,** plus adjacent acreage, as appropriate for a particular species.

**Table 1. ESA-listed Species analyzed in the BA and rationale for early dismissal of some species**

| **Species** | **Status in BA analysis and rationale** |
|---|---|
| Bald eagle | Fully analyzed |
| Mexican spotted owl | Fully analyzed |
| Mexican spotted owl critical habitat | Fully analyzed |
| Southwestern willow flycatcher | Fully analyzed |
| Yellow-billed cuckoo | Fully analyzed |
| Gunnison's Prairie Dog | Fully analyzed |
| Canada lynx | Fully analyzed |
| Gunnison sage grouse | Removed from ESA analysis due to changed legal status of the species (see EA for treatment of this species) |
| Boreal toad | Removed from ESA analysis due to changed legal status of the species (see EA for treatment of this species) |
| Black-footed ferret | Dismissed from analysis. FWS concurrence that ferret does not currently exist in the San Luis Valley and there are no reintroduction plans. |
| Arkansas darter | Dismissed from analysis. Does not occur within 18 miles of land exchange site and there is no aquatic habitat in that site. |

| | |
|---|---|
| Green-back Cuthroat Trout | Dismissed from analysis. There is no stream habitat occurring within the Biedell Creek or the Refuge parcels occurring within Saguache County. |
| New Mexico Meadow Jumping Mouse | Dismissed from analysis. There is no appropriate (dense sedge-dominated) riparian habitat suitable for this species at the La Jara site. |
| Bonytail | Dismissed from analysis. None of the exchange parcels occur in the Colorado River Basin. |
| Colorado pikeminnow | Dismissed from analysis. None of the exchange parcels occur in the Colorado River Basin. |
| Humpback chub | Dismissed from analysis. None of the exchange parcels occur in the Colorado River Basin. |
| Razorback sucker | Dismissed from analysis. None of the exchange parcels occur in the Colorado River Basin. |
| Uncompahgre fritillary butterfly | Dismissed from analysis. None of the exchange parcels occur at or near suitable elevations (>12,000ft), nor do they have habitat suitable for the species. |

**Proposed Action**

An exchange of land between the US DOI Bureau of Land Management (BLM) and the Colorado State Land Board (SLB) is being evaluated in this BA (Figure 1). The proposed land exchange is designed to support the *Great Sand Dunes National Park and Preserve Act of 2000* (PL 106-530: PPA-2000) (Appendix A to EA). Specifically, PPA-2000 provides for the conversion of the Great Sand Dunes National Monument into Great Sand Dunes National Park and Preserve (Park). The law also provides for the establishment of the Baca National Wildlife Refuge (Refuge). Both the Refuge and Park are located in the San Luis Valley of south-central Colorado. They are approximately 92,617 acres and 150,000 acres in size, respectively.

The new boundaries of the Refuge and the Park encompassed significant acres of land managed by State Land Board (SLB) for the State of Colorado. For ease of land management, it is the preference of both the State and federal governments to exchange land parcels to create greater continuity of both surface and subsurface management. Figures 1 through 6 illustrate the current landownership and show how the landownership pattern would be 'blocked up' as a result of the exchange. PPA-2000 required that State lands within the Refuge and Park be acquired by the federal government through a land exchange. As a result of the exchange, the SLB would acquire 20,870.03 acres and the federal government would acquire 57,056.11 acres. These total acreages include subsurface and surface amounts, as noted in Figures 1 through 6 and Table 2.

While the U.S. Fish and Wildlife Service (FWS) and National Park Service (NPS) are the federal beneficiaries of this land exchange, the BLM is the official federal agency for the land exchange and the preparer of this BA. The federal lands being considered for exchange to the State are currently under the management of the BLM, yet the land that would be acquired by the federal government will almost entirely be managed by either the FWS or the NPS, depending on where they are located. Only a small portion of the current SLB acreage would go into BLM management. Appendix B to the BA displays the legal descriptions of the land involved in this proposed exchange and shows how those lands were aggregated into parcels for the purposes of this analysis.

For analysis purposes, the parcels are grouped into seven "sites" based on their geographic location (Figure 1 and Table 2). The individual parcel numbers are identified in black numbers on the Figures.

**Table 2. Summary of Land Exchange Sites.**

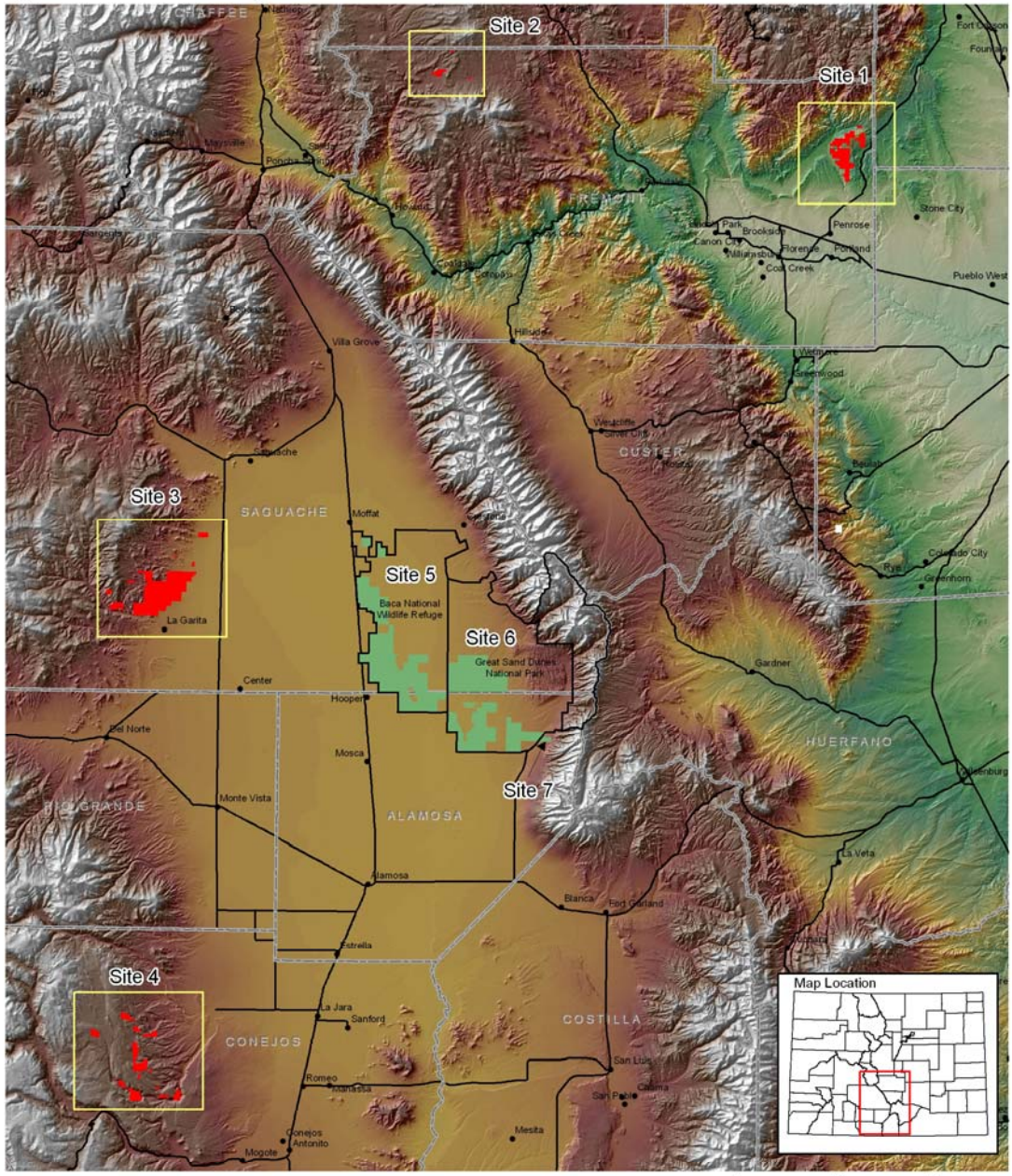
| Site Name | County | Land exchange intent | Total surface acreage (minerals acreage)* |
|---|---|---|---|
| Table Mountain | Fremont | From BLM to State | 1,692.62 (2,680.00) |
| Gribbles Park | Fremont | From BLM to State | 480.00 |
| Biedell Creek | Saguache | From BLM to State | 11,479.58 |
| La Jara | Conejos | From BLM to State | 4,537.83 |
| | | **Total to State** | **20,870.03(2,680.00)** |
| | | | |
| Baca NWR | Saguache/Alamosa | From State to FWS | 27,379.62(3,531.00) |
| Great Sand Dunes NP | Saguache/Alamosa | From State to NPS | 23,486.29(2,280.0) |
| BLM | Alamosa | From State to BLM | 380.00 |
| | | **Total to Federal** | **51,245.61(5,8110)** |

The Environmental Assessment (EA) for the Baca Land Exchange provides more description of the legal background for this project; the EA "Purpose and Need" is hereby incorporated by reference.

**Baca Land Exchange Project**

A Joint Project between U.S. Fish & Wildlife Service, National Park Service, Bureau of Land Management, Colorado State Land Board

Figure 1. Baca Land Exchange Overview.



***Federal Land Parcels Proposed for transfer to the SLB***

Federal lands (for acquisition by the SLB) are located in Fremont, Saguache, and Conejos counties. Approximately 18,190 acres (Figures 2, 3, 4, and 5; Table 2) of surface and mineral estate and approximately 2,680 acres of mineral estate only are included. The Table Mountain and Gribbles Park sites are administered by BLM's Royal Gorge Resource Area, and the Biedell Creek and La Jara sites are administered by BLM's San Luis Valley Public Lands Center.

The BLM Parcels consist of:

- Table Mountain Site (Fremont County, Figure 2)
    - 1,692.62 acres of surface and mineral estate
    - 2,680.00 acres of mineral estate (SLB owns surface)
- Gribbles Park Site (Fremont County, Figure 3)
    - 480.00 acres of surface and mineral estate
- Biedell Creek Site (Saguache County, Figure 4)
    - 11,479.58 acres of surface and mineral estate
- La Jara Site (Conejos County, Figure 5)
    - 4,537.83 acres of surface and mineral estate

The BLM is authorized to complete land exchanges under section 206 of the Federal Land Policy and Management Act of 1976 (FLPMA, as amended 2001, quote below), after a determination is made that the public interest will be served (BLM 2002).

> "Lands acquired by the Secretary by exchange under this section which are within the boundaries of any unit of the National Forest System, National Park System, National Wildlife Refuge System, … upon acceptance of title by the United States shall immediately be reserved for and become part of the unit or area within which they are located, without further action by the Secretary, and shall thereafter be managed in accordance with all laws, rules, and regulations applicable to such unit or area (P.L. 100-409 §3, 8-20-88)".

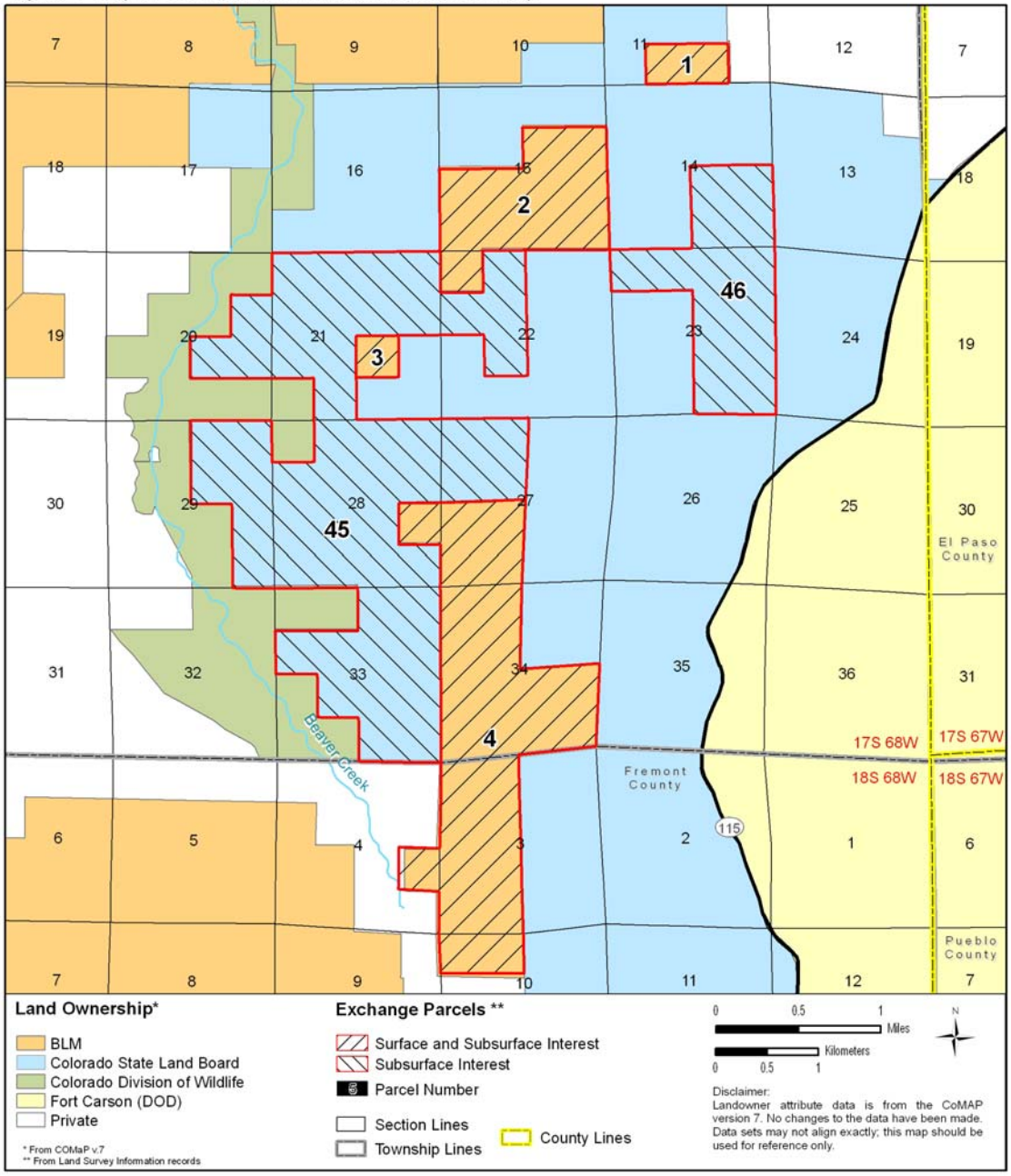
When considering the public interest, the authorized BLM officer gives full consideration to: 1) the opportunity to achieve better management of federal lands; 2) the needs of the state and local residents and their economics; and 3) securing important resource management objectives including but not limited to protection of fish and wildlife habitat, riparian habitat, river frontage, cultural resources, recreation opportunities, and watersheds (BLM 2002).

This proposed exchange provides overall public benefits from the federal government viewpoint, by acquiring lands with exceptional resource values of high public benefit to be managed as part of the Park and Refuge.

**Baca Land Exchange Project**

A Joint Project between U.S. Fish & Wildlife Service, National Park Service, Bureau of Land Management, Colorado State Land Board

Figure 2. Map of Table Mountain in relation to landownership.



**Baca Land Exchange Project**

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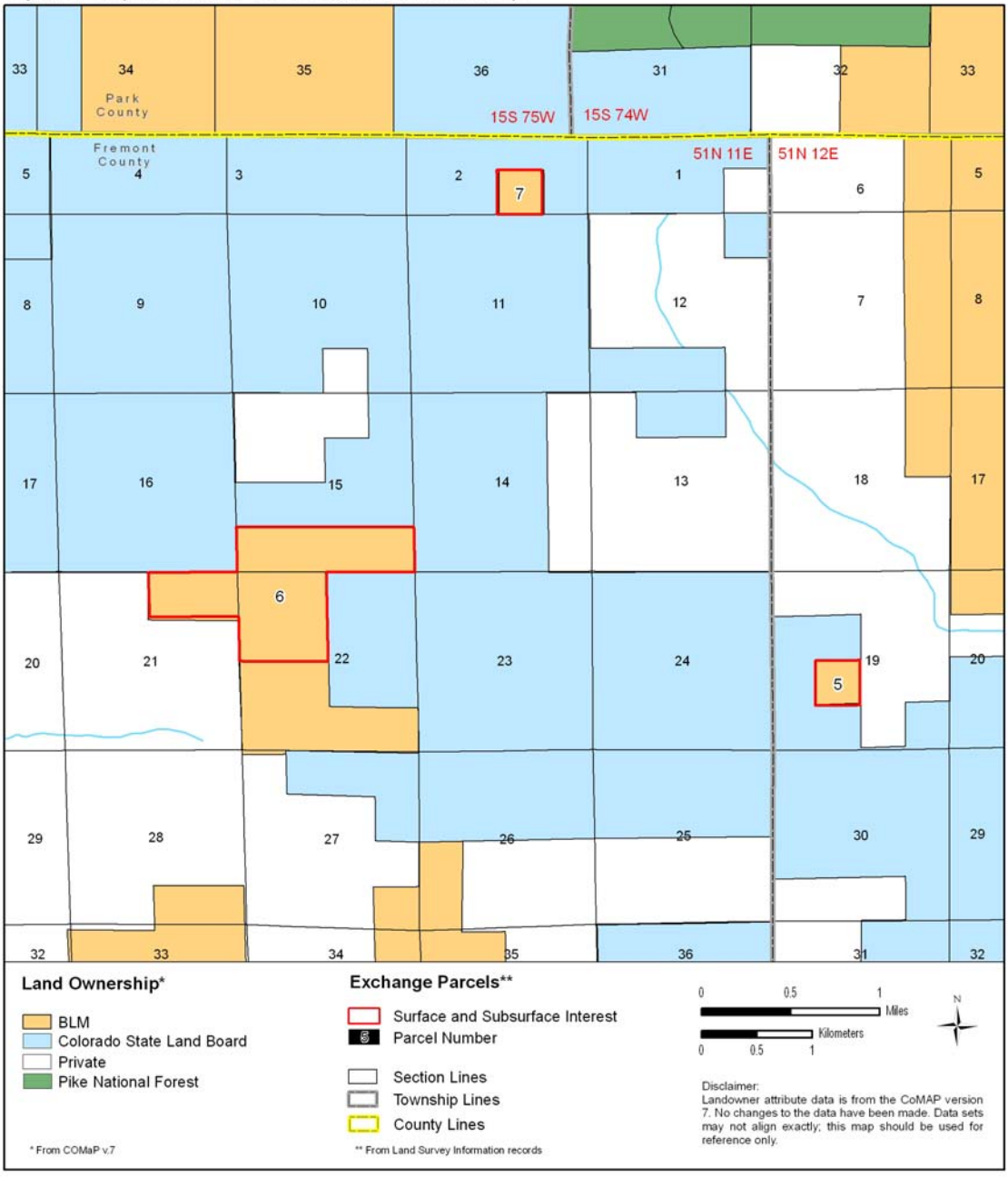
Figure 3. Map of Gribbles Park in relation to landownership.



**Baca Land Exchange Project**

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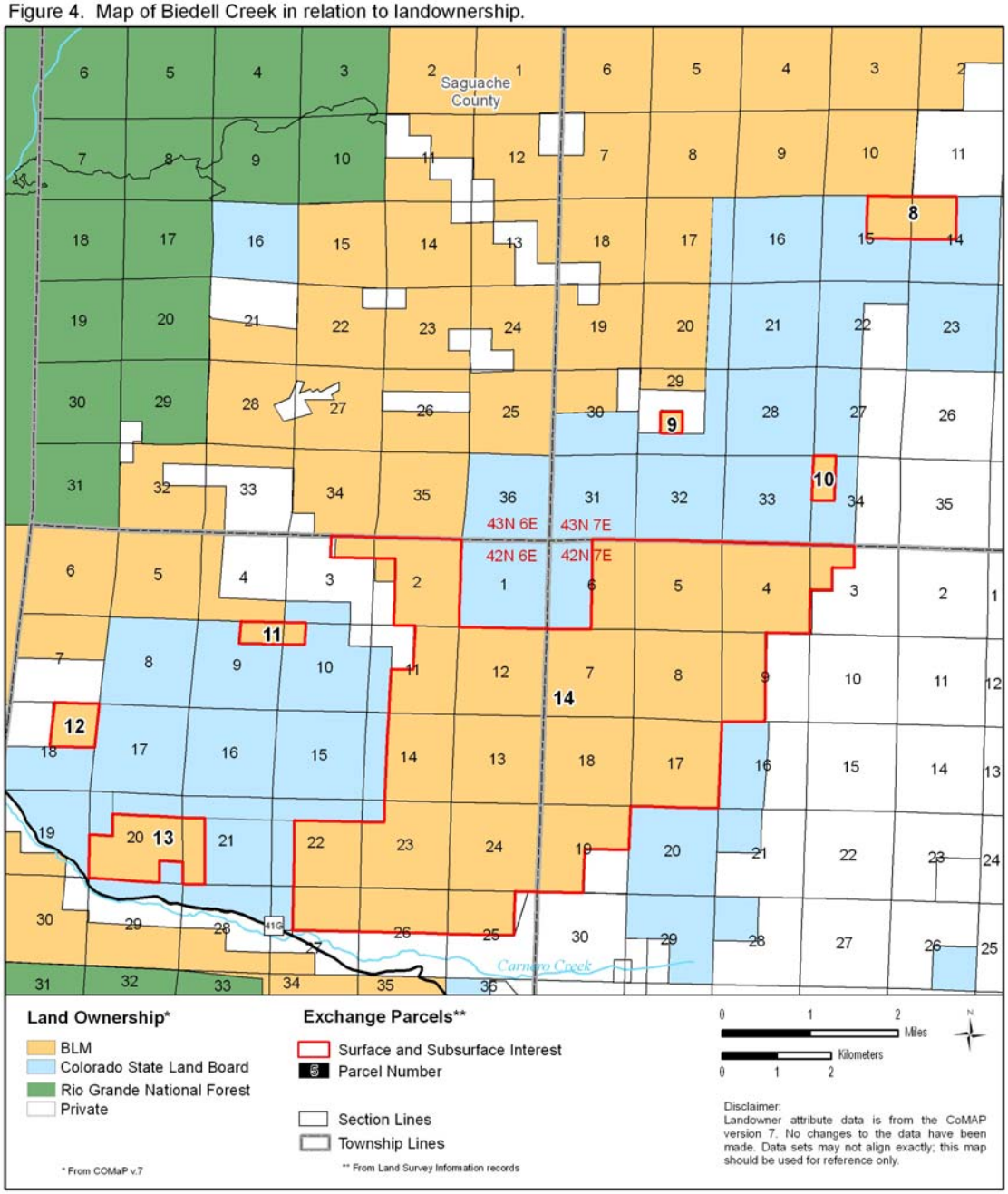
Figure 4. Map of Biedell Creek in relation to landownership.



**Baca Land Exchange Project**

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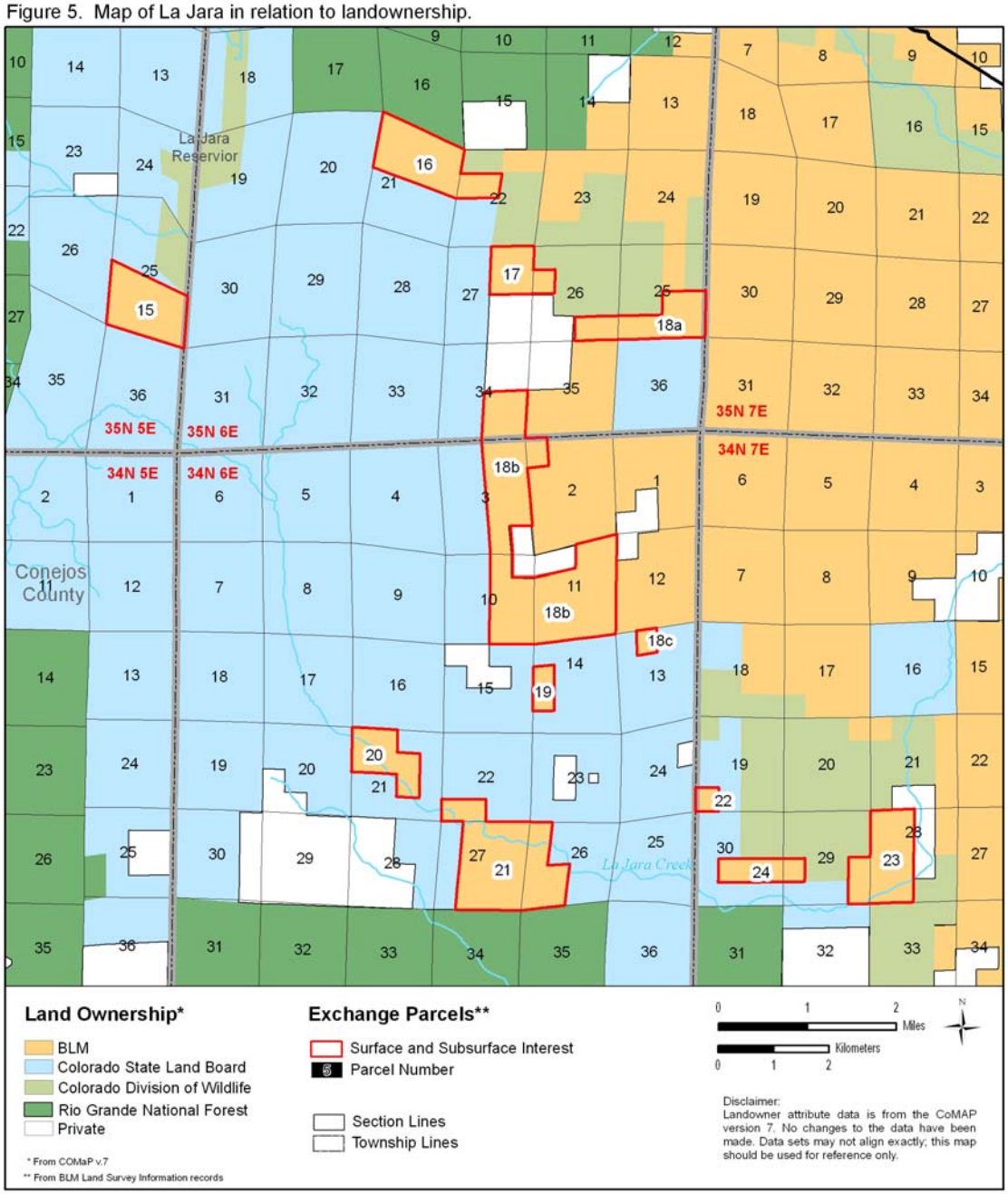
Figure 5. Map of La Jara in relation to landownership.



***State Land Board Parcels proposed for transfer to federal government***

The proposed land exchange involves the federal acquisition of approximately 51,245.61 acres of SLB land surface and mineral estate, and 5,810 acres of mineral estate (Table 2). Nearly all of the SLB land parcels in the land exchange are in the boundaries of the Baca National Wildlife Refuge and the Great Sand Dunes National Park and Preserve (Figure 6). A relatively small parcel would be transferred to the BLM. For the purpose of this BA, we'll discuss the state lands proposed to enter the federal estate as the Refuge Site, the Park Site, or the BLM Site.

These lands include Parcels 26 through 47 in Figure 6. Interest in parcels 26, 39, 40, 41, 42, 43, and 47 are proposed to be transferred to the FWS within the Refuge. Parcels 27, 28, 29, 30, 35, 36, 37, 38, and 44 would be transferred to the NPS. Parcel 31 and that portion of Parcel 30 east of Highway 160 would be transferred to the BLM.

The State parcels consist of:

- Refuge Site (Saguache and Alamosa Counties, Figure 6)
    - 27,379.62 acres of surface and mineral estate
    - 3,531.00 of mineral estate
- Park Site (Saguache and Alamosa Counties, Figure 6)
    - 23,486.29 acres of surface and mineral estate
    - 2,280.00 acres of mineral estate
- BLM Site (Alamosa County, Figure 6)
    - 380.00 acres of surface and mineral estate

The SLB manages approximately 3 million surface acres of trust lands in Colorado to gain a reasonable and consistent income over time, for the benefit of public schools and other designated state institutions. Most of this trust land was granted to the State of Colorado by the federal government at statehood in 1876. The SLB also holds about 1.5 million acres of mineral rights, without surface rights.

The SLB serves as the "trustee" of these trust lands and is authorized to manage these lands for the benefit of beneficiaries today and in the future. Land exchanges are just one tool the SLB has to manage these lands. In 1996, the voters of Colorado amended the state constitution to modify the SLB management of school and other trust lands. The amendment required that the SLB designate between 295,000 and 300,000 acres of trust lands into a special trust, called the Stewardship Trust (ST).

After public-lead nominations and designations by the SLB, the total land in ST is just over 296,100 acres. Once a parcel of land is in the ST, it can only be removed by a "super majority" vote of four out of five SLB commissioners. If land is removed from the ST, it must be replaced with other lands, to maintain the desired acreage in the ST program. Typically, those the replacement acres are trust lands already nominated.

Like other trust lands, the land in the ST is subject to generating economic returns to the SLB beneficiaries, however, it requires additional attention from the SLB toward the natural values of the land. Once lands are entered in the ST, the SLB will inventory the natural values of the land (typically through an outside contractor) so that a baseline of

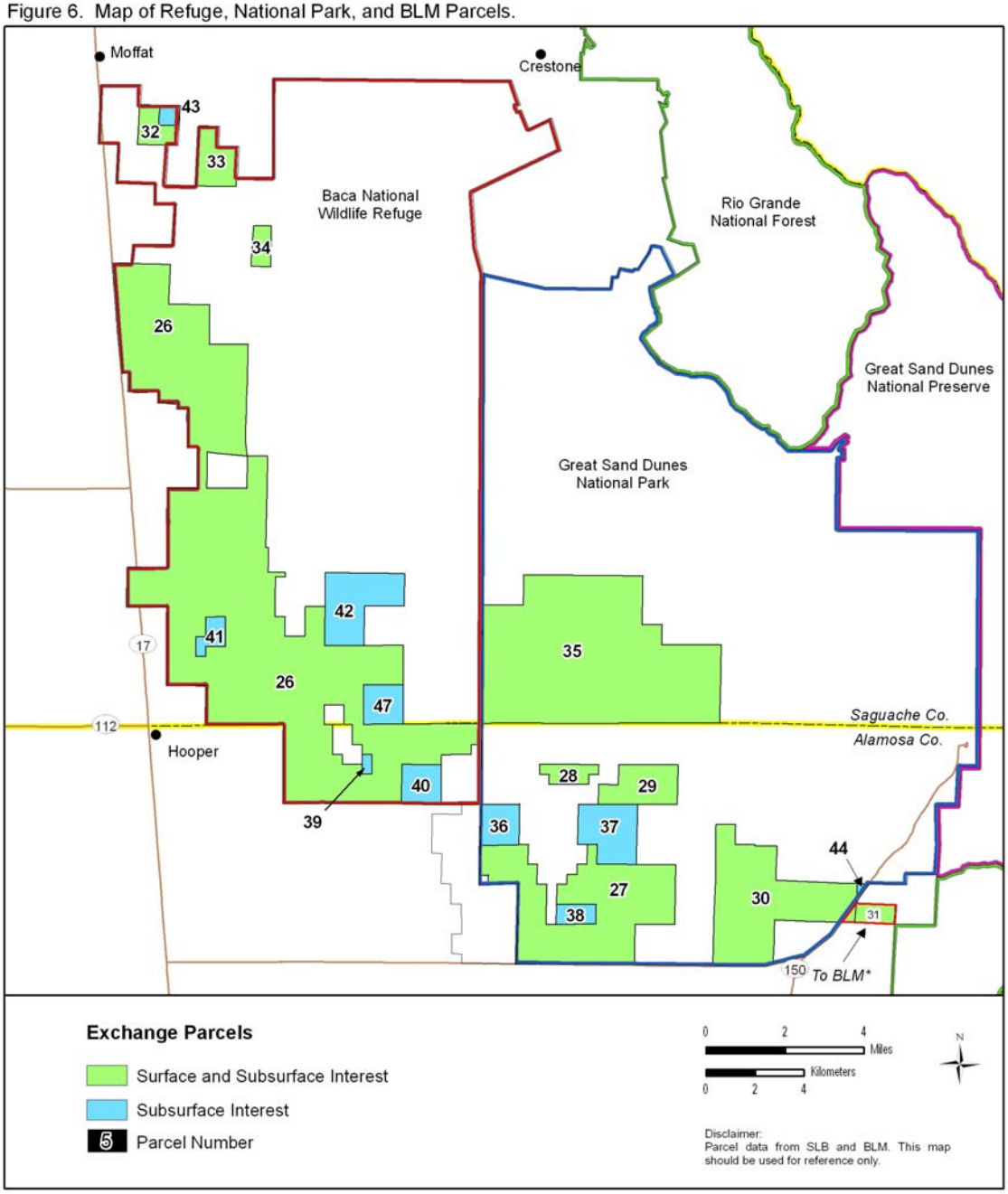
condition quality can be established (K. Page pers. comm. 2007). This baseline condition is to be considered and maintained when management activities are considered. In the majority of cases, ST lands activities include livestock grazing, timber harvest, mineral extraction, and access for wildlife-dependent recreation. Permits for these economic activities are issued by the SLB to the lessee.

Nearly 97% of the state lands involved in the exchange have been either designated or nominated for the Stewardship Trust. The current ST lands include some lands proposed to transfer to the Refuge and Park (over 24,640 acres). Also, 28,000 acres of the SLB lands in the exchange have been nominated for the ST. As a consequence of the 1996 constitutional amendment, if these lands do transfer to the federal government, the SLB is required to replace these lands with additional nominated lands to maintain the balance within the ST. The SLB has indicated that all of the parcels at La Jara and Biedell Creek Sites, would be entered into and managed under the guidelines of the Stewardship Trust program (K. Page pers. comm. 2008).

**Baca Land Exchange Project**

A Joint Project between U.S. Fish & Wildlife Service, National Park Service, Bureau of Land Management, Colorado State Land Board

Figure 6. Map of Refuge, National Park, and BLM Parcels.



## EFFECTS ANALYSIS

### Introduction

This Effects Analysis is presented in three parts. Part 1 is the general Affected Environment for each site, plus general description of how the land parcels would be managed if the exchange occurs as proposed. This provides the general context for understanding how listed species or their habitat may change from the current management. Part 2 is a description of the methods we used to identify whether a land exchange parcel included habitat potentially-suitable for listed species. This is augmented with information in Appendix 2 of the BA, which details the vegetation expected at each parcel. Part 3 is Effects Analyses for each of the species and critical habitat. Part 3 employs information presented in the previous two parts and builds upon that information, when necessary. For example, the general vegetation discussion from Part 1 is augmented with interpretation of how that vegetation may provide habitat characteristics for a particular species.

### Part 1 – General Affected Environment and Future Management of the Land Exchange Parcels

To provide a general context for the individual species Effects Analyses (Part 3), it is necessary to describe expected land management of the seven land exchange sites, and to compare that future management against the current management. The following few pages present the current uses, conditions and vegetation on the sites. The vegetation descriptions here are general, and are quantified in Part 2 and Appendix 2.

We also present four types of human activities that most commonly influence either the habitat conditions for listed species, or the ability of listed species to occupy that habitat. This discussion is intended to be a deconstruction of the proposed action – the land exchange – into the component impacts which could result in responses by individuals or populations of listed species. All of these impacts would be caused by the proposed action, will occur later in time (after the land title exchange) and are reasonably certain to occur. Therefore, all are "indirect effects" in ESA parlance. The future management of the land will result in varying stresses upon the listed species, depending on the land use, the habitat involved and the proximity of species to the land use. The individual species' Effects Analyses elaborate upon this general discussion, where needed.

### Table Mountain Site

#### Description

The Table Mountain parcels are located in northeastern Fremont County. These BLM parcels consist of four surface and mineral estate parcels (parcels 1-4) of 1,692 acres. Also, two mineral estate parcels (parcels 45 and 46; see Figure 2) are 2,860 acres. The majority of land surrounding these parcels is currently owned and managed by the SLB, both surface and mineral estate. The parcels are isolated from other BLM land to the south and north (Figure 2). The Colorado Division of Wildlife (CDOW) manages the 3,000-acre Beaver Creek State Wildlife Area (SWA) directly west of the exchange

parcels. Also in the vicinity of the parcels (to the east) is the Department of Defense Fort Carson military base.

Table Mountain predominantly supports stands of pinyon pine (*Pinus edulis*) – juniper (*Juniperus* spp.) woodland with intermixed stands of ponderosa pine (*Pinus ponderosa*) woodland and limited narrowleaf cottonwood (*Populus angustifolia*) forest patches along drainages (CNHP 2005; Appendix C). The driest exposures of flats, slopes, ridges, mesas, and canyons often support sparse to moderately dense pinyon - juniper woodlands. Elevation on the parcels range from 5,658 to 7,419 feet; and topography ranges from 0 to 94% slopes. These woodland stands are characterized by an open canopy of pinyon pine and one-seed or Rocky Mountain juniper that are short stature, typically between 2-5 m tall. The understory ranges from nearly devoid of vegetation to various grass or shrub layers. Perennial grasses including Arizona fescue (*Festuca arizonica*), blue grama (*Bouteloua gracilis*), mountain muhly (*Muhlenbergia montana*), slimstem muhly (*Muhlenbergia filiculmis*), and squirreltail (*Elymus elymoides*) are likely to occur in sparse to moderate cover. Shrubs, including snakeweed (*Gutierrezia* spp.), prickly-pear (*Opuntia* spp.), mountain mahogany (*Cercocarpus montanus*), and skunkbush sumac (*Rhus trilobata*) are often present.

Ponderosa pine woodlands are characterized by the species in addition to Douglas-fir (*Pseudotsuga menziesii*), pinyon pine, and species of juniper. The understory is shrubby with mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*), kinnikinnick (*Arctostaphylos uva-ursi*), mountain mahogany, and serviceberry (*Amelanchier* spp.) often present. Common understory grasses include the bunchgrasses needle-and-thread (*Hesperostipa comata*), Indian ricegrass (*Achnatherum hymenoides*), and Arizona fescue, and the shortgrass blue grama.

Where canopy openings occur, or where tree and shrub species have not established due to dry conditions or past disturbance, small grassland stands occur. At higher elevations these sites support predominantly bunchgrasses including Arizona fescue and needle-and-thread. At lower elevations blue grama and James' galleta (*Pleuraphis jamesii*) are more common.

Wet drainages and their associated floodplain terraces in Banta Gulch and Patton Canyon support patches of deciduous tree-dominated wetland and riparian vegetation (CNHP 2005). Here, ground water is typically within one-meter of the ground surface and the sites are subject to seasonal flooding due to runoff from snowmelt and thunderstorms. Narrowleaf cottonwood (*Populus angustifolia*) forms an association with species of willow (*Salix* spp.), western birch (*Betula occidentalis*), and chokecherry (*Prunus virginiana*) tall shrubs and species of rushes (*Juncus* spp.), sedges (*Carex* spp.), and mesic grasses in the herbaceous understory. The herbaceous understory is further characterized by species of forbs, including fleabane (*Erigeron* spp.), bluebells (*Mertensia* spp.), lupines (*Lupinus* spp.), and mule's-ears (*Wyethia glabra*).

There are no natural perennial water sources within the Table Mountain parcels; however, three livestock watering ponds have been constructed. Two of these are considered reliable water sources. The third holds water intermittently following large precipitation events.

Agricultural/Range: The four Table Mountain parcels include portions of three BLM grazing allotments: West Patton Canyon Allotment, Patton Canyon Allotment, and Beaver Creek Allotment. The West Patton Canyon Allotment is currently vacant, but is authorized for three Animal Month Units (AUMs). Rough terrain and limited quality forage in this Allotment limit the potential for livestock grazing. The Patton Canyon Allotment has an estimated 13 AUM carrying capacity. Given that the exchange parcels are currently unfenced from the surrounding SLB allotment it is reasonable to expect that these parcels have received some grazing in the past. Formal adjustments to the allowable AUMs would be set by SLB District Manager after consultation with Natural Resource Conservation Service (NRCS) to determine forage production and acceptable grazing levels for the added acreage. An NRCS-designed grazing plan and rotation is presently in place on surrounding state trust lands and likely would be applied to these new acres, with adjustments of total AUMs based on larger land base for the grazing permit.

As a net result, 1,692 acres that are currently incidentally grazed by domestic livestock would likely continue to be grazed. This would likely have little change on forage or browse for wildlife than currently exists.

Recreational: The four BLM parcels are surrounded by state trust lands and private land, and public access currently is either not available or limited by the restrictions placed on public access by SLB and CDOW. In 1993, the SLB and CDOW entered into an agreement to lease approximately 500,000 acres of trust lands with the best wildlife values for wildlife-related activities. This agreement is known as the CDOW/SLB Public Access Program. CDOW currently leases from the SLB approximately 4,640 acres in the Table Mountain area for this purpose. Public access is only allowed from September 1-May 31 for hunting, fishing, and watchable wildlife activities. Non-wildlife related activities like rock climbing, mountain biking, and general hiking are not allowed. Horses and camping (in designated areas) are allowed during the hunting seasons.

The CDOW also manages the Beaver Creek SWA west of the land exchange parcels. Outside of limited seasonal use for hunting, fishing, and watching wildlife, the exchange parcels will likely continue to be generally free of public access. The SLB has stated that the new lands would be entered into the CDOW/SBL Public Access Program (K. Page, SLB, 2006). If the land is not entered into the program, it would be closed to the public. No significant change from the current level of public access and recreational impacts to wildlife is anticipated as a result of the proposed action.

Mineral: The Table Mountain area has an extensive history of mineral exploration and extraction and there are several documented sites where mining and removal of sandstone, shale, and other minerals occurred (BLM 2005). Presently there are three active permits registered with the Colorado Division of Minerals and Geology, they represent rock quarry and gypsum extraction sites. The Table Mountain area is classified as prospectively valuable for oil and gas (Allen et al. 1976 in BLM 2005) but the area does not contain known geologic structures. There are no other known mineral developments (coal, oil and gas, or locatable hardrock minerals), nor are there active lode or placer claims, or oil and gas leases (BLM 2005).

Table Mountain parcels have known commercial deposits of sandstone that is economically important as a source of riprap for road construction projects in the vicinity and for landscaping regionally (BLM 2005). The rock production occurring at Table Mountain is focused solely on Dakota Sandstone or landslide slopes that have slump blocks filled with Dakota Sandstone (BLM 2005). Approximately 46 feet of Dakota Sandstone has been removed from the main rock quarry. The largest active mineral operation on Table Mountain is the Castle Concrete - Table Mountain Quarry, occurring in 450 acres of permitted mineral development land (both federal and state land) (BLM 2005). Based on analysis of aerial photographs, the disturbance footprint for this mine is about 25 acres. A second footprint of 4 acres in size is located to the north of the main quarry.

The Table Mountain area also contains an active gypsum mine (Agri-Cal #1 Mine). Two other sites proposed for gypsum mining remain undeveloped (Red Devil Mine and Caprara Lease) (BLM 2005).

Given the current mining activity and known mineral resources located at the Table Mountain site, it is reasonable to expect that expansion of mining activity will occur in the future. The primary minerals to be extracted are likely to remain in the class of industrial minerals and construction materials, i.e., sandstone, riprap, and gypsum. The likelihood of oil and gas development appears low at this time based on current mineral reports (BLM 2005).

Timber: Currently, there is approximately 1,500 acres of trees on parcels 1-4. The type of vegetation, primarily pinyon-juniper and ponderosa pine woodlands, the rough topography, and the limited road access combine to reduce the potential for large-scale commercial timber harvest. Limited stand data for this area shows sparse ponderosa pine in the 5-9 inch diameter at breast height (DBH) range, which is smaller than generally considered merchantable. It is believed that most of the older trees that once covered the area were removed during the settlement of the Arkansas River Valley. Most of the trees that occur in this area are less than 100 years old.

Forest resources at the Table Mountain site would be managed by Colorado State Forest Service (CSFS). Based on the vegetation of the parcels, there is a possibility of tree removal for firewood, primarily, and to a far lesser degree, whole tree removal (small, live trees are dug up and sold for landscaping). CSFS would propose any potential projects on their annual work plan for SLB approval. In developing forest management proposals, the CSFS considers potential impacts to ESA-listed species when their presence is known, and incorporates protection measures for them. The CSFS does not conduct surveys to determine if the species is present.

Based on recent aerial photography of the entire Table Mountain area, there is no evidence of extensive tree removal activity on the surrounding state lands. While tree removal is possible, given the general lack of merchantable trees and lack of tree removal operations in the past, it is unlikely that the forest resources will be greatly affected by the change in ownership to the SLB.

**Gribbles Park Site**

**Description**

The Gribbles Park Site is comprised of three parcels totaling 480 acres and predominately surrounded by lands owned by the SLB (see Figure 3). This site is located in northwest Fremont County. The parcels are isolated BLM tracts. Grazing is the dominate land use in the area.

Gribbles Park predominantly supports foothills / mountain grasslands, some stands of ponderosa pine woodlands mixed with bristlecone pine (*Pinus aristata*), and Douglas-fir woodlands (CNHP 2005; BLM 2005; Appendix C). The site topography ranges from 0 to 51% slopes. Elevations range from 8,928 to 9,892 feet. Grasslands occupy the dry exposures of the parks, valleys, slopes, and ridge tops typically where deeper soils or dry rocky soils occur. The grasslands are characterized by a moderately dense herbaceous layer of the medium tall bunchgrass, Arizona fescue, and the sod-forming shortgrass, blue grama. Additonal bunchgrasses that may be co-dominant on some sites include slimstem muhly, mountain muhly, pine dropseed (*Blepharoneuron tricholepis*), prairie Junegrass (*Koeleria macrantha*), squirreltail, Parry oatgrass (*Danthonia parryi*), mutton bluegrass (*Poa fendleriana*), and Sandberg bluegrass (*Poa secunda*). Sparse herbaceous cover by forbs includes species such as pingue (*Hymenoxys richardsonii*), wild buckwheat (*Eriogonum umbellatum*), scarlet globemallow (*Sphaeralcea coccinea*), yarrow (*Achillea millefolium*), pussytoes (*Antennaria parvifolia*), and Indian paintbrush (*Castilleja integra*). A sparse layer of dwarf-shrubs is often present, including fringed sagewort (*Artemisia frigida*), rabbitbrush (*Chrysothamnus* spp.), snakeweed (*Gutierrezia sarothrae*), and prickly-pear (*Opuntia polyacantha*).

Mixed stands of ponderosa pine, bristlecone pine, and Douglas-fir occur on shallow soils and rocky substrates of slopes and on ridgetops (CNHP 2005; BLM-RGRA 2005). The composition and structure of the overstory trees is dependent on the temperature and moisture relationships of the site and the successional status of the stand. In addition to the dominant trees, other conifers present in these sparse to moderately vegetated stands include juniper. Scattered shrubs of mountain mahogany and oceanspray (*Holodiscus dumosus*) are occasionally present as are the grasses Arizona fescue, blue grama, and little bluestem (*Schizachyrium scoparium*).

There is no perennial surface water in the form of streams, seeps, springs, or ponds on the Gribbles Park parcels proposed for exchange, based on a BLM inventory. One livestock watering pond has been constructed and it holds water intermittently following large precipitation events.

Agricultural: The existing state lands are currently leased by local ranchers for cattle grazing. The acquired BLM acreage would be merged into the existing grazing lease for surrounding State lands after the current BLM permit expires (K. Page, SLB, 2006). The current permit holder for both the existing state lands and the BLM properties is the Stirrup Ranch, so little change in management is expected. Allowable AUMs would be adjusted by the District Manager after consulting with NRCS to determine forage production and acceptable grazing levels for the acreage. The grazing plan and rotation in place presently on surrounding State lands would likely be applied to these new acres,

with adjustment (increase) of total AUMs based on larger land base for the grazing permit. As a net result, 480 acres that currently are grazed by domestic livestock under the BLM permit would continue to be grazed. This would result in little change in the forage available for grazing and browsing wildlife in the area.

Recreational: Current public access to parcel 6 and 7 is open year round via Fremont county road 2. Access to parcel 5 is limited by the restrictions placed on public access by SLB and CDOW. The CDOW leases 17,773 acres (referred to as Waugh Mountain) surrounding the BLM parcels for seasonal public access for hunting, fishing, and wildlife-related activities. Foot access is allowed from September 1 through February 28th. Motor vehicles are prohibited off designated roads. The SLB has stated that the new lands would be entered into the SLB/CDOW Public Access Program (K. Page, SLB, 2006). If this occurs, the net result would be approximately 480 acres of BLM land which currently has year-round access would be reduced to seasonal access with restrictions in place. Parcel 5 would expect little change from the current use because it is essentially closed except during the seasonal open period via the CDOW lease.

Mineral: Gribbles Park parcels have had little mineral exploration, development, or production. They are possibly prospectively valuable for uranium (BLM 2005). There is no evidence of significant mineral deposits in the Gribbles Park area and the area does not lie in known geologic structures (Allen et al. 1976 in BLM 2005). There are no active lode or placer claims, or oil and gas leases within the Gribbles Park parcels. However, during the 1970s and early 1980s, many mining claims were located in response to a period of intense uranium exploration. None of the uranium claims were maintained past 1982 and all are officially closed (BLM 2005).

Timber:
The BLM parcels within the Gribbles Park area have a mix of ponderosa and bristlecone pine. Ponderosa pine is used to produce lumber and bristlecone pine is valuable for transplants. The limited stand data for this area shows a ponderosa pine stand in the 9 to 16 inch size class on 10 to 15 acres in the larger parcel within this proposal. It is believed that most of the older trees that once covered the area were removed during settlement of this area. Most of the existing trees are less than 100 years old. There is a possibility of some cutting for firewood and whole tree removal. There is limited vehicular access to most of this land which affects future forest management opportunities. The Colorado State Forest Service will oversee the forest resources on Gribbles Park and would propose any potential projects on their annual work plan for SLB approval. In developing forest management proposals, the CSFS considers potential impacts to ESA-listed species, and incorporates protection measures for them, but does not conduct surveys to determine if the species is present.

**Biedell Creek Site**

**Description**

Biedell Creek Site is located in Saguache county in the San Luis Valley. The site consists of seven parcels, the largest of which is over 10,300 acres in size (Figure 4). Additional large blocks of BLM land not included in this exchange are located to the north and west of the parcels. The Nature Conservancy owns a 1,830 acre property adjacent to three of the parcels and is the holder of a conservation easement on over 6,500 acres of private land near the parcels along Carnero Creek.

Biedell Creek predominantly supports semi-desert shrub-steppe and pinyon-juniper woodlands with intermixed patches of montane grasslands (CNHP 2005; Appendix C, Table 3). The site topography ranges from 0 to 95% slopes with an elevation range of 7,649 to 9,801 feet. The driest exposures of alluvial fans and flats support grasslands with an open shrub layer, including Indian ricegrass, blue grama, saltgrass (*Distichlis spicata*), needle-and-thread, alkali sacaton (*Sporobolus airoides*), four-wing saltbush (*Atriplex canescens*), big sagebrush (*Artemisia tridentata*), rabbitbrush species, snakeweed, and winterfat (*Kraschenninnikovia lanata*). These stands are often patchy in appearance and occupy moderately-deep to deep soils.

Slopes, hills, and canyons support sparse to moderately dense pinyon-juniper woodland stands that are characterized by an open canopy of pinyon pine and one-seed or Rocky Mountain juniper of short stature, typically between 2-5 m tall. The understory ranges from nearly devoid of vegetation to various grass or shrub layers. Perennial grasses including Arizona fescue, blue grama, mountain muhly, slimstem muhly, and squirreltail are likely to occur in sparse to moderate cover. Shrubs, including snakeweed, prickly-pear, mountain mahogany, and skunkbush sumac are often present.

Grasslands occurring at the higher site elevations are characterized by species of oatgrass (*Danthonia* spp.), fescue (*Festuca* spp.), slimstem muhly, and/or bluebunch wheatgrass (*Pseudoroegneria spicata*). Montane grasslands typically occupy the dry exposures in tree canopy openings, valleys, slopes, and ridge tops typically where deeper soils or dry rocky sites occur.

BLM inventory of perennial surface water (streams, seeps, springs, or ponds) found none on the Biedell Creek parcels proposed for exchange. There are several stock tanks throughout the parcels, fed by pipelines from springs on adjacent areas. A portion of the historic Rio Grande canal flows through parcel 8.

Agricultural: The acquired acreage likely would be merged into an existing grazing lease for surrounding state lands, after the current BLM permit expires. Parcels 8, 9, 10, and part of 14 are part of the Tracy Commons Allotment. These parcels are currently being grazed with the adjacent state trust lands in a multiple pasture system. One landowner currently is the holder of both the state and BLM permit. Parcels 11, 12, and the remainder of 14 are part of the East Carnero Creek Allotment. Parcel 13 is part of the Hellgate Allotment. These parcels within the two allotments plus the adjacent L-Cross ranch state trust land are managed by one manager under a rest-rotational grazing system.

The number of AUMs currently allotted on the BLM lands is less than that of the state lands.

Moderate change in range management and forage availability is expected based on existing grazing practices on adjacent SLB lands. Allowable AUMs would be set by District Manager after consulting with NRCS to determine forage production and acceptable grazing levels for the acreage. The grazing plan and rotation in place presently on surrounding state lands would likely be applied to these new acres, with adjustment (increase) of total AUMs based on larger land base for the grazing permit. The SLB currently has grazing plans/rotations on most of the adjacent State lands in conjunction with the BLM lands already. As a net result 11,519 acres which currently are grazed by domestic livestock would continue to be grazed, likely at a higher AUM rate than currently with the BLM. This would likely result in a moderate decrease in the forage available for grazing and browsing wildlife in the area. The SLB has indicated that all of the parcels at the Biedell Creek site will be placed in the Stewardship Trust Program (K. Page 2008)

Recreational: Public access to parcels 10, 11, 12 and 13 is currently not available due to SLB and private land surrounding the parcels. Access to parcel 14 is via county roads 42 and 42k which traverse the parcel. Parcel 9 is accessible via county road 42. Given the nature of these county gravel roads, access although possible, could be restricted due to wet or snowy conditions for part of the year. All-terrain vehicle use is currently allowed on the BLM parcels where access is possible.

Penitente Canyon Special Recreational Management Area (SRMA) is largely located south of Carnero Creek south of Parcel 13. The Hellgate rock formation, which is largely on Parcel 13, is listed as being part of this SRMA (BLM 2004). Penitente Canyon SRMA is managed for intensive recreational opportunities including rock climbing. However, discussions with local BLM managers who oversee recreational activities in this SRMA indicate that public access for hiking, mountain biking, camping, and rock climbing are limited to areas south of Carnero Creek (K. Murphy BLM, pers. communication 2006). However, many of the parcels are prime walk-in areas for recreational hunting.

CDOW leases approximately 8,393 acres at Burro Springs 1&2 (6,175 acres), Mogatas Arroyo (320 acres), and Sanderson Gulch (1,898 acres) for seasonal wildlife-related public access. These areas are located north of parcel 14 and would provide seasonal access for hunting, fishing, and wildlife-related activities to parcels 10. Most of the CDOW-leased areas are open to foot and horse access only from August 15 through May 31$^{st}$.

The SLB has stated that the parcels would be entered into the CDOW/SLB Public Access Program. Restrictions and seasonal closures would apply. This would reduce access from year round to seasonal periods on some of the new acres. It would also limit access to foot and/or horse on most areas, removing the use of ATVs. If lands are not enrolled in the Access Program then these lands would likely be closed to public access.

Mineral: According to the BLM mineral report for this project, the Biedell Creek parcels are considered valuable for mining mineral materials such as landscape rock and gravel

and are possibly prospectively valuable for oil and gas, geothermal energy, and locatable metallic minerals (BLM 2005). The SLB through the Colorado Geologic Survey evaluated state lands adjacent to the Biedell Creek parcels and determined that the likelihood of potential oil/gas, coal, and metallic minerals was relatively low (ranking of 0-1 based on a scale of 0-5) while industrial minerals ranked higher (ranking of 0-4) (CGS 2000). Mineral exploration and development on the Biedell Creek parcels appears low to moderate for the foreseeable future.

Timber: The parcels at this site have approximately 4,500 acres of forest vegetation (Table 3 in Appendix C). Over 90% of that vegetation is pinyon-juniper woodland. Forest resources would be managed by CSFS. Based on existing vegetation of the parcels, there is a limited possibility of commercial harvest, and some firewood cutting and whole tree removal. CSFS would propose any potential projects on their annual work plan for SLB approval. In developing forest management proposals, the CSFS considers potential impacts to ESA-listed species, and incorporates protection measures for them, but does not conduct surveys to determine if the species is present.

**La Jara Site**

**Description**

The La Jara Reservoir parcels are located in Conejos county in the southwestern portion of the San Luis Valley, generally east and south of the La Jara Reservoir. The 12 parcels proposed for exchange are predominately surrounded by SLB lands and CDOW State Wildlife Areas (Figure 5). Eight of the parcels are isolated BLM tracts. The SWAs in the area include La Jara Reservoir, La Jara, and Hot Creek. Several of the parcels are adjacent to the Rio Grande National Forest.

Parcels in the La Jara site support a variety of habitat communities including large areas of semi-desert shrub-steppe, montane grasslands, pinyon-juniper woodlands, and aspen stands. Areas of mixed conifer, ponderosa pine, and aspen occur throughout several parcels. Herbaceous riparian vegetation and mixed willow, alder, and cottonwood communities occur along La Jara Creek (CNHP 2005, Appendix C). The site topography ranges from 0 to 121% slopes with elevations ranging from 8,338 to 9,971 feet. The driest exposures of alluvial fans and flats support grasslands with an open shrub layer, including Indian ricegrass, blue grama, saltgrass, needle-and-thread, alkali sacation, four-wing saltbush, big sagebrush, rabbitbrush species, snakeweed, and winterfat.

Slopes, hills, and canyons support sparse to moderately dense pinyon - juniper woodland stands that are characterized by an open canopy of pinyon pine and one-seed or Rocky Mountain juniper of short stature, typically between 2-5 m tall. The understory ranges from nearly devoid of vegetation to various grasses and shrubs. Parcels along La Jara Creek, especially the north facing slopes, support moderate to dense mixed conifer vegetation. Large stands of aspens are also present throughout several of the parcels. Perennial grasses including Arizona fescue, blue grama, mountain muhly, slimstem muhly, and squirreltail are likely to occur in sparse to moderate cover. Shrubs, including snakeweed, prickly-pear, mountain mahogany, skunkbush sumac, and current (*Ribes* spp.) are often present.

Grasslands occurring at the higher site elevations are characterized by species of oatgrass, fescue, and slimstem muhly. Montane and subalpine grasslands typically occupy the dry exposures in tree canopy openings, valleys, slopes, and ridge tops typically where deeper soils or dry rocky sites occur.

Agricultural:
Parcels 16, 17, 18a, 20, 21, 23, and 24 are currently unallocated, meaning there is no approved grazing currently occurring on the parcels. These parcels have been unallocated for over 10 years, however, trespass grazing has been observed and is likely due to general absence of fencing throughout the area (M. Garcia BLM, pers. communication 2006). Parcels 18c, 19, and 22 are part of the Del Rancho Allotment, but this allotment is currently unallocated. Parcel 18b is part of the Ra Jadero Canyon Allotment and is currently grazed annually during the summer as a single pasture. Parcel 15 is the Chicago Bogs Allotment and is currently grazed with 14 cattle from June 1 to September 30 for a total of 56 AUMs. Parcel 15 has been grazed under a similar number of AUMs for several decades.

The state trust lands surrounding the BLM parcels is currently being grazed at various levels and seasons of use. The BLM permits would be honored by SLB until the permits expire and then would be merged with existing state leases. AUMs and season of use would be determined by the District Manager after consultation with NRCS. Therefore, as a net result approximately 2,830 acres would likely be subject to grazing under a SLB lease. Parcels 15 and 18b would continue to be grazed at current levels, then adjusted when the BLM leases expire.

Change in ownership would likely result in moderate changes to the forage available for grazing and browsing wildlife on some of the parcels. Areas more sensitive to grazing impacts such as the riparian communities along La Jara Creek, especially in areas where access by cattle occurs easily as in Parcel 23, vegetation likely would continue to be negatively impacted by increases in cattle grazing unless specific measures were in place to reduce the impacts such as fencing or water gaps. In areas were cattle access is restricted or severely limited due to rough terrain including boulder fields as in Parcels 20 and 21, riparian vegetation will likely be less impacted. Periodic monitoring of forage utilization in these areas would be necessary to ensure that negative impacts would be minimized. The SLB has indicated that the La Jara Parcels would be placed in the Stewardship Trust and those parcels along the creek would be monitored to ensure grazing impacts are minimized.

Recreational:
The entire 4,537.83 acres likely would be included in CDOW/SLB Public Access Program with seasonal public access for wildlife-related activities by foot or horseback (K. Page, SLB, 2006). In general, seasonal access for hunting is currently allowed on adjacent SLB properties from September 1 through February 28$^{th}$ for many big game species including deer, elk, and black bear. Year-round access for fishing and wildlife viewing is currently allowed on the expansive state trust lands around the La Jara Reservoir.

Additional CDOW-managed State Wildlife Areas are in the vicinity of the exchange parcels. Hot Creek SWA is located adjacent to three of the parcels. Recreation activities include hunting, trapping, wildlife watching and photography. Motor vehicles are not allowed from December 1 to April 30, including snowmobiles. La Jara Reservoir SWA has limited waterfowl, and big game hunting. Coldwater lake fishing and coldwater stream fishing for brook trout is available. Other recreational opportunities include wildlife observation and photography. La Jara SWA is open to hunting, fishing, wildlife observation and photography. Primitive camping is allowed, however, snowmobiles are prohibited. Vehicles are prohibited from January 1 through the last Thursday prior to Memorial Day.

As a net result, public recreational access to 4,537.83 acres would be reduced from year-round to seasonal access, generally in the fall and winter for hunting and fishing opportunities. This would reduce human disturbance impacts to wildlife in the area during most of the year and would be the same disturbance in the fall hunting season.

Mineral:
According to the BLM mineral report for this project, the La Jara parcels received a Low Potential rating for locatable metallic minerals, a High Potential rating for mineral materials (i.e., landscape rock), a No Potential rating for coal, a Low Potential rating for oil and gas, and a Low Potential rating for geothermal resources (BLM 2005). Local production of landscape rock occurs, i.e., a SLB lease for moss rock includes about 468 acres near La Jara Reservoir (BLM 2005). Approximately 250 tons of moss rock was removed during 2003 (K. Page, SLB, 2004 in BLM 2005). Current mineral production in Saguache, Alamosa, and Conejos counties is limited to high-grade limestone and aggregate (BLM 2005).

The SLB through the Colorado Geologic Survey evaluated state lands adjacent to the La Jara parcels for mineral potential (CGS 2000b). Results of the evaluation, expressed as a rating number between 0 and 5 are as follows: a) Oil and Gas (0-1), b) Coal (0-1), c) Metallic Minerals (0-1), and d) Industrial Minerals (2-4). The analysis indicated that the tract contains no coal resources, is not or has minor prospective potential for metallic mineral resources, has little or no potential for hydrocarbon production (due to lack of most of the essential elements for hydrocarbon accumulations), and contains alluvial gravel and/or sand deposits at a mineable depth of 10-ft. (the gravel resource quality has not been determined) and volcanic rock that is suitable for use as crushed rock and road base. Along the western edge of the SLV, mineral materials present include low to high potential for sand and gravel production, low to high potential for cinder production, low to moderate potential for decorative rock production, and low to high potential for pumice production (BLM 1989).

Given these two reports, it appears reasonable to expect very limited or no mineral activity to occur on the parcels in the foreseeable future.

Timber: There is over 3,600 acres of timbered areas on the La Jara parcels. Most of this acreage is mixed conifer forest, ponderosa pine, aspen forests, and pinyon-juniper woodlands (Table 4 in Appendix C). The forest resources would be managed by CSFS. CSFS proposes any potential projects on their annual work plan for SLB approval. In

developing forest management proposals, the CSFS considers potential impacts to ESA-listed species, and incorporates protection measures for them, but does not conduct surveys to determine if the species is present.

Based on recent aerial photography for the La Jara parcels, there is no evidence of extensive tree removal activity on the surrounding state lands. Recent data from CSFS corroborates this impression (J. Burns, CSFS, pers. com. 2007). In 2007, two CSFS projects were executed in the vicinity of the La Jara parcels. In one project, up to 3000 small-sized aspen trees within a 100 acre area were available for removal; actual numbers expected to be less than 3000. The other project involved opening a 70 acre area to the public for fuelwood harvesting. Thus, while tree removal is possible in the La Jara area, given the general lack of merchantable trees and lack of tree removal operations in the past, we conclude it is unlikely that the forest resources will be greatly changed by the ownership transfer to the SLB.

**National Wildlife Refuge Site**

The acreage considered in this BA as the "Refuge site" would be included in the Baca National Wildlife Refuge (Figure 6). This Refuge is one of three managed by the FWS in the San Luis Valley. It is the mission of the National Wildlife Refuge System:

> "*to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans*" (NWRS Improvement Act of 1997).

Goals to further the mission of the Refuge system nationally include:

> a. *To fulfill our statutory duty to achieve refuge purpose(s) and further the System mission.*
> b. *Conserve, restore where appropriate, and enhance all species of fish, wildlife, and plants that are endangered or threatened with becoming endangered.*
> c. *Perpetuate migratory bird, interjurisdictional fish, and marine mammal populations.*
> d. *Conserve a diversity of fish, wildlife, and plants.*
> e. *Conserve and restore, where appropriate, representative ecosystems of the United States, including the ecological processes characteristic of those ecosystems.*
> f. *To foster understanding and instill appreciation of fish, wildlife, and plants, and their conservation, by providing the public with safe, high-quality, and compatible wildlife-dependent public use. Such use includes hunting fishing, wildlife observation and photography, and environmental education and interpretation.*

Specifically, the purpose of Refuge as currently proposed (FWS 2005) is:

> *"… to restore, enhance and maintain wetland, upland, riparian and other habitats for wildlife, plants and fish species that are native to the San Luis Valley,*

*Colorado. Management of the refuge will emphasize migratory bird conservation and will consider the refuge's role in broader landscape conservation efforts."*

A Conceptual Management Plan (CMP) has been prepared to provide interim management direction for the Refuge (FWS 2005). A comprehensive conservation planning process (CCP) will begin in 2011. This CCP will guide management for the next 15 years following completion. The CMP provides local landowners, neighboring governmental agencies, and citizens with an overview of anticipated management approaches by describing FWS's proposed management for wildlife and habitats, public uses, facilities, interagency coordination, and other operational needs.

Of the SLB parcels proposed to transfer to the Refuge, 4,720 acres are currently in the Stewardship Trust program. The remaining parcels have been nominated, but not designated, for the Stewardship Trust program. The SLB recognizes that lands placed in the Stewardship Trust have unique natural values, whether cultural or biological. As such, these lands are managed in a way that promotes sounds stewardship for future generations.

Agricultural/Range:
The refuge would use targeted grazing by livestock, where appropriate, to meet habitat goals and objectives. Grazing has been used in the San Luis Valley as a means to control the spread of invasive plants, particularly whitetop (*Lepidium latifolia*), and to enhance native vegetation. Most of the SLB parcels coming to the refuge are dominated by greasewood and rabbitbrush vegetation types, or are playa wetlands with little vegetation (Table 5 in Appendix C). Vegetation surveys in 2006 of the SLB parcels indicate few invasive species issues. Because of this, it is unlikely that the majority of the new parcels would be subject to grazing in the near term. In those areas where the refuge staff determines that habitat could be improved through livestock grazing, this management strategy would be considered. The existing SLB grazing leases were transferred to the Refuge in 2005. Due to the habitat communities present and lack of invasive plants, the refuge chose not to graze these areas in 2006.

Recreational:
The refuge has not completed a visitor services plan. Such a plan will outline how recreational activities will occur on the Refuge and will involve public participation. The National Wildlife Refuge Improvement Act of 1997 formally recognized six wildlife dependent public uses of refuge system lands. These six uses are: hunting, fishing, wildlife observation, wildlife photography, environmental education, and interpretation. These uses have been determined to be appropriate uses of refuge lands and once determined to be compatible with the refuge purpose, should be facilitated by refuge staff.

The CDOW currently leases the exchange parcels from the SLB from September 1 through February 28th for a limited dispersal elk hunt (cows only). This hunt is an effort to reduce the estimated 5,000-6,000 animal herd to the unit goal of 1,500 animals. The elk hunt is open to the public; hunters request to be put on a waiting list. Hunters are notified when elk are within the hunt area. In its Conceptual Management Plan (FWS 2005), the refuge recognized the CDOW dispersal hunt as an existing public hunting

opportunity. Service policy requires that an interim compatibility determination be completed for lands potentially entering the Refuge System where public uses have been documented to occur. The interim compatibility determination concluded that this activity would be allowed to continue if and when the state land becomes part of the refuge (FWS 2005). The interim compatibility determination is valid until a formal hunting plan has been developed and approved for the refuge.

Mineral:
The refuge has no plans to disturb subsurface features for mineral extraction on any lands it would acquire in the exchange.

Timber: There is no forest vegetation on the refuge site that would be considered merchantable for timber, firewood, or other uses. Further, refuge management priority would be to maintain and enhance native trees which would serve as potential habitat for wildlife.

**National Park Site**

The Park Site is located in Saguache and Alamosa counties in the San Luis Valley. The five surface and subsurface parcels total 23,486.29 acres and the 4 subsurface only parcels total 2,280 acres. Intermixed with the SLB and existing Park lands within the Park boundary are lands owned by the The Nature Conservancy as the Medano-Zapata Ranch.

The habitats on the parcels are dominated by semi-desert shrub steppe (13,100 acres) and greasewood flats (7,776 acres). Also present are approximately 2,300 acres of active and stabilized dunes and 1,465 acres of irrigated wet meadows (Table 6 in Appendix C)

Great Sand Dunes National Park and Preserve recently completed a General Management Plan (GMP) to guide all park activities in the next 20 years (NPS 2007). The GMP reiterates the Park's expectation of most public use occurring in the immediate vicinity of the dunes with relatively sparse or controlled use of the park acreage where ESA-listed species habitat may occur. The exception to this general conclusion is the cottonwood areas near the park visitor center which have the potential to provide yellow-billed cuckoo habitat. The GMP restates NPS priorities to "Conserve and restore habitats for threatened and endangered species".

Agricultural/Range:
The parcels in-coming to the NPS are currently leased by the SLB to the Nature Conservancy (TNC) as part of the Conservancy's "Medano Ranch" and are currently grazed by bison. The SLB acreage is intermixed with TNC private property which may be transferred to the Park in the future. The Park's General Management Plan (GMP) includes discussion of whether bison grazing would continue on these acres but defers a decision to a later date. For the purposes of analysis in this BA, we take a worst-case scenario approach and assume the bison grazing would continue. This grazing assumption would result in no change in the forage available for grazing and browsing wildlife in the area.

Recreational:
In the GMP, the SLB parcels occur in Designated and Proposed Wilderness, Backcountry Adventure and Guided Learning zones. Little to no road access would occur to most of these parcels; recreational access would be on foot or horseback. Public use of the Guided Learning zone and the Medano Ranch would be limited to activities guided by NPS staff or a designee. This recreational use of the parcels would be little change from the existing uses.

Mineral:
If the land exchange were to occur as proposed, mineral development and extraction would not occur on the parcels which become part of the Park, as per the recent GMP.

Timber:
There is no forest vegetation on the Park site that would be considered merchantable for timber, fuelwood, or other uses. Further, the Park management priority would be to maintain and enhance trees which would serve as potential habitat for wildlife.

**BLM Site**

**Description**
This site consists of one parcel totaling 380 acres located in Alamosa County. This parcel falls outside of the Great Sand Dunes National Park and Preserve acquisition boundary thus it was not able to be included with the Park Site. Therefore, the BLM will accept this from the SLB.

The habitat on this 380-acre site is dominated by pinyon-juniper woodlands (199 acres) and semi-desert shrub steppe (102 acres; Table 7 in Appendix C). Elevations increase along a west to east direction from 7,915 ft to 8,470 ft. This parcel is on the toe slope of the Sangre de Cristo mountain range.

Agricultural/Range:
The BLM management of Parcel 31 will focus on meeting land health monitoring program protocols established under the RMP for the San Luis Valley.

Recreational:
The small acreage of the BLM site, the location, and the vegetation, combine to make it location unlikely to receive anything more than occasional, dispersed recreation.

Mineral:
The small acreage of the BLM site makes this location unlikely to receive attention for mineral development.

Timber:
This is the only SLB parcel coming into the Federal estate where forest resources are present. This stand of pinyon-juniper will be managed by the BLM and could provide some fuelwood and some transplant trees.

**Part 2 - Methods for General Analysis to Identify Focus Areas for Species-Specific Analysis**

The land exchange proposal covers a large area for which consistent, site-specific vegetation data is not available. To provide a consistent analytical approach to this effects analysis, we used the best available vegetation data, in this case, this was the SWReGAP data set. The vegetation map classes in this data set are NatureServe's Ecological Systems. These map classes are general descriptions of the plant community composition and do not include site-specific descriptions of canopy closure, tree age and size, etc. These data provided a coarse starting point for the analysis of each species. In most instances, the coarse view was sufficient to conclude whether the habitat types present were suitable for a particular species. In some instances a closer look was necessary. When a closer look was necessary, we used interpretation of recent aerial photographs, other data available in GIS, and discussions with local biologists to construct a more detailed picture of the habitat present on the parcels.

Table 3 illustrates the Ecological Systems vegetation types that correspond to potential habitat for listed species across all the seven land exchange sites (the coarse data). Table 4 is a summary of how we cross-walked the vegetation types and other GIS data to evaluate potential habitat for each of the ESA-listed species. This cross-walking was focused on the species life history needs that are vulnerable to human disturbance to the habitat. This focus was necessary to analyze the effects potentially resulting from the change in land management.

Two species - the bald eagle and the Canada lynx – use a longer list of vegetation types because of their ability and propensity to move across large areas. These widely dispersed movements can be irrelevant to the habitat conditions and not amenable to analysis in this BA. Nor is the species' conservation dependent on the management of these broadly occurring vegetation types. Therefore, for these two species, we focused on the vegetation conditions that typify the species more vulnerable life history needs (Table 4). For bald eagle it is winter roost and open water foraging habitat. For Canada lynx it is particular forest cover types.

The vegetation acreage data has been calculated and summarized for each of the parcels and is presented in Appendix C. Note: The acreage figures in Appendix C will not exactly match those in Appendix B because of difference in how GIS products were generated.

Table 3. Vegetation considered potential habitat for ESA-listed species in the Baca Land Exchange Biological Assessment

| **Vegetation from SWReGAP in parcels** | **BE** | **MSO** | **SWWF** | **YBC** | **CL** | **GPD** |
|---|---|---|---|---|---|---|
| Agriculture | | | | | | x |
| Inter-Mountain Basins Big Sagebrush Shrubland | | | | | | x |
| Inter-Mountain Basins Greasewood Flat | | | | | | x |
| Inter-Mountain Basins Mat Saltbrush Shrubland | | | | | | x |
| Inter-Mountain Basins Mixed Salt Desert Scrub | | | | | | x |
| Inter-Mountain Basins Montane Sagebrush Steppe | | | | | | x |
| Inter-Mountain Basins Semi-Desert Grassland | | | | | | x |
| Inter-Mountain Basins Shale Badlands | | | | | | x |
| Inter-Mountain Basins Semi-Desert Shrub Steppe | | | | | | x |
| Inter-Mountain West Aspen-Mixed Conifer Forest and Woodland Complex | | x | | | | |
| Invasive Annual and Biennial Forbland | | | | | | x |
| Invasive Annual Grassland | | | | | | x |
| Invasive Perennial Grassland | | | | | | x |
| Open Water | x | | | | | |
| Rocky Mountain Lodgepole Pine Forest | | | | | x | |
| Rocky Mountain Lower Montane Riparian Woodland and Shrubland | x | | x | x | x | |
| Rocky Mountain Lower Montane-Foothill Shrubland | | | | | x | |
| Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland | x | x | | | x | |
| Rocky Mountain Montane Mesic Mixed Conifer Forest and Woodland | x | x | | | x | |
| Rocky Mountain Ponderosa Pine Woodland | x | | | | | |
| Rocky Mountain Subalpine Dry-Mesic Spruce-Fir Forest and Woodland | | x | | | x | |
| Rocky Mountain Subalpine Mesic Meadow | | | | | | x |
| Rocky Mountain Subalpine Mesic Spruce-Fir Forest and Woodland | | x | | | x | |
| Rocky Mountain Subalpine-Montane Limber-Bristlecone Pine Woodland | | x | | | | |
| Rocky Mountain Subalpine-Montane Riparian Shrubland | | | x | | | |
| Southern Rocky Mountain Montane-Subalpine Grassland | | | | | | x |
| Southern Rocky Mountain Pinyon-Juniper Woodland | | | | | | |
| Western Great Plains Foothill and Piedmont Grassland | | | | | | x |

BE = Bald Eagle; MSO = Mexican Spotted Owl; SWWF = Southwestern Willow Flycatcher; YBC= Yellow-Billed Cuckoo; CL = Canada Lynx; GPD = Gunnison's Prairie Dog.

**Table 4. Vegetation Features and Other Factors Used for Identifying Potential Habitat for ESA-listed Species in the Baca Land Exchange BA.**

| Species | Vegetation Features of focus for this species | Secondary Habitat Query |
|---|---|---|
| **Bald Eagle** | Vegetation Types supporting trees large enough to serve as roosts or nests | Proximity to water |
| **Spotted owl** | Conifer vegetation types | Steep slopes, >40% |
| **Willow flycatcher** | Riparian shrubland, willow and cottonwood types | |
| **Cuckoo** | Cottonwood vegetation types of sufficient tree size | Patches greater than 25 acres |
| **Lynx** | Spruce-fir forest types | Contiguous forest cover; north-facing and steeper slopes |
| **Gunnison Prairie Dog** | Vegetation listed in Table 3 | Slopes <20%, and elevation between 3,773-10,006 ft |

**Part 3 – Species Effects Analysis**

**Bald Eagle (*Haliaeetus leucocephalus*):**

(Note: The Bald Eagle was officially delisted on August 8, 2007; however the species was retained for the BA due to the completion of the analysis.)

**A. Species biology**

The bald eagle was first listed under the ESA on March 11, 1967. It is federally listed as threatened in the coterminous United States. The primary habitat for this species is large, open bodies of water - lakes, reservoirs, and rivers - with suitable roost/perch/nest structures nearby. The eagles typically nest in tall, sturdy trees along shorelines in relatively secluded areas. At the population's lowest point in Colorado, only 2-3 bald eagle nests were found in the state. Recently, nesting pairs have increased by 8 or 9 each year. In 2001, there were an estimated 51 breeding pairs documented in the state (CDOW website). There are no documented nest sites near any of the land exchange parcels.

Wintering and migrating bald eagles roost in large, mature trees and snags, and forage on primarily on waterfowl and carrion. Also in winter, bald eagles may occur locally in semi-deserts and grasslands, especially in the vicinity of prairie dog towns.
Annual midwinter eagle counts show a stable wintering population of about 800 birds in Colorado. The San Luis Valley has a high occurrence of wintering eagles due to its supply of fish and waterfowl, and areas of open water.

Major threats to this species include the destruction and degradation of its habitat and environmental contaminants. In regards to land management, attention is given to developing and maintaining suitable nest and roost trees, and protecting those locations from human disturbance during times of the year important for eagle survival and reproduction – nesting season and wintering.

An estimated 7,800 nesting pairs of eagles occur in the lower 48 states. Additional information regarding the bald eagle can be found in the final rule for the bald eagle reclassification (60 Fed. Reg. 36000-36010 (July 12, 1995)), in Snyder (1993), and at http://www.natureserve.org/.

**B. Affected Environment**

In bald eagle recovery planning and management, the focus is on life history characteristics in which the eagles are most vulnerable – wintering and breeding.

The CDOW has mapped areas of the most recent documented use by eagles. The eagle uses mapped in or near the land exchange sites are:

- Bald Eagle Winter Range – a broad range of habitat types in which bald eagles may occur throughout the migration and wintering seasons; does not necessarily include vegetation that would provide roost/perch structures, such as large trees. Management of habitat in this large area would not necessarily be focused on

specific eagle uses, but would acknowledge the possibility of eagles foraging in the winter.

- Bald Eagle Winter Concentration Area – within the Bald Eagle Winter Range, these areas are identified by their combination of suitable food sources in proximity to suitable roost/perch structures. For protection of eagles, management of habitat in these areas would focus on maintaining and growing suitable roost/perch trees, maintaining food sources and minimizing human disturbance of the area when eagles are present.
- Eagle Roost Sites – these locations are suitable roost/perch structures which eagles have been documented to use. For protection of eagles through time, management of these locations would maintain and grow suitable roost/perch trees and greatly minimize human disturbance of eagles in winter.

These CDOW bald eagle maps provide a basis for the BA analysis. Bald eagles are known to migrate through, and winter in, the broad vicinity around the land exchange sites. Wintering eagles could conceivably occur in any of the parcels, if food were available to attract them to a local area. The focus of this BA analysis, though, is the combination of more predictable food availability and proximity to perching/roosting structures. This focus is based upon the knowledge that these two habitat features are the more limiting aspects of eagle use of an area; when food and perches are not present, it is much less likely that eagles will use the area with any regularity.

**Table Mountain Site**

The land exchange would result in approximately 145 acres of bald eagle winter concentration area transferring from federal to SLB management at the Table Mountain site. The Table Mountain site includes two parcels, numbers 4 and 45, which overlap an area along Beaver Creek mapped as a bald eagle winter concentration area (Figure 7). None of the riparian vegetation along Beaver Creek is within the parcels. CDOW manages the area along Beaver Creek as a state wildlife management area (Figure 2).

Parcel 4 is a surface and subsurface parcel. None of the overlap area in Parcel 4 contains vegetation conducive to bald eagle roost sites (i.e., large trees, particularly cottonwoods); only pinyon-juniper woodlands and herbaceous vegetation occur here.

Parcel 45 is subsurface only (that is, the SLB currently owns and manages the surface). In parcel 45, the SLB acquisition of subsurface mineral rights would create a possibility of developing mineral resources (quarries, etc.) on this property in which the surface habitat is currently intact.

**Gribbles Park and Biedell Creek Sites**

The Gribbles Park and Biedell Creek sites have no overlap with any of the CDOW bald eagle use areas (Figures 8 and 9). The Gribbles Park site is farther than 15 miles of any mapped bald eagle use areas. The lack of perennial water sources on or near these parcels, and the lack of trees conducive to eagle roosting, makes these parcels not suitable to wintering eagles. The Biedell Creek site is just west of mapped winter range and a winter concentration area at Russell Lakes state wildlife area (Figure 9.) Transient eagle

use of the Biedell Creek parcels is possible, though it is unlikely bald eagles would frequent these parcels due to lack of perching/roosting habitat and foraging opportunities.

**La Jara Site**

With the exception of parcel 15, all of the parcels at the La Jara site fall within mapped bald eagle winter range (parcels 16, 17, 18a, 18b, 18c, 19, 20, 21, 22, 23 and 24) (Figure 10). The area around La Jara Reservoir is mapped as a winter concentration area for bald eagles. Transient use by bald eagles of all parcels at the La Jara site is possible, but the habitat within the parcels is not conducive to extensive use by bald eagles. Four different state wildlife areas are adjacent to parcels at the La Jara site. They include La Jara, Hot Creek, and La Jara Creek SWA (see Figure 5).

**Park Site**

The Park site is entirely within mapped bald eagle winter range, and parcel 35 includes a documented roost site (Figure 11). The roost site in parcel 35 is located along Sand Creek with approximately one hundred cottonwood trees. Another winter roost site is located about a half mile south of parcel 30 on The Nature Conservancy-owned Zapata Ranch.

**Refuge and BLM Sites**

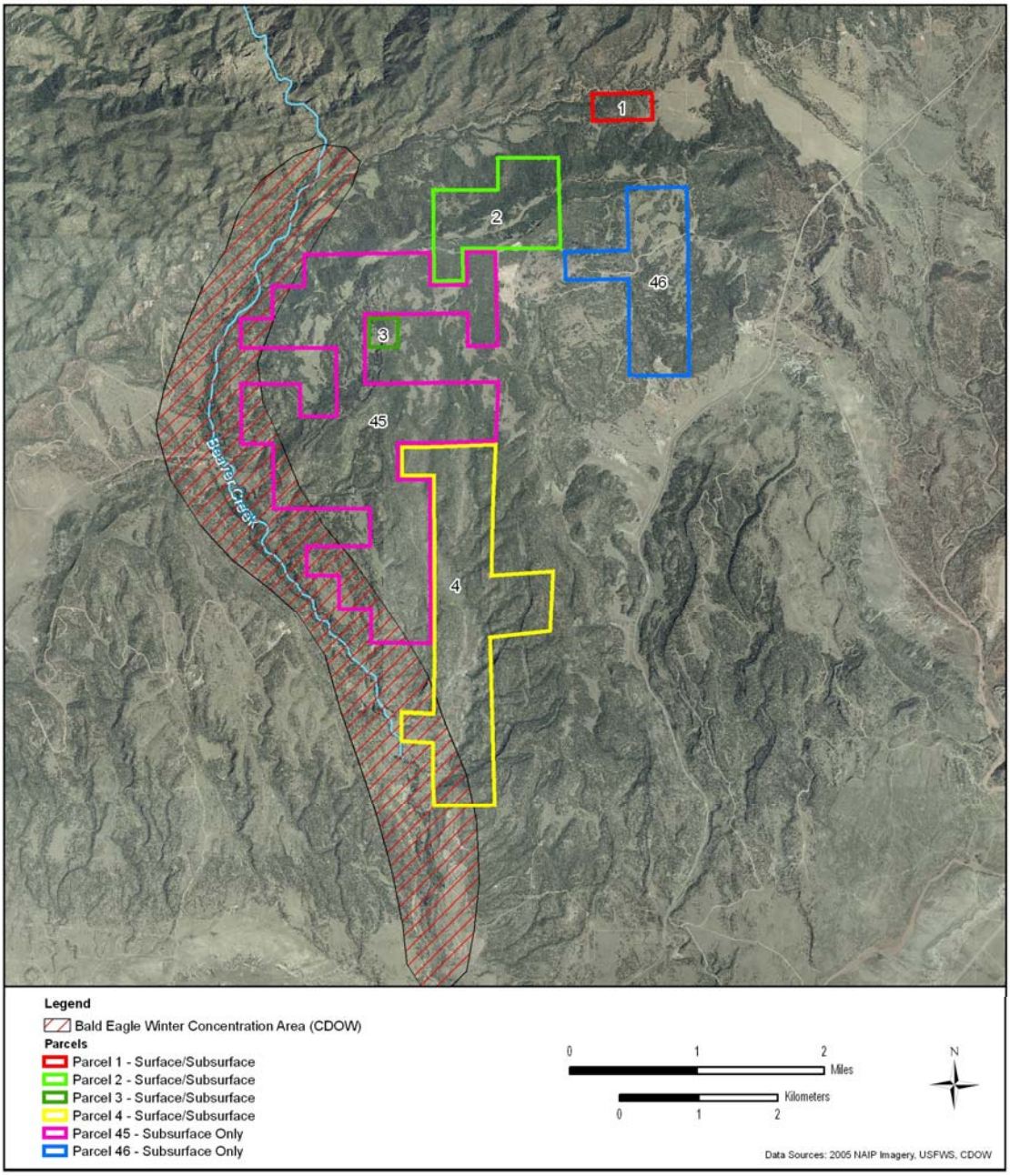
The Refuge and BLM sites are also entirely in bald eagle winter range (Figure 11). Documented winter roost sites are located just west of the refuge. No roost trees occur in the Refuge site, however the power line infrastructure from the Bureau of Reclamation's Closed Basin Project provides, although less than ideal, perching sites for bald eagles. Coupled with the open water channel nearby, the Refuge parcels are a popular gathering area for eagles in the winter.

No forest habitat exists for eagles on the BLM site. This site is dominated by grasslands and pinyon-juniper woodlands.

**Baca Land Exchange Project**

A Joint Project between U.S. Fish & Wildlife Service, National Park Service, Bureau of Land Management, Colorado State Land Board

Figure 7. Photo of Table Mountain Parcels in relation to CDOW Bald Eagle winter use areas.



**Baca Land Exchange Project**

A Joint Project between U.S. Fish & Wildlife Service, National Park Service, Bureau of Land Management, Colorado State Land Board

Figure 8. Map of Gribbles Park Parcels in relation to CDOW Bald Eagle Activity Areas.

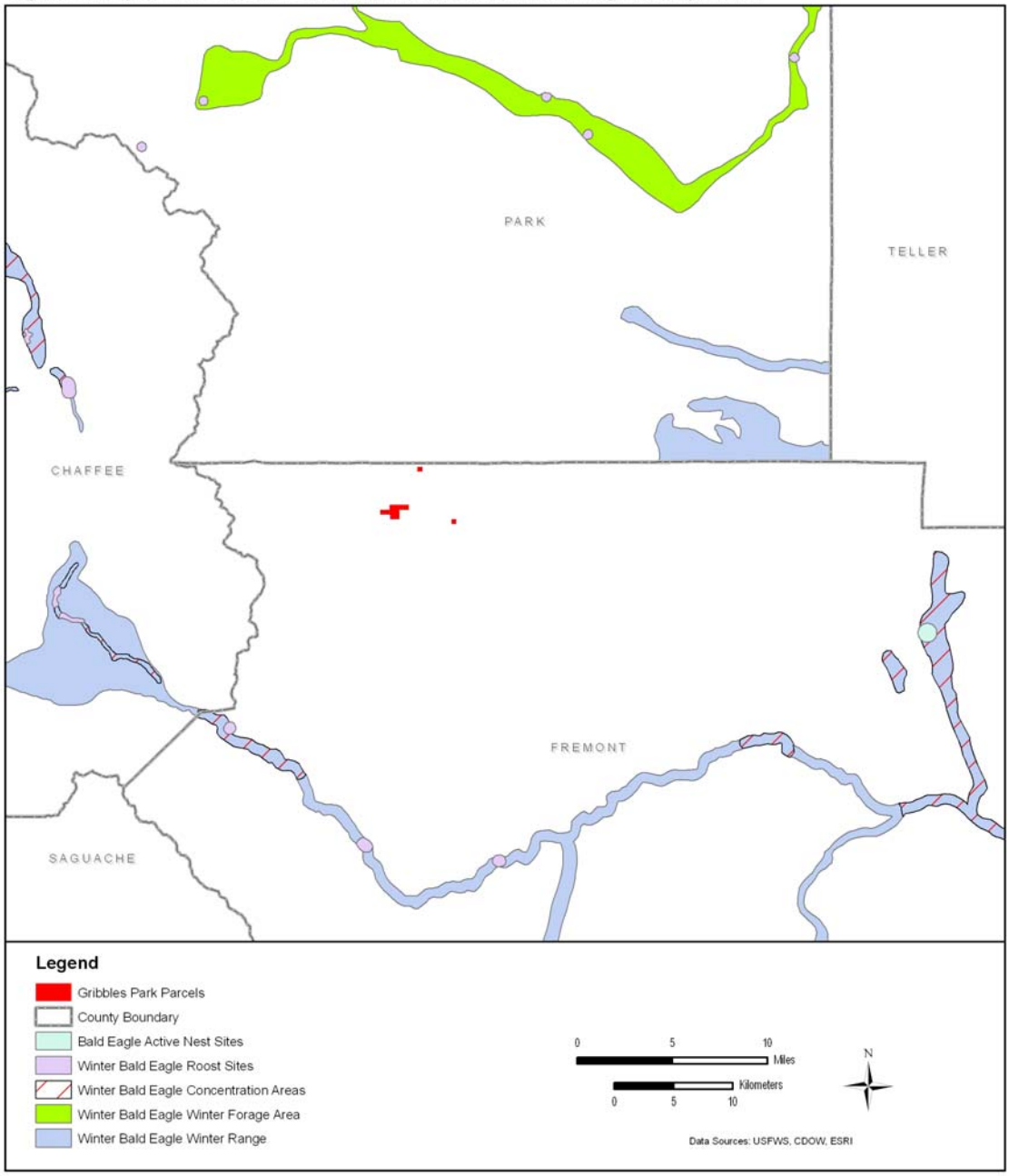
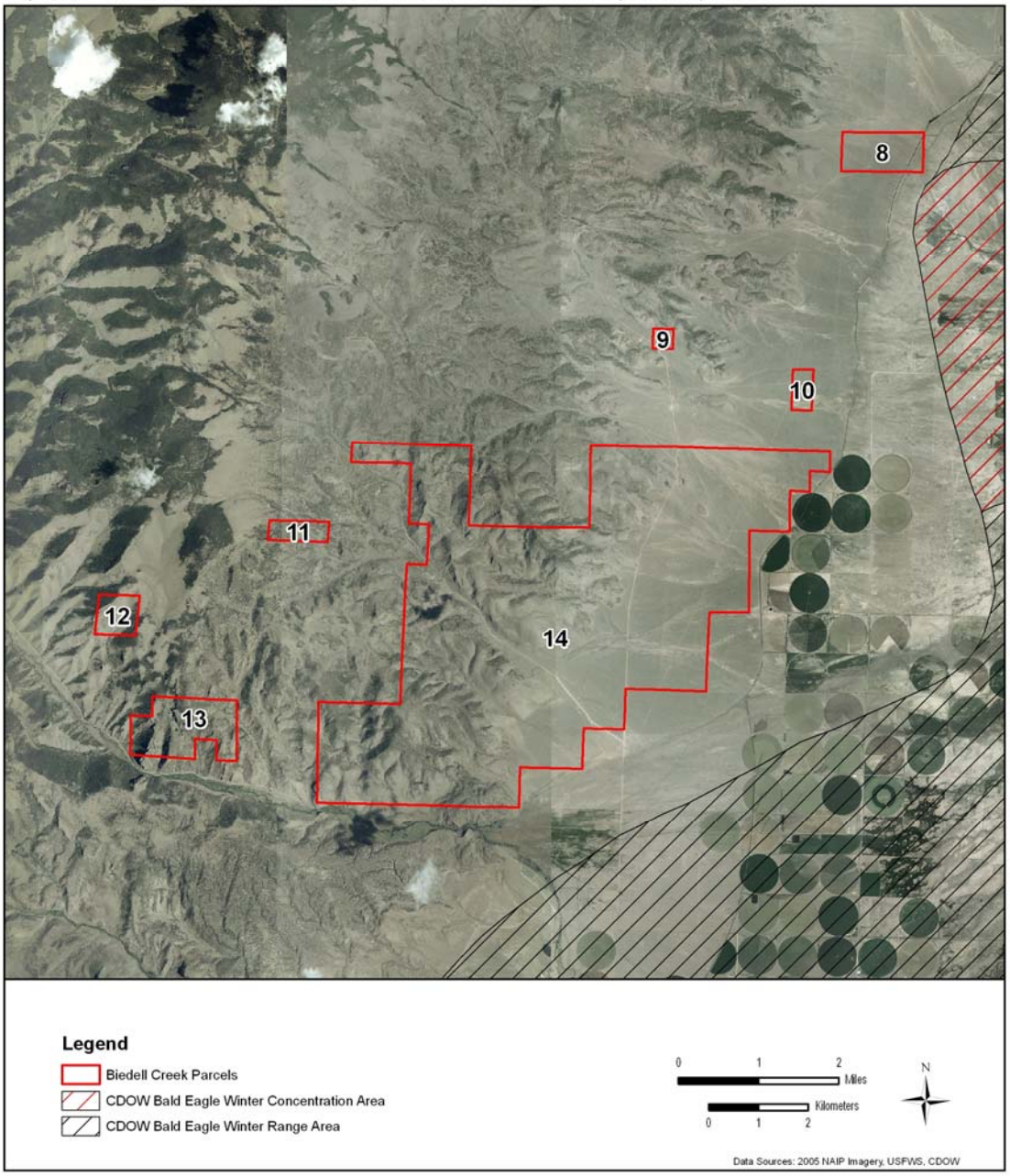


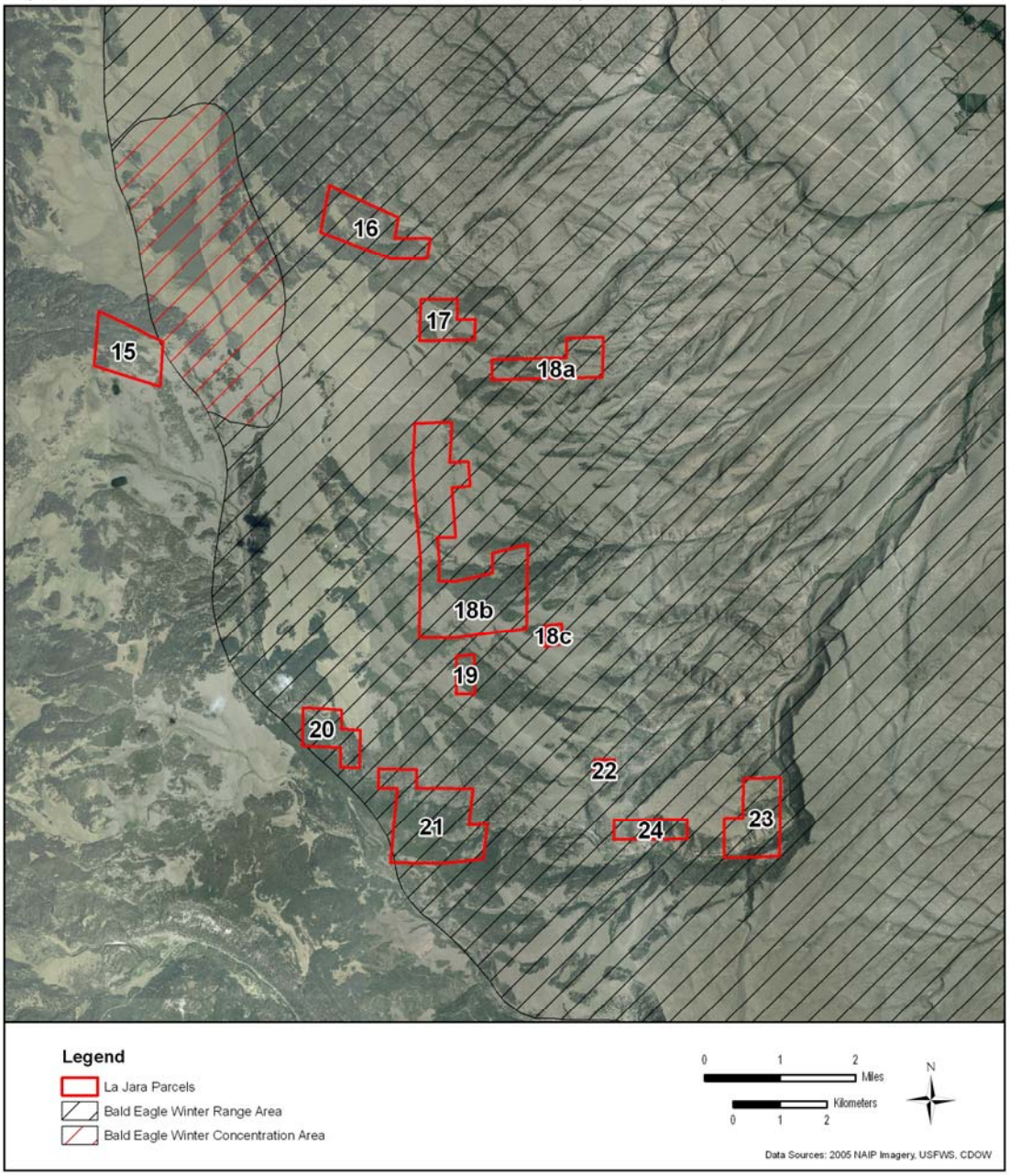
Figure 9. Photo of Biedell Creek Parcels in relation to CDOW Bald Eagle Activity Areas.



**Baca Land Exchange Project**

A Joint Project between U.S. Fish & Wildlife Service, National Park Service, Bureau of Land Management, Colorado State Land Board

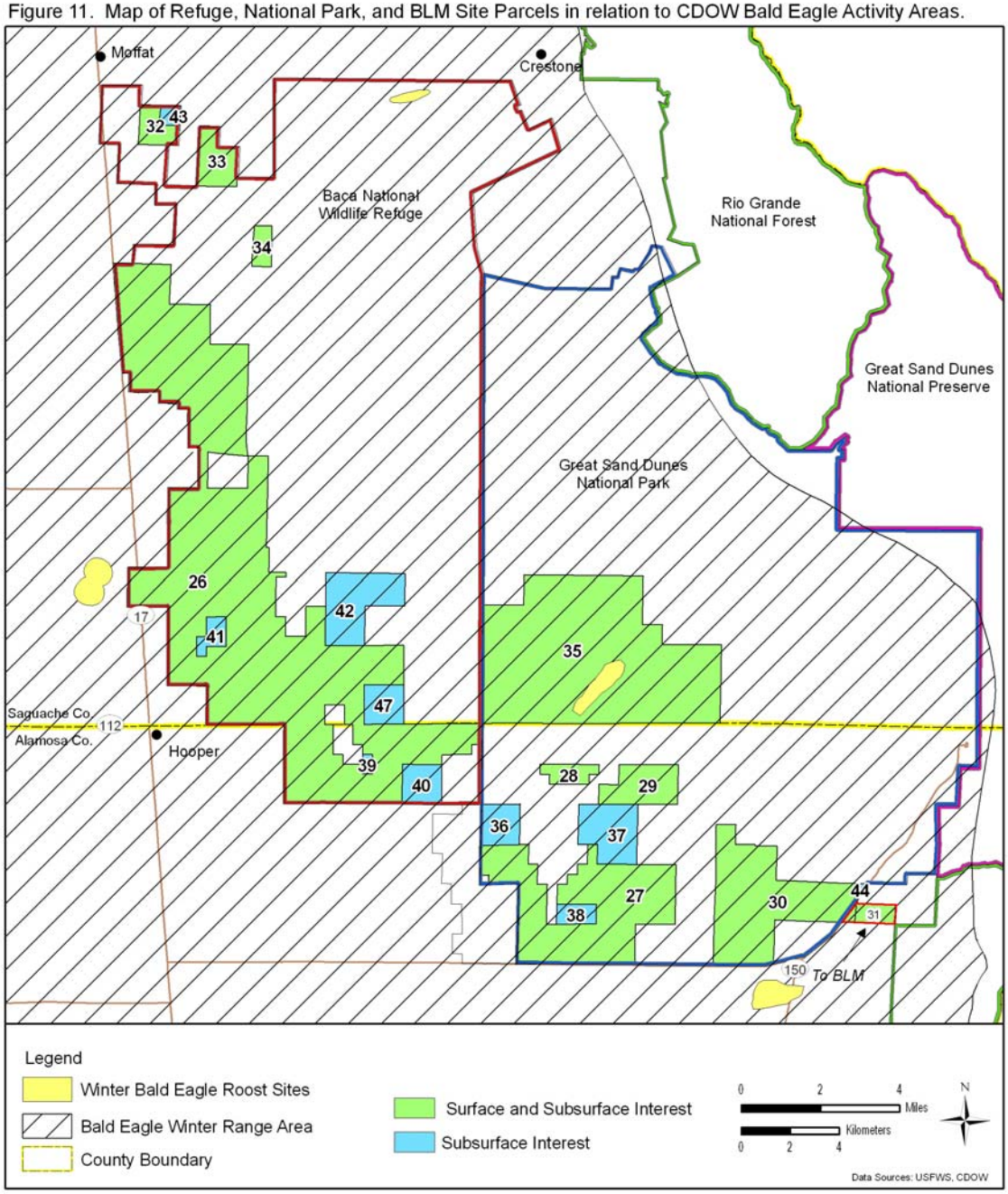
Figure 10. Photo of La Jara Parcels in relation to CDOW Bald Eagle Winter Activity Areas.



**Baca Land Exchange Project**

A Joint Project between U.S. Fish & Wildlife Service, National Park Service, Bureau of Land Management, Colorado State Land Board

Figure 11. Map of Refuge, National Park, and BLM Site Parcels in relation to CDOW Bald Eagle Activity Areas.



## C. Bald Eagle Species Status Locally

### 1. Knowledge of occurrences, habitat and surveys

There has been little coordinated monitoring of bald eagles in most of the action area. As a consequence of this absence of coordinated monitoring, this analysis relies on the CDOW maps of known bald eagle use areas.

Eagle nesting

No eagle nest sites, either active or inactive, are identified in or near the land exchange sites. Given the bird's conspicuous nature, it is unlikely that an existing nest territory would not be detected and on record. The absence of documented eagle nesting areas makes it unnecessary to analyze effects to bald eagle reproduction.

Eagle wintering

Bald eagles winter in the San Luis Valley, ranging between 100 and 200 individuals across the years for which data are available (Rawinski 2004). Typically, bald eagles are present from November 15th through the end of March. A large number of bald eagles were observed at San Luis Lakes State Park in late March of 2005. Most individuals migrate north from the area by late spring of each year (Rawinski 2004).

Wintering bald eagles in the San Luis Valley concentrate where there is roosting habitat. Such habitat includes mature cottonwoods along ice-free water where there are concentrations of wintering waterfowl, or in areas where carrion is likely to be found. Most of the waterways in the land exchange parcels are frozen or dry in the winter, and therefore, are less-than-ideal winter foraging sites for bald eagles.

### 2. Cumulative Effects

We are not aware of any changes in nonfederal land management in, or adjacent to, the land exchange parcels that would have an effect on the migratory and wintering bald eagle population. The SLB has no actions planned on the Refuge, Park, and BLM sites that would affect migratory or wintering habitat for eagles. The HCP being developed for non-federal lands in the San Luis Valley addressed bald eagles and would guide management of current and future non-federal eagle habitat.

## D. Critical habitat

There is no designated critical habitat for the bald eagle in or near the action area of the land exchange.

## E. Effects of the Proposed Action on the Bald Eagle

### 1. Direct Effects

The ESA regulations definition of "direct effects" is such that a land exchange would not result in any direct effects to bald eagles (see discussion in Introduction to the BA).

### 2. Indirect Effects

No bald eagle nest territories are in or near the land exchange parcels; there would be no indirect effects to bald eagle reproduction from the Proposed Action.

As illustrated in Figures 7, 10 and 11, large portions of the land exchange parcels are in areas mapped as having some value to wintering bald eagles. The vast majority of the areas mapped are eagle winter range. In these areas, bald eagles forage for carrion, waterfowl, and other prey with some frequency; sightings of eagles in the winter are not uncommon. The occurrence of eagles in these areas is largely dependent on the maintenance of natural vegetation, availability of foraging opportunities, and open space relatively free of human disturbance. In addition, the existence of open water areas surrounding the parcels, (e.g., La Jara Reservoir or the Closed Basin Canal) are needed to keep these areas attractive to wintering eagles.

There would be no reduction in eagle habitat quantity or quality in these areas as a result of the Proposed Action. The SLB management will retain the native vegetation and prey populations. Riparian areas were eagles are likely to spend a majority of there time are not likely to be affected by timber harvest or mineral development on these parcels. The limited access and dispersed recreational activities of hunting, fishing, or other outdoor activities will not change from current levels. The absence of stressors on eagles mean there will be no measurable response by either individuals or the eagle population as a whole. These areas will continue to provide habitat necessary to support bald eagle use.

Impacts of the land exchange on bald eagles would include those management actions which result in effects to the extent and structure of the cottonwood riparian community under the future management. Also, the effects on bald eagles would include those human activities during the winter months or migration seasons, when the eagles may be using the habitat in and near the land exchange parcels. These effects would be disturbance of eagles from their normal loafing, hunting, and roosting behavior. On the Park and Refuge sites, this could result from agency employees working in or near cottonwood galleries. Such disturbance would be temporary, lasting as long as people are present in the area and for a short time afterward.

The future management of the Refuge and Park sites would be intended to improve bald eagle habitat and further contribute to the recovery of the species. The winter roost area on the NPS site would be maintained and enhanced under guidance provided under the General Management Plan (NPS 2006)

This determination is based in part upon the knowledge approximately 57,056 acres of bald eagle winter range will be transferred into the federal estate (Table 5). Within this acreage, the Park will gain a documented winter roost area of approximately 400 acres. Once in federal management, the acreage will be subject to the NPS, FWS and BLM legal direction and agency policy to improve conditions for ESA-listed species. In exchange, the State will acquire approximately 4,665 acres of bald eagle winter range which is currently being managed by the BLM. The net change would be an increase of 53,391 acres of bald eagle winter range into federal management.

**Table 5. Net Change in Federal Management of Bald Eagle Winter Range**

| Site Name | Acres of Winter Range | Change in Federal Management of Eagle Winter Range |
|---|---|---|
| Refuge | 30,910.62 | Added to Federal management |
| Park | 25,765.79 | Added to Federal management |
| BLM | 320.00 | Added to Federal management |
| Table Mountain | 495.00 | Removed from Federal management |
| Gribbles | 0 | |
| Biedell | 0 | |
| La Jara | 4,163 | Removed from Federal management |
| | **53,391** | Net change - Addition to Federal Management |

The acreage of bald eagle winter range that will be removed from federal management will not be 'lost' as habitat for bald eagles. Given the current management by the BLM, and the expected management by the SLB, it is unlikely that habitat for bald eagles in the parcels will change significantly from current conditions. The SLB timber management program will not include harvest of cottonwood trees, as these are not commercially valuable species. The portions of the parcels which are potentially valuable for mineral development do not support any winter roost sites nor contain vegetation conducive to become a roost site in the foreseeable future.

### 3. Interrelated and Interdependent Effects

The interrelated and interdependent effects of this land exchange are those actions and effects that would occur as a consequence of the exchange in land title. Those effects are included in the discussion above, "Indirect effects".

## F. Conservation Measures

Conservation measures are actions taken by federal agencies to reduce or eliminate the effects of their proposed actions on listed species; specifically, actions to reduce or eliminate 'take'. Assuming the exchange were to occur as proposed, the lands out-going from Federal management will be subject to management decisions of the SLB, and no longer within the purview of the Federal government. Therefore the Federal government would have no authority to implement conservation measures on these lands.

At this time, there are no specific land management actions planned on the three land exchange sites in-coming to the Federal government (Refuge, Park and BLM sites) that would warrant conservation measures. Therefore it is not necessary to describe specific conservation measures for future Federal land management actions on these sites. It is possible to discuss general management practices that may be considered conservation

measures under the Endangered Species Act (ESA). For example, on the Refuge, Park and BLM sites, surveys for bald eagles and Section 7 consultation will be conducted prior to implementation of any land management with the possibility of affecting bald eagles. Also, with the bald eagle delisting, Federal agencies will be implementing the National Bald Eagle Management Guidelines.

## G. Conclusion and Determination for Bald Eagle

The proposed Baca Land Exchange "may affect, but is not likely to adversely affect" bald eagles or their habitat. This determination is based in part upon the following:

- No bald eagle nest territories would be affected by the exchange.
- Approximately 57,056 acres of bald eagle winter range will be transferred into the federal estate.
- The Park will gain a winter roost area of approximately 400 acres.
- The State will acquire approximately 4,665 acres of bald eagle winter range.
- The SLB management of the acquired winter range will have no discernable detrimental effect on the eagle wintering population due to the nature of expected management – minimal cutting of trees, maintenance of water, etc.

**Mexican Spotted Owl (*Strix occidentalis lucida*) and Critical Habitat**

## A. Species biology and rangewide status

The Mexican spotted owl (MSO) is a federally-listed threatened species (58 Fed. Reg. 14,248-14,271 (March 16, 1993)). A recovery plan for the MSO was developed in 1995 and provides guidance for federal land managers to recover the species (USDI 1995). The primary reasons for listing include historical alteration of its habitat as the result of timber management practices, specifically the use of even-aged silviculture, plus the threat of these practices continuing into the future as provided for in National Forest Plans (USDI 1995). The growing danger of catastrophic wildfire over large areas within its primary range was also cited as a potential threat for additional habitat loss (USDI 1995).

The Mexican spotted owl has the largest geographical range of the three subspecies of spotted owls. Its range extends from Aguascaleintes, Mexico through the mountains of Arizona, New Mexico and western Texas, to the canyon lands of Utah and Colorado, and the front range of Colorado. In general, Mexican spotted owl is distributed discontinuously throughout its range, with its distribution largely restricted to montane forest and canyons. The recovery plan identified six recovery units (RU) throughout the southwestern United States and 5 RU in Mexico. The proposed action is located within the Southern Rocky Mountains – Colorado RU. This RU covers the majority of Colorado's mountainous regions and represents the northeastern geographic extent of Mexican spotted owls.

Habitat-use patterns vary throughout the range and with respect to owl activity. In Colorado, canyon habitat is used by owls for nesting, roosting, and foraging, and includes landscapes dominated by vertical-walled rocky cliffs within complex watersheds, including many tributary side canyons. These areas typically include parallel walled canyons up to 1.2 miles (2 kilometers (km)) in width (from rim to rim), with canyon reaches often 1.2 miles (2 km) or greater, and cool north-facing aspects. Most nests in Colorado have been found in caves or on cliff ledges in steep-walled canyons. While other trees species are used for nesting and roosting sites, Douglas fir is the most commonly used tree species. Nests are typically in large, mature trees.

The owl occurs in a variety of multi-layered forest types with high canopy closure and high stand density; it is more frequently found in uneven-aged, old-growth mixed conifer forests. Uneven-aged stands with high basal area and many snags and downed logs are most favorable. These forests are composed of white fir (*Abies concolor*), Douglas fir (*Pseudotsuga menziesii*), and co-dominant with southwestern white pine (*Pinus strobiformis*), limber pine (*Pinus flexilis*), and ponderosa pine (*Pinus ponderosa*). Mexican spotted owls also occur in piñon-juniper forests where that vegetation is near canyons and steep-slopes.

Owls typically hunt from perches in trees with dense canopies using a perch-and-wait strategy; therefore, cover must be present within their home range for them to successfully hunt and survive. MSO consume a variety of prey throughout its range but

most commonly eats small to medium-sized rodents including woodrats, voles, and mice. Small birds, insects, and snakes are also eaten by owls.

Nesting activity usually begins in late-March or early April with females typically laying 1-3 eggs. Incubation begins shortly after the first egg is laid. The male does most or all of the foraging during incubation and the first half of brood-rearing. Nestling owls generally fledge four to five weeks after hatching in early to mid-June. Fledglings remain dependent on their parents for food during the early portion of this period. Dispersal of young occurs generally in September and October.

Reliable estimates of the number of MSO occurring rangewide is currently not available. A pilot study in 1999 estimated the number of MSO for the Upper Gila Mountains RU at 2,950 birds (Ganey et al. 2000). This RU is believed to contain over half of all known owl sites in the U.S.

Additional information regarding the Mexican spotted owl can be found at the FWS website (http://www.fws.gov/ifw2es/mso/) and at http://www.natureserve.org/.

**B. Affected environment**

Critical habitat for Mexican spotted owl has been designated (FR 69: 53181-53298). We used the primary constituent elements (PCE) outlined in the critical habitat designation as a starting point for evaluating potential habitat for Mexican spotted owls on the seven sites in the proposed action. We also used definitions found in the recovery plan for guidance on habitat suitable for owls. The PCE are those physical and biological features that are "essential to the conservation of the species and that may require special management considerations or protections." Below is the list of the PCE for Mexican spotted owl:

PCE related to forest structure:

- A range of tree species, including mixed conifer, pine-oak, and riparian forest types, composed of different tree ages reflecting different ages of trees, 30 percent to 45 percent of which are large trees with a trunk diameter of 12 inches (0.3 meters) or more when measured at 4.5 feet (1.4 meters) from the ground;
- A shade canopy created by the tree branches covering 40 percent or more of the ground; and
- Large dead trees with a trunk diameter of at least 12 inches when measured at 4.5 feet from the ground.

PCE related to maintenance of adequate prey species:

- High volumes of fallen trees and other woody debris;
- A wide range of tree and plant species, including hardwoods; and
- Adequate levels of residual plant cover to maintain fruits, seeds, and allow plant regeneration.

PCE related to canyon habitat includes one or more of the following:

- Presence of water (often providing cooler and often more humidity than the surrounding areas);
- Clumps or stringers of mixed-conifer, pine-oak, pinyon-juniper, and/or riparian vegetation;

- Canyon walls containing crevices, ledges, or caves; and
- High percent of ground litter and woody debris.

Given the above primary constituent elements, we evaluated each site for its potential as owl habitat. Primary data that we used included vegetation data from the SWReGAP, digital elevation models, and 2005 1-meter resolution color aerial photographs. The Table Mountain site, which partly falls within designated critical habitat, and the La Jara site, were the two sites deemed to have habitat that may support one of the life history requirements for the Mexican spotted owl. The Table Mountain site is the primary focus of our analysis regarding possible impacts to owls for this project due to its location to known owl locations. However, given that owl protocol surveys have not been conducted in the area, we more fully analyzed this site compared to the other 5 sites which lacked suitable vegetation and canyon structure. The La Jara site has potentially suitable vegetation but lacks the associated canyon structure, making it less suitable for nesting habitat.

**Gribbles Park site**
The habitat on this site is considered unsuitable for Mexican spotted owls; the vegetation (Table 2 in Appendix C) and topography do not meet the owl's habitat requirements. The three parcels which make up this site are dominated by montane-subalpine grassland communities. Canyons or even rocky outcrops of any size are not present on these parcels. The portion of the parcels that does contain trees is not contiguous with larger blocks of forest. There is also a lack of perennial water. Taken together these parcels do not represent suitable habitat for Mexican spotted owl.

**Biedell Creek site**
The habitat on this site is also considered unsuitable for Mexican spotted owls. The vegetation and topography do not meet the owl's habitat requirements. Nearly half of the vegetation on the parcels is listed as shrub-scrub communities. The next most common vegetation on the parcels is pinyon-juniper woodlands. While pinyon-juniper habitats may be used by dispersing owls during the winter, the associated topographic relief in the form of canyons is not present on this site.

**Refuge, Park, and BLM sites**
The habitat of the parcels within all of these sites is not suitable for Mexican owls. The vegetation is dominated by greasewood shrub lands, shrub steppe, and playa basins (Tables 5, 6, 7 in Appendix C). The topography is essentially flat; the nearest canyon-like features occur in the Sangre de Cristo Mountains greater than 14 miles from the Refuge and Park sites. The BLM site is closer to the canyon-like features (~3-miles), however, on-site conditions are not conducive for owls.

**Table Mountain site**
As mentioned earlier, we evaluated the sites based on information provided in the recovery plan and the literature supporting the designation of critical habitat including the PCE described above. We assessed all the parcels in relation to the Recovery Plan definitions of 'Protected' and 'Restricted' areas habitat. These terms are defined below:

‘Protected areas’ within recovery units include:

- all occupied nest or roost areas,
- all areas with slopes >40% in mixed-conifer and pine-oak forests where timber harvest has not occurred in the past 20 years,
- and all legally administered reserved lands such as Wilderness Areas or Research Natural Areas.”

‘Restricted areas’ includes mixed conifer forests, pine-oak forest, and riparian areas adjacent to or outside of ‘protected areas’.

Protected Activity Centers (PACs) are areas with documented nesting or roosting activity. PACs encompass 243 ha (600 ac) surrounding a known nest or roost location. We received data from the BLM delineating known PACs in the vicinity of the Table Mountain parcels (E. Brekke, BLM pers. communication 2006; see figure 12). There are several PACs located within 2 miles of the northern most parcels at Table Mountain on other BLM lands. No PACs are designated on the BLM parcels identified for exchange.

We also looked for areas within the parcels that would meet the other protected area definition of mixed-conifer or pine-oak forests with a slope >40% and where timber harvest has not occurred in the past 20 years. Using the SWReGAP data set, below are the vegetation classes we considered to evaluate potential mixed-conifer forests and pine-oak forests:

SWReGAP classes:

- Rocky Mountain Sub-alpine Dry Mesic Spruce-Fir Forest and Woodland
- Rocky Mountain Sub-alpine Mesic Spruce-Fir Forest and Woodland
- Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland
- Rocky Mountain Montane Mesic Mixed Conifer Forest and Woodland
- Intermountain-west Aspen-Mixed Conifer Forest and Woodland Complex

None of these classes occur on the Table Mountain site (Table 1, Appendix C) therefore the mixed-conifer component of the protected or restricted areas is not applicable. In regards to the pine-oak forests, we used the recovery plan definitions for guidance as well as consultation with FWS biologist Leslie Elwood. Although owls will occasionally use ponderosa pine habitat, the recovery plan states that “present evidence suggests that the ponderosa pine series includes many areas that could never attain the type of forest structure sought by spotted owls for roosting and nesting.” (USDI 1995) As such, the recovery plan defines pine-oak habitats as:

- Any stand within the Chihuahua pine (*Pinus leiophylla*) Series
- Any stand with the ponderosa pine Series that meets the following criteria:
    - Habitat types that reflect *Quercus gambelii* or a *Quercus gambelii* phase of the habitat type.
    - The stand is located in either the Upper Gila Mountains Recovery Unit, the Basin and Range-West Recovery Unit, or the Zuni Mountains or Mount Taylor regions of the Colorado Plateau Recovery Unit
    - ≥10% of the stand basal area consists of Gambel oak ≥ 13 cm (5 in.) diameter at root collar.

- Any stand within the Basin and Range-West Recovery Unit of any other series that meets the following criteria simultaneously:
    - A plurality of the basal area exists in yellow pines (ponderosa, Chihuahua, Apache, or Arizona)
    - ≥10% of the stand basal area consists of any oaks ≥ 13 cm (5 in.) diameter at root collar.

There are no Chihuahua pine forests within the parcels, or within Colorado. According to the SWReGAP data, approximately 750 acres of ponderosa pine woodlands occur on the Table Mountain site (Table 1 in Appendix C). Gambel's oak occur in even smaller amounts and are described as a shrubland community type as opposed to woodland or forest type. We queried both the vegetation data and the elevation data for vegetation satisfying the species and slope requirements (Figure 13). No suitable mixed-conifer stands or pine-oak stands (as defined in the recovery plan) occur on slopes greater than 40% within the exchange parcels. The dominant vegetation at Table Mountain is pinyon-juniper woodland community types (Table 1 in Appendix C).

We also looked at the general topography of the Table Mountain site. While there are slopes in excess of 40%, the majority of the area is not steep. Approximately 10% of the Table Mountain parcels contain a slope greater than 40%. Patton Canyon contains the majority of areas with slopes >40%. Within just the surface parcels (parcels 1-4), the area containing slopes greater than 40% is 16%.

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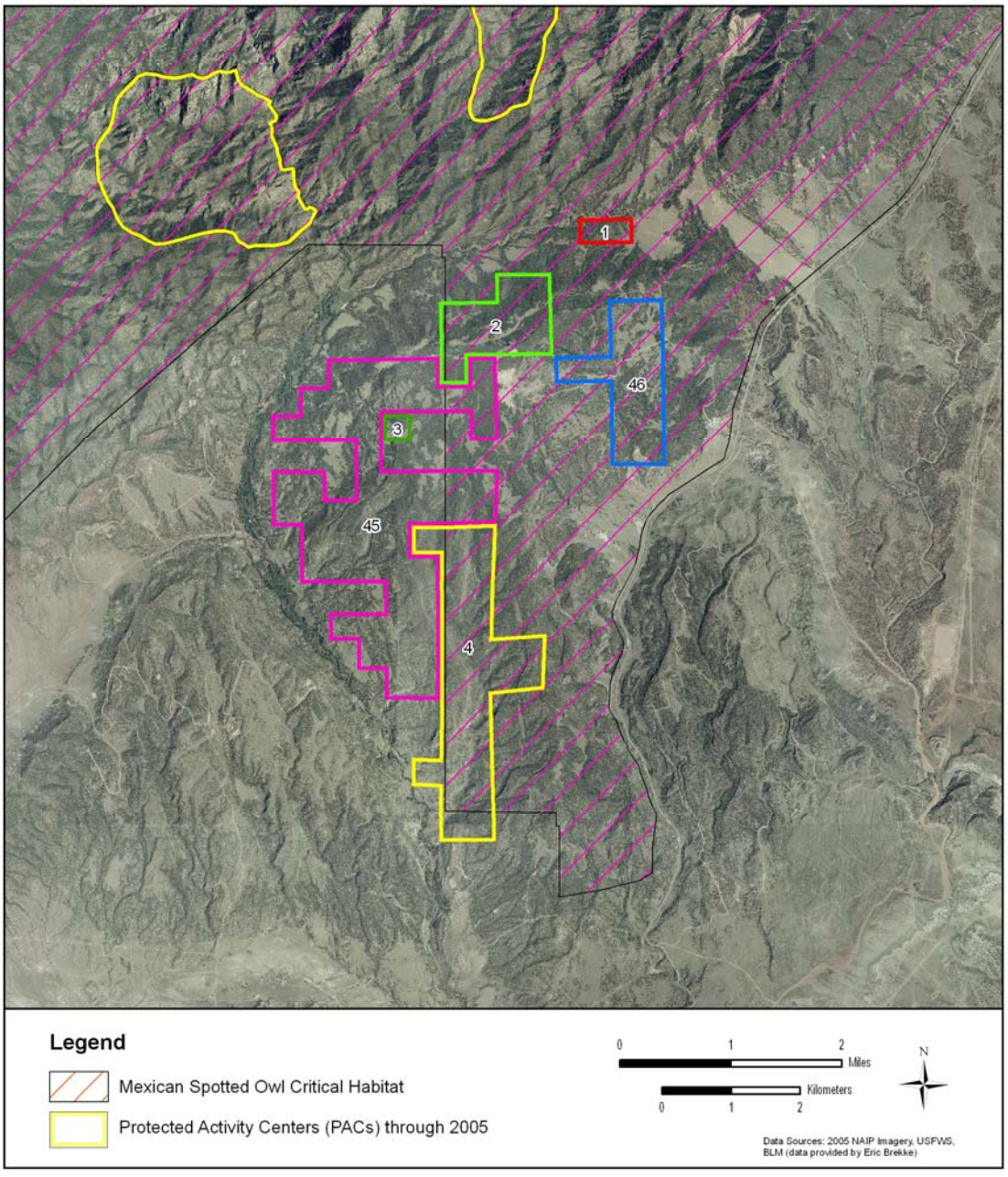
Figure 12. Photo of Table Mountain Parcels in relation to Mexican Spotted Owl "protected activity centers" or (PACs) and designated critical habitat.

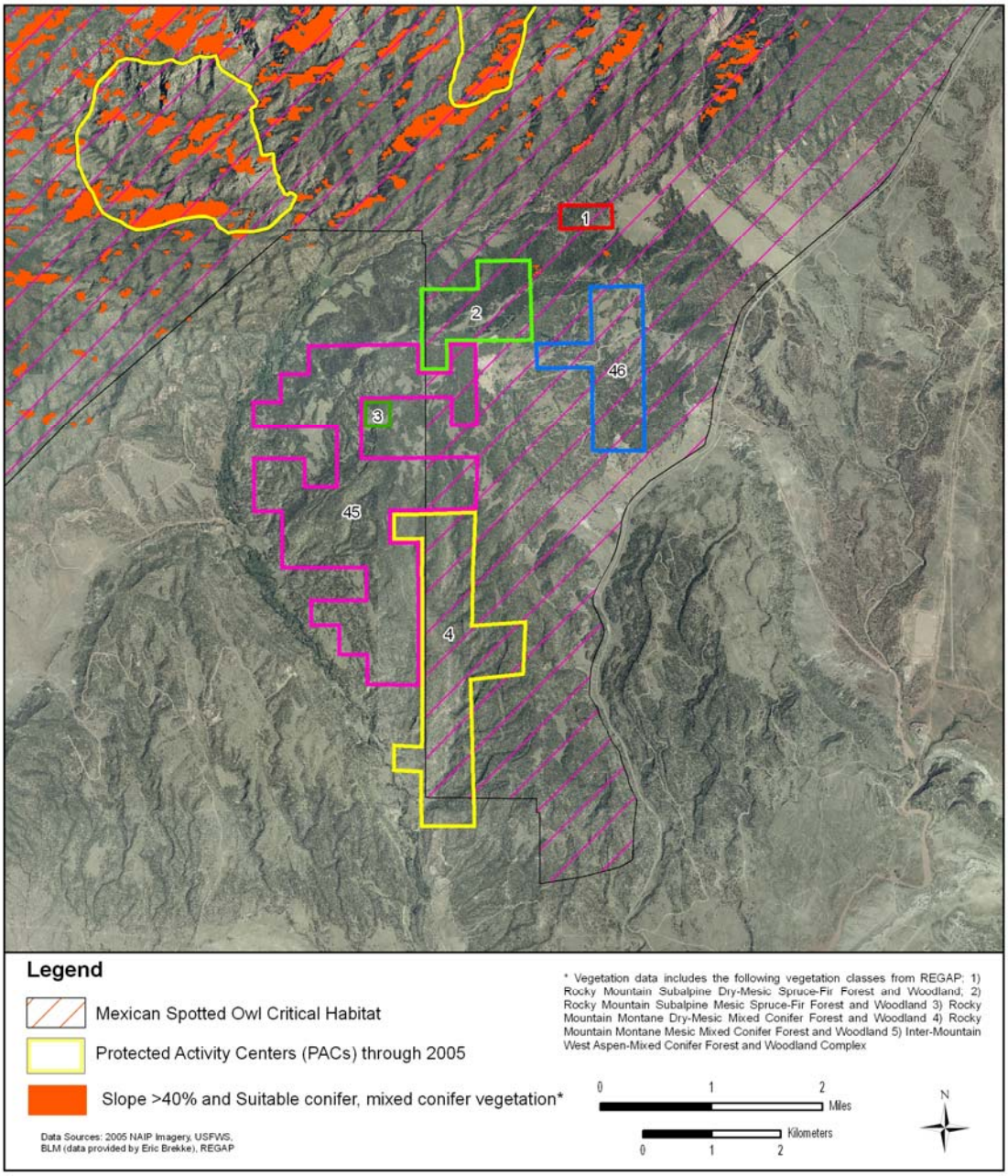


Our analysis suggests that the parcels being considered for exchange at the Table Mountain site do not provide suitable breeding habitat for Mexican spotted owl.

However, given the close proximity to known nesting areas and established PACs, it is plausible that these parcels may receive use by owls during the fall/winter either by adults or dispersing young owls. Owls associated with the PACs to the north have been documented to move down slope small distances within the drainages (E. Brekke BLM pers. communication 2006). In addition, sporadic use by wintering owls has also been reported on the Fort Carson military base located east of the exchange parcels (Warren 2003). Two birds, known from radio-telemetry studies, occupied portions of Booth Mountain in the southern half of Fort Carson from December 1995 to February 1996. One of the birds was only recorded for one day on the base. The sites used by these two birds were approximately 12 km east of the parcels at Table Mountain. No additional records of owls at Fort Carson have been documented since 1996.

Based on analysis of aerial photos and vegetation data, there appears to be little difference in the habitat on Booth Mountain versus that on Table Mountain. Therefore given that owls have been known to move from nesting areas to the north and west, and the habitats are similar, for the purposes of this BA, we assume that suitable wintering habitat is present on the Table Mountain site. Patton Canyon and Banta Gulch are some of the better quality wintering habitat within the parcels (E. Breke, BLM, pers. communication 2006). Outside of radio-telemetry studies or incidental disturbance detection by flushing a bird from a roosting area, there are no known methods to detect wintering owls because they do not vocalize during this time. The importance of the quality and quantity of wintering habitat is not clear; no guidance is given in the recovery plan pertaining to wintering habitat.

Figure 13. Photo of Table Mountain Parcels in relation to potentially suitable Mexican Spotted Owl habitat and designated critical habitat.

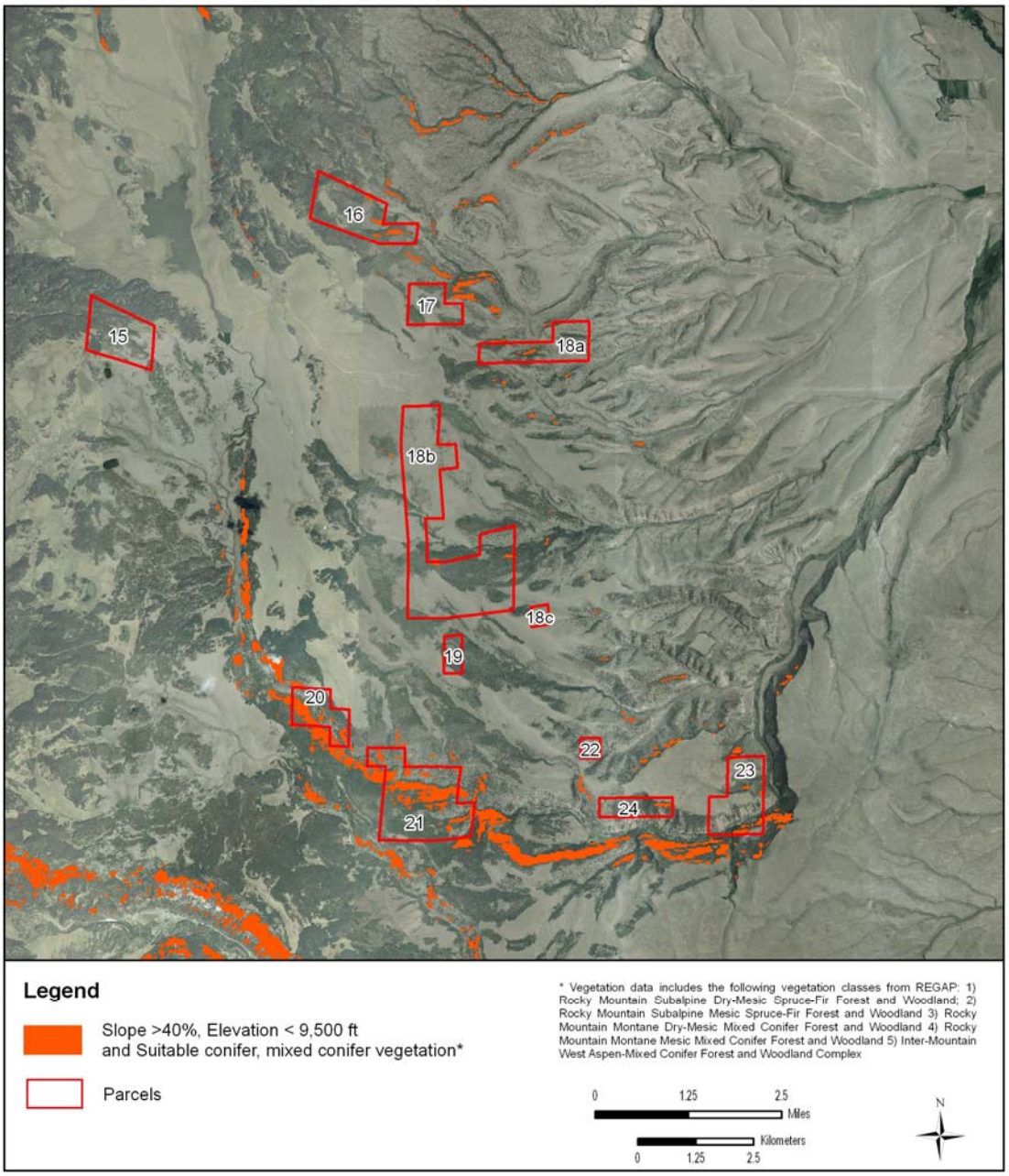


**La Jara site**

We used a similar modeling approach for the La Jara site that was done at the Table Mountain site. We used vegetation data along with elevation and slope/aspect data to assist with identifying potential habitat at the La Jara site. Based on discussions with local biologists, we also added a maximum elevation parameter into the model of 9,500ft. On the whole, this site is largely considered unsuitable for Mexican spotted owls. The vegetation and topography characteristics on 10 of 12 parcels do not meet the owl's primary nesting or roosting habitat requirements, or have limited isolated patches of potential habitat (see Figure 14).

PACs have not been established in this area due to the lack of documented nesting or roosting use by owls. Parcels 20 and 21 along La Jara Creek, however, include approximately 220 acres mixed-conifer vegetation on slopes greater than 40% (Figure 14). Much of this habitat is located on the south side of La Jara Creek. Although potential habitat exists, the canyon structure may be considered too open to be conducive for nesting owls. The steep south facing canyon ledges on the north side of La Jara Creek lack the vegetation necessary to make this area suitable for spotted owl nesting. No formal surveys have been conducted on these parcels (M. Garcia, BLM pers. communication, 2006) there have been no proposed actions in the area that would trigger the need for such surveys.

Figure 14. Photo of La Jara Parcels in relation to potentially suitable Mexican Spotted Owl habitat.



## C. Species status locally

### 1. Knowledge of occurrences and surveys

Mexican spotted owls have not been reported to occur in the parcels of the land exchange. However, comprehensive owl surveys have not been conducted on Table Mountain or La Jara sites, so the absence of reports cannot be interpreted as absence of the species. These sites have not been surveyed by federal land managers largely because of limited quality nesting and roosting habitat, difficulties in access, and lack of proposed projects which would require such surveys. The BLM has conducted owl surveys in the area to the north and west of the Table Mountain site, as evidenced by establishment of PACs.

Some survey work has been completed north of the La Jara parcels in the Poso Creek drainage. No owls have been located. In 1989, one possible record was recorded in Alamosa Canyon, located about 13 miles north of the La Jara parcels (R. Ghormley USFS, pers. communication 2006). Follow-up surveys could not confirm the record. No other records since 1989, either confirmed or unconfirmed, are known in this area however, limited surveys have been conducted. CDOW data indicate no records of spotted owls in Saguache or Alamosa County.

Adjacent to the Table Mountain parcels is the Fort Carson military base. During the winter of 1995-1996, 2 owls were documented on the base. One owl was present from December 1995 through February 1996, while the other bird was only recorded on one day in February 1996 (Warren 2003). The bird tracked via telemetry for over 2 months was an adult female which had nested in Red Creek Canyon (Warren 2003), approximately 6 miles west of the base, (and several miles north of Table Mountain). No breeding owls are known to occur on Fort Carson.

### 2. Cumulative Effects

The FWS noted that State and private lands are not essential to the conservation of the owl (FR Vol. 69, No. 168, p. 53211). The most pertinent ESA cumulative effect for spotted owls and critical habitat is the change in landownership of the Table Mountain parcels, and the expected change in land management.

## D. Critical habitat

There is designated critical habitat for the Mexican spotted owl. A total of 8.6 million acres have been designated in the southwestern United States for the owl. In Colorado, 3 areas totaling 322,326 acres have been designated. Six of the land exchange sites are far removed from, and would have no impact on, the critical habitat units (Figure 14). As discussed earlier, the Table Mountain site partially overlaps with owl critical habitat Unit SRM-C-1a, where parcels 1, 2, 4, 45 and 46 are entirely or partially within the designation (Figure 12). A total of 1,400 surface acres currently managed by the BLM are within the designated critical habitat. This represents approximately 1.2% of the acres in Unit SRM-C-1a. Unit SRM-C-1a totals approximately 108,545 acres and covers parts

of the Pike Ranger District, Pike/San Isabel National Forest, and Royal Gorge Field Office for BLM lands.

In describing Unit SRM-C-1a, the Federal Register notice states, "Areas with steep slopes (≥ 40%), canyons, and rocky outcroppings with mixed-coniferous forests are included in this unit. State, private and military lands (Cheyenne Mountain Operations Center) are not designated as critical habitat." (FR Vol. 69, No. 168, p. 53213) To rephrase, this means that only those areas of federal, non-military, mixed-conifer vegetation with a slope greater than 40% have the primary constituent elements in Unit SRM-C-1a. Those specific areas are the focus of the critical habitat analysis for the land exchange.

The analysis is the same for the critical habitat designation. We used GIS to query the vegetation and slope data to locate any areas that contain the required vegetation and steep slopes requirements for the owl. We found no area within the parcels that matched the query parameters. The sites to the north which did contain known PACs did contain vegetation and slope characteristics suitable for owls (Figure 13).

Table 6 provides a summary of the Table Mountain parcels in relation to other owl habitat features.

Table 6. Summary of land exchange parcels in relation to designated Mexican spotted owl critical habitat and important habitat features other than vegetation.

| Parcel ID | Total acreage | Acreage of parcel in CH as per GIS overlay | Presence of steep north-facing slopes of <u>any vegetation type</u> in CH |
|---|---|---|---|
| 1 | 80.00 | 80 acres | 4 acres |
| 2 | 440.00 | 440 acres | 85 acres |
| 4 | 1132.62 | 880 acres | 144 acres |
| 45 | 2120.00 | 310 acres | 3 acres |
| 46 | 560.00 | 560 acres | 30 acres |

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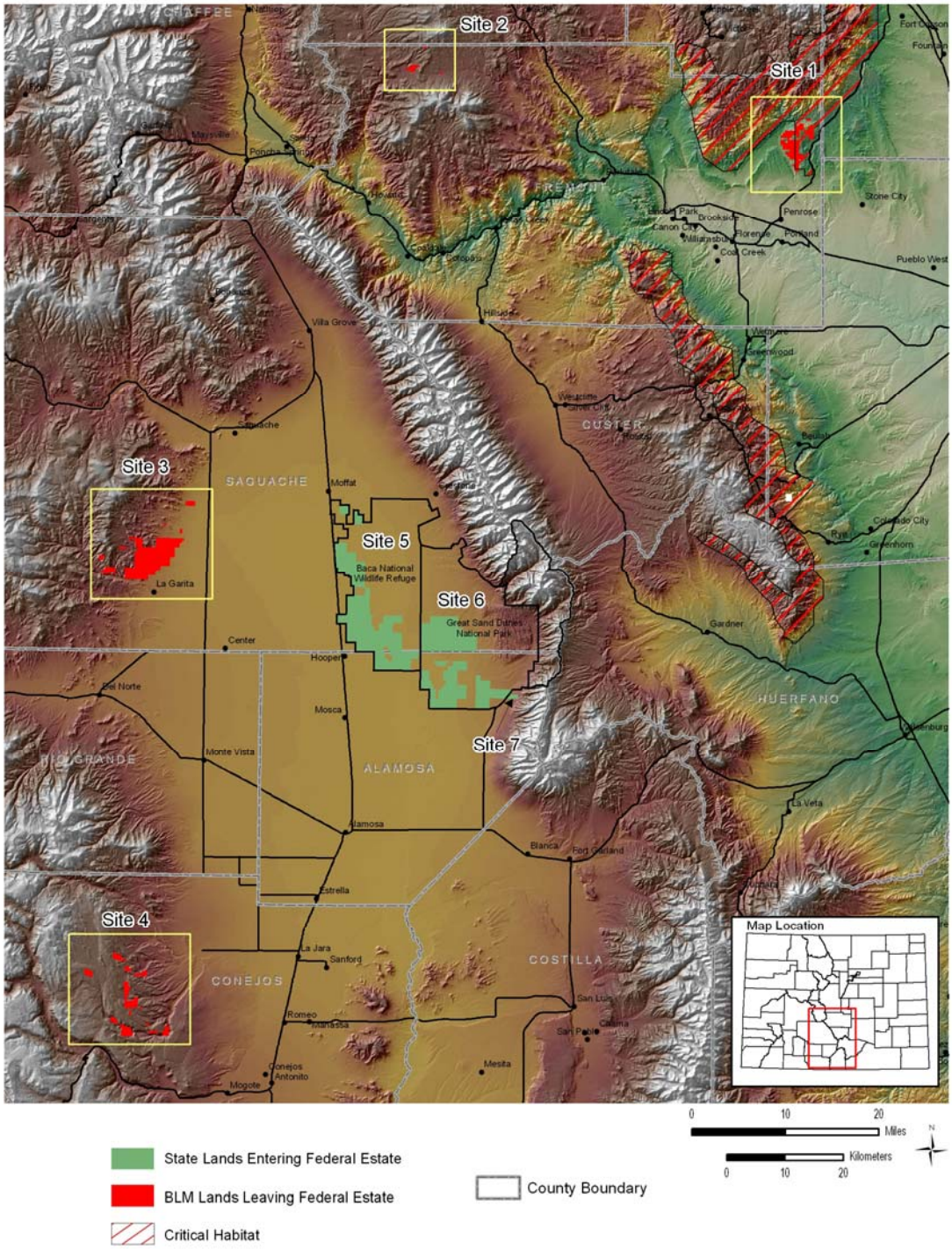
Figure 14. Map of all Parcels in relation to designated Mexican Spotted Owl critical habitat.



## E. Effects of the proposed action

Based on our review and analysis of habitat conditions, none of the habitat to be exchanged under the Proposed Action appears to be suitable breeding habitat for Mexican spotted owls. The proximity of the Table Mountain site to identified PACs, the habitat condition at the site, the knowledge of past winter use of areas on Fort Carson to the east, and the knowledge of local biologists lead us to pursue an additional analysis of potential wintering habitat at this site. Spotted owl movements to areas separate from their breeding habitat (PACs) in winter months has been documented. However, it is not well understood enough to result in specific direction from the Recovery Team. No direction or guidance is presented in the Recovery Plan regarding criteria to evaluate to suitability of wintering habitat for the owl.

### 1. Direct effects

The ESA regulations definition of "direct effects" is such that a land exchange would not result in any direct effects to Mexican spotted owls (see discussion in Introduction to the BA).

An important consideration at Table Mountain is the existence of spotted owl critical habitat. There are two aspects of this issue: first is the legal application of the critical habitat designation, which is a direct effect. Second is the ecological effect of the exchange. As summarized in Table 6, there are 2,270 acres of owl critical habitat that would be leaving the federal estate. Of this, 870 acres is subsurface only (the SLB already manages the surface). Per the federal register notice, it is understood that once the land title is exchanged, the implications of the critical habitat designation on these acres would disappear. This is because the critical habitat designation does not apply to nonfederal land ownerships. In considering the effect of this loss of raw acres of critical habitat, we analyzed the actual habitat conditions on the parcels. None of this acreage has the PCEs needed for it to be considered "critical habitat" per the federal register notice. This is primarily due to the absence of mixed conifer forest. Thus the biological effect of this legal nuance will be neutral in regards to owl nesting habitat. Though the land exchange would result in a 1,400 surface acres lost from critical habitat unit SRM-C-1a, it would have no effect on the biological capacity of the critical habitat.

### 2. Indirect effects

Five of the seven sites do not contain vegetation types or topography required by owls for suitable breeding habitat. They are also far removed from designated critical habitat. For these reasons as described earlier, the proposed action at Gribbles Park, Biedell Creek, Refuge, Park, and BLM sites will have no effect on spotted owl individuals or the population.

In the land exchange proposal, Table Mountain parcels 1, 2, 3 and 4 would change the surface ownership, whereas portions of parcels 45 and 46 would change sub-surface ownership. Existing rock quarry activities do occur south of parcel 2 and east of parcel 45 on State lands (see discussion in Introduction to Effects Analysis). It is reasonable to expect the State management would expand this quarry into parcels 2 and 45 once they

acquire the mineral rights. Such expansion would remove primarily pinyon-juniper vegetation and enlarge an area of human disturbance. The removal of forest vegetation (as a stressor on the owl) would reduce the acreage of habitat potentially used for foraging by wintering owls.

For the purposes of this BA, we estimate the acreage of habitat loss to be 30 acres, or doubling in size of the existing quarry. This loss of habitat would reduce the overall prey availability in the area, as well as perch sites for owls. It would also increase the disturbance of owls from the area; the disturbance would be temporary and seasonal when the quarry is actively mined. As a result of these stresses, we expect the owl response would be to avoid the location due to the lack of tree cover, the reduced prey available and the disturbance factors. This avoidance would require the owl(s) to forage over a larger area, or relocate their winter activities to entirely different areas.

As a consequence of the response of enlarging their winter area, the risk to the individual owl is increased vulnerability to predation and increased energy expenditure while hunting. The risk of relocating would also include increased exposure to predation, and also the possibility of encountering other spotted owls already using the habitat they move in to. All of these risks could reduce an individual owl's winter survival to an unknown extent.

Expansion of the existing quarry would be outside any of the primary canyons at Table Mountain, including Patton Canyon. The owl that wintered at Fort Carson in 1995-1996 used primarily large trees on north-facing slopes in steep canyons (Warren 2003).

Small changes in the grazing regime as would likely occur from SLB management likely would not result in a decrease the prey base of small mammals required and utilized by wintering owls. The steep terrain and limited forage on these parcels result in few AUMs for these units. General access into the parcels is limited and difficult presently. No change or a further decrease in recreational activities in these parcels would be expected as a result of the Proposed Action. This would result in little to no change in human-related disturbances as a result from recreational activities.

At the La Jara site, parcels 20 and 21 contain habitat potentially suitable for Mexican spotted owls. The parcels have not been surveyed. If owls were known to occur, which we have no evidence to suggest that they do, the change in ownership to the SLB would be expected to have little or no impact on the resources the owls depend upon. Cattle grazing will likely be added into parcels 20 and 21; these parcels have not been officially grazed for over 10 years, however trespass grazing is known to occur. However, given the remoteness and rough terrain of these two parcels we believe the impact of grazing will be limited, especially in the areas along the creek. Change to vegetation structure in the understory and herbaceous plant community is likely to occur to some degree; however, impacts to small mammal populations likely would not change substantially as a result.

Timber harvest on these two parcels is not likely due to limited access, rough terrain, and stands of trees with questionable commercial value. The mineral potential in this site as a whole is generally considered low except for landscape-type rocks in which case the

potential is high. Small amounts of landscape rock have been removed on the adjacent SLB lands in the past. The remoteness and lack of existing roads for access to parcel 20 and 21 may reduce the likelihood of landscape-type rocks being commercial valuable to extract.

### 3. Interrelated and Interdependent effects

The interrelated and interdependent effects of this land exchange are those actions and effects that would occur as a consequence of the exchange in land title. Those effects are included in the discussion above, "Indirect effects".

## F. Conservation Measures

At this time, there are no specific land management actions planned on any of the seven land exchange sites. Therefore it is not possible to describe specific conservation measures that would be tied to future land management actions. However, it is possible to discuss general management practices that may be considered conservation measures under the Endangered Species Act (ESA). For example, on the Refuge, Park and BLM sites, surveys for spotted owls and Section 7 consultation will be conducted prior to implementation of any land management with the possibility of affecting Mexican spotted owls. However, the absence of spotted owl habitat on these lands coming into the Federal estate indicates such future Section 7 consultation is unlikely to be needed.

## G. Conclusion and Determination for Mexican spotted owl and critical habitat

Implementation of the land exchange "may affect, is not likely to adversely affect" Mexican spotted owl for the following reasons:

- The exchange of five of the sites will have no effect on Mexican spotted owls. The Gribbles Park, Biedell, Refuge, Park and BLM sites are dominated by vegetation types entirely unsuitable for spotted owls, and they are in terrain that is equally unsuitable.
- The Table Mountain site does not include habitat for spotted owl breeding, but does have the vegetation and the proximity to PACs to provide wintering habitat.
- The expected future State management of the Table Mountain site would largely retain the vegetation cover used by wintering owls.
- The La Jara site does contain parcels with potentially suitable habitat for Mexican spotted owls, however the expected future management of the State would largely retain the vegetation cover used by owls, if they are present.
- Analysis of the Proposed Action against the designated critical habitat for Mexican spotted owl leads us to conclude the land exchange would not likely adversely effect the critical habitat because the parcels do not include the primary constituent elements of spotted owl critical habitat.
- The exchange in land title will result in 1,400 surface acres not being subject to the critical habitat designation in unit SRM-C-1a.

**Southwestern Willow Flycatcher (*Empidonax traillii extimus*)**

## A. Species biology

The southwestern willow flycatcher is a federally-listed endangered species (FR Vol 60, p. 10694-10715 (February 27, 1995)). The subspecies breeds in dense, multistoried riparian habitats in the arid southwestern United States and potentially northwestern Mexico. They nest primarily in swampy thickets, especially of willow, but sometimes of cottonwood and buttonbush (Phillips, Marshall and Monson 1964; AOU 1983), tamarisk (Brown 1988), vines, or other plants, where vegetation is 12-21 feet or more in height. Tamarisk is commonly used in the eastern part of the range. In non-breeding seasons of the year, it migrates in the winter to southern Mexico, Central America, and northern South America.

The primary cause of the decline of southwestern willow flycatcher populations has been the loss and modification of breeding habitat. Because it is a migratory species (occupying the northern limits of the range only in spring/summer/fall) and the best documented threat is loss of breeding habitat, the focus of the Recovery Plan is protection and improvement of breeding habitat. Additional information regarding southwestern willow flycatcher can be found in the final rule determining endangered status for the southwestern willow flycatcher (FR Vol 60, p. 10694-10715 (February 27, 1995)), the species' recovery plan (FWS 2002), and at http://www.natureserve.org/.

## B. Affected environment

The San Luis Valley is in the northernmost portion of the Rio Grande Recovery Unit for the flycatcher (FWS, 2002), including the Biedell, La Jara, Refuge, Park and BLM sites of the land exchange. The Table Mountain and Gribbles Park sites are outside of the range of the subspecies and will not be analyzed further in this BA.

Important habitat for flycatchers in the San Luis Valley includes willow-dominated riparian and wetland communities along the Conejos and Rio Grande Rivers. A recent mapping effort identifying habitat for a Valley-wide Habitat Conservation Plan documented approximately 10,000 stands of willow and cottonwood totaling over 9,700 acres of habitat (B. Mangle pers. communication 2006).

We used the vegetation data from the SWReGAP (summarized in Appendix C) as a coarse filter to detect parcels that may have suitable flycatcher habitat. Habitat considered potentially suitable for flycatchers included Rocky Mountain Lower Montane Riparian Woodland and Shrubland and Rocky Mountain Subalpine-Montane Riparian Woodland and Shrubland (Table 3). We used recent color aerial photos (2005) to quality check the vegetation data and to look for riparian areas that may have been excluded in the SWReGAP data set. Throughout our assessments, habitat was considered suitable for flycatchers if it was a minimum of 0.25 acres and at least 30 feet wide (T. Ireland, FWS pers. communication 2006).

During the peer review of the draft BA, biologists in the area of the La Jara properties expressed concern that we had overlooked potential flycatcher habitat on those parcels.

They arranged for a biologist certified in flycatcher habitat assessment to visit those parcels in the field. Her report is discussed below in the La Jara site discussion, and can be found in Appendix D.

**Biedell Creek site**
Based upon our coarse filter, this site is largely unsuitable as habitat for the Southwestern willow flycatcher; the vegetation is dominated by shrub steppe and pinyon-juniper habitat (Table 3 in Appendix C). Parcels 8, 9, 10, 11 and 12 have no habitat suitable for flycatchers.

The coarse filter also indicated approximately 14 acres of habitat potentially suitable for flycatchers (Figure 15). After a close look at the aerial photos of parcels 13 and 14 (see Figure 15), we found no evidence of the Rocky Mountain Lower Montane Riparian Woodland and Shrubland as suggested in the SWReGAP data set. We asked the TNC manager of the adjacent property if he was aware of flycatcher habitat on the BLM parcels (P. Robertson, pers. communication 2006). He did not consider it likely flycatcher habitat. Local BLM biologists reviewed the aerial photos and acknowledged that willow habitat is not present on these parcels (M. Garcia, BLM pers. communication, 2006).

A BLM inventory of perennial surface water (described in the EA) states there is no perennial surface water - streams, seeps, springs, or ponds - at the Biedell Creek site. Such perennial water would be necessary to reach a determination that the vegetation is flycatcher habitat. Based on this accumulation of evidence, we determine the Biedell Creek parcels do not provide flycatcher habitat.

We have no information on detections of flycatchers on the parcels and no records of any surveys having been conducted in the Biedell Creek area.

**La Jara site**
This site is also largely unsuitable habitat for the Southwestern willow flycatcher; the vegetation is dominated by montane-subalpine grassland, pinyon-juniper, and other coniferous forest types (Table 4 in Appendix C).

The SWReGAP data indicates individual parcels appear to have small amounts of vegetation potentially suitable for flycatchers. We reviewed all of the parcel vegetation data, and in particular, those containing Rocky Mountain Lower Montane Riparian Woodland and Shrubland and Rocky Mountain Subalpine-Montane Riparian Woodland and Shrubland. Again we used the aerial photos to take a closer look at the vegetation data.

The SWReGAP data showed parcels 15 and 16 could have about 2 acres of potentially suitable flycatcher habitat (Table 4 in Appendix C and Figure 16). The photos did not corroborate the SWReGAP data because parcels 15 and 16 do not appear to have any riparian habitat; no discernable streams or wetlands are visible on the photos. After checking with local biologists, we confirmed that willow habitat is not present on parcels 15 or 16.

Parcel 20 is bisected by La Jara Creek, a perennial stream, and the coarse filter indicated about 5 acres of potential flycatcher habitat there. The BLM biologist made a field visit to the location and concluded there was a small portion of "borderline Potential [flycatcher] habitat" (Appendix D), but concluded the site was generally not suitable. This conclusion was based upon the hydrologic characteristics of the stream (e.g high stream gradient) and the vegetation, where conifers often grow up to the stream edge.

Parcel 21 was reported by the coarse filter to have about ½ acre of potential flycatcher habitat (Figure 16). Aerial photo interpretation also detected habitat, which we estimate to be 7 acres in scattered patches. The field visit by the BLM biologist concluded the parcel did include suitable flycatcher habitat along much of the stream (Appendix D). Though she could not reach the site due to rough terrain, she could look down on, and photograph the habitat. She did not estimate the acreage, so we used photo interpretation and GIS calculations to reach our estimate of 7 acres. Note this estimate overrides the coarse filter estimate of .5 acre.

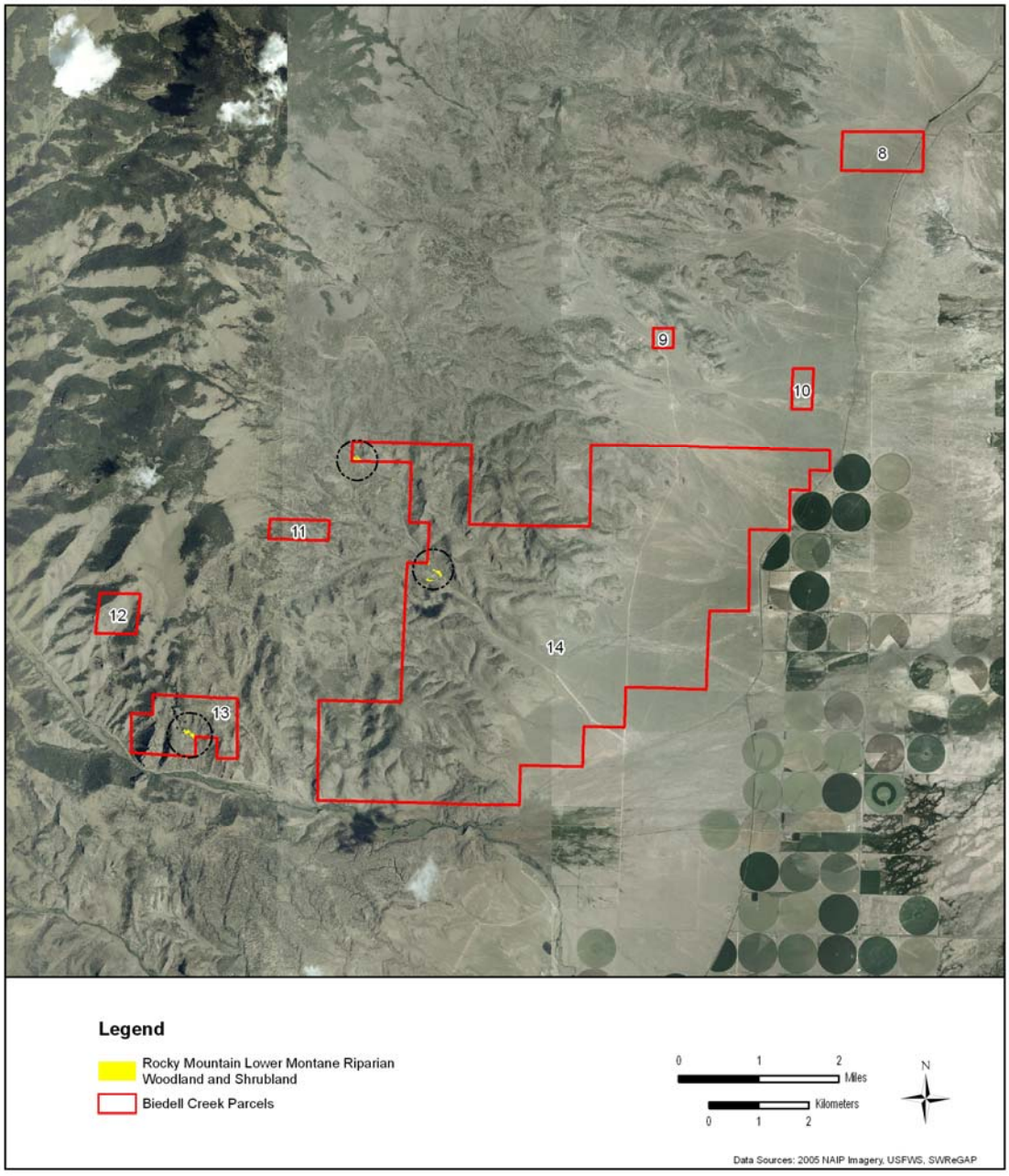
Small patches of willow vegetation were detected along La Jara Creek in the photos of parcel 23, but this was not identified in the SWReGAP data set (see Figure 16). Several small stands of cottonwoods are also visible in parcel 23. These willow patches along La Jara Creek in parcel 23 range in size from approximately 0.35 acres in size to 0.10 acres; they are at or slightly larger than the minimum of 0.25 acre (T. Ireland, FWS pers. communication 2006). Our assessment based on the aerial photos lead us to think these patches in parcel 23 may represent 3.2 acres of potential habitat for flycatchers. The field visit also concluded the location was potential habitat based on the plant species present (cottonwood, alder and willow), but found that the parcels current condition was less than suitable. The grazing pressure has resulted in 'mushroomed' willow plants which cannot grow to the size and density needed by flycatchers ( M. Garcia, BLM pers. communication 2007). If grazing were to be managed differently, these areas may become suitable habitat for flycatchers.

In summary for the La Jara site, parcels 15, 16, 17, 18a, 18b, 18c, 19, 22 and 24 do not support vegetation capable of becoming flycatcher habitat. After adjustments to the coarse filter habitat estimates, we estimate there to be a trace of poor quality habitat in parcel 20, seven acres of currently potential habitat in parcel 21, and 3.2 acres in parcel 23.

**Baca Land Exchange Project**

A Joint Project between U.S. Fish & Wildlife Service, National Park Service, Bureau of Land Management, Colorado State Land Board

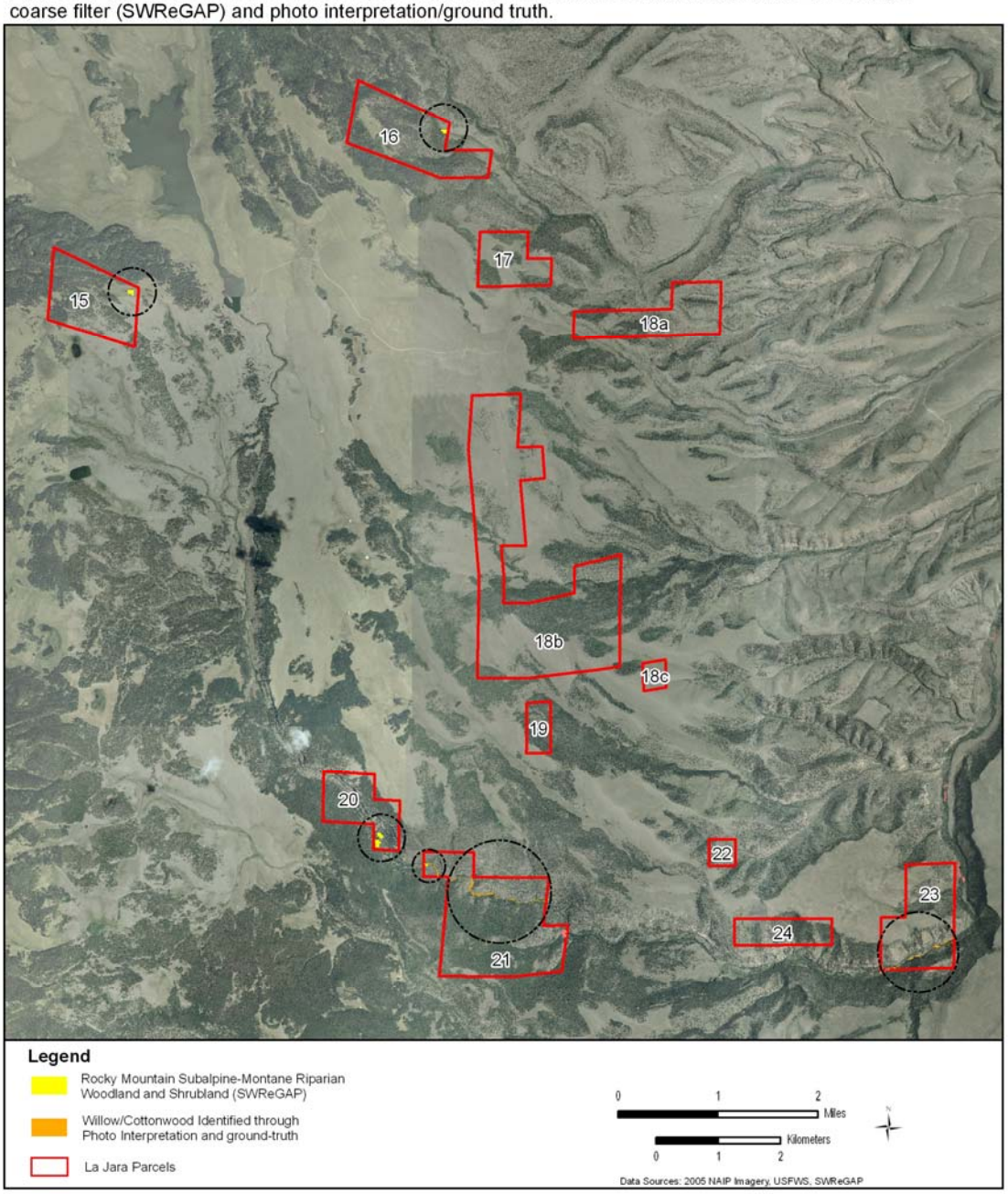
Figure 15. Photo of Biedell Creek Parcels in relation to potential habitat for Southwestern Willow Flycatcher, accordingly to REGAP data.



**Baca Land Exchange Project**

A Joint Project between U.S. Fish & Wildlife Service, National Park Service, Bureau of Land Management, Colorado State Land Board

Figure 16. Photo of La Jara Parcels with potential habitat for Southwestern willow flycatcher according to coarse filter (SWReGAP) and photo interpretation/ground truth.



**Refuge, Park, and BLM sites**
The Refuge site is entirely unsuitable habitat for the Southwestern willow flycatcher; the vegetation is dominated by greasewood flat, shrub steppe, and playa habitat (Table 5 in Appendix C). Analysis of the aerial photos confirmed the lack of habitat suitable for flycatchers. There is no potential for this habitat to become suitable in the foreseeable future.

The Park site is considered unsuitable habitat for the Southwestern willow flycatcher; the vegetation is dominated by shrub steppe and pinyon-juniper habitat (Table 6 in Appendix C). There are 78.5 acres of cottonwood galleries located along Sand Creek. These cottonwoods are not considered capable of becoming willow flycatcher habitat due to the lack of near surface water to support an understory shrub component (F. Bunch NPS, pers communication 2007).

The BLM site is entirely unsuitable habitat for the Southwestern willow flycatcher; the vegetation is shrub steppe, pinyon-juniper habitat and Ponderosa pine woodland (Table 7 Appendix C). There is no potential for this site to become habitat for flycatchers in the foreseeable future.

## C. Species status locally

### 1. Knowledge of occurrences and surveys

The flycatcher's breeding range encompasses portions of southwestern Colorado; it is known to breed in, and migrate through, areas dominated by willow and cottonwood in the San Luis Valley. Portions of the action area may support suitable migrating and nesting habitat (USFWS 2002-2004). While there may be some question as to which subspecies of willow flycatcher inhabits the action area, for the purposes of this BA, any willow flycatchers within the action area are considered southwestern willow flycatchers.

No records of the species are known from the land exchange parcels. Surveys for the flycatcher have not been conducted in the action area, and therefore, it is unknown if they occur. Two flycatcher "sites" with 34 flycatcher territories are located approximately 30 miles from the La Jara land exchange site (Recovery Plan 2002). The flycatcher has been reported at Alamosa National Wildlife Refuge, approximately 25 miles south of the Refuge and Park sites (Hawks Aloft 2002; Rawinski 2004). Closer to the exchange area, and after the Recovery Plan, flycatchers have been documented approximately 6 miles downstream from parcel 23 on La Jara Creek (M. Garcia BLM pers. communication 2006). Other records exist from Hot Creek State Wildlife Area, Alamosa River Canyon (on BLM and private), and other BLM sites not within the exchange (M. Garcia BLM pers. communication 2006).

Because the flycatcher has been documented in the San Luis Valley, for the purposes of this BA, we assume that potentially suitable habitat in the action area may be occupied by flycatchers.

**2. Cumulative Effects**

We are not aware of any specific activities on the non-federal lands that would affect flycatchers, either positively or negatively.

As recommended by the Recovery Plan, a Habitat Conservation Plan (HCP) is being developed for the San Luis Valley with the intention of identifying existing habitat and possible mitigation for potential non-federal impacts to three listed species: southwestern willow flycatcher, yellow-billed cuckoo, and bald eagle. Within the San Luis Valley these species generally occur in similar habitats of riparian willow and cottonwood vegetation types. The flycatcher and cuckoo breed in these habitats, while the bald eagle primarily uses these areas for roost sites and winter concentration areas.

The State Land Board and the Colorado Division of Wildlife, through the Division of Natural Resources, are co-applicants in the HCP with the Rio Grande Water Conservation District. As part of the HCP process, mapping of willow and cottonwood habitats was undertaken valley-wide. This mapping process identified over 10,000 stands of habitat totaling about 9,700 acres (B. Mangle pers. communication 2006). The HCP identified core areas of non-federal habitat in the valley which are most important to the successful recovery of these species. One outcome of the HCP will be identification of habitat and the amount of protection needed in the core areas through various mechanisms (e.g., fee-purchase, or conservation easements). Another outcome of the HCP will be best management practices and educational outreach to landowners with habitat for listed species.

The Table Mountain and Gribbles Park sites are outside of the San Luis Valley, and therefore not involved with the HCP. The Refuge, Park and BLM sites would not be involved with the HCP because they would become federal land. The Biedell Creek and La Jara sites are in HCP area, but were not identified as core habitat for these species due to the scarcity of habitat. If the HCP is approved by FWS and implemented, landowners with habitat for listed species (including SLB and CDOW) would be encouraged to follow best management practices, but there would be no specific requirement.

**D. Critical habitat**

There is no designated critical habitat for the flycatcher in or near the action area of the land exchange. The land exchange would have no effect on designated willow flycatcher critical habitat.

**E. Effects of the proposed action**

**1. Direct effects**

The ESA regulations definition of “direct effects” is such that a land exchange would not result in any direct effects to the Southwestern willow flycatcher (see discussion in Introduction to the BA).

**2. Indirect effects**

The flycatchers depend on relatively late successional stages of riparian habitat and will move seasonally, and year-to-year, between patches of appropriate habitat. Providing a mosaic of riparian habitats with willows, alders, and cottonwoods in various growth forms will benefit the species in the long-term.

The Recovery Plan indicates that recovery efforts should be focused on the Rio Grande River and tributaries in the San Luis Valley. The recovery actions most applicable to this land exchange seem to be:

1) work with…State agencies….to conserve and enhance habitat on nonfederal lands.

2) enhance connectivity to currently isolated small populations (such as may exist at the La Jara parcel 23),

3) enhance the occupancy of those sites

Other recovery actions would also improve conditions for the species and/or knowledge of the population, but are less applicable to this land exchange.

The flycatcher Recovery Plan directs federal agencies to increase the amount of and improve the quality of occupied, suitable and potential nesting habitat. Without survey results, we do not know if any habitat in the action area is occupied by flycatchers. In lieu of analysis of impacts to known flycatcher territories, this BA must rely on information about habitat conditions in the land exchange parcels. We must make assumptions about the quality of the habitat and the likelihood of it being occupied by flycatchers. Also, we can weigh the overall benefits of the land exchange to this species by the estimated acres of potential habitat (our coarse filter in Appendix C) that would come into federal management versus that going out of federal management. Our underlying assumption is that federal agencies have a greater responsibility to manage habitat for the benefit of listed species, in comparison to the SLB. While the federal agencies have a responsibility to further the purposes of the ESA, the SLB need only avoid take of the species.

This BA uses four types of human activities and land uses for the analyses of impacts to habitat and effects to species. Of those four types, mineral and timber uses would be considered to remove habitat for flycatcher. For mineral extraction, we consider this habitat loss to be permanent. In the La Jara parcels, we found little likelihood that the SLB would pursue mineral development; the source minerals do not appear to exist here and the absence of roads greatly limits the removal of decorative rock.

If timber harvest were to occur, we consider it a loss of habitat for at least 40 years, based on our assumptions of time needed for forest patches to recover tree density and canopy closure. However, the vegetation types occupied by flycatchers (willow and cottonwood) are unlikely to be the subject of timber harvest.

Livestock grazing has the potential to degrade the quality and extent of flycatcher habitat. In cases of severe overgrazing, it can remove habitat entirely or render it unusable by the birds. In such cases, livestock grazing would cause a displacement of flycatchers from the area. This potential for disruption of flycatcher occupancy may be considered temporary and limited to the years when livestock are actively grazing in the area, plus

approximately 10 years. This time estimate is based solely on our estimate of the time needed for willow stands to recover their height and health after heavy grazing pressure.

If human recreation were to occur in the spring/summer of the year, and at sufficient intensity and proximity, it could cause a disruption of flycatcher territory establishment or nesting success.

**Biedell Creek Site**

Based on review of vegetation data, aerial photographs, discussions with local biologists, and other information like lack of perennial water, we do not believe suitable vegetation exists for flycatchers at Biedell Creek site. Therefore, the expected management activities at Biedell Creek would have no effect on the species.

**La Jara site**

We have no information on detections of flycatchers or any surveys being conducted on the parcels and therefore conclude that no survey data exists.

Our coarse filter look at vegetation identified approximately 9.3 acres of habitat potentially suitable for flycatchers (Appendix C. Table 4 and Figures 16) at this site. However, review of the aerial photos, and discussions with local biologists, yielded different conclusions.

Parcels 15 and 16 were ultimately determined to not have flycatcher habitat, though the coarse filter indicated that possibility.

Parcel 20 has a very small amount of "borderline potential habitat" (Appendix D). This amount is so small that the certified flycatcher biologist from BLM concluded the parcel is not suitable. The context for her conclusion includes observations that there was little evidence of either livestock or people. Our concern for recreation impacts is a moot point here due to the inaccessibility. The preliminary concern that livestock grazing may be degrading habitat conditions is also no longer an issue, based on her field visit.

Parcel 21 contains about 7 acres of suitable riparian habitat with a willow/cottonwood component. Based on photo interpretation, we estimate the patches range in size from 0.1 acre to 1.4 acres, with an average of 0.5 acre. Due to inaccessibility, the field visit to this parcel was limited to observations from the rim of the canyon (Appendix D). As with parcel 20, there was almost no evidence of human or livestock use of the parcel. The very rough terrain of boulders serves as a deterrent for livestock, in particular. Her appraisal of the habitat conditions concluded the willow stands are suitable for occupation by flycatchers.

Parcel 23 includes willow patches ranges in size from 0.1 acre to 0.35 acre as well as cottonwood stands. Only one willow patch in the southwest corner of the parcel would exceed the minimum patch size of 0.25 acres considered large enough for potential flycatcher habitat. The condition of this patch and the other small patches along La Jara Creek in parcel 23 is considered degraded due to livestock grazing (M. Garcia, BLM, pers. comm. 2007).

Parcels 20, 21 and 23 have not been grazed under BLM permits for over 10 years. However, trespass grazing from adjacent properties has occurred, especially in Parcel 23 (M. Garcia, BLM pers. communication 2006). These parcels would be potentially subject to a grazing lease once transferred to the SLB. The SLB has indicated that specific conservation measures will be in place to manage the grazing of this parcel (see Conservation Measures below). In addition, the SLB has indicated they will include the flycatcher as one of the resources to be managed under their Stewardship Trust designation for these lands (K. Page, SLB, pers. communication 2007).

Human access into these parcels is very limited especially from early to mid spring, thus the potential disturbance to flycatcher nesting caused by hikers, bird watchers, and others is negligible. Timber harvest in the area of the La Jara parcels is unlikely due to lack of merchantable trees and poor road access. The willow and cottonwood trees would not be impacted by timber harvest due to their non-merchantable qualities. Mineral extraction is not expected in the La Jara parcels along the stream where flycatcher habitat may exist.

**Refuge, Park and BLM sites**

These sites are ecologically incapable of supporting flycatcher habitat. The Refuge and BLM sites do not contain any riparian habitat that would be considered suitable for willow flycatchers, either now or in the foreseeable future. The Park site does contain approximately 78.5 acres of cottonwoods along Sand Creek. However, due to the soil conditions and the water table, the understory vegetation is incapable of becoming suitable habitat for willow flycatchers (F. Bunch, NPS pers. communication 2007). Therefore, this portion of the land exchange would have no effect on flycatchers.

**Table 7. Net Change in Federal Management of Potential Southwestern Willow Flycatcher Habitat**

| Site Name | Acres of Potential Flycatcher Habitat | Change in Federal Management of Habitat |
|---|---|---|
| Refuge | 0 | |
| Park | 0 | |
| BLM | 0 | |
| Table Mountain | - | No change/out of subspecies' range |
| Gribbles | - | No change/out of subspecies' range |
| Biedell | 0.0 | |
| La Jara | Approx. 10.5 acres | Removed from Federal management |
| | **Loss of approx. 10.5 acres** | Net change – Removal from Federal Management |

### 3. Interrelated and Interdependent effects

The interrelated and interdependent effects of this land exchange are those actions and effects that would occur as a consequence of the exchange in land title. Those effects are included in the discussion above, "Indirect effects".

## F. Conservation Measures

Conservation measures are actions taken by federal agencies to reduce or eliminate the effects of their proposed actions on listed species; specifically, actions to reduce or eliminate 'take'. Assuming the exchange were to occur as proposed, the lands out-going from Federal management will be subject to management decisions of the SLB, and no longer within the purview of the Federal government. Therefore, the Federal government would have no authority to implement conservation measures on these lands.

With that said, however, the SLB proposes to manage for the Southwestern willow flycatcher on parcels 21 and 23 along La Jara Creek where Southwestern willow flycatcher habitat is present. Currently, livestock are not grazing in parcel 21 because of difficult access to the parcel, due in part to steep canyon walls along the creek. The SLB plans to maintain this parcel in its current condition. In parcel 23, grazing occurs occasionally from adjacent lands. The SLB plans to allow grazing in parcel 23 and will manage the grazing in this parcel to enhance restoration of Southwestern willow flycatcher habitat, including recruitment of woody vegetation necessary to the Southwestern willow flycatcher. The SLB will conduct an initial monitoring, including photo documentation, of these sites as part of their inclusion into the Stewardship Trust. The SLB will provide a copy of the initial inventory report to the USFWS upon completion.

For parcel 21, the SLB will: 1) monitor annually for the presence of cattle within the area along the creek; 2) if cattle are not present in the area along the creek, then monitoring of vegetation utilization is not necessary; 3) if cattle are present during the summer season, then monitor the vegetation utilization levels annually to make sure area continues to provide suitable Southwestern willow flycatcher habitat (see grazing utilization standards below); and 4) if utilization standards are exceeded, livestock management will be revised in order to meet the utilization standards. Changes in livestock management may include, but are not limited to, timing of grazing, number of AUMs, riding, and fencing of riparian vegetation to create a riparian pasture.

For parcel 23, the SLB will: 1) monitor the vegetation utilization levels annually (see grazing utilization standards below) if cattle are present during the summer season; and 2) if utilization standards are exceeded or riparian vegetation is not showing improvement, livestock management will be revised in order to meet the utilization standards or to improve the riparian vegetation conditions. Changes in livestock management may include, but are not limited to, timing of grazing, number of AUMs, riding, and fencing of riparian vegetation to create a riparian pasture.

Grazing Utilization Standards should not exceed the following levels in Southwestern willow flycatcher habitat:

- 50 percent of palatable, perennial grasses and grass-like plants,
- 40 percent of woody vegetation on occurrence of use,
- 10 percent of extent of alterable stream banks with damage.

If requested by the BLM or FWS, the SLB will provide access to the BLM, FWS, CDOW, or their designees to these parcels in order to conduct Southwestern willow flycatcher surveys. If Southwestern willow flycatchers are detected within the parcel(s), the SLB will consult further with the USFWS but will not be required to remove cattle from the occupied parcel(s) as long as the Grazing Utilization Standards are met and disturbances from activities (i.e., recreation) are minimized during the breeding season (May 1 – August 15). If the Grazing Utilization Standards are not met in occupied habitat, then cattle will be removed from the Southwestern willow flycatcher habitat during the breeding season for the remainder of the year that the standards were exceeded and the following year to allow for regrowth of the vegetation.

At this time, there are no specific land management actions planned on the three land exchange sites in-coming to the Federal government (Refuge, Park and BLM sites) that would warrant conservation measures. Therefore it is not necessary to describe specific conservation measures for future Federal land management actions on these sites.

**G. Conclusion and Determination for Southwestern willow flycatcher**

The change in land use as a result of the Baca Land Exchange "may affect, is not likely to adversely affect" Southwestern Willow Flycatcher. Factors that contributed to our determination were:

- The exchange of the Table Mountain and Gribbles Park sites will have no effect on flycatcher due to their location outside of the species range.
- The exchange of the Refuge, Park, BLM, and Biedell Creek sites will have no effect on flycatcher due to the absence of flycatcher habitat on these parcels.
- There are no known records of flycatcher presence in the parcels, however surveys have not been conducted.
- At the La Jara site, parcels 15, 16, 17, 18a, 18b, 18c, 19, 22 and 24 do not support vegetation capable of becoming flycatcher habitat.
- There are no records of flycatchers using parcels on La Jara Site. However, there would be a reduction of nearly 10.2 acres of potential flycatcher habitat from Federal management in parcels 21 and 23. The SLB has agreed to implement conservation measures to ensure future actions, particularly grazing, does not degrade existing potential flycatcher habitat in these parcels. The SLB will provide monitoring reports upon request by the FWS.

**Yellow-billed Cuckoo (*Coccyzus americanus*):**

## A. Species biology

Yellow-billed cuckoos in the western U.S. have been determined by FWS to be a Distinct Population Segment (DPS) and are listed as a federally-listed candidate species (FR vol. 69, p.24887 (May 4, 2004)). The area of this DPS is west of the crest of the Rocky Mountains. For the northern tier of Rocky Mountain states (Montana, Wyoming, northern and central Colorado), the crest coincides with the Continental Divide. In the southern tier of Colorado and New Mexico, the crest coincides with the eastern boundary of the upper Rio Grande drainage, including the Sangre de Cristo Mountains and excluding the Pecos River drainage.

Western yellow-billed cuckoos typically breed in large blocks (25-99 acres) of riparian habitats (particularly woodlands with robust cottonwoods and willows), while eastern yellow-billed cuckoos breed in a wider range of habitats including deciduous woodlands and parks. Dense understory vegetation appears to be an important factor in nest site selection, while cottonwood trees are an important foraging habitat. Nesting west of the continental divide occurs almost exclusively close to water. Biologists have hypothesized that moist condition along rivers in the west aid in successful hatching and rearing of young.

In Colorado, west of the Continental Divide, the species was probably never common and now is extremely rare (Kingery 1998). The cuckoo is an uncommon summer resident of Colorado. According to the Colorado Breeding Atlas (1998), the general status of the yellow-billed cuckoo in Colorado is nearly extirpated in the west with once common eastern populations becoming uncommon to rare. Only one confirmed nesting observation occurred along the Yampa River near Hayden during the Breeding Bird Atlas surveys conducted from 1987-1994.

The primary causes of the decline of this species include conversion of riparian habitats to agriculture, grazing, competition from non-native plants, river management practices, and flood control practices. Additional information about this species can be found in the annual review of candidate species and at http://www.natureserve.org/.

## B. Affected environment

Based on the DPS definitions, two of the sites within the proposed action are not within the range of the DPS – Table Mountain and Gribbles Park Sites. These two sites are east of the continental divide and outside of the Rio Grande drainage. These sites will not be discussed further in this BA. The other 5 sites are discussed below.

In our coarse filter methodology, only one of the 35 vegetation types occurring in the Baca Land Exchange parcels, was identified as potential suitable habitat for the yellow-billed cuckoo (Table 3). This vegetation, Rocky Mountain Lower Montane Riparian Woodland and Shrubland, occurs at two sites – Biedell Creek and the Park site. Similar to the southwestern willow flycatcher analysis, we used aerial photos to verify vegetation

presented in the SWReGAP data set and to look for additional areas that may be suitable, but were misclassified in the SWReGAP data.

**Biedell Creek site**
This site is largely unsuitable habitat for the yellow-billed cuckoo; the vegetation is dominated by shrub steppe and pinyon-juniper habitat (Table 3 in Appendix C). There is little to no perennial water sources outside of artificial structures. Using our coarse filter process, Parcel 13 has over three acres of potential habitat. Parcel 14 has almost seven acres of potential habitat, occurring in small patches. However, as noted in the flycatcher discussion above, in reviewing the aerial photos we do not see vegetation that would be considered suitable habitat. Large stands of cottonwoods and willows as would be required by cuckoos are clearly not present within these parcels (see Figure 15). Perennial water sources, conducive to support riparian vegetation, are not present. Therefore, we do not consider the Biedell Creek site to contain any suitable habitat for yellow-billed cuckoos.

**La Jara site**
This site is largely unsuitable habitat for the yellow-billed cuckoo; the vegetation is dominated by montane-subalpine grassland, and coniferous forest types (Table 4 in Appendix C). Areas along La Jara Creek contain very small stands of cottonwood trees (< 1 acre), along with small patches of willow (parcel 23 only). Given the lack of large cottonwood stands or willows, we do not consider the La Jara Creek site to contain any suitable habitat for yellow-billed cuckoos.

**Refuge site**
This site is entirely unsuitable habitat for the yellow-billed cuckoo; the vegetation is dominated by greasewood flats, shrub steppe, and playa habitat (Table 5 in Appendix C). There are no cottonwoods or willows on any of the parcels coming into the refuge. Therefore, no suitable habitat exists for yellow-billed cuckoos on the Refuge parcels.

**Park site**
This site is largely unsuitable habitat for the yellow-billed cuckoo; the vegetation is dominated by shrub steppe and pinyon-juniper habitat (Table 6 in Appendix C). However, there is approximately 50 acres of cottonwoods at this site located in parcel 35 along Sand Creek that is potentially suitable for cuckoos. While the cottonwood trees are present, the understory shrub community is lacking and therefore does not provide suitable nesting and foraging opportunities for cuckoos. No surveys have been conducted on this parcel.

**BLM site**
This site is entirely unsuitable habitat for the yellow-billed cuckoo; the vegetation is shrub steppe, pinyon-juniper habitat and Ponderosa pine woodland (Table 7 in Appendix C).

## C. Species status locally

### 1. Knowledge of occurrences, habitat and surveys

As mentioned earlier, yellow-billed cuckoo was probably never common in Colorado and is now considered extremely rare. Rawinski (2004) indicated that a yellow-billed cuckoo was reported at Great Sand Dunes in 1984. No subsequent records in the park are known. CDOW has no confirmed records of this species from Saguache or Alamosa counties.

In the San Luis Valley, the yellow-billed cuckoo has been documented in thick tall cottonwood forests along portions of the Conejos River (BLM, 2003-2004). In addition, the species has been observed on the BLM-managed McIntyre Springs area. Limited or no surveys for yellow-billed cuckoo have been conducted throughout the majority of the action area.

### 2. Cumulative Effects

A Habitat Conservation Plan is being developed for the entire San Luis Valley with the intent of identifying existing habitat and mitigating for potential impacts to three listed species: southwestern willow flycatcher, yellow-billed cuckoo, and bald eagle. Within the San Luis Valley these species generally occur in similar habitats including riparian willow and cottonwood vegetation types. The flycatcher and cuckoo breed in these habitats, while the bald eagle primarily uses these areas for roost sites and winter concentration areas.

The State Land Board and the Colorado Division of Wildlife, through the Division of Natural Resources, are co-applicants in the HCP with the Rio Grande Water Conservation District. As part of the HCP process, mapping of willow and cottonwood habitats was undertaken valley-wide. This mapping process identified over 10,000 stands of habitat totaling about 9,700 acres (B. Mangle pers. communication 2006). The HCP has identified core areas of habitat throughout the valley which are most important to the successfully recovery of these species. Identification of parcels and the amount in need of protections within the core areas through various mechanisms (e.g., fee-purchase, or conservation easements) will be one outcome of the HCP. Another outcome of the HCP will be best management practices and educational outreach to landowners with habitat for listed species.

The Biedell Creek and La Jara sites are not located within the identified core habitat for these species. If the HCP is approved by FWS and implemented, landowners (including SLB and CDOW) with habitat for listed species would be encouraged to follow best management practices, but would not be required. Approval of the HCP would satisfy any federal nexus that may be otherwise in effect in the absence of an approved HCP.

## D. Critical habitat

There is no designated critical habitat for the yellow-billed cuckoo.

## E. Effects of the proposed action

### 1. Direct effects

The ESA regulations definition of "direct effects" is such that a land exchange would not result in any direct effects to the yellow-billed cuckoo (see discussion in Introduction to the BA). All effects to the species are indirect; see discussion below.

### 2. Indirect effects

**Biedell Creek, La Jara, Refuge and BLM sites**

The exchange of these sites will have no effect on cuckoos due to the absence or lack of suitable cottonwood and willow habitat on these parcels. Small stands of cottonwoods (<1 acre) exist on the La Jara site along La Jara Creek, however, they are considered too small to support yellow-billed cuckoos.

**Park site**

Acquisition of these parcels by the Federal government would add approximately 50 acres of cottonwood habitat which could be potentially suitable habitat for yellow-billed cuckoos. Although yellow-billed cuckoos are not known at this time to occur in these parcels, potential effects to this species would be considered in management decisions on the Park site, including surveys to determine species presence. Evaluation of the habitat and discussions on ways to increase the understory shrub component within this cottonwood stand would be undertaken by Park Service personnel.

**Table 8. Net Change in Federal Management of Potential Yellow-billed Cuckoo Habitat**

| Site Name | Acres of Potential Cuckoo Habitat | Change in Federal Management of Habitat |
|---|---|---|
| Refuge | 0 | |
| Park | 50.7 | Added to Federal management |
| BLM | 0 | |
| Table Mountain | - | No change – out of DPS range |
| Gribbles | - | No change – out of DPS range |
| Biedell | 0 | |
| La Jara | 0 | |
| | **50.7** | Net change – Addition to Federal Management |

### 3. Interrelated and Interdependent effects

The interrelated and interdependent effects of this land exchange are those actions and effects that would occur as a consequence of the exchange in land title. Those effects are included in the discussion above, "Indirect effects".

## F. Conservation Measures

Conservation measures are actions taken by federal agencies to reduce or eliminate the effects of their proposed actions on listed species; specifically, actions to reduce or eliminate 'take'. Assuming the exchange were to occur as proposed, the lands out-going from Federal management will be subject to management decisions of the SLB, and no longer within the purview of the Federal government. Therefore the Federal government would have no authority to implement conservation measures on these lands.

At this time, there are no specific land management actions planned on the three land exchange sites in-coming to the Federal government (Refuge, Park and BLM sites) that would warrant conservation measures. Therefore it is not necessary to describe specific conservation measures for future Federal land management actions on these sites. It is possible to discuss general management practices that may be considered conservation measures under the Endangered Species Act (ESA). For example, on the Refuge, Park and BLM sites, surveys for cuckoos and Section 7 consultation will be conducted prior to implementation of any land management with the possibility of affecting yellow-billed cuckoos.

## G. Conclusion and Determination for Yellow-billed cuckoo

The change is land use as a result of the Baca Land Exchange "may affect, is not likely to adversely affect" yellow-billed cuckoo. Factors that contributed to this determination area:

- The exchange of the Table Mountain and Gribbles Park sites will have no effect on cuckoo due to their location outside of the range of the listed entity.
- The exchange of the Biedell Creek, La Jara, Refuge and BLM sites will have no effect on cuckoos due to the absence or lack of suitable habitat on these parcels.
- The net change in potential cuckoo habitat in Federal management is an increase of nearly 50 acres. The habitat in-coming to the Federal government has a high likelihood of being managed for the benefit and recovery of cuckoos, if they are present.

**Canada Lynx (*Lynx canadensis*)**

## A. Species biology

The Canada lynx is a Federally-listed threatened species (65 FR, 16,052) and a state-listed endangered species, which occurs in high elevation, boreal forest types (i.e. subalpine fir (*Abies lasiocarpa*) and spruce (*Picea* spp.) forests), and mixed conifer forests at lower elevations (Ruediger et al. 2000). Lynx are solitary carnivores that typically exist at low densities. Population levels of Canada lynx tend to fluctuate and are closely tied to the population levels of its prey, particularly the snowshoe hare (*Lepus americanus*).

Canada lynx in the lower 48 states have larger home ranges than individuals living at northerly latitudes. Average sizes of lynx home ranges in Montana and Wyoming ranged 54- 104 km2 for females and 114- 231 km2 for males (Squires and Laurion 2000). Typically, home ranges of males and females overlap. Food availability (i.e., snowshoe hare numbers) directly correlates with natality and the survival of offspring (Brand and Keith 1979). While the snowshoe hare comprises 80 percent of the lynx's diet, they will also take squirrels, beaver, muskrats, and even large ungulates such as deer.

Canada lynx offspring are capable of dispersals as long as 930 km and adults may move as far as 1,000 km in response to declining prey densities (Koehler and Aubry 1994, Poole 1997). Dispersal movements are most frequent in March–June (Slough and Mowat 1996, Apps 2000). Although Canada lynx may occasionally cross large (> 100 m) openings and disperse across large rivers and lakes, open areas that are natural or human-made serve to discourage Canada lynx use and disrupt movement (Mowat et al. 2000).

At the landscape scale, Canada lynx principally forage in variable- age forest mosaics that support snowshoe hares and other small prey (McCord and Cordoza 1982). At the stand level, Canada lynx prefer regenerating forests, but microsites with the heaviest cover favor snowshoe hares (Mowat et al. 2000). In Wyoming, lynx occur primarily in spruce- fir and lodgepole pine forests, on 8–12° mountain slopes, and at 8,000- 9,600 feet elevation (Reeve 1986). Aspen (*Populus tremuloides*) stands and forest edges are also used. Canada lynx may also be associated with shrub- steppe habitats near (< 40 km) subalpine or cool montane forests, particularly when alternate prey such as ground squirrels (*Spermophilus* spp.) are abundant.

For denning and nursery sites, lynx prefer forests with abundant downfall and woody debris that provide security and thermal cover (Squires and Laurion 2000). In Colorado recent evidence suggests that den sites were located at higher elevations (mean = 3,354 m), on steeper slopes (mean 30 degrees) and more commonly north-facing slope with dense understory of coarse woody debris than other areas occupied (Shenk, 2006).

Travel corridors that provide linkage for individuals between local foraging areas and other populations may be important for maintaining viable populations of Canada lynx in the lower 48 states (Ruediger et al. 2000). In general, cover requirements for traveling individuals include coniferous or deciduous vegetation > 2 m in height with a closed canopy (Brittell et al. 1989, cited in Koehler and Aubry 1994). Canada lynx prefer

to move through continuous forest to hunt, using high terrain afforded by ridges and saddles, and may also hunt along edges (Mowat et al. 2000).

The Colorado Division of Wildlife (CDOW) began reintroducing Canada lynx into southwestern Colorado in spring 1999 in an effort to reestablish a viable population within the state. Since 1999, 218 lynx have been reintroduced into Colorado. The core release area is from the New Mexico state line north to Gunnison, west as far as Taylor Mesa and east to Monarch Pass. Eighty known mortalities have been documented through June 30, 2006 (Shenk 2006). Some of the reintroduced lynx are being monitored by CDOW through radio telemetry.

More information regarding the Canada lynx can be found in the final rule for the determination of threatened status for this species (65 Fed. Reg. 16,052-16,086 (March 24, 2000)), at http://www.natureserve.org/, and in Ruediger et al. 2000.

**B. Affected environment**

Our basis for analyzing the parcels as potential lynx habitat was the Canada Lynx Conservation Assessment and Strategy (Ruediger et al. 2000) document, plus information in the Federal Register for proposed lynx critical habitat (70 FR 68293-68328). There is no recovery plan for the Canada lynx at this time. However, there is a Recovery Plan Outline, which we used as a reference document to guide our analysis.

Primary data sets that we used to analyze the sites included vegetation data from the SWReGAP, digital elevation models (for elevation, slope, and aspect), 1-meter resolution color aerial photographs taken in 2005, and data provided by the lynx habitat mapping procedures and the LAU delineations by the Forest Service. We also used data provided by the BLM State Office showing areas mapped as potential lynx habitat on lands surrounding and including BLM lands. The BLM mapping effort was conducted by the Colorado Natural Heritage Program and concluded in 2002. Habitat maps were reviewed by BLM and Forest Service field office personnel. In certain areas, the maps were completely revised due to inadequate delineation of habitats.

The BLM mapping effort also produced “add-on” and “stand-alone” LAUs. Specifically for the San Luis Field Office, a total of 35 add-on LAUs were created (CNHP 2002). One of these add-on LAUs occurred near the La Jara site (see Figure 17). While, these add-on LAUs were intended to be merged with adjacent FS LAUs, they were never formally merged nor were they officially accepted by USFWS. This may occur in the future as evaluation of the mapping effort is fully developed and reviewed. For the purposes of this BA, we compared the amount of lynx habitat within the parcels, if any, to the closest FS LAU, to the closest add-on BLM LAU, and to an expanded combined LAU.

Utilizing the FS and BLM mapping data alone provided one straightforward method to evaluate potential lynx habitat on the parcels as the habitat has already been categorized into denning, wintering, and ‘other’ lynx habitat. However, we found it beneficial to apply an additional coarse filter analysis to the mapped habitat provided by the Forest Service and BLM for areas within the parcels.

The coarse filter evaluation focused primarily at the spruce-fir and mixed conifer forest communities. In addition to these spruce-fir communities, we also queried for the presence of lodgepole pine forests, and riparian woodlands and shrublands, especially those riparian areas in proximity to spruce-fir and mixed conifer forests.

As detailed below, the majority of the sites in the Proposed Action are considered non-habitat for Canada Lynx. Portions of the La Jara site, however, appeared to be more favorable to Canada lynx. This is due the presence of spruce-fir and other mixed conifer vegetation types, favorable elevations, and close proximity to mapped lynx habitat in the La Jara LAU on the Rio Grande National Forest and surrounding BLM lands. The BLM mapping effort created an add-on La Jara LAU.

**Table Mountain site**
The forested habitat on the Table Mountain site is far removed from landscapes considered non-habitat for lynx. Although these BLM parcels are within 8 miles of the southern boundary of the Pike National Forest, the Forest Service did not map potential lynx habitat due to the absence of snowshoe hares and the low elevation characteristic of this portion of the Pike National Forest. No spruce-fir or mixed conifer vegetation occurs on the site. Because of the dominance of pinyon-juniper and ponderosa pine woodlands at Table Mountain (Table 1, Appendix C), and the significant distance from any mapped lynx habitat related to a LAU, we concluded that the site does not provide habitat for lynx.

**Gribbles Park site**
This site is also considered non-habitat for Canada lynx; the forested vegetation is discontinuous from other forest habitat, making it less likely to be used by lynx (Table 2 in Appendix 3). Montane–subalpine grasslands surround the isolated forested tracts within the parcels. These BLM parcels are relatively close (less than 4 miles) to both the San Isabel and Pike National Forests. However, none of the Forest lands within 15 miles of the parcels have been mapped as potential lynx habitat by the Forest Service. This is primarily due to the absence of snowshoe hares and lack of suitable vegetation communities. Therefore, because the natural fragmentation of the forest stands, the dominance of montane-subalpine grasslands surrounding the parcels, and the distance from other mapped lynx habitat within a LAU, we conclude that the site does not provided habitat for Canada lynx.

**Biedell Creek site**
This site is located several miles east of the Rio Grande NF. Biologists with the Forest Service have completed the lynx habitat mapping for the Rio Grande NF. The closest LAUs to the Biedell site are the Embargo LAU and the Lagarita Creek LAU. The closest potential denning habitat on these LAUs is approximately 2 miles to the west. Habitat similar to that of the parcels occurs on the Rio Grande NF, several miles south of the parcels. This area of the Forest, with a predominance of pinyon-juniper and shrub steppe, was identified by the Forest Service as non-habitat for lynx and was not included in a LAU. Given the close distance to potentially suitable habitat within the Rio Grande NF farther to the west and especially at higher elevations, it is possible that these parcels may receive transient use by Canada lynx. The BLM mapping effort which concluded in 2002

did not identify lynx habitat around the Biedell Creek site. We agree with this assessment, and conclude that this site does not provide habitat for Canada lynx.

**Refuge site**
This site is habitat considered non-habitat for Canada lynx; the vegetation does not meet the cat's habitat requirements. The habitat on this site is greasewood and rabbitbrush shrublands, playa wetlands, and grasslands (Figure 6; Table 5 in Appendix C). This SLB acreage is 10 miles from land mapped by the Forest Service as potential lynx habitat on the Rio Grande NF in the Sangre de Cristo Mountains.

**Park and BLM sites**
These sites are considered non-habitat for Canada lynx; the vegetation does not meet the cat's habitat requirements (Tables 6 and 7 in Appendix C). At the closest point, this SLB acreage is less than 2 miles from land mapped by the Forest Service as potential lynx habitat. However, there is a dramatic difference in vegetation across that 2 miles; there is a quick transition in vegetation from the shrub steppe vegetation on the SLB lands to the forest types on the Great Sand Dunes Preserve and the National Forest (Figure 6).

**La Jara site**
As mentioned earlier, we received data showing mapped lynx habitat from staff at the Rio Grande NF and the BLM. These data sets delineate denning, winter foraging, and 'other' lynx habitat throughout Colorado. Several of the parcels are adjacent to the Forest boundary. In mapping lynx habitat, the Forest Service mapped additional areas outside the Forest boundary where contiguous lynx habitat occurred. A complete mapping of the BLM parcels adjacent the Forest boundary (utilizing the USFS mapping protocols) was not done; the intent of the BLM mapping effort was to identify these additional areas. A summary of these two data sets within the parcels is summarized below and depicted in Figure 17:

- USFS mapped:
  - 83 acres of Denning habitat
  - 81 acres of Winter habitat
  - 33 acres of 'Other' habitat
- BLM mapped (in addition to USFS acres):
  - 39 acres of Denning/Winter habitat
  - 87 acres of 'Other' habitat
- **Totals:**
  - 203 acres Denning/Wintering habitat
  - 120 acres 'Other' habitat

After reviewing the mapped habitat, the criteria used to map the habitat, the vegetation data, and the 2005 aerial photos, we believed additional lynx habitat was present within the parcels. Local biologists for the FS and BLM agreed with the likelihood of additional habitat occurring on the parcels. It is not uncommon for either the BLM or Forest Service to revised large area habitat maps based on the analysis of a specific project as finer scale information and project specific parameters are applied.

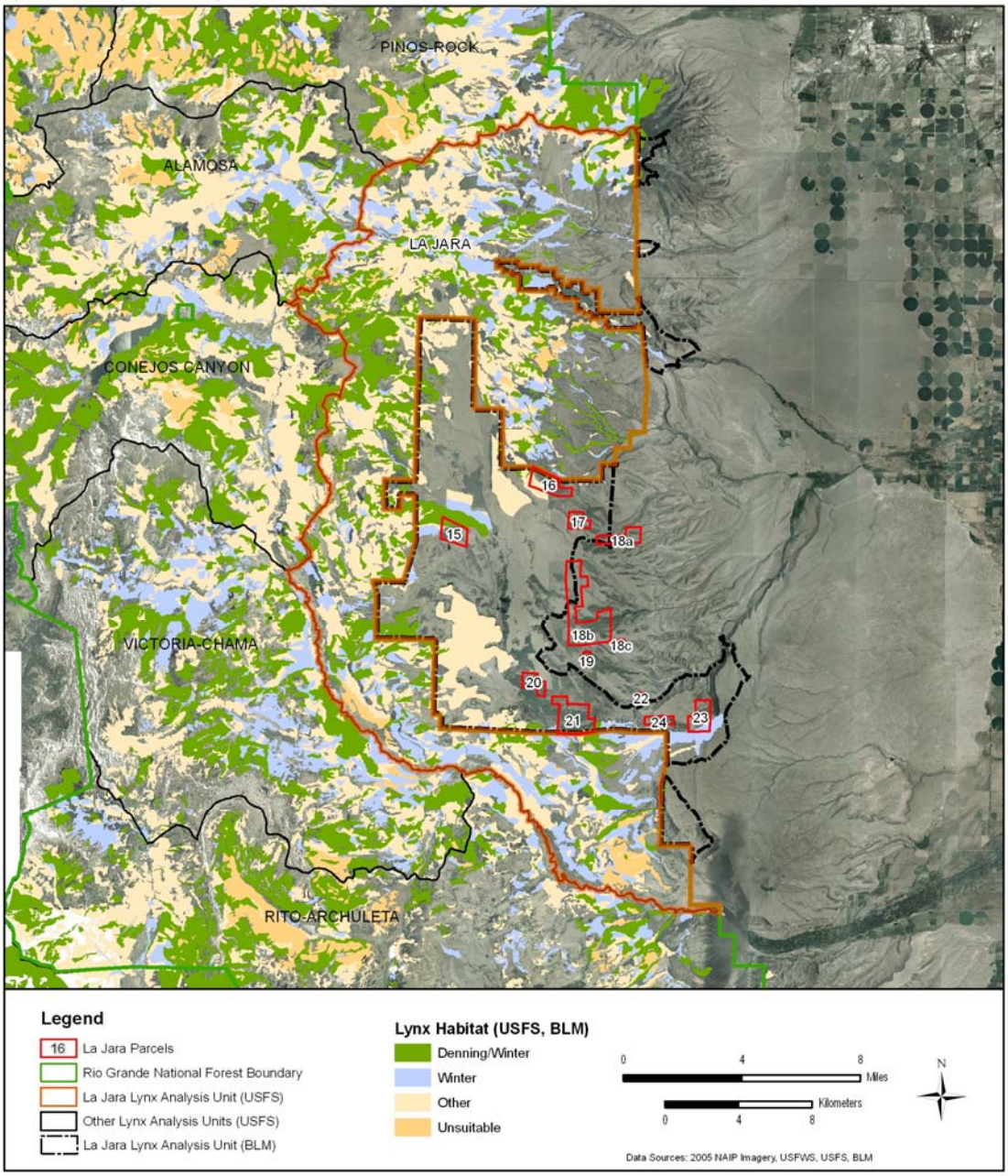
We reviewed the imagery and vegetation data to identify additional lynx habitat within the parcels. We queried for any spruce-fir vegetation types or mixed conifer types. Characteristics looked for in the imagery included degree of canopy closure and the relative amount of tree to non-tree habitat. Polygons were delineated within a GIS, and acres were calculated. Isolated, small islands of conifers surrounded by extensive grasslands (e.g., parcel 18a and 19) were considered non-habitat as were areas of grasslands, pinyon-juniper, or ponderosa pine woodlands.

Using the methods described above, we identified an additional 510 acres of potential lynx habitat in parcels 20 and 21 along La Jara Creek (Figure 18). We classified this additional habitat as 'Other' habitat based on the habitat characteristics and the mapped habitats near by. When added to the mapped habitat provided by the USFS and BLM, the total lynx habitat within the parcels is estimated to be 833 acres (Table 9). The majority of the new acres are along La Jara Creek in the spruce-fir dominated areas south of the creek. We concluded that parcels 17, 18a, 18c, 22, and 24 do not contain vegetation types suitable as lynx habitat. Vegetation in these parcels is dominated by grassland, pinyon-juniper, and ponderosa pine woodlands (Table 4, Appendix C). The forest canopy cover on these parcels is relatively open, as evident by the visible soil between individual trees.

Table 9. Parcels with potential lynx habitat within the La Jara Site.

| **Parcel #** | **Potential habitat** | **% of Parcel** |
|---|---|---|
| 15 | 84 | 23 |
| 16 | 156 | 35 |
| 20 | 97 | 40 |
| 21 | 413 | 53 |
| 23 | 63 | 15 |
| Total | 833 | 22% |

Figure 17. La Jara Parcels in relation to Rio Grande National Forest Lynx Analysis Units and BLM-mapped lynx habitat in the vicinity of La Jara Reservior.



As a percentage of the area proposed for exchange, the 833 acres represents approximately 18%. To better understand how the habitat on these parcels relates to available lynx habitat, we summarized several data sets and drew comparison between the established FS La Jara LAU and the add-on BLM La Jara LAU. We also calculated the amount of BLM lands within the upper Rio Grande drainage with identified lynx habitat. For these analyses, we used data provided by the BLM, FS, and landowner data provided in COMAP v.4

Based on these data, there are 1,233,758 acres of potential lynx habitat in the upper Rio Grande drainage (Table 10). The vast majority of this total occurs in the Rio Grande NF (>1 million acres). Within the San Luis Valley, there are 12,560 acres (1%) of lynx habitat on BLM lands. The 833 acres of lynx habitat on the parcels represents approximately 6.7% of the mapped acreage on BLM lands in the Valley.

Table 10. Comparison between lynx habitat within La Jara parcels and surrounding landscape

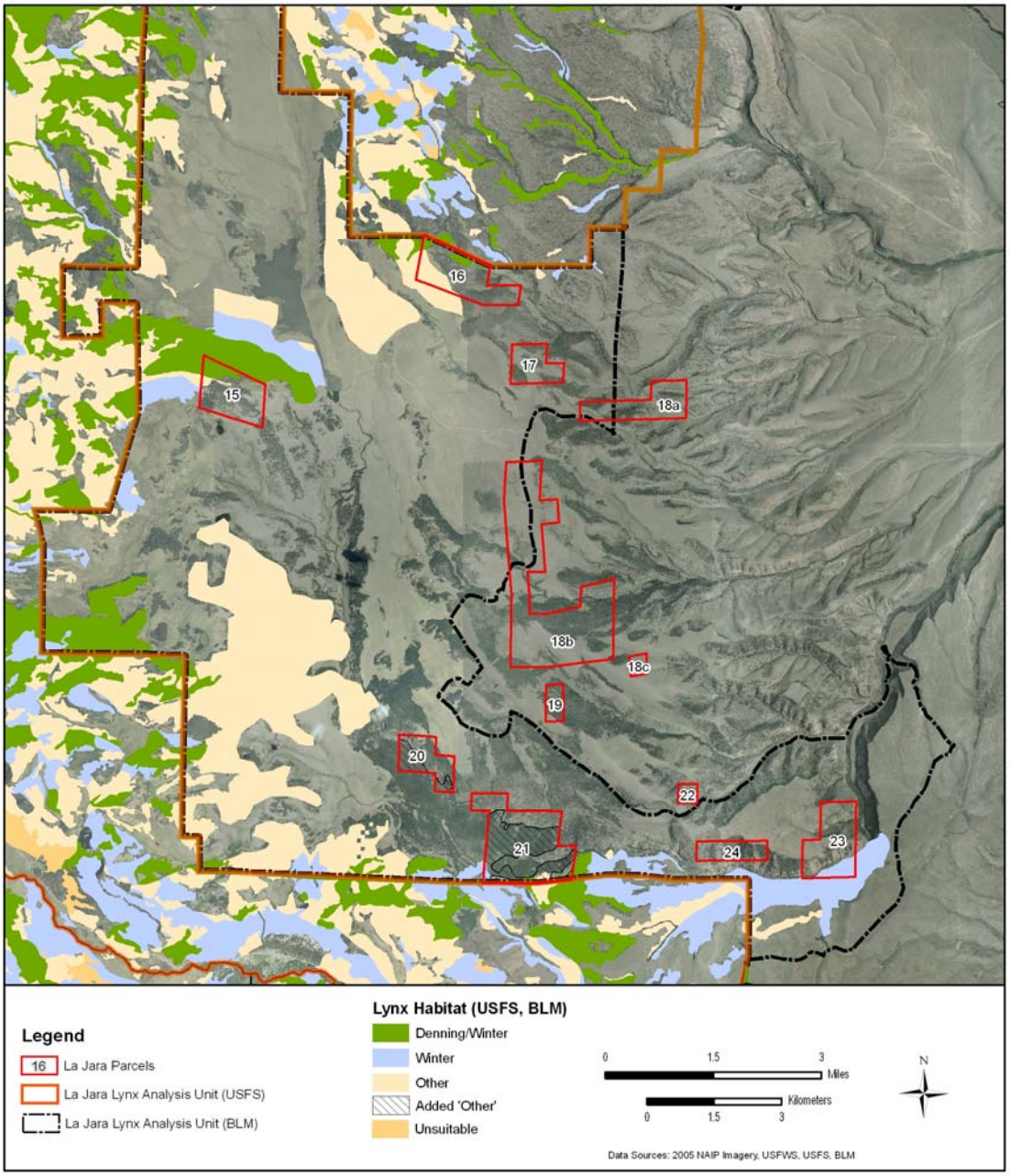
| | **Habitat Type** | | | | |
|---|---|---|---|---|---|
| **Description** | **Denning/Winter** | **Winter** | **Other** | **Unsuitable** | **Total** |
| Upper Rio Grande | 488,583 | 206,592 | 463,969 | 74,611 | 1,233,758 |
| La Jara LAU (FS)[1] | 17,482 | 13,295 | 26,640 | 2,563 | 59,980 |
| La Jara LAU (BLM)[1] | 2,695 | 2,149 | 7,718 | 3 | 12,565 |
| La Jara LAU (FS,BLM) | 20,177 | 15,444 | 34,359 | 2,566 | 72,545 |
| La Jara parcels | 132 | 82 | 631 | 0 | 833 |

1. Refer to Figures 17 and 18.

The add-on BLM La Jara LAU has 53,426 acres and encompasses a portion of the La Jara parcels (see Figure 18). Of this total, 12,565 acres (24%) have been mapped as lynx habitat. Interestingly, the SLB lands and private lands comprise over 90% of the mapped habitat. The BLM only manages 1,206 acres of mapped habitat within this add-on LAU. Thus relative to what the BLM manages, the exchange of 833 acres (69%) is considerable. However, in the context of available habitat within the add-on LAU, the percentage to be exchanged is 6.7%.

In context with the larger landscape, if we combine the FS La Jara LAU and the add-on BLM LAU, the 833 acres represents 1.1 % (833 / 72,545) of the available lynx habitat. While we are not advocating these LAUs be lumped, it is reasonable to look at the combined numbers when analyzing the expected effects of this land exchange. In addition, the vast majority of quality lynx habitat occurs to the west of the parcels on the Rio Grande NF. None of these parcels are located in lynx linkage areas as delineated by the FS and the BLM. The closest linkage area, Wolf Creek Pass, is 27 miles to the northwest. Lynx linkage areas are those areas that link large areas of important habitat and help to ensure connectivity and travel corridors.

Figure 18. Existing mapped lynx habitat and additional 'Other' habitat delineated based on vegetation analysis and photo intrepretation within the La Jara Reservoir parcels.



## C. Species status locally

### 1. Knowledge of occurrences, habitat and surveys

As a result of the Colorado DOW telemetry of reintroduced animals, Canada lynx are known to move through the action area and in the general vicinity of all seven land exchange sites. These movements have been exploratory in nature and have included the low elevation grassland and shrub habitats, as well as in the forested vegetation with which we would normally associate Canada lynx. These detections are not interpreted as established lynx home ranges, but rather, the result of normal dispersal behavior which is to be expected when a highly-mobile species (with a natural inclination to long-distance movements) is reintroduced into new country. Exploratory movement through poor quality habitat is expected (FWS 2005).

There is no indication of lynx denning near the land exchange sites and no reported sightings of lynx kittens in the vicinity of the seven land exchange sites. However, potential foraging and denning habitat does occur in the parcels, particularly in mixed conifer and spruce-fir forests.

### 2. Cumulative Effects

The Colorado DOW continues their admirable efforts to reestablish a viable lynx population in the State. While no lynx introductions occurred in the winter of 2006/2007, they continue radio-telemetry studies of cats already here.

### 3. Other Federal actions affecting species local status

The Forest Service has been implementing the Lynx Conservation Assessment Strategy (Ruediger et al. 2000) since 1999. As a result of this implementation, the Rio Grande National Forest has delineated Lynx Analysis Units (LAUs), and mapped all lynx habitat within them. A total of 20 LAUs have been identified on the Forest; the La Jara LAU is the closest to the parcels at La Jara Reservoir. These LAUs have been accepted by the USFWS. In each LAU, vegetation is classified into different habitat values for lynx, and quantified (Figure 17 as an illustration). The Forest Service effort also identified important landscapes, called “lynx linkage areas” where habitat conditions for lynx dispersal and movement would receive management attention.

The BLM is in the process of adopting the LCAS in Colorado. A final document is expected soon (Wes Anderson, pers. communication 2006). The BLM contracted with the Colorado Natural Heritage Program to map any lynx habitat on BLM lands in the state (CNHP 2002). The mapping effort also identified lynx linkage areas.

The NPS is interested in adopting the LCAS and will begin procedures to do so. In the meantime, National Parks are implementing the LCAS and the Recovery Plan Outline as the best management direction for Canada lynx. The Great Sand Dunes GMP specifically states that the park and preserve will implement the LCAS on park-managed lands.

The FWS has distributed a Recovery Plan Outline which provides guidance to Federal land managers on the conservation priorities, preliminary recovery objectives, and actions for the lynx (FWS 2005). The outline stratifies the lynx range into areas which somewhat reflect priority for recovery planning. The entire lynx range is divided into "core areas" "secondary areas" and "peripheral areas", based on the evidence of persistence of lynx detections. All of Colorado is identified as a "provisional core area", based on the question of whether the reintroduced lynx here will become a self-sustaining population (FWS 2005).

The Outline does not describe specific federal actions in the provisional core area, but it is our assumption that the general discussion would apply to this area. That is, "On major Federal land ownerships within each core area, establish and implement long-term guidance whose adequacy to conserve lynx has been verified in a biological opinion." In Colorado, the National Forests have amended their Forest Plans to incorporate lynx management direction. This action is currently the subject of a Section 7 consultation and the biological opinion has not yet been completed. But it will be available soon.

## D. Critical habitat

There is no designated critical habitat for lynx in Colorado. The closest designated critical habitat is in Glacier National Park in Montana (70 FR 68293-68328). Therefore the land exchange will have no effect on lynx critical habitat.

## E. Effects of the proposed action

### 1. Direct effects

The ESA regulations definition of "direct effects" is such that a land exchange would not result in any direct effects to Canada lynx (see discussion in Introduction to the BA).

### 2. Indirect effects

Under the ESA regulations, indirect effects are those which occur later in time, after the action occurs. The Proposed Action is the exchange of land title, and all effects to habitat and species will occur after that action.

The LCAS (Ruediger, et al. 2000) includes the following guidance for land ownership: "…Contiguous tracts of land in public ownership (national forests, national parks, wildlife refuges and BLM lands) provide an opportunity for management that can maintain lynx habitat connectivity…." The objectives and standards to implement this priority are:

- Retain lands in lynx linkage areas in public ownership.
- Identify lynx linkage areas by management jurisdiction(s) in management plans and prescriptions.
- In land adjustment programs, identify lynx linkage areas. Work towards unified management direction via habitat conservation plans, conservation easements or agreements, and land acquisition [presumably, in the lynx linkage areas].

- Develop and implement specific management prescriptions to protect/enhance lynx linkage areas.
- Evaluate proposed land exchanges, land sales, and special use permits for effects on lynx linkage areas.

Lynx linkage

None of the seven land exchange sites are in or near areas identified as lynx linkage areas. The closest linkage area to the La Jara site is 27 miles to the northwest at Wolf Creek Pass. At Biedell Creek, the closest linkage area is 26 miles to the northwest at North Pass/Cochetopa Hills. Therefore, no additional analysis was done in this BA for lynx dispersal. Further, the expected land management of the sites (both the SLB and the Federal agencies) is not expected to influence the ability of lynx to move through these areas; the agencies acquiring land are not planning to change the vegetation structure or roads in a manner that would affect lynx movements any more than already exists.

Lynx habitat maintenance and management

**Table Mountain, Gribbles Park, Biedell, Refuge, Park and BLM sites**

The habitat conditions at these 6 sites, and the distance from potential denning and winter foraging habitat for lynx, leads us to conclude this portion of the land exchange will have no effect on Canada lynx individuals or the population. The lynx use of these areas is limited to occasional movements through the habitat. There is insufficient forest vegetation and prey availability to allow lynx to occupy these areas for any length of time. Further, the expected land management of the sites is compatible with maintaining existing forest vegetation in adequate conditions for sustaining any marginal prey populations to support the few dispersing lynx.

**La Jara site**

The La Jara site is the only site determined to have suitable vegetation and be in a location that would necessitate an in-depth analysis of potential lynx habitat. Below is a summary of information provided in the Affected Environment and will be the focus of the effects discussion:

- 833 acres of potential habitat for lynx were identified; this represents 18% of the area to be exchanged
- 203 acres of Denning/Winter habitat and 630 acres of 'Other' habitat were identified
- Mapped lynx habitat in the parcels represents 6.7% of the add-on BLM La Jara LAU, and less than 1% of the combined FS and BLM La Jara LAU
- Over 90% of the mapped lynx habitat within the BLM La Jara LAU occurs on SLB and private lands

Of the threats summarized in the 2005 Recovery Plan Outline, timber harvest, grazing, roads, trails, dispersed recreation, and snow compaction are all potentially pertinent to the future management of these lands by the SLB. The SLB management intent indicates a low likelihood of degrading the existing potential lynx habitat at La Jara via timber

harvest. There is over 2,400 acres of timber on the La Jara parcels. Most of this acreage is mixed conifer forest, ponderosa pine, aspen forests, and pinyon-juniper woodlands (Table 4 in Appendix C). The forest resources would be managed by Colorado State Forest Service (CSFS).

Based on recent aerial photography for the La Jara parcels, there is no evidence of extensive tree removal activity on the surrounding State lands. Recent data from CSFS corroborates this impression (J. Burns, CSFS, pers. com. 2007). In 2007, two CSFS projects were executed. In one project, small aspen trees were allowed to be removed for transplantation. This occurred on a 100 acre area where up to 3000 individual trees were available for removal. The second project was a 70 acre treatment area where the public is allowed to cut fuelwood. While tree removal is possible, given the general lack of merchantable trees and lack of tree removal operations in the past, we conclude it is unlikely that the forest resources will be greatly changed by the ownership transfer to the SLB. If the timber management plans were to dramatically change, and the SLB were to greatly degrade the forest resources on these parcels (worst case scenario), that habitat loss would affect less than 1 % of the combined FS and BLM La Jara LAU. We do not expect this to occur.

As for grazing impacts to lynx habitat, several of the parcels at La Jara Reservoir have not been subject to permitted grazing for over 10 years. Under the direction of the SLB, these areas will be leased for grazing. The potential exists for negative impacts from cattle grazing especially in sensitive areas such as in riparian communities. Loss of vegetation resulting from increased grazing pressure could impact forage available to snow shoe hares, the primary prey species for lynx. Notably, parcels 20 and 21 have "other" lynx habitat identified and these parcels are subject to SLB grazing. Parcels 15 and 16, which may contain denning habitat, have had consistent grazing under a BLM grazing lease. We do not expect the grazing on these parcels to change significantly. We do not believe the changes in grazing management would result in significant changes to snow shoe hare populations.

We do not anticipate the construction of any additional trails or roads as a result of this exchange. Most of the parcels are accessible by existing roads or are adjacent to SLB lands. Year around access is available to the La Jara Reservoir for fishing and other activities. Recreational access by foot or horseback to the expansive "La Jara Reservoir" Stewardship Trust land is allowed from September 1 to February 28 for hunting. Vehicles are required to stay on designated trails. Public access to the Los Chavez Stewardship Trust land, which is north of parcel 20, is not currently allowed. Outside of recreational hunting and fishing, limited dispersed recreational activities occur currently in these parcels; this is expected to remain relatively the same.

### 3. Interrelated and Interdependent effects

The interrelated and interdependent effects of this land exchange are those actions and effects that would occur as a consequence of the exchange in land title. Those effects are included in the discussion above, "Indirect effects".

## F. Conservation Measures

Conservation measures are actions taken by Federal agencies to reduce or eliminate the effects of their proposed actions on listed species; specifically, actions to reduce or eliminate 'take'. Assuming the exchange were to occur as proposed, the lands out-going from Federal management will be subject to management decisions of the SLB, and no longer within the purview of the Federal government. Therefore the Federal government would have no authority to implement conservation measures on these lands.

At this time, there are no specific land management actions planned on any of the seven land exchange sites. Therefore it is not possible to describe specific conservation measures that would be tied to future Federal land management actions. However, it is possible to discuss general management practices that may be considered conservation measures under the Endangered Species Act (ESA). For example, on the Refuge, Park and BLM sites, Section 7 consultation will be conducted prior to implementation of any land management with the possibility of affecting Canada lynx. However, the absence of lynx habitat on these lands coming into the Federal estate indicates such future Section 7 consultation is unlikely to be needed.

## G. Conclusion and Determination for Canada lynx

The Proposed Action of exchanging land title between the BLM and the State Land Board "may affect, is not likely to adversely affect" Canada lynx for the following reasons.

- The exchange of six of the sites will have No Effect on Canada lynx. The Table Mountain, Gribbles Park, Biedell, Refuge, Park and BLM sites are dominated by vegetation types unsuitable for lynx.
- None of the sites are in lynx linkage areas.
- The La Jara site does have the vegetation characteristics and proximity to other potential lynx habitat to support denning, winter foraging and other foraging. The amount of this habitat is negligible (<1% of the combined FS and BLM La Jara LAU).
- The SLB has indicated the La Jara parcels would be place into the Stewardship Trust program, though the effect of this designation on lynx habitat is unknown.
- The expected future State management of the La Jara site would largely retain the vegetation cover and habitat conditions for lynx. The possibility of adverse effects from SLB management is considered discountable (unlikely to occur).
- The designated critical habitat for Canada lynx does not include Colorado, therefore, there would be No Effect on the critical habitat.

**Gunnison's Prairie Dog (***Cynomys gunnisoni***)**

**A. Species biology**

Following a 12-month finding (published February 5, 2008; FR Volume 73, Number 24), the Service determined that the Gunnison's prairie dog is not threatened or endangered throughout all of its range. However, the finding stated the species is warranted for listing under the Act in a significant portion of it's the current range. The actual listing was precluded by higher priorities. The Service assigned a listing priority number (LPN) of 3 to this species (December 10, 2008, FR Volume 73, Number 238) which means Federal agencies should manage this population as a candidate species until a listing action occurs.

The portion of the range where the Gunnison's prairie dog is a Federal candidate species is in central and south-central Colorado and north-central New Mexico. The northeastern or "montane" range consists primarily of higher elevation, cooler, more mesic plateaus, benches, and intermountain valleys. This area represents about 40% of the total potential habitat within the current range (FWS 2008). Within Colorado, the Colorado Division of Wildlife (CDOW) has designated individual population areas (IPA) to identify where Gunnison's prairie dogs predominantly exist and where management activities should be focused (CDOW 2008). The montane portion of the species range in Colorado is composed of the Gunnison, San Luis Valley, South Park, and Southeast IPAs (CDOW 2008). The prairie portion of the species range in Colorado includes the La Plata/Archuleta and Southwest IPAs (CDOW 2008). Approximately 25% of the potential habitat is in Colorado (Seglund et el. 2005).

Gunnison's prairie dogs are diurnal, burrowing rodents occurring only in western North America. They are small, highly social animals weighing between 0.6 to 3 lbs and measuring around 12 to 15 inches in length. They are dependent on burrows for protection from predators and weather, for shelter, and for a place to raise young. Gunnison's prairie dogs generally cease above-ground activities during cold weather. Individuals at higher elevations tend to remain underground for longer periods. They generally hibernate 4-5 months during the winter.

Mating generally begins in mid-March and lasts through mid-May with females limited to one litter per year, regardless of available food resources. Age at first reproduction is dependent on available food. Gunnison's prairie dog exhibit a polygynous mating system in that females mate with more that 1 male. Reproductive success and litter size is highly correlated with body mass.

Gunnison's prairie dog inhabit shortgrass and mid-grass prairies, grass-shrub habitats in low valleys, and mesic high elevation sites (up to 12,000 feet). A diversity of grasses, shrubs, and forbs are common in Gunnison's prairie dog complexes. Topography is usually level to gently sloping. Gunnison's prairie dogs are primarily herbivores but will also eat insects and browse shrubs when preferred foods are not available.

The primary factor threatening Gunnison's prairie dog populations in Colorado, and throughout its range, is outbreaks of sylvatic plague. Plague is caused by an introduced, flea-transmitted disease caused by the bacterium *Yersinia pestis.* Loss of an entire colony

is common during epizootic outbreaks. Other threats are habitat fragmentation, via agricultural conversion and urbanization, and losses attributed to recreational shooting, but these threats tend to affect Gunnison's prairie dogs at much more localized scales.

**B. Affected Environment**

Five of the seven sites in this land exchange (Biedell Creek, La Jara, Refuge, Park, and BLM sites) occur within the San Luis Valley IPA, and one occurs in the Southeast IPA (Gribbles Park; Figure 19). The Table Mountain site does not occur in any of the IPAs or in the map depicted in the Federal Register notice delineating the montane portion of the range (FWS 2008). Thus we are excluding the Table Mountain site from this analysis.

We used information in the Draft Gunnison's and White-tailed Prairie Dog Conservation Plan developed by the Colorado Division of Wildlife (CDOW 2008) and the 12-month finding determination (FWS 2008) to analyze these six sites for potential impacts of the land exchange on the Gunnison's prairie dog. Many of the data sets used by the CDOW to model potentially suitable habitat have been used throughout this biological assessment. The CDOW modeled potential habitat using parameters for elevation, slope, and a number of vegetation types. These associations were based on published literature, known species occurrences, and expert opinion (CDOW 2008).

Potentially suitable habitat for Gunnison's prairie dog included the following parameters:

1) elevation between 3,773 ft and 10,006 ft,
2) slope between 0 to 20%, and
3) vegetation types using Southwest ReGAP Land Cover data including:.

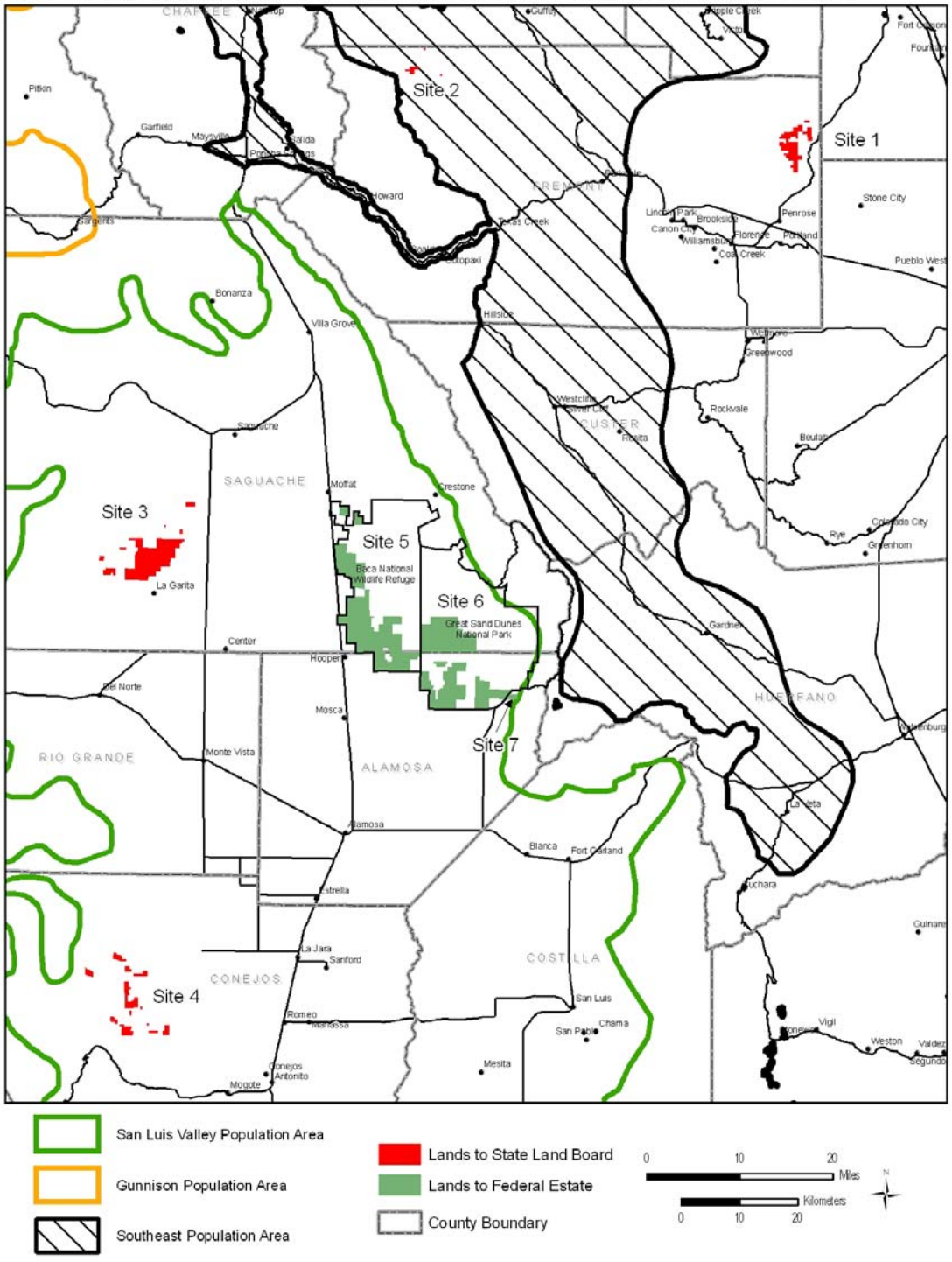
- Agriculture
- Colorado Plateau Mixed Low Sagebrush Shrubland
- Inter-mountain Basins Big Sagebrush Shrubland
- Inter-mountain Basins Greasewood Flats
- Inter-mountain Basins Mat Saltbush Shrubland
- Inter-mountain Basins Mixed Salt Desert Scrub
- Inter-mountain Basins Montane Sagebrush Steppe
- Inter-mountain Basins Semi-desert Grassland
- Inter-mountain Basins Semi-desert Shrub Steppe
- Inter-mountain Basins Shale Badlands
- Invasive Annual and Biennial Forbland
- Invasive Annual Grassland
- Invasive Perennial Forbland
- Invasive Perennial Grassland
- Rocky Mountain Subalpine Mesic Meadow
- Southern Rocky Mountain Montane-Subalpine Grassland
- Western Great Plains Foothill and Piedmont Grassland

It should be noted that soil type is very important for proper burrow excavation. Soils information (e.g., flooded soils, or sandy soils) was not available for this assessment, thus the following estimates are likely overestimates of potential habitat at a localized scale such as the parcels in the project.

**Baca Land Exchange Project**

A Joint Project between U.S. Fish & Wildlife Service, National Park Service, Bureau of Land Management, Colorado State Land Board

Figure 19. Individual Population Areas (IPA) for Gunnison's Prairie Dog in Vicinity of Baca Land Exchange.



**Gribbles Park**

The Gribbles Park site falls within the Southeast IPA. This IPA covers approximately 1.7 million acres. Based on habitat suitability modeling, approximately 260 acres, or 55%, of the area at Gribbles Park is potentially suitable for Gunnison's prairie dog (Figure 20). This habitat is primarily subalpine-montane grasslands in Parcel 6. There is a considerable amount of potential habitat surrounding the parcels as well. We have no information about the occurrence of Gunnison's prairie dog colonies in the vicinity of this site, although colonies in this IPA tend to be small and widely scattered (CDOW 2008).

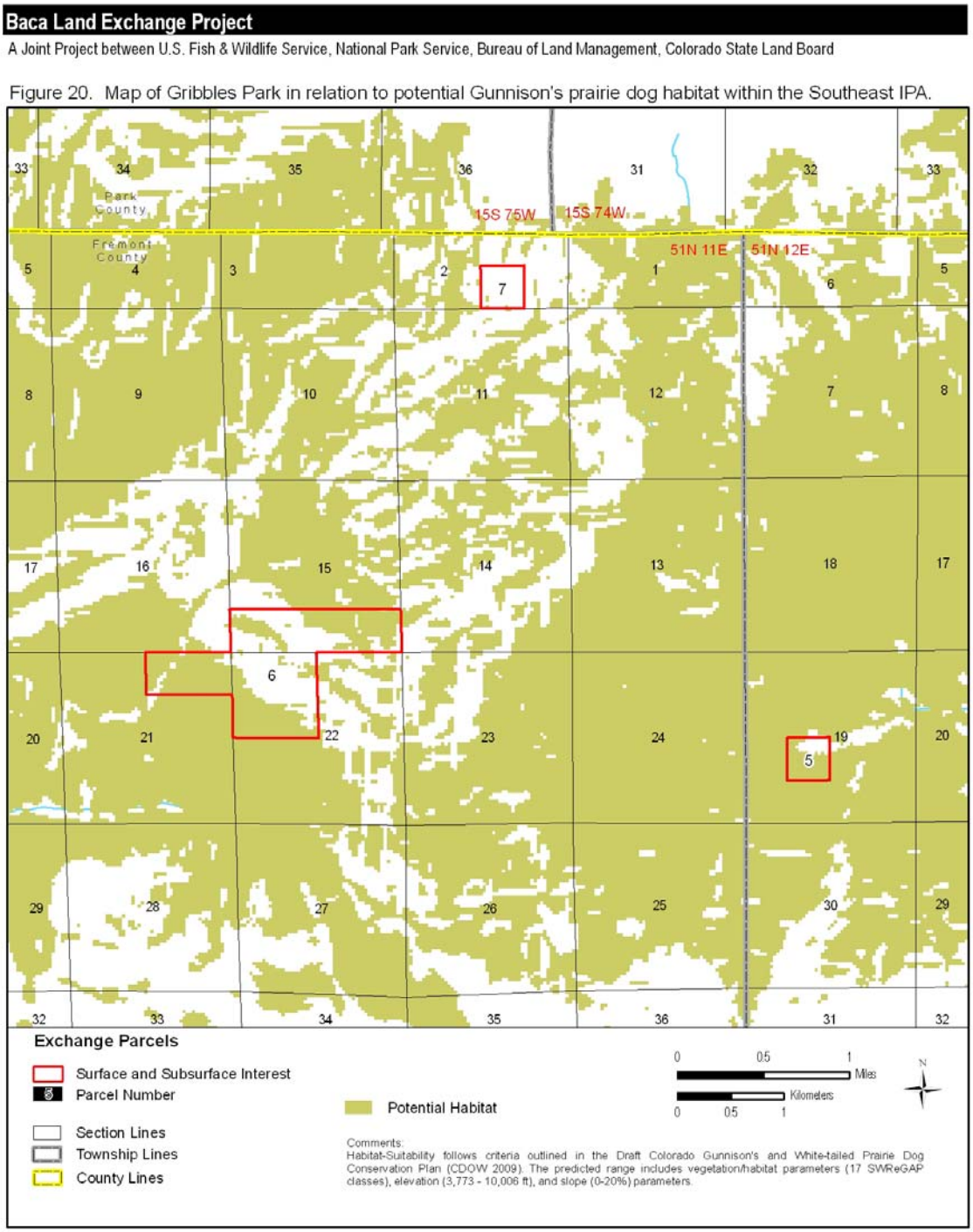


Figure 20. Map of Gribbles Park in relation to potential Gunnison's prairie dog habitat within the Southeast IPA.

**Biedell Creek and La Jara Sites**

Both the Biedell Creek and La Jara sites are located within the San Luis Valley IPA. This IPA encompasses approximately 3.4 million acres. The Biedell Creek site is dominated by a mixture of semi-desert shrub steppe and pinion-juniper habitats. According to the habitat suitability modeling, approximately 5,840 acres (or 51%) of the site is potential habitat for Gunnison's prairie dogs (Figure 21). Much of the potential habitat is on the eastern side of the parcels in the shrub steppe habitats at lower elevations. According to local Forest Service and BLM biologists, prairie dogs do occur on the eastern side of the Biedell Creek parcels (Randy Ghormley, personal communication 2009). While the exact extent of the colonies is unknown, however, they are believed to be small and widely distributed colonies.

The La Jara site contains approximately 1,300 acres of potential habitat based on habitat suitability modeling (Figure 21). There are known small colonies on the eastern edge of the parcels at the La Jara site (Randy Ghormley, pers communication 2009). Extensive surveys have not been completed.

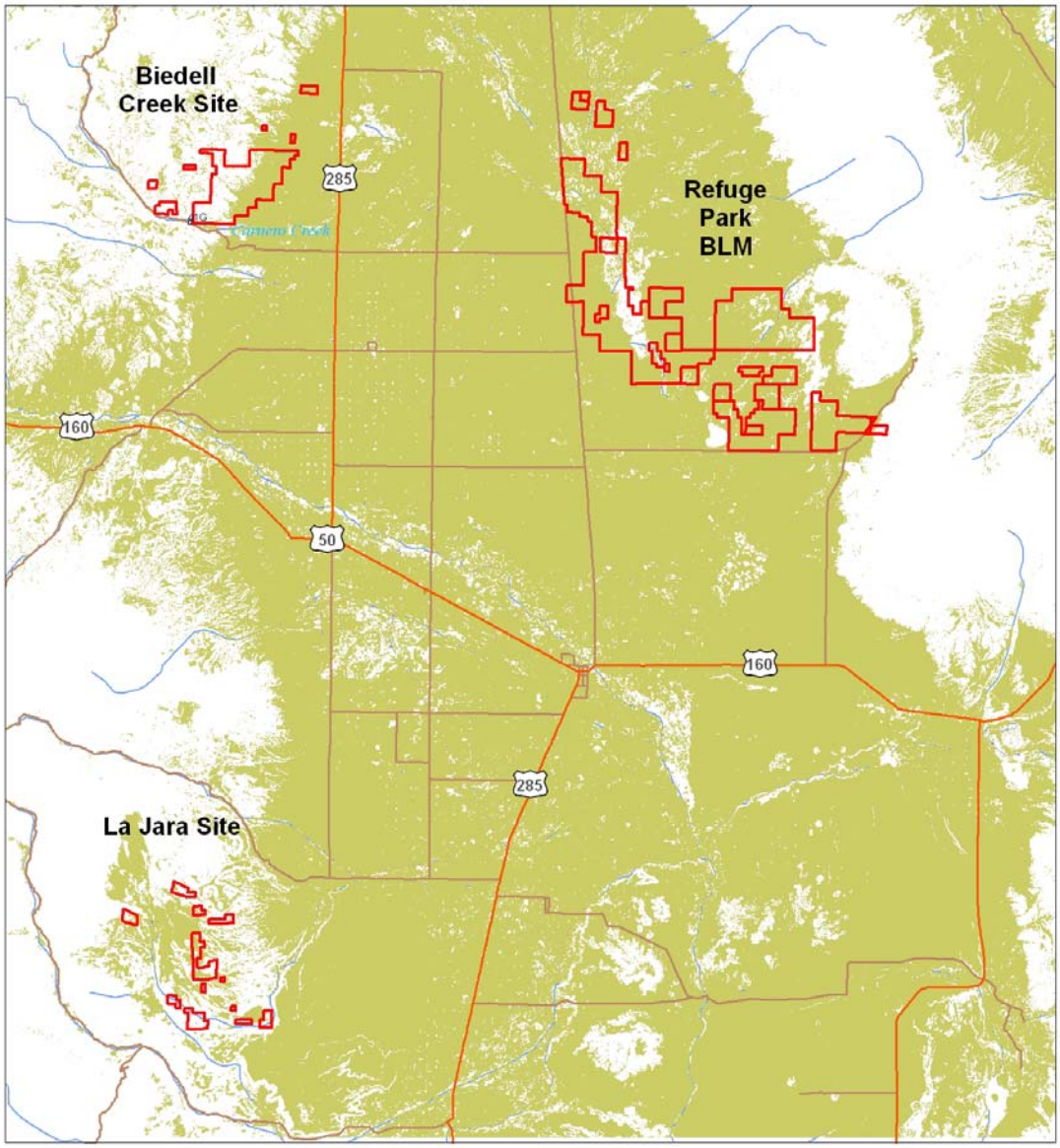
**Refuge/Park/BLM Site**

Gunnison's Prairie dogs are known to occur on the SLB parcels proposed to transfer to the federal government (Ron Garcia pers. communication 2009). Detailed mapping of colonies on the parcels has not been conducted, thus an accurate estimate of the actual number of acres supporting Gunnison's prairie dog is unknown at this time. However, CDOW modeling efforts indicate that much of the area around these sites have the potential to support Gunnison's prairie dogs. Based on this modeling, approximately 48,638 acres of potential habitat may exist on the parcels to be acquired by the Federal government. Given the nature of some of the soils in this area, however, we believe this estimate to be high. Nevertheless, we believe the habitats on the refuge and park sites are more conducive to supporting larger Gunnison's prairie dog colonies than the other sites in the land exchange due to the configuration of the parcels and habitat presence on these parcels.

**Baca Land Exchange Project**

A Joint Project between U.S. Fish & Wildlife Service, National Park Service, Bureau of Land Management, Colorado State Land Board

Figure 21. Map of Biedell Creek in relation to potential Gunnison's prairie dog habitat within San Luis Valley IPA.




Exchange Parcels

Surface and Subsurface Interest

Potential Habitat

Comments:
Habitat-Suitability follows criteria outlined in the Draft Colorado Gunnison's and White-tailed Prairie Dog Conservation Plan (CDOW 2009). The predicted range includes vegetation/habitat parameters (17 SWReGAP classes), elevation (3,773 - 10,006 ft), and slope (0-20%) parameters.

0 5 10 Miles

0 5 10 Kilometers

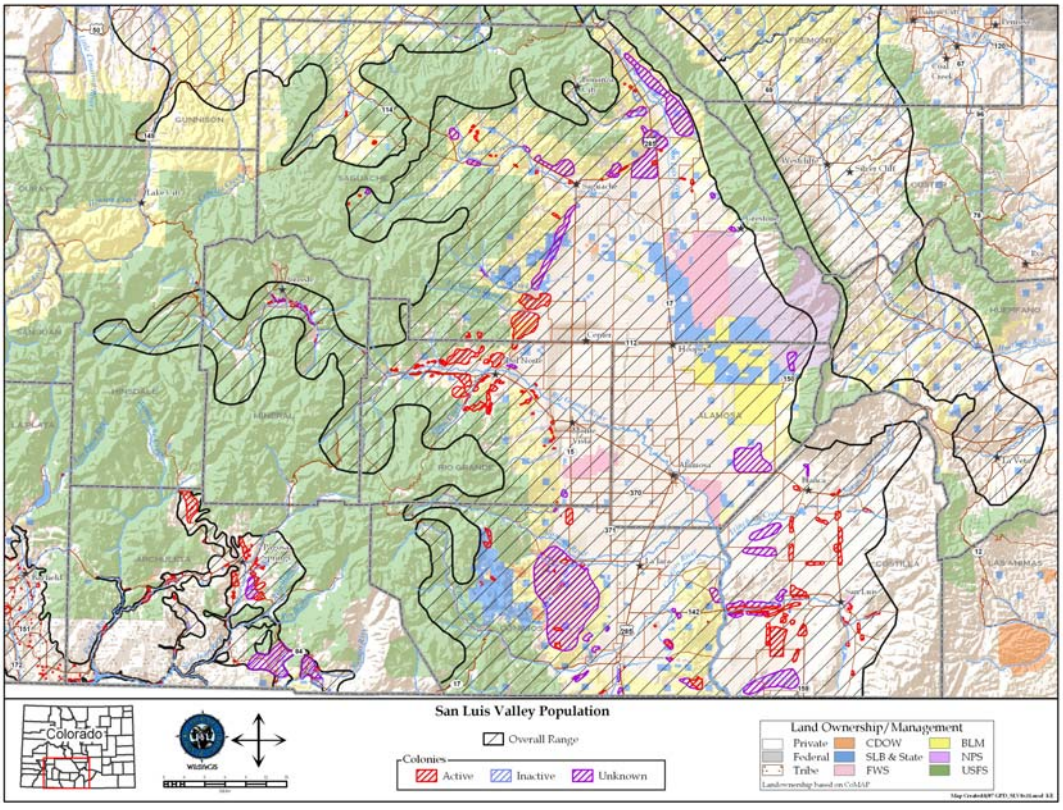
**Gunnison's Prairie Dog Status Locally**

**1. Knowledge of occurrences, habitat and surveys**

From 2002-2005, the CDOW interviewed field personnel from CDOW, the Service, the USFS, and the BLM regarding habitat occupied by Gunnison's prairie dogs in the state. Colonies were identified as "active" (known to have prairie dogs within 3 years), "inactive" (occurred in the site, but not within 3 years), or "unknown" (prairie dogs were known to historically occur there, but current status is unknown). Based on this information, the CDOW estimated 60,200 acres of active colonies, 1,320 acres of inactive colonies, and 148,818 acres of colonies in unknown status in the San Luis Valley IPA, (CDOW 2007). Within the Southeast IPA (where Gribbles Park is located), the CDOW estimates 37 acres of inactive colonies (CDOW 2007).

We have no knowledge of Gunnison's prairie dogs occurring at the Gribbles Park site. To our knowledge, no surveys have been conducted. In contrast, local biologists in the San Luis Valley did confirm the existence of small colonies on both the Biedell Creek and La Jara Sites. No formal surveys have been conducted by BLM biologists on these sites, rather, prairie dogs have been noted while conducting other field work (Melissa Garcia, personal communication 2009). The colonies present have been noted to occur on the eastern edges of the parcels. Refuge manager at the Baca NWR did confirm that prairie dogs do occur scattered throughout the refuge site, as well as on the Park site (Ron Garcia personal communication 2009).

Figure 21 (From CDOW 2007). San Luis Valley IPA with colony status in relation to approximate locations of Biedell Creek, La Jara, and the Refuge, Park and BLM sites.



### 2. Cumulative Effects

We are not aware of any activities by non-federal entities in the vicinity of the proposed land exchange that would affect the local populations of Gunnison's prairie dogs, or affect the conclusions in this BA.

## D. Critical Habitat

There is no critical habitat designation for Gunnison's prairie dog.

## E. Effects of the Proposed Action of Gunnison's Prairie Dog

### 1. Direct Effects

The ESA regulations definition of "direct effects" is such that a land exchange would not result in any direct effects to the Gunnison's prairie dog (see discussion in Introduction to the BA). All effects to the species are indirect; see discussion below.

### 2. Indirect Effects

The primary threat to this species is catastrophic population losses resulting from outbreaks of sylvatic plague (FWS 2008). Complete or near complete loss of individuals within colonies is common following epizootic episodes. We have no reason to believe that the management activities proposed by the SLB (i.e., continued grazing, limited timber harvest), would change the risk of plague outbreaks occurring at the La Jara and Biedell Creek sites. These disease events result from mammals carrying plague-bearing fleas into an uninfected area. The likelihood of this transmission of disease is the same whether the colony is under SLB or Federal management. The SLB has clearly indicated that the existing BLM grazing leases will be honored until their expiration, when the leases would be evaluated and likely reissued as a SLB lease. Thus areas subject to grazing before the land exchange will be subject to grazing upon transfer. Continued grazing likely will maintain conditions in the uplands conducive for the existence of prairie dog colonies.

Local biologists noted that localized recreational shooting of prairie dogs was a concern related to the persistence of small isolated colonies. Shooting is considered a manageable threat as opposed to plague. Currently, the BLM lands are open to year round access and the BLM does not restrict shooting activities. Following the transfer of the La Jara and Biedell lands to the SLB, public access to these areas would be restricted to fall/winter access during the hunting seasons. If actively enforced by the SLB, this change in public access would reduce the shooting pressure on some prairie dog towns from what is currently occurring under BLM management. The SLB also has indicated that no coordinated effort by permittees to poison Gunnison's prairie dogs would be allowed under the lease agreements.

| Table . Acreage and percentage of land exchange sites potentially suitable for Gunnison's prairie dog. | | |
|---|---|---|
| **Site Name** | **Potential Habitat (ac)** | **% of Site** |
| Gribbles Park | 262 | 55% |
| Biedell Creek | 5,839 | 51% |
| La Jara | 1,316 | 29% |
| **Total** | **7,417** | **36%** |
| Refuge | 25,144 | 81% |
| Park | 23,334 | 91% |
| BLM | 160 | 50% |
| **Total** | **48,638** | **85%** |
| **Net Gain** | **41,221** | |

**3. Interrelated and Interdependent Effects**

The interrelated and interdependent effects of this land exchange are those actions and effects that would occur as a consequence of the exchange in land title. Those effects are included in the discussion above, "Indirect effects".

**F. Conservation Measures**

Conservation measures are actions taken by Federal agencies to reduce or eliminate the effects of their proposed actions on listed species; specifically, actions to reduce or eliminate 'take'. Assuming the exchange were to occur as proposed, the lands out-going from Federal management will be subject to management decisions of the SLB, and no longer within the purview of the Federal government. Therefore the Federal government would have no authority to implement conservation measures on these lands.

At this time, there are no specific land management actions planned on any of the seven land exchange sites. Therefore it is not possible to describe specific conservation measures that would be tied to future Federal land management actions. However, it is possible to discuss general management practices that may be considered conservation measures under the Endangered Species Act (ESA). For example, on the Refuge, Park and BLM sites, Section 7 consultation will be conducted prior to implementation of any land management with the possibility of affecting Gunnison's prairie dog. These consultations will be an opportunity to develop conservation measures applicable to the proposed actions.

**G. Conclusion and Determination for Gunnison's Prairie Dog**

Implementation of the land exchange "may affect, is not likely to adversely affect" Gunnison's prairie dog for the following reasons:

- The SLB management is compatible for continued Gunnison's prairie dog occupancy on the land exchange sites to be acquired by the State.
    - The SLB management of the LaJara, Biedell and Gribble's Park parcels includes continued livestock grazing will likely have limited impact on

habitat conditions necessary for existence of Gunnison's prairie dogs. In fact, maintenance of an active grazing program can be viewed as positive for the species.
    - The SLB has no plans to institute poisoning of any kind on these parcels.
    - These parcels would be less available to recreational shooting activities.
- The Biedell Creek and La Jara Sites, which contain the majority of potential habitat for Gunnison's prairie dogs leaving the federal estate will be placed in the Stewardship Trust Program. An inventory of habitat conditions and species use will be documented as part of the State's management on this candidate species.
- The amount of land involved in the land exchange that is considered potentially suitable habitat is a minor portion (<0.5%) of the habitat within the Individual Population Areas.
- There is a net gain of over 41,000 acres of potentially suitable habitat coming into the federal estate through this land exchange at the refuge and park sites. Any prairie dog populations on these acres would be managed as a protected candidate species on the Federal lands.

## III. CONCLUSION

The Baca Land Exchange proposal would exchange the land title interest of 77,926.14 acres. As a result of the exchange, the Colorado State Land Board would acquire interest in 20,870.03 acres that is currently under management of the BLM. The Federal government would acquire interest in 57,056.11 acres of State land, and would manage those acres in a National Wildlife Refuge, a National Park, and as BLM public lands. The acreages include subsurface and surface amounts. The discrepancy in the amount of acres is a consequence of the appraised value of the land involved; on average, the BLM land to be acquired by the State has a higher dollar value than the State land to be acquired by the Federal government.

The change in land management that would occur as a consequence of the land title exchange would have impacts on habitat conditions for ESA-listed species. These impacts to habitat do not rise to the level of "take" of listed species. That is, any effects are negligible and/or discountable.

An underlying assumption of this BA is that land (habitat) under Federal management has a higher likelihood of providing benefits to listed species, due to the ESA responsibility of Federal agencies.

The land exchange occurs across a large area and includes various types of wildlife habitat. As a consequence of this, and the variability of habitat requirements of ESA-listed species, the effects to listed species are not consistent. The instances where we reached a conclusion of "No Effect" for a species were the situations where the species is entirely absent from the Action Area (black-footed ferret, Colorado River fish, Arkansas darter, Uncompahgre fritillary butterfly, greenback cutthroat trout, New Mexico meadow jumping mouse). These species are discussed briefly in Appendix A. For the other species, we lacked site-specific surveys to document their possible occurrence. This required our use of habitat conditions as measures of the likelihood of species occurrence. Also, we asked wildlife biologists who work in the project area to review of our document and provide any supplemental information that would improve the veracity of this BA. This BA has been modified based on the review comments.

**Table 11. Species analyzed in the Baca Land Exchange BA and determinations reached for each species.**

| Species | Determination |
|---|---|
| Bald eagle | May Affect, Not Likely to Adversely Affect |
| Mexican spotted owl | May Affect, Not Likely to Adversely Affect |
| Mexican spotted owl critical habitat | May Affect, Not Likely to Adversely Affect |
| Southwestern willow flycatcher | May Affect, Not Likely to Adversely Affect |
| Yellow-billed cuckoo | May Affect, Not Likely to Adversely Affect |
| Black-footed ferret | No Effect |
| Gunnison's Prairie Dog | May Affect, Not Likely to Adversely Affect |
| Canada lynx | May Affect, Not Likely to Adversely Affect |
| Greenback Cutthroat Trout | No Effect |
| New Mexico Meadow Jumping | No Effect |

| | |
|---|---|
| Mouse | |
| Arkansas darter | No Effect |
| Bonytail | No Effect |
| Colorado pikeminnow | No Effect |
| Humpback chub | No Effect |
| Razorback sucker | No Effect |
| Uncompahgre fritillary butterfly | No Effect |

# Appendix A

**Rationale for Dismissing Species from Detailed Analysis**

When this biological assessment was initiated in 2005, we received a concurrence letter from the U.S. Fish and Wildlife Service to the BLM (on April 12, 2005) stating that the analysis should begin with the entire list of candidate, threatened, and endangered species occurring within the vicinity of the action area (Alamosa, Conejos, Fremont and Saguache Counties, Colorado). As the process has moved on, species have been dropped or added based on changes to listing status. Below is the final list of species that are known to or believed to occur in the counties comprising the action area (Table 1). For a variety of reasons, as state below, several of these species were not analyzed in depth in this assessment.

**Table 1. Federally-listed species identified by FWS as occurring in the counties of the Land Exchange and potentially requiring analysis in the Biological Assessment.**

| Species | Alamosa | Conejos | Fremont | Saguache |
|---|---|---|---|---|
| Bald eagle | x | x | x | x |
| Mexican spotted owl | x | x | x | x |
| Southwestern willow flycatcher | x | x | | x |
| Yellow-billed cuckoo | x | x | | x |
| Black-footed ferret | x | x | x | x |
| Canada lynx | x | x | x | x |
| Arkansas darter | | | x | |
| Gunnison's Prairie Dog | x | x | x | x |
| Greenback Cutthroat Trout | | | | x |
| Bonytail | | | | x |
| Colorado pikeminnow | | | | x |
| Humpback chub | | | | x |
| Razorback sucker | | | | x |
| Uncompahgre fritillary butterfly | | | | x |
| New Mexico Meadow Jumping Mouse | | x | | |
| | | | | |

Preliminary analysis for the BA determined that several of these species could be removed from detailed analysis for the following reasons:

**Black-footed ferret (*Mustela nigripes*)**
This species was once widespread in central North America, but was practically extirpated by 1987, primarily as a result of prairie dog and predator control (Nature Serve 2005). Captive breeding has been successful, and reintroductions are in progress. The last confirmed sighting of black-footed ferrets in the San Luis Valley was in 1974. In 1988, a survey of prairie dog towns was conducted to evaluate the potential reintroduction of

black-footed ferrets (Patton 1988). The results from this survey concluded that there were insufficient populations of prairie dogs to support black-footed ferrets. Small isolated Gunnison's prairie dog colonies are believed to occur on the parcels, however they are not the size required to support black-footed ferrets. Therefore, we saw no need to analyze this species in this BA; the land exchange would have No Effect on black-footed ferrets.

**Arkansas darter (*Etheostoma cragini*)**
The land exchange parcels do not occur near the current or potential range of the species (Figure 27). The distance from current/potential habitat to the nearest land exchange parcel is 18 miles. Suitable aquatic habitat for darters is not present on any of the sites. With the concurrence of Leslie Ellwood, FWS, the darter was eliminated from further analysis. The land exchange would have No Effect on the Arkansas darter.

**Bonytail (*Gila elegans*), Humpback chub (*Gila cypha*), Razorback sucker (*Xyrauchen texanus*)**, and **Colorado pikeminnow (*Ptychocheilus lucius*)**
These fish species are native to the Colorado River basin and currently occur only in portions of that basin. None of the land exchange parcels are in the Colorado River basin, so these four fish species are dismissed from further analysis. The land exchange would have No Effect on these species.

**Uncompahgre fritillary butterfly (*Boloria acronema*)**
Habitat for the Uncompahgre fritillary is moist alpine slopes above 12,000 feet with extensive snow willow (*Salix nivalis*). The parcels in this land exchange are well below that elevation and far removed from the known butterfly populations. With the concurrence of Leslie Ellwood, FWS, the butterfly was eliminated from further analysis. The land exchange would have No Effect on the butterfly.

**Greenback Cutthroat Trout** (*Oncorhynchus clarki stomias*)
Saguache County was added in February 2009 to the list of counties in Colorado with potential habitat and/or occurrences for this species. The parcels involved in this exchange located in Saguache County do not contain any suitable stream habitat. Thus this land exchange will have No Effect on this species.

**New Mexico Meadow Jumping Mouse (*Zapus hudsonius luteus*)**
Conejos County was added in February 2009 to the list of counties in Colorado with potential habitat and or occurrences for this species. The La Jara site is the only site within Conejos County. This species is a habitat specialist requiring riparian areas dominated by tall, dense, grasses, forbs, and sedges associated with perennially moist to wet soils. Only three parcels are associated with riparian habitat. The higher elevation, higher stream gradient parcels (21 and 20) do not contain the type of dense sedge cover required for this species. Parcel 23, which is lower elevation, has been subjected to grazing pressures in the past and does not contain suitable habitat structure for this species. Therefore, this land exchange will have No Effect on this species.

## Appendix B

## Lands Leaving Federal Estate

| Parcel # | See Figures 2-5 | | Acres | Site | County |
|---|---|---|---|---|---|
| 1 | T. 17 S., R. 68 W., | Sec. 11, SE1/4SW1/4 and SW1/4SE1/4; | 80.00 | Table Mtn. | Fremont |
| | | | **80.00** | | |
| 2 | T. 17 S., R. 68 W., | Sec. 15, S1/2NE1/4 and S1/2; | 400.00 | Table Mtn. | Fremont |
| | T. 17 S., R. 68 W., | Sec. 22, NW1/4NW1/4; | 40.00 | Table Mtn. | Fremont |
| | | | **440.00** | | |
| 3 | T. 17 S., R. 68 W., | Sec. 21, NW1/4SE1/4; | 40.00 | Table Mtn. | Fremont |
| | | | **40.00** | | |
| 4 | T. 17 S., R. 68 W., | Sec. 27, SW1/4; | 160.00 | Table Mtn. | Fremont |
| | T. 17 S., R. 68 W., | Sec. 28, NE1/4SE1/4; | 40.00 | Table Mtn. | Fremont |
| | T. 17 S., R. 68 W., | Sec. 34, W1/2 and SE1/4; | 480.00 | Table Mtn. | Fremont |
| | T. 18 S., R. 68 W., | Sec. 3, lots 3, 4, 5, 6, 7, S1/2NW1/4, and NW1/4SW1/4; | 332.62 | Table Mtn. | Fremont |
| | T. 18 S., R. 68 W., | Sec. 4, NE1/4SE1/4; | 40.00 | Table Mtn. | Fremont |
| | T. 18 S., R. 68 W., | Sec. 10, N1/2NW1/4; | 80.00 | Table Mtn. | Fremont |
| | | | **1,132.62** | | |
| | | **Table Mountain subtotal** | **1,692.62** | | |
| | | | | | |
| 5 | T. 51 N., R. 11 E., | Sec. 2, SW1/4SE1/4; | 40.00 | Gribbles Park | Fremont |
| | | | **40.00** | | |
| 6 | T. 51 N., R. 11 E., | Sec. 15, S1/2S1/2; | 160.00 | Gribbles Park | Fremont |
| | T. 51 N., R. 11 E., | Sec. 21, N1/2NE1/4; | 80.00 | Gribbles Park | Fremont |
| | T. 51 N., R. 11 E., | Sec. 22, NW1/4 | 160.00 | Gribbles Park | Fremont |
| | | | **400.00** | | |
| 7 | T. 51 N., R. 12 E.; | Sec. 19, NE1/4SW1/4; | 40.00 | Gribbles Park | Fremont |
| | | | **40.00** | | |
| | | **Gribbles Park subtotal** | **480.00** | | |
| | | | | | |
| 8 | T. 43 N., R. 7 E.; | Sec. 14, NW1/4; | 160.00 | Biedell Creek | Saguache |
| | T. 43 N., R. 7 E.; | Sec. 15, NE1/4; | 160.00 | Biedell Creek | Saguache |
| | | | **320.00** | | |
| 9 | T. 43 N., R. 7 E.; | Sec. 29, NE1/4SW1/4; | 40.00 | Biedell Creek | Saguache |
| | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| | | | **40.00** | | |
| **10** | T. 43 N., R. 7 E.; | Sec. 34, W1/2NW1/4 | 80.00 | Biedell Creek | Saguache |
| | | | **80.00** | | |
| **11** | T. 42 N., R. 6 E. | Sec. 9, N1/2NE1/4; | 80.00 | Biedell Creek | Saguache |
| | T. 42 N., R. 6 E. | Sec. 10, NW1/4NW1/4; | 40.00 | Biedell Creek | Saguache |
| | | | **120.00** | | |
| **12** | T. 42 N., R. 6 E. | Sec. 18, NE1/4; | 160.00 | Biedell Creek | Saguache |
| | | | **160.00** | | |
| **13** | T. 42 N., R. 6 E. | Sec. 21, SW1/4NW1/4 and W1/2SW1/4; | 120.00 | Biedell Creek | Saguache |
| | T. 42 N., R. 6 E. | Sec. 20, S1/2NE/14, SE1/4NW/14, SW1/4, N1/2SE1/4, and SW1/4SE1/4; | 400.00 | Biedell Creek | Saguache |
| | | | **520.00** | | |
| **Parcel #** | | | **Acres** | | **County** |
| **14** | T. 42 N., R. 6 E. | Sec. 2, lots 1, 2, 3, 4, S1/2NE1/4, SE1/4NW1/4, E1/2SW1/4,and SE1/4; | 514.80 | Biedell Creek | Saguache |
| | T. 42 N., R. 6 E. | Sec. 3, lots 1 and 2; | 77.50 | Biedell Creek | Saguache |
| | T. 42 N., R. 6 E. | Sec. 11, E1/2 and E1/2SW1/4; | 400.00 | Biedell Creek | Saguache |
| | T. 42 N., R. 6 E. | Sec. 12, all; | 640.00 | Biedell Creek | Saguache |
| | T. 42 N., R. 6 E. | Sec. 13, all; | 640.00 | Biedell Creek | Saguache |
| | T. 42 N., R. 6 E. | Sec. 14, E1/2 and E1/2W1/2; | 480.00 | Biedell Creek | Saguache |
| | T. 42 N., R. 6 E. | Sec. 22, S1/2NE1/4, SE1/4NW1/4, E1/2SW1/4, and SE1/4; | 360 | Biedell Creek | Saguache |
| | T. 42 N., R. 6 E. | Sec. 23, E1/2, E/12NW/14, SW1/4NW1/4, and SW1/4; | 600.00 | Biedell Creek | Saguache |
| | T. 42 N., R. 6 E. | Sec. 24, all; | 640.00 | Biedell Creek | Saguache |
| | T. 42 N., R. 6 E. | Sec. 25, W1/2NE1/4 and NW1/4; | 240.00 | Biedell Creek | Saguache |
| | T. 42 N., R. 6 E. | Sec. 26, N1/2; | 320.00 | Biedell Creek | Saguache |
| | T. 42 N., R. 6 E. | Sec. 27, NE1/4 and E1/2NW1/4; | 240.00 | Biedell Creek | Saguache |
| | T. 42 N., R. 7 E. | Sec. 3, lots 3, 4, and SW1/4NW1/4; | 119.76 | Biedell Creek | Saguache |
| | T. 42 N., R. 7 E. | Sec. 4, lots 1, 2, 3, 4, S1/2N1/2, and S1/2; | 637.47 | Biedell Creek | Saguache |
| | T. 42 N., R. 7 E. | Sec. 5, lots 1, 2, 3, 4, S1/2N1/2, and S1/2; | 635.41 | Biedell Creek | Saguache |
| | T. 42 N., R. 7 E. | Sec. 6, lots 1, 2, S1/2NE1/4, and SE1/4; | 319.05 | Biedell Creek | Saguache |
| | T. 42 N., R. 7 E. | Sec. 7, lots 1, 2, 3, 4, E1/2, and E1/2W1/2; | 645.20 | Biedell Creek | Saguache |
| | T. 42 N., R. 7 E. | Sec. 8, all; | 640.00 | Biedell Creek | Saguache |
| | T. 42 N., R. 7 E. | Sec. 9, W1/2; | 320.00 | Biedell Creek | Saguache |
| | T. 42 N., R. 7 E. | Sec. 17, all; | 640.00 | Biedell Creek | Saguache |

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|---|---|---|---|---|---|
| | T. 42 N., R. 7 E. | Sec. 18, lots 1, 2, 3, 4, E1/2, and E1/2W1/2; | 645.20 | Biedell Creek | Saguache |
| | T. 42 N., R. 7 E. | Sec. 19, lots 1, 2, 3, 4, NE1/4, and E1/2W1/2; | 485.19 | Biedell Creek | Saguache |
| | | | **10,239.58** | | |
| | | **Biedell Creek subtotal** | **11,479.58** | | |
| | | | | | |
| **15** | T. 35 N., R. 5 E., | Sec. 25, lots 1, 2, 3, 4, 5, 6, 7, and 8 | 374.17 | La Jara Reservoir | Conejos |
| | | | **374.17** | | |
| **16** | T. 35 N., R. 6 E., | Sec. 21, lots 1, 2, 3, 4, 5, 6, 7, and 8; | 374.74 | La Jara Reservoir | Conejos |
| | T. 35 N., R. 6 E., | Sec. 22, S1/2NW1/4 | 80.00 | La Jara Reservoir | Conejos |
| | | | **454.74** | | |
| **17** | T. 35 N., R. 6 E., | Sec. 26, lot 1 | 42.20 | La Jara Reservoir | Conejos |
| | T. 35 N., R. 6 E., | Sec. 27, lots 1, 2, 3, and 4; | 169.06 | La Jara Reservoir | Conejos |
| | | | **211.26** | | |
| **Parcel #** | | | **Acres** | | **County** |
| **18a** | T. 35 N., R. 6 E., | Sec. 25, S1/2SW1/4, and SE1/4 | 240.00 | La Jara Reservoir | Conejos |
| | T. 35 N., R. 6 E., | Sec. 26, lots 5 and 6 | 84.24 | La Jara Reservoir | Conejos |
| | | | | | |
| | | | **324.24** | | |
| **18b** | T. 35 N., R. 6 E., | Sec. 34, lots 5, 6, 7, and 8 | 170.89 | La Jara Reservoir | Conejos |
| | T. 34 N., R. 6 E., | Sec. 3, lots 5, 6, 7, 8, 9, 10, and 11 | 360.44 | La Jara Reservoir | Conejos |
| | T. 34 N., R. 6 E., | Sec. 10, SE1/4, and S1/2NE1/4, and NW1/4NE1/4 | 280.00 | La Jara Reservoir | Conejos |
| | T. 34 N., R. 6 E., | Sec. 11, E1/2, and E1/2SW1/4, and SE1/4 NW 1/4 and Lots 1, 2, and 3 | 552.98 | La Jara Reservoir | Conejos |
| | T. 34 N., R. 6 E., | Sec 2 Lot 8 | 51.25 | La Jara Reservoir | Conejos |
| | | | **1,415.56** | | |
| | | | | | |
| **18c** | T. 34 N., R. 6 E., | Sec. 13, NE1/4NW1/4 | 40.00 | La Jara Reservoir | Conejos |
| | | | **40.00** | | |
| **19** | T. 34 N., R. 6 E., | Sec. 14, SW1/4NW/14 and NW1/4SW1/4; | 80.00 | La Jara Reservoir | Conejos |
| | | | **80.00** | | |
| **20** | T. 34 N., R. 6 E., | Sec. 21, SW1/4NE1/4, NW1/4, and NW1/4SE1/4; | 240.00 | La Jara Reservoir | Conejos |
| | | | **240.00** | | |
| **21** | T. 34 N., R. 6 E., | Sec. 22, S1/2SW1/4; | 80.00 | La Jara Reservoir | Conejos |
| | T. 34 N., R. 6 E., | Sec. 26, lots 1, 2, and W1/2W1/2; | 234.70 | La Jara Reservoir | Conejos |
| | T. 34 N., R. 6 E., | Sec. 27, E1/2 and E1/2W1/2; | 480.00 | La Jara Reservoir | Conejos |

| | | | | | |
|---|---|---|---|---|---|
| | | | **794.70** | | |
| **22** | T. 34 N., R. 7 E., | Sec. 19, lot 4; | 43.16 | La Jara Reservoir | Conejos |
| | | | **43.16** | | |
| **23** | T. 34 N., R. 7 E., | Sec. 28, W1/2; | 320.00 | La Jara Reservoir | Conejos |
| | T. 34 N., R. 7 E., | Sec. 29, E1/2SE1/4; | 80.00 | La Jara Reservoir | Conejos |
| | | | **400.00** | | |
| **24** | T. 34 N., R. 7 E., | Sec. 29, NW1/4SW1/4; | 40.00 | La Jara Reservoir | Conejos |
| | T. 34 N., R. 7 E., | Sec. 30, NE1/4SW1/4 and N1/2SE1/4; | 120.00 | La Jara Reservoir | Conejos |
| | | | **160.00** | | |
| | | **La Jara Reservoir subtotal** | **4,537.83** | | |
| | | | | | |
| | **Subsurface Mineral Parcels** | | | | |
| **Parcel #** | | | **Acres** | | **County** |
| | T. 17 S., R. 68 W., | Sec. 20, SE1/4NE1/4 and N1/2SE1/4; | 120.00 | Table Mtn. | Fremont |
| | T. 17 S., R. 68 W., | Sec. 21, N1/2, N1/2SW1/4, and SE1/4SW1/4; | 440.00 | Table Mtn. | Fremont |
| | T. 17 S., R. 68 W., | Sec. 22, E1/2NW1/4, SW1/4NW1/4, and NE1/4SW1/4; | 160.00 | Table Mtn. | Fremont |
| **45** | T. 17 S., R. 68 W., | Sec. 27, NW1/4; | 160.00 | Table Mtn. | Fremont |
| | T. 17 S., R. 68 W., | Sec. 28, NE1/4, E1/2NW1/4, SW1/4NW1/4, SW1/4, NW1/4SE1/4, and S1/2SE1/4; | 560.00 | Table Mtn. | Fremont |
| | T. 17 S., R. 68 W., | Sec. 29, NE1/4 and E1/2SE1/4; | 240.00 | Table Mtn. | Fremont |
| | T. 17 S., R. 68 W., | Sec. 33, E1/2, S1/2NW/14, and NE1/4 SW1/4; | 440.00 | Table Mtn. | Fremont |
| | | | **2,120.00** | | |
| **46** | T. 17 S., R. 68 W., | Sec. 14. SE1/4; | 160.00 | Table Mtn. | Fremont |
| | T. 17 S., R. 68 W., | Sec. 23, E1/2 and N1/2NW1/4; | 400.00 | Table Mtn. | Fremont |
| | | | **560.00** | | |
| | | | **2,680.00** | | |
| | | **Exhibit B - surface acreage** | **18,190.03** | | |
| | | **Exhibit B Minerals-only acreage** | **2,680.00** | | |
| | | **Total Exhibit B acreage** | **20,870.03** | | |

## Appendix B continued

## Lands Entering the Federal Estate

| Parcel # | Legal description | | Acres | County | Target owner |
|---|---|---|---|---|---|
| 26 | T. 40 N., R. 11 E. | Sec. 2, lots 1, 2, 3, 4, S1/2N1/2, N1/2SW1/4, and NW1/4SE1/4; | 456.52 | Alamosa | Baca NWR |
| | T. 40 N., R. 11 E. | Sec. 3, lots 1, 2, 3, 4, S1/2N1/2, and S1/2; | 654.02 | Alamosa | Baca NWR |
| | T. 40 N., R. 11 E. | Sec. 4, lots 1, 2, 3, 4, S1/2N1/2, N1/2S1/2, SE1/4SW1/4, and S1/2SE1/4; | 610.40 | Alamosa | Baca NWR |
| | T. 40 N., R. 11 E. | Sec. 5, lots 1, 4, SE1/4NE1/4, SW1/4NW1/4, W1/2SW1/4, and SE1/4SW1/4; | 283.01 | Alamosa | Baca NWR |
| | T. 40 N., R. 11 E. | Sec. 6, lots 1, 2, 3, 4, 5, 6, 7, S1/2NE1/4, SE1/4NW1/4, E1/2SW1/4, and SE1/4; | 643.61 | Alamosa | Baca NWR |
| | T. 40 N., R. 11 E. | Sec. 7, lots 1, 2, 3, 4, E1/2, and E1/2W1/2; | 644.42 | Alamosa | Baca NWR |
| | T. 40 N., R. 11 E. | Sec. 8, all; | 640.00 | Alamosa | Baca NWR |
| | T. 40 N., R. 11 E. | Sec. 9, E1/2, E1/2NW1/4, SW1/4NW1/4, and SW1/4; | 600.00 | Alamosa | Baca NWR |
| | T. 41 N., R. 10 E. | Sec. 1, lots 1, 2, 3 and 4, and S1/2NW1/4 and SW1/4; | 353.52 | Saguache | Baca NWR |
| | T. 41 N., R. 10 E. | Sec. 2, lots 1, 2, 3, 4, S1/2N1/2, and S1/2; | 637.98 | Saguache | Baca NWR |
| | T. 41 N., R. 10 E. | Sec. 3, lots 1, 2, 3, 4, S1/2N1/2, and S1/2; | 637.60 | Saguache | Baca NWR |
| | T. 41 N., R. 10 E. | Sec. 10, all; | 640.00 | Saguache | Baca NWR |
| | T. 41 N., R. 10 E. | Sec. 11, all; | 640.00 | Saguache | Baca NWR |
| | T. 41 N., R. 10 E. | Sec. 12, lot 2 and W1/2; | 340.11 | Saguache | Baca NWR |
| | T. 41 N., R. 10 E. | Sec. 13, fractional SW1/4NE1/4, S1/2NE1/4, W1/2, and W1/2SE1/4; | 479.90 | Saguache | Baca NWR |
| | T. 41 N., R. 10 E. | Sec. 14, all; | 640.00 | Saguache | Baca NWR |
| | T. 41 N., R. 10 E. | Sec. 15, all; | 640.00 | Saguache | Baca NWR |
| | T. 41 N., R. 10 E. | Sec. 16, all; | 640.00 | Saguache | Baca NWR |
| | T. 41 N., R. 10 E. | Sec. 22, N1/2, SW1/4, W1/2SE1/4, and NE1/4SE1/4; | 600.00 | Saguache | Baca NWR |
| | T. 41 N., R. 10 E. | Sec. 23, E1/2 and N1/2NW1/4; | 400.00 | Saguache | Baca NWR |
| | T. 41 N., R. 10 E. | Sec. 24, W1/2NE1/4, SE1/4NE1/4, W1/2, and SE1/4; | 600.00 | Saguache | Baca NWR |
| | T. 41 N., R. 10 E. | Sec. 25, all; | 640.00 | Saguache | Baca NWR |
| | T. 41 N., R. 10 E. | Sec. 26, all; | 640.00 | Saguache | Baca NWR |
| | T. 41 N., R. 10 E. | Sec. 27, W1/2NE1/4, SE1/4NE1/4, W1/2, and SE1/4; | 600.00 | Saguache | Baca NWR |
| | T. 41 N., R. 10 E. | Sec. 35, all; | 640.00 | Saguache | Baca NWR |
| | T. 41 N., R. 10 E. | Sec. 36, all; | 640.00 | Saguache | Baca NWR |
| | T. 41 N., R. 11 E. | Sec. 19, lot 4, E1/2, and SE1/4 SW1/4; | 400.30 | Saguache | Baca NWR |
| | T. 41 N., R. 11 E. | Sec. 28, all; | 640.00 | Saguache | Baca NWR |
| | T. 41 N., R. 11 E. | Sec. 29, all; | 640.00 | Saguache | Baca NWR |

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|---|---|---|---|---|---|
| | T. 41 N., R. 11 E. | Sec. 30, lots 1, 2, 3, 4, E1/2, and E1/2W1/2; | 641.98 | Saguache | Baca NWR |
| **Parcel #** | **Legal description** | | **Acres** | **County** | **Target owner** |
| | T. 41 N., R. 11 E. | Sec. 31, lots 1, 2, 3, 4, E1/2, and E1/2W1/2; | 641.60 | Saguache | Baca NWR |
| | T. 41 N., R. 11 E. | Sec. 32, N1/2 and SE1/4; | 480.00 | Saguache | Baca NWR |
| | T. 42 N., R. 10 E. | Sec. 9, all; | 640.00 | Saguache | Baca NWR |
| | T. 42 N., R. 10 E. | Sec. 10, all; | 640.00 | Saguache | Baca NWR |
| | T. 42 N., R. 10 E. | Sec. 14, all; | 640.00 | Saguache | Baca NWR |
| | T. 42 N., R. 10 E. | Sec. 15, all; | 640.00 | Saguache | Baca NWR |
| | T. 42 N., R. 10 E. | Sec. 16, all; | 640.00 | Saguache | Baca NWR |
| | T. 42 N., R. 10 E. | Sec. 17, Fractional portion east of railroad right-of-way; | 115.00 | Saguache | Baca NWR |
| | T. 42 N., R. 10 E. | Sec. 21, N1/2 and NE1/4SE1/4; | 360.00 | Saguache | Baca NWR |
| **26, cont'd.** | T. 42 N., R. 10 E. | Sec. 22, E/12, NW1/4, N1/2SW1/4, and SE1/4SW1/4; | 600.00 | Saguache | Baca NWR |
| | T. 42 N., R. 10 E. | Sec. 23, all; | 640.00 | Saguache | Baca NWR |
| | T. 42 N., R. 10 E. | Sec. 26, all; | 640.00 | Saguache | Baca NWR |
| | T. 42 N., R. 10 E. | Sec. 27, E1/2; | 320.00 | Saguache | Baca NWR |
| | T. 42 N., R. 10 E. | Sec. 34, E1/2E1/2; | 160.00 | Saguache | Baca NWR |
| | T. 42 N., R. 10 E. | Sec. 36, lots 1, 2, and W1/2; | 370.60 | Saguache | Baca NWR |
| | T. 42 N., R. 10 E. | Sec. 4, lots 1, 2, 3, 4, S1/2N1/2, and S1/2; | 642.19 | Saguache | Baca NWR |
| | T. 42 N., R. 10 E. | Sec. 5, Fractional portion east of railroad right-of-way; | 207.40 | Saguache | Baca NWR |
| | T. 42 N., R. 10 E. | Sec. 8, Fractional portion east of railroad right-of-way; | 167.22 | Saguache | Baca NWR |
| | | | **25807.38** | | |
| | T. 40 N., R. 12 E. | Sec. 19, lots 1, 2, 3, 4, and E1/2SW1/4; | 238.98 | Alamosa | GRSA |
| | T. 40 N., R. 12 E. | Sec. 20, E1/2NE1/4, SE1/4SW1/4, and SE1/4; | 280.00 | Alamosa | GRSA |
| | T. 40 N., R. 12 E. | Sec. 21, S1/2; | 320.00 | Alamosa | GRSA |
| | T. 40 N., R. 12 E. | Sec. 22, S1/2; | 320.00 | Alamosa | GRSA |
| | T. 40 N., R. 11 E. | Sec. 24, E1/2, NW1/4, N1/2SW1/4, and SE1/4SW1/4 | 600.00 | Alamosa | GRSA |
| **27** | T. 40 N., R. 12 E. | Sec. 27, all; | 640.00 | Alamosa | GRSA |
| | T. 40 N., R. 12 E. | Sec. 28, all; | 640.00 | Alamosa | GRSA |
| | T. 40 N., R. 12 E. | Sec. 29, N1/2; | 320.00 | Alamosa | GRSA |
| | T. 40 N., R. 12 E. | Sec. 30, lots 1, 2, 3, 4, W1/2E1/2 and E1/2 W1/2; | 477.88 | Alamosa | GRSA |
| | T. 40 N., R. 12 E. | Sec. 31, lots 1, 2, 3, 4, E1/2, and E1/2W1/2; | 645.48 | Alamosa | GRSA |
| | T. 40 N., R. 12 E. | Sec. 32, all; | 640.00 | Alamosa | GRSA |
| | T. 40 N., R. 12 E. | Sec. 33, all; | 640.00 | Alamosa | GRSA |
| | | | **5762.34** | | |
| **28** | T. 40 N., R. 12 E. | Sec. 7, E1/2NE1/4 and NW1/4NE1/4; | 120.00 | Alamosa | GRSA |
| | T. 40 N., R. 12 E. | Sec. 8, N1/2NE1/4, SW1/4NE1/4, and NW1/4; | 280.00 | Alamosa | GRSA |
| | | | **400.00** | | |
| **29** | T. 40 N., R. 12 E. | Sec. 9, E1/2 and SW1/4; | 480.00 | Alamosa | GRSA |
| | T. 40 N., R. 12 E. | Sec. 10, all; | 640.00 | Alamosa | GRSA |

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|---|---|---|---|---|---|
| | | | **1120.00** | | |
| **Parcel #** | **Legal description** | | **Acres** | **County** | **Target owner** |
| | T. 40 N., R. 12 E. | Sec. 13, SW1/4; | 160.00 | Alamosa | GRSA |
| | T. 40 N., R. 12 E. | Sec. 24, all; | 633.23 | Alamosa | GRSA |
| | T. 40 N., R. 12 E. | Sec. 25, all; | 635.08 | Alamosa | GRSA |
| | T. 27 S., R. 73 W. | Sec. 20, all; (computed from resurvey plat) | 591.21 | Alamosa | GRSA |
| **30** | T. 27 S., R. 73 W. | W.Sec. 19, lots 1, 2, 3, 4, E1/2 and E1/2W1/2; (computed from resurvey plat) | 666.93 | Alamosa | GRSA |
| | T. 40 N., R. 13 E. | Sec. 31, all; | 347.30 | Alamosa | GRSA |
| | T. 40 N., R. 13 E. | Sec. 19, all; | 357.93 | Alamosa | GRSA |
| | T. 40 N., R. 13 E. | Sec. 30, all; | 351.70 | Alamosa | GRSA |
| | T. 40 N., R. 12 E. | Section 36 | 640.00 | Alamosa | GRSA |
| | | | **4383.38** | | |
| **31** | T. 27 S., R. 73 W. | Sec. 20, portion | 59.70 | Alamosa | BLM |
| | | | **59.70** | | |
| **31** | T. 27 S., R. 73 W. | Sec. 21, S1/2; (outside Monument boundary) | 320.00 | Alamosa | BLM |
| | | | **320.00** | | |
| **32** | T. 43 N., R. 10 E. | Sec. 16, W1/2, and SE1/4; | 480.00 | Saguache | Baca NWR |
| | | | **480.00** | | |
| | T. 43 N., R. 10 E. | Sec. 15, SE1/4; | 160.00 | Saguache | Baca NWR |
| **33** | T. 43 N., R. 10 E. | Sec. 22, E1/2; | 320.00 | Saguache | Baca NWR |
| | T. 43 N., R. 10 E. | Sec. 23, W1/2; | 320.00 | Saguache | Baca NWR |
| | | | **800.00** | | |
| **34** | T. 43 N., R. 10 E. | Sec. 36, lots 1, 2, 3, 4, and W1/2W1/2; | 292.24 | Saguache | Baca NWR |
| | | | **292.24** | | |
| **35** | T. 41 N., R. 11 E. | Sec. 24, all; | 640.00 | Saguache | GRSA |
| | T. 41 N., R. 11 E. | Sec. 25, all; | 640.00 | Saguache | GRSA |
| | T. 41 N., R. 11 E. | Sec. 36, all; | 640.00 | Saguache | GRSA |
| | T. 41 N., R. 12 E. | Sec. 16, all; | 465.03 | Saguache | GRSA |
| | T. 41 N., R. 12 E. | Sec. 17, all; | 472.36 | Saguache | GRSA |
| | T. 41 N., R. 12 E. | Sec. 18, lots 2, 3, 4, and fractional S1/2NE1/4, SE1/4NW1/4, and E1/2SW1/4 and SE1/4; | 479.14 | Saguache | GRSA |
| | T. 41 N., R. 12 E. | Sec. 19, lots 1, 2, 3, 4, E1/2, and E1/2W1/2; | 642.40 | Saguache | GRSA |
| | T. 41 N., R. 12 E. | Sec. 20, all; | 640.00 | Saguache | GRSA |
| | T. 41 N., R. 12 E. | Sec. 21, all; | 640.00 | Saguache | GRSA |
| | T. 41 N., R. 12 E. | Sec. 22, SW1/4; | 160.00 | Saguache | GRSA |
| | T. 41 N., R. 12 E. | Sec. 26, all; | 640.00 | Saguache | GRSA |
| | T. 41 N., R. 12 E. | Sec. 27, all; | 640.00 | Saguache | GRSA |
| | T. 41 N., R. 12 E. | Sec. 28, all; | 640.00 | Saguache | GRSA |
| | T. 41 N., R. 12 E. | Sec. 29, all; | 640.00 | Saguache | GRSA |
| | T. 41 N., R. 12 E. | Sec. 30, lots 1, 2, 3, 4, E1/2, and E1/2W1/2; | 641.22 | Saguache | GRSA |
| | T. 41 N., R. 12 E. | Sec, 31, lots 1, 2, 3, 4, E1/2, and E1/2W1/2; | 640.42 | Saguache | GRSA |
| | T. 41 N., R. 12 E. | Sec. 32, all; | 640.00 | Saguache | GRSA |

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|---|---|---|---|---|---|
| | T. 41 N., R. 12 E. | Sec. 33, all; | 640.00 | Saguache | GRSA |
| | T. 41 N., R. 12 E. | Sec. 34, all; | 640.00 | Saguache | GRSA |
| | T. 41 N., R. 12 E. | Sec. 35, all; | 640.00 | Saguache | GRSA |
| | | | **11820.57** | | |
| **Parcel #** | **Legal description** | | **Acres** | **County** | **Target owner** |
| **36** | T. 40 N., R. 11 E. | Sec. 13, all; | 640.00 | Alamosa | GRSA |
| | | | **640.00** | | |
| | T. 40 N., R. 12 E. | Sec. 16, all; | 640.00 | Alamosa | GRSA |
| **37** | T. 40 N., R. 12 E. | Sec. 17, E1/2; | 320.00 | Alamosa | GRSA |
| | T. 40 N., R. 12 E. | Sec. 21, N1/2; | 320.00 | Alamosa | GRSA |
| | | | **1280.00** | | |
| **38** | T. 40 N., R. 12 E. | Sec. 29, S1/2; | 320.00 | Alamosa | GRSA |
| | | | **320.00** | | |
| | T. 40 N., R. 11 E. | Sec. 4, SW1/4SW1/4; | 40.00 | Alamosa | Baca NWR |
| **39** | T. 40 N., R. 11 E. | Sec. 9, NW1/4NW1/4; | 40.00 | Alamosa | Baca NWR |
| | | | **80.00** | | |
| **40** | T. 40 N., R. 11 E. | Sec. 10, all; | 640.00 | Alamosa | Baca NWR |
| | | | **640.00** | | |
| | T. 41 N., R. 10 E. | Sec. 22, SE1/4SE1/4; | 40.00 | Saguache | Baca NWR |
| **41** | T. 41 N., R. 10 E. | Sec. 23, S1/2NW1/4 and SW1/4; | 240.00 | Saguache | Baca NWR |
| | T. 41 N., R. 10 E. | Sec. 27, NE1/4NE1/4; | 40.00 | Saguache | Baca NWR |
| | | | **320.00** | | |
| | T. 41 N., R. 11 E. | Sec. 17, fractional; | 531.00 | Saguache | Baca NWR |
| **42** | T. 41 N., R. 11 E. | Sec. 20, all; | 640.00 | Saguache | Baca NWR |
| | T. 41 N., R. 11 E. | Sec.16, fractional; | 520.00 | Saguache | Baca NWR |
| | | | **1691.00** | | |
| **43** | T. 43 N., R. 10 E. | Sec. 16, NE1/4; | 160.00 | Saguache | Baca NWR |
| | | | **160.00** | | |
| **44** | T. 27 S., R 73 W | Sec. 21, portion lying west of road | 40.00 | Alamosa | GRSA |
| | | | **40.00** | | |
| **47** | T. 41 N., R. 11 E. | Sec. 33, All | 640.00 | Saguache | Baca NWR |
| | | | **640.00** | | |
| | | | | | |
| | | **Total Exhibit A acreage** | **57,056.11** | | |
| | | **Exhibit A Minerals-only acreage** | **5,811.00** | | |
| | | **Exhibit A surface acreage** | **51,245.11** | | |

# Appendix C. Vegetation and Elevation of the Baca Land Exchange Parcels

## Table 1. Table Mountain Parcels Vegetation and Elevation Summary

| Parcel # | Ecological System | Acres | % |
|---|---|---|---|
| 1 | Rocky Mountain Ponderosa Pine Woodland | 48.2 | 62.36% |
| | Southern Rocky Mountain Pinyon-Juniper Woodland | 23.6 | 30.46% |
| | Western Great Plains Foothill and Piedmont Grassland | 5.6 | 7.18% |
| | **Total** | **77.4** | **100.00%** |
| 2 | Rocky Mountain Ponderosa Pine Woodland | 212.5 | 47.51% |
| | Southern Rocky Mountain Pinyon-Juniper Woodland | 111.8 | 25.00% |
| | Rocky Mountain Gambel Oak-Mixed Montane Shrubland | 91.1 | 20.38% |
| | Western Great Plains Foothill and Piedmont Grassland | 30.5 | 6.81% |
| | Rocky Mountain Lower Montane Riparian Woodland and Shrubland | 1.3 | 0.30% |
| | **Total** | **447.3** | **100.00%** |
| 3 | Rocky Mountain Ponderosa Pine Woodland | 7.6 | 18.68% |
| | Southern Rocky Mountain Pinyon-Juniper Woodland | 18.5 | 45.60% |
| | Rocky Mountain Gambel Oak-Mixed Montane Shrubland | 3.6 | 8.79% |
| | Western Great Plains Foothill and Piedmont Grassland | 9.3 | 23.08% |
| | Rocky Mountain Lower Montane Riparian Woodland and Shrubland | 0.2 | 0.55% |
| | Recently Mined or Quarried | 1.3 | 3.30% |
| | **Total** | **40.5** | **100.00%** |
| 4 | Rocky Mountain Ponderosa Pine Woodland | 49.4 | 4.36% |
| | Southern Rocky Mountain Pinyon-Juniper Woodland | 1,042.1 | 91.98% |
| | Western Great Plains Foothill and Piedmont Grassland | 26.9 | 2.37% |
| | Western Great Plains Shortgrass Prairie | 11.8 | 1.04% |
| | Recently Mined or Quarried | 1.3 | 0.12% |
| | Invasive Perennial Grassland | 1.6 | 0.14% |
| | **Total** | **1,133.1** | **100.00%** |
| | | **1,698.1** | |
| | | | |
| | | | |
| **Subsurface** | **Ecological System** | **Acres** | **%** |
| 45 | Rocky Mountain Ponderosa Pine Woodland | 342.1 | 15.59% |
| | Southern Rocky Mountain Pinyon-Juniper Woodland | 1,677.3 | 76.45% |
| | Rocky Mountain Gambel Oak-Mixed Montane Shrubland | 26.9 | 1.23% |
| | Southern Rocky Mountain Juniper Woodland and Savanna | 1.3 | 0.06% |
| | Western Great Plains Foothill and Piedmont Grassland | 122.7 | 5.59% |
| | Western Great Plains Shortgrass Prairie | 19.1 | 0.87% |
| | Rocky Mountain Lower Montane Riparian Woodland and Shrubland | 2.0 | 0.09% |
| | Western Great Plains Riparian Woodland and Shrubland | 1.3 | 0.06% |
| | Agriculture | 0.7 | 0.03% |
| | Recently Mined or Quarried | 0.4 | 0.02% |
| | **Total** | **2,193.9** | **100.00%** |
| 46 | Rocky Mountain Ponderosa Pine Woodland | 94.5 | 16.84% |
| | Southern Rocky Mountain Pinyon-Juniper Woodland | 320.3 | 57.09% |
| | Rocky Mountain Gambel Oak-Mixed Montane Shrubland | 30.7 | 5.47% |
| | Western Great Plains Foothill and Piedmont Grassland | 115.6 | 20.60% |
| | **Total** | **561.1** | **100.00%** |

| | | | |
|---|---|---|---|
| | | **2,755.0** | |
| | | | |
| **Summary** | Southern Rocky Mountain Pinyon-Juniper Woodland | **3,193.6** | **71.72%** |
| **All Parcels** | Rocky Mountain Ponderosa Pine Woodland | **754.3** | **16.94%** |
| | Western Great Plains Foothill and Piedmont Grassland | **310.6** | **6.97%** |
| | Rocky Mountain Gambel Oak-Mixed Montane Shrubland | **152.3** | **3.42%** |
| | Western Great Plains Shortgrass Prairie | **30.9** | **0.69%** |
| | Rocky Mountain Lower Montane Riparian Woodland and Shrubland | **3.6** | **0.08%** |
| | Recently Mined or Quarried | **3.1** | **0.07%** |
| | Invasive Perennial Grassland | **1.6** | **0.03%** |
| | Western Great Plains Riparian Woodland and Shrubland | **1.3** | **0.03%** |
| | Southern Rocky Mountain Juniper Woodland and Savanna | **1.3** | **0.03%** |
| | Agriculture | **0.7** | **0.01%** |
| | | **4,453.1** | **100.00%** |
| | Elevation Range for Table Mountain Parcels - 5,658 - 7,419 ft. | | |

**Acreage values in all vegetation summary tables will not equal the total acres listed in Appendix B because these are calculated using GIS acreage calculations.**

**Table 2. Gribbles Park Parcels Vegetation and Elevation Summary**

| Parcel # | Ecological System | Acres | % |
|---|---|---|---|
| 5 | Rocky Mountain Subalpine-Montane Limber-Bristlecone Pine Woodland | 14.9 | 34.18% |
| | Rocky Mountain Subalpine Dry-Mesic Spruce-Fir Forest and Woodland | 8.4 | 19.39% |
| | Rocky Mountain Lodgepole Pine Forest | 1.8 | 4.08% |
| | Rocky Mountain Montane Mesic Mixed Conifer Forest and Woodland | 4.2 | 9.69% |
| | Rocky Mountain Ponderosa Pine Woodland | 2.9 | 6.63% |
| | Southern Rocky Mountain Montane-Subalpine Grassland | 11.3 | 26.02% |
| | **Total** | **43.6** | **100.00%** |
| 6 | Rocky Mountain Aspen Forest and Woodland | 4.0 | 0.62% |
| | Rocky Mountain Subalpine-Montane Limber-Bristlecone Pine Woodland | 16.7 | 2.60% |
| | Rocky Mountain Subalpine Dry-Mesic Spruce-Fir Forest and Woodland | 2.7 | 0.42% |
| | Rocky Mountain Subalpine Mesic Spruce-Fir Forest and Woodland | 21.1 | 3.29% |
| | Rocky Mountain Montane Mesic Mixed Conifer Forest and Woodland | 5.6 | 0.87% |
| | Rocky Mountain Ponderosa Pine Woodland | 13.8 | 2.15% |
| | Inter-Mountain Basins Montane Sagebrush Steppe | 2.4 | 0.38% |
| | Southern Rocky Mountain Montane-Subalpine Grassland | 570.6 | 88.98% |
| | Rocky Mountain Alpine-Montane Wet Meadow | 4.4 | 0.69% |
| | **Total** | **641.3** | **100.00%** |
| 7 | Rocky Mountain Gambel Oak-Mixed Montane Shrubland | 6.2 | 14.29% |
| | Southern Rocky Mountain Montane-Subalpine Grassland | 33.1 | 76.02% |
| | Rocky Mountain Alpine-Montane Wet Meadow | 4.2 | 9.69% |
| | **Total** | **43.6** | **100.00%** |
| | | | |
| **Summary** | Southern Rocky Mountain Montane-Subalpine Grassland | **615.1** | **84.44%** |
| **All Parcels** | Rocky Mountain Subalpine-Montane Limber-Bristlecone Pine Woodland | **31.6** | **4.33%** |
| | Rocky Mountain Subalpine Mesic Spruce-Fir Forest and Woodland | **21.1** | **2.90%** |
| | Rocky Mountain Ponderosa Pine Woodland | **16.7** | **2.29%** |
| | Rocky Mountain Subalpine Dry-Mesic Spruce-Fir Forest and Woodland | **11.1** | **1.53%** |
| | Rocky Mountain Montane Mesic Mixed Conifer Forest and Woodland | **9.8** | **1.34%** |
| | Rocky Mountain Alpine-Montane Wet Meadow | **8.7** | **1.19%** |
| | Rocky Mountain Gambel Oak-Mixed Montane Shrubland | **6.2** | **0.85%** |
| | Rocky Mountain Aspen Forest and Woodland | **4.0** | **0.55%** |
| | Inter-Mountain Basins Montane Sagebrush Steppe | **2.4** | **0.34%** |
| | Rocky Mountain Lodgepole Pine Forest | **1.8** | **0.24%** |
| | **Total** | **728.5** | **100.00%** |
| | Elevation Range for Gribbles Park Parcels - 8,928 - 9,892 ft. | | |

**Acreage values in all vegetation summary tables will not equal the total acres listed in Appendix B because these are calculated using GIS acreage calculations.**

**Table 3. Biedell Creek Parcels Vegetation and Elevation Summary**

| Parcel # | Ecological System | Acres | % |
|---|---|---|---|
| 8 | Inter-Mountain Basins Semi-Desert Shrub Steppe | 250.5 | 79.20% |
| | Inter-Mountain Basins Greasewood Flat | 65.8 | 20.80% |
| | **Total** | **316.3** | **100.00%** |
| 9 | Inter-Mountain Basins Semi-Desert Shrub Steppe | 27.1 | 67.78% |
| | Inter-Mountain Basins Semi-Desert Grassland | 12.9 | 32.22% |
| | **Total** | **40.0** | **100.00%** |
| 10 | Inter-Mountain Basins Semi-Desert Shrub Steppe | 84.9 | 100.00% |
| | **Total** | **84.9** | **100.00%** |
| 11 | Rocky Mountain Ponderosa Pine Woodland | 6.9 | 5.78% |
| | Southern Rocky Mountain Pinyon-Juniper Woodland | 97.8 | 82.09% |
| | Southern Rocky Mountain Montane-Subalpine Grassland | 14.4 | 12.13% |
| | **Total** | **119.2** | **100.00%** |
| 12 | Rocky Mountain Subalpine Mesic Spruce-Fir Forest and Woodland | 11.6 | 7.07% |
| | Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland | 18.7 | 11.43% |
| | Rocky Mountain Montane Mesic Mixed Conifer Forest and Woodland | 3.6 | 2.18% |
| | Rocky Mountain Ponderosa Pine Woodland | 6.2 | 3.81% |
| | Southern Rocky Mountain Pinyon-Juniper Woodland | 0.2 | 0.14% |
| | Southern Rocky Mountain Montane-Subalpine Grassland | 123.2 | 75.37% |
| | **Total** | **163.4** | **100.00%** |
| 13 | Rocky Mountain Subalpine-Montane Limber-Bristlecone Pine Woodland | 1.6 | 0.28% |
| | Rocky Mountain Subalpine Mesic Spruce-Fir Forest and Woodland | 2.2 | 0.41% |
| | Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland | 22.5 | 4.11% |
| | Rocky Mountain Montane Mesic Mixed Conifer Forest and Woodland | 4.7 | 0.85% |
| | Rocky Mountain Ponderosa Pine Woodland | 133.4 | 24.42% |
| | Southern Rocky Mountain Pinyon-Juniper Woodland | 257.4 | 47.13% |
| | Rocky Mountain Lower Montane-Foothill Shrubland | 2.7 | 0.49% |
| | Southern Rocky Mountain Montane-Subalpine Grassland | 115.4 | 21.12% |
| | Rocky Mountain Subalpine-Montane Riparian Shrubland | 3.1 | 0.57% |
| | Rocky Mountain Lower Montane Riparian Woodland and Shrubland | 3.3 | 0.61% |
| | **Total** | **546.2** | **100.00%** |
| 14 | Rocky Mountain Cliff and Canyon | 12.2 | 0.12% |
| | Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland | 7.6 | 0.07% |
| | Rocky Mountain Montane Mesic Mixed Conifer Forest and Woodland | 15.3 | 0.16% |
| | Rocky Mountain Ponderosa Pine Woodland | 173.8 | 1.69% |
| | Southern Rocky Mountain Pinyon-Juniper Woodland | 3,715.1 | 36.09% |
| | Rocky Mountain Gambel Oak-Mixed Montane Shrubland | 1.3 | 0.01% |
| | Rocky Mountain Lower Montane-Foothill Shrubland | 2.4 | 0.06% |
| | Inter-Mountain Basins Big Sagebrush Shrubland | 12.7 | 0.12% |
| | Inter-Mountain Basins Semi-Desert Shrub Steppe | 5,324.5 | 51.27% |
| | Southern Rocky Mountain Montane-Subalpine Grassland | 602.4 | 5.86% |
| | Inter-Mountain Basins Semi-Desert Grassland | 448.6 | 4.32% |
| | Rocky Mountain Lower Montane Riparian Woodland and Shrubland | 6.4 | 0.07% |
| | Inter-Mountain Basins Greasewood Flat | 16.5 | 0.15% |
| | **Total** | **10,339.0** | **100.00%** |
| | | | |

| | | | |
|---|---|---|---|
| **Summary** | Rocky Mountain Cliff and Canyon | **12.2** | **0.10%** |
| **All Parcels** | Rocky Mountain Subalpine-Montane Limber-Bristlecone Pine Woodland | **1.6** | **0.01%** |
| | Rocky Mountain Subalpine Mesic Spruce-Fir Forest and Woodland | **11.6** | **0.10%** |
| | Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland | **48.7** | **0.42%** |
| | Rocky Mountain Montane Mesic Mixed Conifer Forest and Woodland | **24.5** | **0.21%** |
| | Rocky Mountain Ponderosa Pine Woodland | **322.3** | **2.77%** |
| | Southern Rocky Mountain Pinyon-Juniper Woodland | **4,103.2** | **35.22%** |
| | Rocky Mountain Gambel Oak-Mixed Montane Shrubland | **1.3** | **0.01%** |
| | Rocky Mountain Lower Montane-Foothill Shrubland | **8.4** | **0.07%** |
| | Inter-Mountain Basins Big Sagebrush Shrubland | **12.7** | **0.11%** |
| | Inter-Mountain Basins Semi-Desert Shrub Steppe | **5,686.2** | **48.80%** |
| | Southern Rocky Mountain Montane-Subalpine Grassland | **861.9** | **7.40%** |
| | Inter-Mountain Basins Semi-Desert Grassland | **461.5** | **3.96%** |
| | Rocky Mountain Subalpine-Montane Riparian Shrubland | **3.1** | **0.03%** |
| | Rocky Mountain Lower Montane Riparian Woodland and Shrubland | **10.2** | **0.09%** |
| | Inter-Mountain Basins Greasewood Flat | **81.1** | **0.70%** |
| | **Total** | **11,651.2** | **100.00%** |
| | Elevation Range for Biedell Creek Parcels - 7,649 - 9,801 ft. | | |

**Acreage values in all vegetation summary tables will not equal the total acres listed in Appendix B because these are calculated using GIS acreage calculations.**

**Table 4. La Jara Reservoir Parcels Vegetation and Elevation Summary**

| Parcel # | Ecological System | Acres | % |
|---|---|---|---|
| 15 | Rocky Mountain Aspen Forest and Woodland | 151.8 | 40.68% |
| | Rocky Mountain Subalpine Dry-Mesic Spruce-Fir Forest and Woodland | 36.2 | 9.71% |
| | Rocky Mountain Subalpine Mesic Spruce-Fir Forest and Woodland | 0.2 | 0.06% |
| | Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland | 18.5 | 4.94% |
| | Inter-Mountain West Aspen-Mixed Conifer Forest and Woodland Complex | 18.9 | 5.06% |
| | Rocky Mountain Subalpine Mesic Meadow | 10.9 | 2.92% |
| | Southern Rocky Mountain Montane-Subalpine Grassland | 135.2 | 36.21% |
| | Rocky Mountain Subalpine-Montane Riparian Shrubland | 1.6 | 0.42% |
| | **Total** | **373.2** | **100.00%** |
| 16 | Rocky Mountain Aspen Forest and Woodland | 57.1 | 12.49% |
| | Rocky Mountain Subalpine-Montane Limber-Bristlecone Pine Woodland | 5.3 | 1.17% |
| | Rocky Mountain Subalpine Dry-Mesic Spruce-Fir Forest and Woodland | 9.6 | 2.09% |
| | Rocky Mountain Lodgepole Pine Forest | 0.9 | 0.19% |
| | Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland | 39.3 | 8.60% |
| | Rocky Mountain Montane Mesic Mixed Conifer Forest and Woodland | 108.5 | 23.71% |
| | Rocky Mountain Ponderosa Pine Woodland | 159.2 | 34.79% |
| | Southern Rocky Mountain Pinyon-Juniper Woodland | 0.2 | 0.05% |
| | Inter-Mountain West Aspen-Mixed Conifer Forest and Woodland Complex | 18.2 | 3.98% |
| | Southern Rocky Mountain Montane-Subalpine Grassland | 54.7 | 11.95% |
| | Rocky Mountain Subalpine-Montane Riparian Shrubland | 0.7 | 0.15% |
| | Rocky Mountain Subalpine-Montane Riparian Woodland | 1.6 | 0.34% |
| | Rocky Mountain Alpine-Montane Wet Meadow | 1.1 | 0.24% |
| | Invasive Perennial Grassland | 1.1 | 0.24% |
| | **Total** | **457.5** | **100.00%** |
| 17 | Rocky Mountain Aspen Forest and Woodland | 48.9 | 23.40% |
| | Rocky Mountain Subalpine Mesic Spruce-Fir Forest and Woodland | 1.1 | 0.53% |
| | Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland | 8.7 | 4.15% |
| | Rocky Mountain Montane Mesic Mixed Conifer Forest and Woodland | 10.9 | 5.21% |
| | Rocky Mountain Ponderosa Pine Woodland | 18.2 | 8.72% |
| | Southern Rocky Mountain Montane-Subalpine Grassland | 121.2 | 57.98% |
| | **Total** | **209.0** | **100.00%** |
| 18a | Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland | 3.6 | 1.1% |
| | Rocky Mountain Montane Mesic Mixed Conifer Forest and Woodland | 59.8 | 18.1% |
| | Rocky Mountain Ponderosa Pine Woodland | 47.3 | 14.3% |
| | Southern Rocky Mountain Pinyon-Juniper Woodland | 98.0 | 29.6% |
| | Inter-Mountain Basins Semi-Desert Shrub Steppe | 3.1 | 0.9% |
| | Southern Rocky Mountain Montane-Subalpine Grassland | 118.9 | 36.0% |
| | **Total** | **330.8** | **100.00%** |
| 18b | Rocky Mountain Aspen Forest and Woodland | 117.8 | 8.4% |
| | Rocky Mountain Subalpine-Montane Limber-Bristlecone Pine Woodland | 0.9 | 0.17% |
| | Rocky Mountain Montane Dry-Spruce-Fir Forest and Woodland | 0.4 | 0% |
| | Rocky Mountain Montane Mesic Spruce Fir Forest and Woodland | 4.0 | 0.3% |
| | Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland | 101.4 | 7.2% |
| | Rocky Mountain Montane Mesic Mixed Conifer Forest and Woodland | 213.6 | 15.2% |
| | Rocky Mountain Ponderosa Pine Woodland | 92.5 | 6.6% |
| | Southern Rocky Mountain Pinyon-Juniper Woodland | 27.1 | 1.9% |

| | | | |
|---|---|---|---|
| | Intermountain West Aspen-Mixed Conifer Forest and Woodland | 7.8 | 0.6% |
| | Rocky Mountain Subalpine-Montane Riparian Shrubland | 1.1 | 0.1% |
| | Southern Rocky Mountain Montane-Subalpine Grassland | 843.9 | 59.9% |
| | **Total** | **1409.4** | **100.00%** |
| 18c | Southern Rocky Mountain Montane-Subalpine Grassland | 41.1 | 100.00% |
| | **Total** | **41.1** | **100.00%** |
| 19 | Rocky Mountain Aspen Forest and Woodland | 6.9 | 8.73% |
| | Rocky Mountain Subalpine Dry-Mesic Spruce-Fir Forest and Woodland | 1.1 | 1.41% |
| | Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland | 35.6 | 45.07% |
| | Rocky Mountain Montane Mesic Mixed Conifer Forest and Woodland | 14.2 | 18.03% |
| | Rocky Mountain Ponderosa Pine Woodland | 8.9 | 11.27% |
| | Southern Rocky Mountain Montane-Subalpine Grassland | 12.2 | 15.49% |
| | **Total** | **78.9** | **100.00%** |
| 20 | Rocky Mountain Aspen Forest and Woodland | 48.5 | 19.98% |
| | Rocky Mountain Subalpine Mesic Spruce-Fir Forest and Woodland | 6.2 | 2.57% |
| | Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland | 27.6 | 11.37% |
| | Rocky Mountain Montane Mesic Mixed Conifer Forest and Woodland | 34.0 | 14.02% |
| | Rocky Mountain Ponderosa Pine Woodland | 38.2 | 15.77% |
| | Inter-Mountain West Aspen-Mixed Conifer Forest and Woodland Complex | 25.3 | 10.45% |
| | Southern Rocky Mountain Montane-Subalpine Grassland | 57.8 | 23.83% |
| | Rocky Mountain Subalpine-Montane Riparian Shrubland | 4.9 | 2.02% |
| | **Total** | **242.5** | **100.00%** |
| 21 | Rocky Mountain Cliff and Canyon | 2.0 | 0.25% |
| | Rocky Mountain Aspen Forest and Woodland | 134.9 | 17.16% |
| | Rocky Mountain Subalpine-Montane Limber-Bristlecone Pine Woodland | 0.9 | 0.11% |
| | Rocky Mountain Subalpine Dry-Mesic Spruce-Fir Forest and Woodland | 26.2 | 3.34% |
| | Rocky Mountain Subalpine Mesic Spruce-Fir Forest and Woodland | 31.6 | 4.01% |
| | Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland | 92.7 | 11.79% |
| | Rocky Mountain Montane Mesic Mixed Conifer Forest and Woodland | 265.0 | 33.69% |
| | Rocky Mountain Ponderosa Pine Woodland | 114.7 | 14.58% |
| | Southern Rocky Mountain Pinyon-Juniper Woodland | 18.0 | 2.29% |
| | Inter-Mountain West Aspen-Mixed Conifer Forest and Woodland Complex | 12.9 | 1.64% |
| | Rocky Mountain Gambel Oak-Mixed Montane Shrubland | 5.6 | 0.71% |
| | Southern Rocky Mountain Montane-Subalpine Grassland | 81.6 | 10.37% |
| | Rocky Mountain Subalpine-Montane Riparian Shrubland | 0.4 | 0.06% |
| | **Total** | **786.5** | **100.00%** |
| 22 | Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland | 1.6 | 3.47% |
| | Rocky Mountain Montane Mesic Mixed Conifer Forest and Woodland | 12.4 | 27.72% |
| | Rocky Mountain Ponderosa Pine Woodland | 11.6 | 25.74% |
| | Southern Rocky Mountain Pinyon-Juniper Woodland | 7.1 | 15.84% |
| | Southern Rocky Mountain Montane-Subalpine Grassland | 12.2 | 27.23% |
| | **Total** | **44.9** | **100.00%** |
| 23 | Rocky Mountain Montane Mesic Mixed Conifer Forest and Woodland | 39.3 | 9.53% |
| | Rocky Mountain Ponderosa Pine Woodland | 31.6 | 7.64% |
| | Southern Rocky Mountain Pinyon-Juniper Woodland | 202.3 | 48.98% |
| | Rocky Mountain Gambel Oak-Mixed Montane Shrubland | 2.4 | 0.59% |
| | Inter-Mountain Basins Big Sagebrush Shrubland | 4.2 | 1.02% |
| | Southern Rocky Mountain Montane-Subalpine Grassland | 132.3 | 32.02% |
| | Agriculture | 0.9 | 0.22% |
| | **Total** | **413.0** | **100.00%** |

| | | | |
|---|---|---|---|
| 24 | Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland | 6.7 | 3.94% |
| | Rocky Mountain Ponderosa Pine Woodland | 13.1 | 7.74% |
| | Southern Rocky Mountain Pinyon-Juniper Woodland | 103.6 | 61.15% |
| | Southern Rocky Mountain Montane-Subalpine Grassland | 46.0 | 27.17% |
| | **Total** | **169.4** | **100.00%** |
| | | | |
| **Summary** | Southern Rocky Mountain Montane-Subalpine Grassland | 1,694.4 | 37.5% |
| **All Parcels** | Rocky Mountain Montane Mesic Mixed Conifer Forest and Woodland | 795.6 | 17.6% |
| | Rocky Mountain Aspen Forest and Woodland | 549.1 | 12.1% |
| | Rocky Mountain Ponderosa Pine Woodland | 538.0 | 11.9% |
| | Southern Rocky Mountain Pinyon-Juniper Woodland | 454.4 | 10.0% |
| | Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland | 243.2 | 5.4% |
| | Inter-Mountain West Aspen-Mixed Conifer Forest and Woodland Complex | 83.1 | 1.8% |
| | Rocky Mountain Subalpine Dry-Mesic Spruce-Fir Forest and Woodland | 73.6 | 1.6% |
| | Rocky Mountain Subalpine Mesic Spruce-Fir Forest and Woodland | 43.1 | 1.0% |
| | Rocky Mountain Subalpine Mesic Meadow | 10.9 | 0.2% |
| | Rocky Mountain Subalpine-Montane Riparian Shrubland | 8.7 | 0.2% |
| | Rocky Mountain Gambel Oak-Mixed Montane Shrubland | 8.0 | 0.2% |
| | Rocky Mountain Subalpine-Montane Limber-Bristlecone Pine Woodland | 7.1 | 0.2% |
| | Inter-Mountain Basins Big Sagebrush Shrubland | 4.2 | 0.1% |
| | Inter-Mountain Basins Semi-Desert Shrub Steppe | 3.1 | 0.1% |
| | Rocky Mountain Cliff and Canyon | 2.0 | 0.0% |
| | Rocky Mountain Subalpine-Montane Riparian Woodland | 1.6 | 0.0% |
| | Rocky Mountain Alpine-Montane Wet Meadow | 1.1 | 0.0% |
| | Invasive Perennial Grassland | 1.1 | 0.0% |
| | Rocky Mountain Lodgepole Pine Forest | 0.9 | 0.0% |
| | Agriculture | 0.9 | 0.0% |
| | | 4,524.0 | 100.0% |
| | Elevation Range for La Jara Reservoir Parcels - 8,338 - 9,971 ft. | | |

**Acreage values in all vegetation summary tables will not equal the total acres listed in Appendix B because these are calculated using GIS acreage calculations.**

**Table 5. Baca National Wildlife Refuge Parcels Vegetation and Elevation Summary**

| Parcel # | Ecological System | Acres | % |
|---|---|---|---|
| 26 | Inter-Mountain Basins Active and Stabilized Dune | 53.8 | 0.21% |
| | Inter-Mountain Basins Playa | 5,232.1 | 20.23% |
| | Inter-Mountain Basins Big Sagebrush Shrubland | 20.7 | 0.08% |
| | Inter-Mountain Basins Semi-Desert Shrub Steppe | 4,637.4 | 17.93% |
| | Southern Rocky Mountain Montane-Subalpine Grassland | 12.9 | 0.05% |
| | Inter-Mountain Basins Semi-Desert Grassland | 25.1 | 0.10% |
| | Inter-Mountain Basins Greasewood Flat | 15,421.8 | 59.62% |
| | Rocky Mountain Alpine-Montane Wet Meadow | 41.3 | 0.16% |
| | Open Water | 11.6 | 0.04% |
| | Developed, Medium - High Intensity | 10.0 | 0.04% |
| | Agriculture | 202.5 | 0.78% |
| | Recently Mined or Quarried | 4.0 | 0.02% |
| | Invasive Perennial Grassland | 12.9 | 0.05% |
| | Invasive Annual and Biennial Forbland | 179.0 | 0.69% |
| | **Total** | **25,865.0** | **100.00%** |
| 32 | Inter-Mountain Basins Semi-Desert Shrub Steppe | 178.5 | 36.65% |
| | Inter-Mountain Basins Semi-Desert Grassland | 147.6 | 30.31% |
| | Inter-Mountain Basins Greasewood Flat | 117.4 | 24.10% |
| | Agriculture | 43.6 | 8.95% |
| | **Total** | **487.1** | **100.00%** |
| 33 | Rocky Mountain Ponderosa Pine Woodland | 8.9 | 1.08% |
| | Southern Rocky Mountain Pinyon-Juniper Woodland | 16.5 | 1.99% |
| | Inter-Mountain Basins Semi-Desert Shrub Steppe | 152.5 | 18.45% |
| | Inter-Mountain Basins Semi-Desert Grassland | 343.2 | 41.53% |
| | Inter-Mountain Basins Greasewood Flat | 197.6 | 23.91% |
| | Rocky Mountain Alpine-Montane Wet Meadow | 1.8 | 0.22% |
| | Agriculture | 104.9 | 12.69% |
| | Invasive Annual and Biennial Forbland | 1.1 | 0.13% |
| | **Total** | **826.5** | **100.00%** |
| 34 | Inter-Mountain Basins Playa | 29.8 | 9.61% |
| | Inter-Mountain Basins Semi-Desert Shrub Steppe | 39.1 | 12.63% |
| | Inter-Mountain Basins Semi-Desert Grassland | 8.7 | 2.80% |
| | Inter-Mountain Basins Greasewood Flat | 209.9 | 67.72% |
| | Agriculture | 22.5 | 7.25% |
| | **Total** | **309.9** | **100.00%** |
| | **Total Surface/Subsurface** | **27,488.5** | |
| **Subsurface** | **Ecological System** | **Acres** | **%** |
| 39 | Inter-Mountain Basins Playa | 25.6 | 33.82% |
| | Inter-Mountain Basins Semi-Desert Shrub Steppe | 0.9 | 1.18% |
| | Inter-Mountain Basins Greasewood Flat | 49.1 | 65.00% |
| | **Total** | **75.6** | **100.00%** |
| 40 | Inter-Mountain Basins Playa | 68.9 | 10.78% |
| | Inter-Mountain Basins Big Sagebrush Shrubland | 8.9 | 1.39% |
| | Inter-Mountain Basins Semi-Desert Shrub Steppe | 78.0 | 12.20% |
| | Southern Rocky Mountain Montane-Subalpine Grassland | 65.6 | 10.26% |

| | | | |
|---|---|---|---|
| | Inter-Mountain Basins Semi-Desert Grassland | 15.6 | 2.43% |
| | Inter-Mountain Basins Greasewood Flat | 303.9 | 47.53% |
| | Rocky Mountain Alpine-Montane Wet Meadow | 38.0 | 5.95% |
| | Agriculture | 50.5 | 7.89% |
| | Invasive Perennial Grassland | 10.0 | 1.56% |
| | **Total** | **639.3** | **100.00%** |
| 41 | Inter-Mountain Basins Active and Stabilized Dune | 14.9 | 4.68% |
| | Inter-Mountain Basins Semi-Desert Shrub Steppe | 11.6 | 3.63% |
| | Inter-Mountain Basins Greasewood Flat | 285.7 | 89.80% |
| | Open Water | 2.4 | 0.77% |
| | Agriculture | 2.4 | 0.77% |
| | Invasive Annual and Biennial Forbland | 1.1 | 0.35% |
| | **Total** | **318.1** | **100.00%** |
| 42 | Inter-Mountain Basins Semi-Desert Shrub Steppe | 1,280 | 76.08% |
| | Inter-Mountain Basins Semi-Desert Grassland | 0.4 | 0.03% |
| | Inter-Mountain Basins Greasewood Flat | 400.6 | 23.90% |
| | **Total** | **1,681** | **100.00%** |
| 43 | Inter-Mountain Basins Semi-Desert Shrub Steppe | 25.1 | 15.35% |
| | Inter-Mountain Basins Semi-Desert Grassland | 88.0 | 53.80% |
| | Inter-Mountain Basins Greasewood Flat | 35.6 | 21.74% |
| | Agriculture | 14.9 | 9.10% |
| | **Total** | **163.6** | **100.00%** |
| 47 | Inter-Mountain Basins Semi-Desert Shrub Steppe | 489.5 | 76.3% |
| | Inter-Mountain Basins Greasewood Flat | 152.3 | 23.7% |
| | **Total** | **641.8** | **100.00%** |
| | **Total Subsurface** | 3,519.4 | |
| | | | |
| **Summary** | Inter-Mountain Basins Greasewood Flat | **17,154.5** | **56.53%** |
| **All Parcels** | Inter-Mountain Basins Semi-Desert Shrub Steppe | **6,826.4** | **21.07%** |
| | Inter-Mountain Basins Playa | **5,356.3** | **17.81%** |
| | Inter-Mountain Basins Semi-Desert Grassland | **628.7** | **2.09%** |
| | Agriculture | **238.8** | **0.79%** |
| | Invasive Annual and Biennial Forbland | **181.2** | **0.60%** |
| | Rocky Mountain Alpine-Montane Wet Meadow | **81.1** | **0.27%** |
| | Southern Rocky Mountain Montane-Subalpine Grassland | **78.5** | **0.26%** |
| | Inter-Mountain Basins Active and Stabilized Dune | **68.7** | **0.23%** |
| | Inter-Mountain Basins Big Sagebrush Shrubland | **29.6** | **0.10%** |
| | Invasive Perennial Grassland | **22.9** | **0.08%** |
| | Southern Rocky Mountain Pinyon-Juniper Woodland | **16.5** | **0.05%** |
| | Open Water | **14.0** | **0.05%** |
| | Developed, Medium - High Intensity | **10.0** | **0.03%** |
| | Rocky Mountain Ponderosa Pine Woodland | **8.9** | **0.03%** |
| | Recently Mined or Quarried | **4.0** | **0.01%** |
| | **Total** | **31,007.9** | **100.00%** |
| | Elevation Range for Refuge Parcels - 7,521 - 7,577 ft. | | |

**Acreage values in all vegetation summary tables will not equal the total acres listed in Appendix B because these are calculated using GIS acreage calculations.**

**Table 6. Great Sand Dunes National Park Parcels Vegetation and Elevation Summary**

| Parcel # | Ecological System | Acres | % |
|---|---|---|---|
| 27 | Inter-Mountain Basins Active and Stabilized Dune | 15.3 | 0.26% |
| | Inter-Mountain Basins Playa | 35.6 | 0.61% |
| | Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland | 8.2 | 0.14% |
| | Rocky Mountain Ponderosa Pine Woodland | 5.3 | 0.09% |
| | Rocky Mountain Gambel Oak-Mixed Montane Shrubland | 0.9 | 0.02% |
| | Inter-Mountain Basins Semi-Desert Shrub Steppe | 886.1 | 15.20% |
| | Inter-Mountain Basins Semi-Desert Grassland | 36.2 | 0.62% |
| | Rocky Mountain Subalpine-Montane Riparian Shrubland | 2.0 | 0.03% |
| | Rocky Mountain Lower Montane Riparian Woodland and Shrubland | 9.8 | 0.17% |
| | Inter-Mountain Basins Greasewood Flat | 3,979.2 | 68.28% |
| | North American Arid West Emergent Marsh | 7.8 | 0.13% |
| | Rocky Mountain Alpine-Montane Wet Meadow | 41.3 | 0.71% |
| | Open Water | 42.2 | 0.72% |
| | Developed, Medium - High Intensity | 11.8 | 0.20% |
| | Agriculture | 741.8 | 12.73% |
| | Invasive Annual and Biennial Forbland | 4.2 | 0.07% |
| | **Total** | **5,827.8** | **100.00%** |
| 28 | Inter-Mountain Basins Active and Stabilized Dune | 2.0 | 0.49% |
| | Inter-Mountain Basins Semi-Desert Shrub Steppe | 118.5 | 28.84% |
| | Inter-Mountain Basins Greasewood Flat | 160.5 | 39.07% |
| | Rocky Mountain Alpine-Montane Wet Meadow | 2.4 | 0.60% |
| | Agriculture | 126.3 | 30.74% |
| | Invasive Annual and Biennial Forbland | 1.1 | 0.27% |
| | **Total** | **410.8** | **100.00%** |
| 29 | Inter-Mountain Basins Active and Stabilized Dune | 19.6 | 1.73% |
| | Rocky Mountain Gambel Oak-Mixed Montane Shrubland | 0.4 | 0.04% |
| | Inter-Mountain Basins Semi-Desert Shrub Steppe | 292.8 | 25.96% |
| | Rocky Mountain Lower Montane Riparian Woodland and Shrubland | 11.3 | 1.01% |
| | Inter-Mountain Basins Greasewood Flat | 231.2 | 20.50% |
| | Rocky Mountain Alpine-Montane Wet Meadow | 73.1 | 6.48% |
| | Agriculture | 499.5 | 44.28% |
| | **Total** | **1,128.0** | **100.00%** |
| 30 | Inter-Mountain Basins Active and Stabilized Dune | 321.4 | 7.25% |
| | Inter-Mountain Basins Semi-Desert Shrub Steppe | 4,042.1 | 91.12% |
| | Inter-Mountain Basins Greasewood Flat | 72.5 | 1.63% |
| | **Total** | **4,436.0** | **100.00%** |
| 35 | Inter-Mountain Basins Active and Stabilized Dune | 1,964.9 | 16.61% |
| | Rocky Mountain Ponderosa Pine Woodland | 1.8 | 0.02% |
| | Southern Rocky Mountain Pinyon-Juniper Woodland | 1.8 | 0.02% |
| | Inter-Mountain Basins Big Sagebrush Shrubland | 28.9 | 0.24% |
| | Inter-Mountain Basins Semi-Desert Shrub Steppe | 7,556.0 | 63.88% |
| | Rocky Mountain Lower Montane Riparian Woodland and Shrubland | 22.0 | 0.19% |
| | Inter-Mountain Basins Greasewood Flat | 1,920.4 | 16.24% |
| | North American Arid West Emergent Marsh | 6.2 | 0.05% |
| | Rocky Mountain Alpine-Montane Wet Meadow | 18.5 | 0.16% |
| | Open Water | 1.3 | 0.01% |

| | | | |
|---|---|---|---|
| | Agriculture | 294.8 | 2.49% |
| | Invasive Annual and Biennial Forbland | 11.3 | 0.10% |
| | **Total** | **11,827.9** | **100.00%** |
| | **Total Surface** | **23,630.5** | |
| | | | |
| **Subsurface** | **Ecological System** | **Acres** | **%** |
| 36 | Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland | 8.0 | 1.21% |
| | Southern Rocky Mountain Pinyon-Juniper Woodland | 2.2 | 0.34% |
| | Inter-Mountain Basins Semi-Desert Shrub Steppe | 18.9 | 2.85% |
| | Rocky Mountain Subalpine-Montane Riparian Shrubland | 1.1 | 0.17% |
| | Rocky Mountain Lower Montane Riparian Woodland and Shrubland | 5.6 | 0.84% |
| | Inter-Mountain Basins Greasewood Flat | 344.3 | 51.95% |
| | North American Arid West Emergent Marsh | 10.7 | 1.61% |
| | Rocky Mountain Alpine-Montane Wet Meadow | 1.3 | 0.20% |
| | Open Water | 1.1 | 0.17% |
| | Agriculture | 261.0 | 39.37% |
| | Invasive Annual and Biennial Forbland | 8.7 | 1.31% |
| | **Total** | **662.9** | **100.00%** |
| 37 | Inter-Mountain Basins Active and Stabilized Dune | 0.9 | 0.07% |
| | Rocky Mountain Gambel Oak-Mixed Montane Shrubland | 0.7 | 0.05% |
| | Inter-Mountain Basins Big Sagebrush Shrubland | 2.2 | 0.17% |
| | Inter-Mountain Basins Semi-Desert Shrub Steppe | 182.7 | 14.18% |
| | Inter-Mountain Basins Semi-Desert Grassland | 0.9 | 0.07% |
| | Rocky Mountain Lower Montane Riparian Woodland and Shrubland | 2.0 | 0.16% |
| | Inter-Mountain Basins Greasewood Flat | 752.5 | 58.40% |
| | Rocky Mountain Alpine-Montane Wet Meadow | 55.6 | 4.31% |
| | Agriculture | 275.2 | 21.36% |
| | Invasive Annual and Biennial Forbland | 15.8 | 1.22% |
| | **Total** | **1,288.5** | **100.00%** |
| 38 | Inter-Mountain Basins Active and Stabilized Dune | 0.2 | 0.07% |
| | Inter-Mountain Basins Semi-Desert Shrub Steppe | 3.6 | 1.11% |
| | Inter-Mountain Basins Semi-Desert Grassland | 1.6 | 0.48% |
| | Inter-Mountain Basins Greasewood Flat | 315.9 | 98.34% |
| | **Total** | **321.2** | **100.00%** |
| 44 | Inter-Mountain Basins Semi-Desert Shrub Steppe | 40.5 | 100% |
| | **Total** | **40.5** | **100%** |
| | | | |
| | **Total Subsurface** | **2,313.1** | |
| | | | |
| **Summary** | Inter-Mountain Basins Semi-Desert Shrub Steppe | **13,141.1** | **52.07%** |
| **All Parcels** | Inter-Mountain Basins Greasewood Flat | **7,776.5** | **30.91%** |
| | Inter-Mountain Basins Active and Stabilized Dune | **2,324.4** | **9.24%** |
| | Agriculture | **1,456.7** | **5.79%** |
| | Rocky Mountain Alpine-Montane Wet Meadow | **192.3** | **0.76%** |
| | Rocky Mountain Lower Montane Riparian Woodland and Shrubland | **50.7** | **0.20%** |
| | Open Water | **44.7** | **0.18%** |
| | Invasive Annual and Biennial Forbland | **41.1** | **0.16%** |
| | Inter-Mountain Basins Semi-Desert Grassland | **38.7** | **0.15%** |
| | Inter-Mountain Basins Playa | **35.6** | **0.14%** |
| | Inter-Mountain Basins Big Sagebrush Shrubland | **31.1** | **0.12%** |

| | | | |
|---|---|---|---|
| | North American Arid West Emergent Marsh | **24.7** | **0.10%** |
| | Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland | **16.2** | **0.06%** |
| | Developed, Medium - High Intensity | **11.8** | **0.05%** |
| | Rocky Mountain Ponderosa Pine Woodland | **7.1** | **0.03%** |
| | Southern Rocky Mountain Pinyon-Juniper Woodland | **4.0** | **0.02%** |
| | Rocky Mountain Subalpine-Montane Riparian Shrubland | **3.1** | **0.01%** |
| | Rocky Mountain Gambel Oak-Mixed Montane Shrubland | **2.0** | **0.01%** |
| | **Total** | **25,201.7** | **100.00%** |
| | Elevation Range for Park Parcels - 7,518 - 7,928 ft. | | |

**Acreage values in all vegetation summary tables will not equal the total acres listed in Appendix B because these are calculated using GIS acreage calculations.**

**Table 7. BLM Parcel Vegetation and Elevation Summary**

| Parcel # | Ecological System | Acres | % |
|---|---|---|---|
| 31 | Rocky Mountain Ponderosa Pine Woodland | 10.7 | 3.42% |
| | Southern Rocky Mountain Pinyon-Juniper Woodland | 199.4 | 63.89% |
| | Inter-Mountain Basins Semi-Desert Shrub Steppe | 102.0 | 32.69% |
| | **Total** | 312.1 | 100.00% |
| | Elevation Range for BLM Parcel - 7,915 - 8,469 ft. | | |

All data from SWReGAP vegetation data set. See Lowery et al. 2005, The Southwest Regional Gap Analysis Project – Final Report of Land Cover Mapping Methods, October 13, 2005.

**Acreage values in all vegetation summary tables will not equal the total acres listed in Appendix B because these are calculated using GIS acreage calculations.**

# APPENDIX D

## *Assessment of Southwest Willow Flycatcher Habitat*
## *La Jara Canyon BLM Parcels 20 and 21 – Conejos County, Colorado*

**Loree' A. Harvey, Biologist & Contractor – Supervisor Melissa Garcia**
**San Luis Valley Public Lands Center, Monte Vista, Colorado**

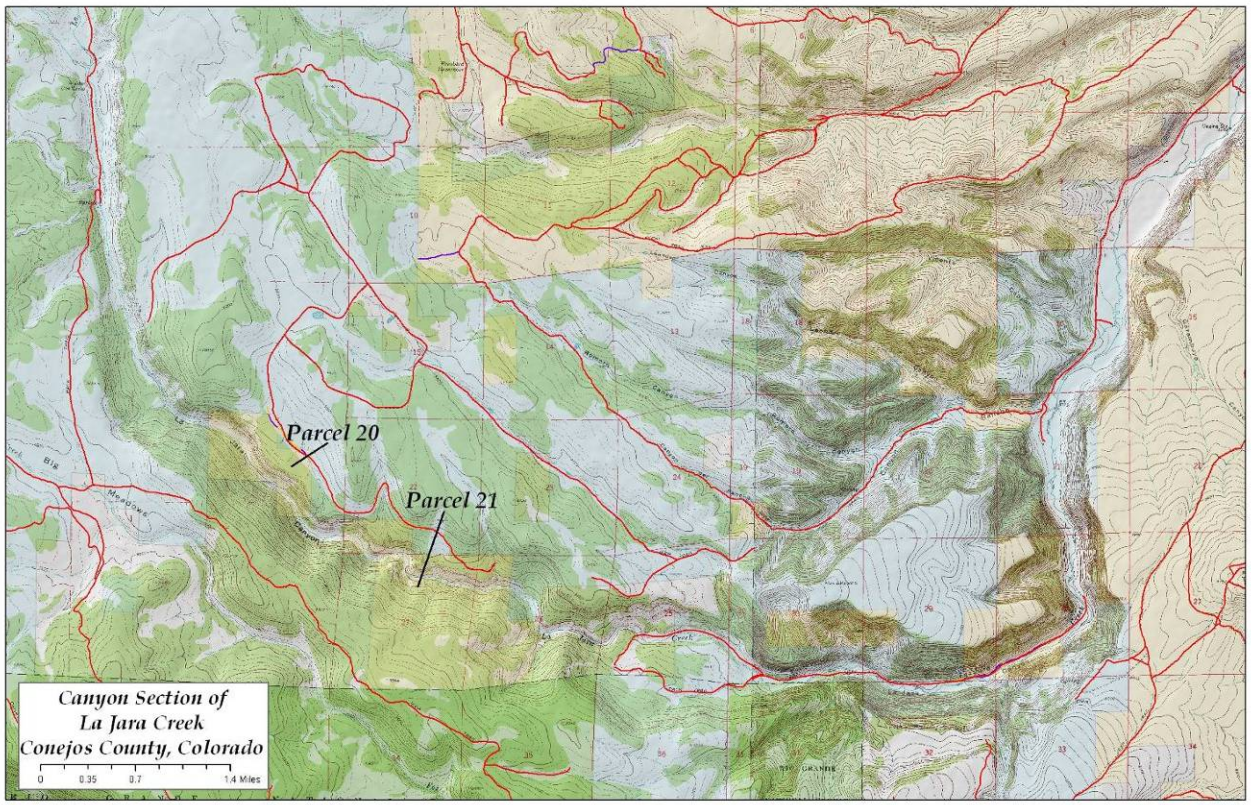
***Overview***

La Jara Creek is a major tributary of the Rio Grande, with its main stem flowing over 70 miles of terrain and ranging in elevation from 11900ft (Willow Mountain), to 7500ft at its confluence with the Rio Grande on the Alamosa National Wildlife Refuge. The creek itself runs through a diverse range of habitat, including subalpine forests, montane woodlands, drier foothills, and finally wet meadows across a substantial portion of the valley floor. The creek is impounded near its headwaters to form 14,000 acre-foot La Jara Reservoir.

La Jara Creek intersects BLM lands in a number of locations, and some of these BLM parcels are slated to become State Trust Lands as part of a large land exchange between the state of Colorado and federal agencies. BLM parcels #20 and #21 are located approximately 5.5 miles SSE of La Jara Reservoir, and lie within a remote section of La Jara Creek called La Jara Canyon (Figure 1). La Jara Canyon is a steep-walled, gently curving box canyon with sheer basalt cliffs on most of its northern and southern rims, providing little access from any direction. No established roads or trails lead to the bottom of the box section, and hiking along the creek itself is difficult due to the amount of deadfall and dense vegetation present.

As part of the larger effort to inventory all potential and suitable Southwest Willow Flycatcher habitat on BLM lands within the San Luis Valley, overall willow structure and habitat suitability was assessed in parcels #20 and #21 in La Jara canyon in June of 2007.

Figure 1. Overview of La Jara Canyon and vicinity, and position of Parcels 20 & 21.




***Parcel #20***

This section of La Jara Canyon is characterized as a steep-sided rocky valley, beginning at approximately 9050 ft and ending at 8910 ft in elevation (Figure 2). Talus is present right at creek's edge in many locations, creating large plunge pools and excellent fish habitat (fish were visible from the creek's banks in many locations). Plants include conifers, alders, several species of shrubs and forbs, wetland grasses, sedges, rushes, and occasional willow plants (Figures 3-5). Signs of cattle grazing or human foot traffic are minimal. At no point does the willow become dense enough to be considered Southwest Willow Flycatcher habitat, as the creek's grade, stream flow, and lack of sedimentation do not support dense stands of willow. At the eastern-most point of Parcel #20, the creek's grade eases a bit and willows become more prominent, and could be considered borderline Potential habitat. However, for the majority of the segment, the plant composition and stream grade are **Not Suitable** for Southwest Willow Flycatcher occupation.

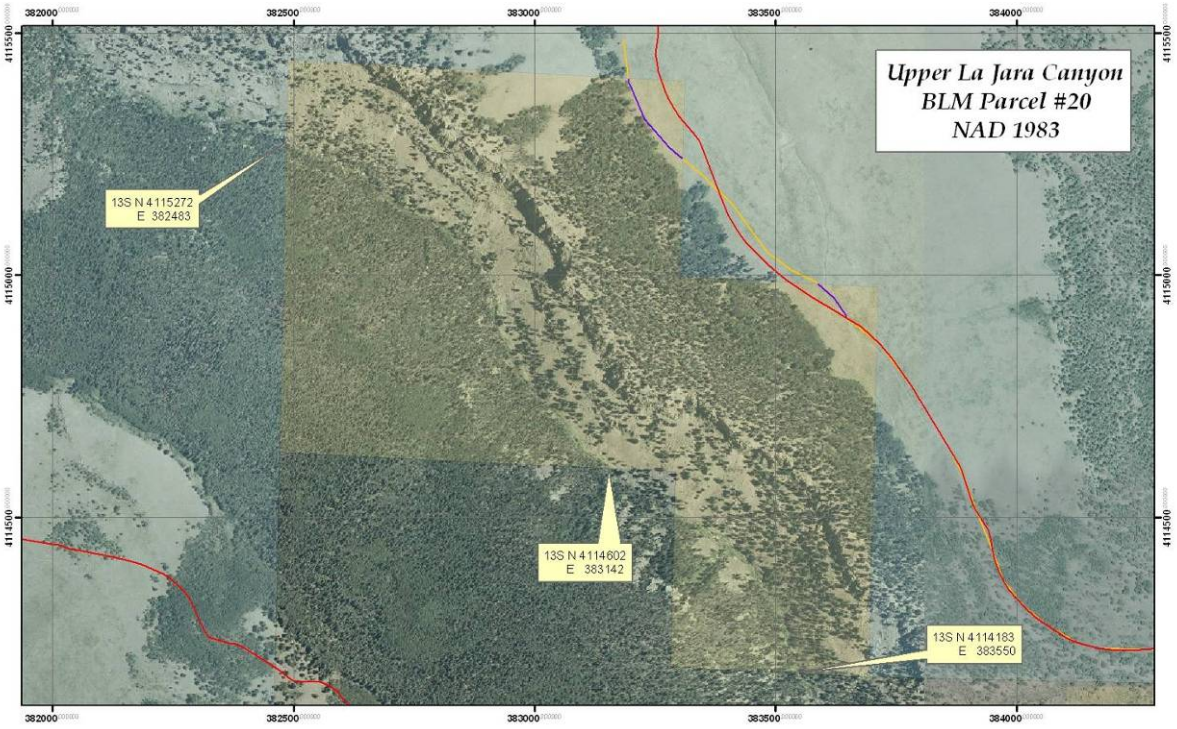



Figure 2. Arial photo of BLM Parcel #20 in La Jara Canyon

Figure 3. Plant community at northern edge of BLM Parcel #20, La Jara Canyon

Figure 4. Plant community in middle section of BLM Parcel #20, La Jara Canyon

Figure 5. Plant community at eastern edge of BLM Parcel #20, La Jara Canyon

***Parcel #21***

This parcel is perhaps the most remote part of La Jara Canyon, and showed virtually no signs of use by domestic animals or humans (Figure 6). The cliffs on the north rim are quite sheer and represent a drop of 100's of feet before turning into steep talus slopes leading to the creek's edge. The elevations range from 8870 ft at the western creek entry, to 8630 ft at its eastern edge. The stream gradient in parcel #21 appears to be somewhat lower than parcel #20, thus allowing more stream meandering and willow establishment to occur in non-wooded areas. Fish habitat appears to be excellent, and the banks are predominated by willow, conifers, alder, several species of shrubs and forbs, wetland grasses, sedges, and rushes (Figures 7-13). Based on willow structure, height, and density, the majority of parcel #21 is **Suitable** for Southwest Willow Flycatcher occupation.

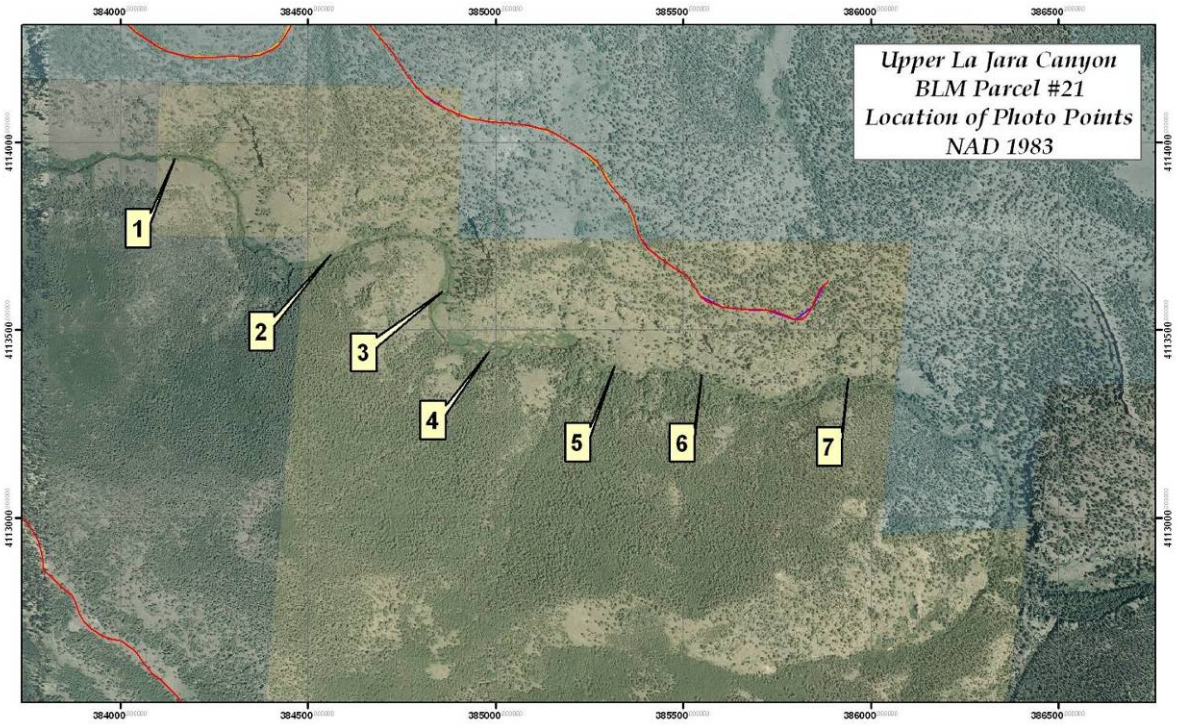



Figure 6. Arial photo and location of photo points of BLM Parcel #20 in La Jara Canyon

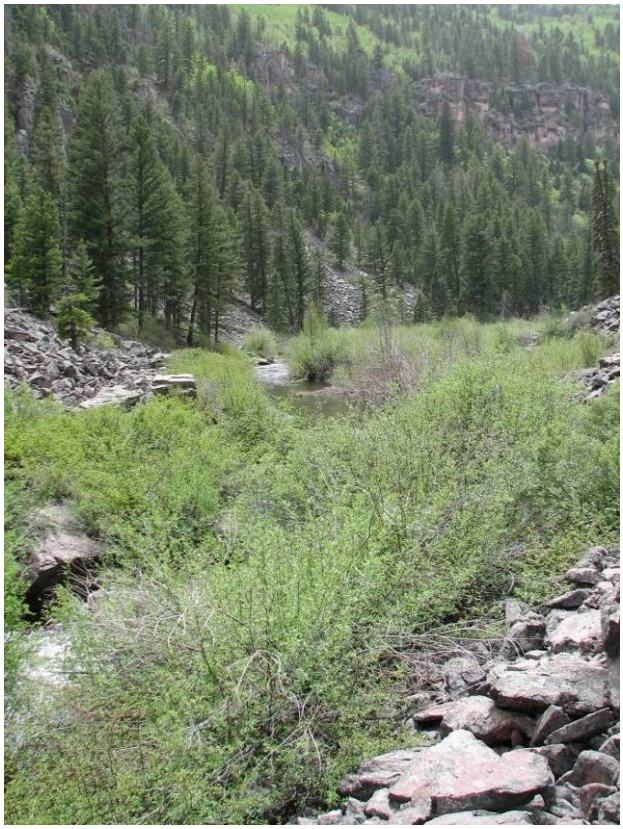


Figure 7. Willow structure at Photo point #1

Figure 8. Willow Structure at Photo point #2

Figure 9. Willow Structure at Photo point #3

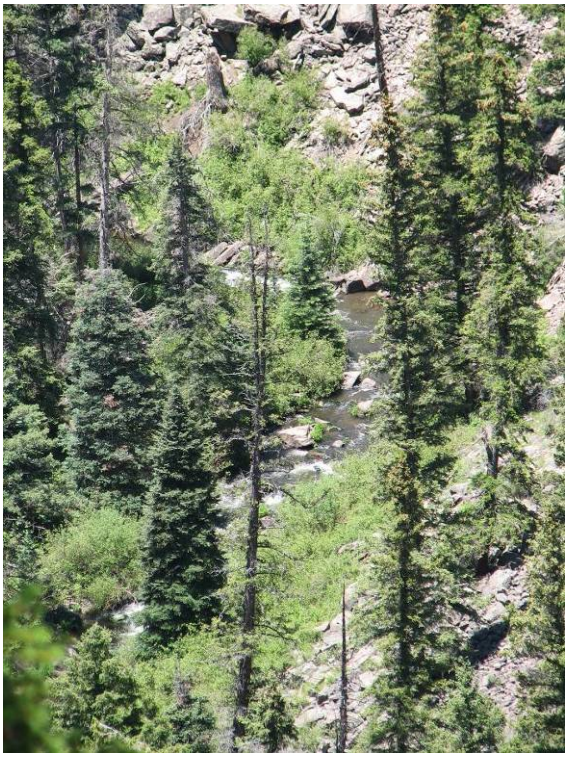


Figure 10. Willow Structure at Photo point #4

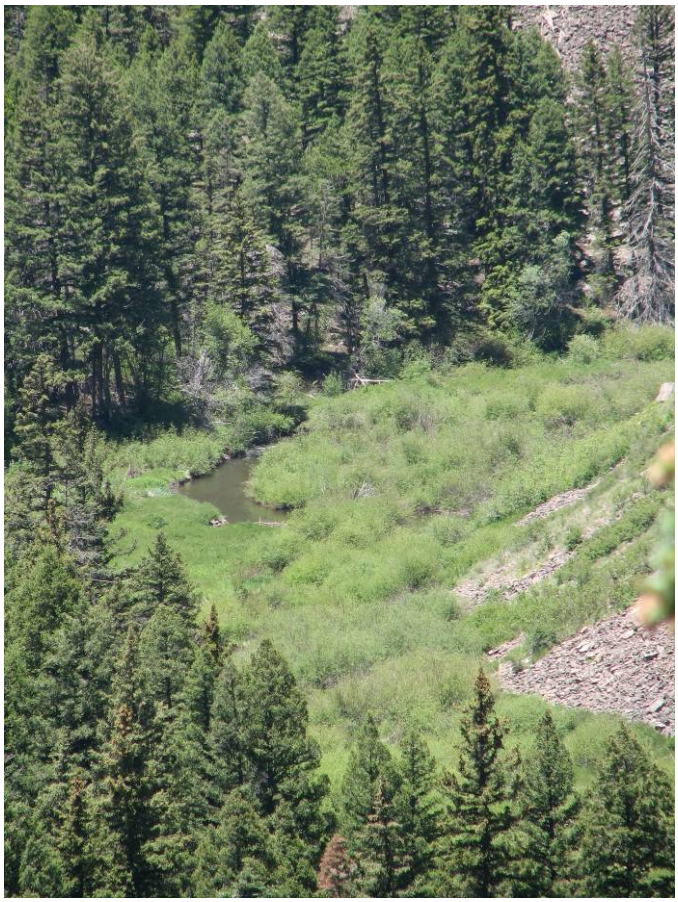


Figure 11. Willow Structure at Photo point #5

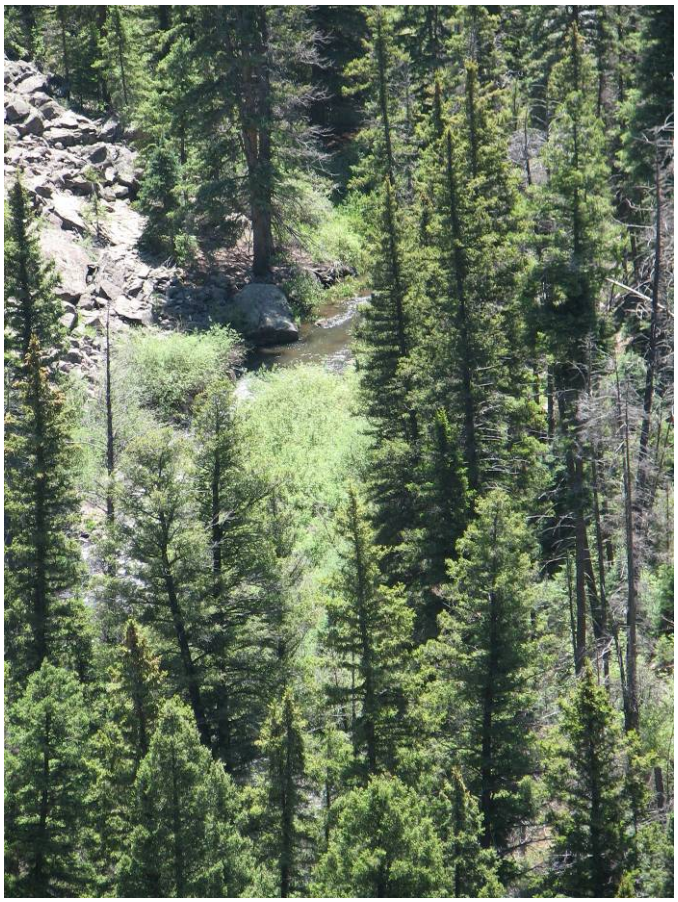


Figure 12. Willow Structure at Photo point #6

Figure 13. Willow Structure at Photo point #7

58 FR pages 14,248-14,271, March 16, 1993.
FWS decision to list the Mexican spotted owl as a threatened species
60 FR pages 10,694-10,715, February 27, 1995
FWS decision to list the Southwestern willow flycatcher as an endangered species
60 FR pages 36,000-36,010, July 12, 1995
FWS decision to reclassify the bald eagle
65 FR pages 16,052-16,086
FWS decision to list the Canada lynx as a threatened species
69 FR page 24,887, May 4, 2004
FWS candidate species list
69 FR pages 53,181-53,298,
FWS publication of Mexican spotted owl critical habitat
70 FR page 56,800, September 29, 2005.
FWS decision to remove Boreal toad from federal candidate species list
70 FR pages 68,293-68,328
FWS publication of Canada lynx critical habitat
71 FR pages 19,954-19,982, April 18, 2006.
FWS decision to remove the Gunnison sage grouse from the federal candidate species list
73 FR pages 6660-6684
FWS 12-month Finding on Petition to List the Gunnison's Prairie Dog as Threatened or Endangered. February 5, 2008
AOU, 1983.
American Ornithological Union Check-list of North American Birds, 6th edition. Allen Press, Inc. Lawrence, KS. 877pp.
Apps, C.D. 2000.
Space-use, diet, demographics and topographic associations of lynx in the southern Canadian Rocky Mountains: a study. *In* Ruggiero et al. 2000a.
B. Mangle, ERO Resources, Consultants, pers comm. 2006
Conversation and email regarding the Habitat Conservation Plan for San Luis Valley.
BLM, 1989
San Luis Resource Management Plan and EIS – draft. Unpublished Report. USDI, BLM, Denver, CO.
BLM, 2005.
Mineral Potential Report for the Land Exchange Between the Colorado Bureau of Land Management and the Colorado State Land Board. San Luis Valley Public Lands Center and Royal Gorge Field Office. Del Norte, CO.
BLM, Rio Grande Resource Area, 2005.
Brown, 1988.
Breeding ecology of a willow flycatcher population in Grand Canyon Arizona. Western Birds 19:25-33.
CGS, 2000.
Colorado Geological Survey
CNHP, 2002.
Colorado Natural Heritage Program
CNHP, 2005.
Colorado Natural Heritage Program
Colorado Breeding Bird Atlas, 1998.
Colorado Breeding Bird Atlas. Colorado Division of Wildlife, Denver, CO. 636 pp.
Colorado Division of Wildlife 2007. Summary of Information for use by USFWS in the Gunnison Prairie Dog 12-month review. Unpublished Report. 146pp.

Colorado Division of Wildlife 2008. Draft Gunnison and White-tailed Prairie Dog Conservation Plan. February 2009. Accessed Online at http://wildlife.state.co.us/WildlifeSpecies/GunnisonsWhitetailPrairieDogConsPlan.htm on 3/1/09

Erik Brekke, BLM, pers comm. 2006
Series of telephone conversation and email correspondence with Mike Artmann and Cay Ogden

F. Bunch, NPS, pers comm. 2007.
Telephone conversation with Cay Ogden

FWS, 2002.
Recovery Plan for the Southwestern Willow Flycatcher

FWS, 2003.
Alamosa-Monte Vista National Wildlife Refuge Complex, Colorado. Comprehensive Conservation Plan. Division of Refuge Planning, Denver, CO.

FWS, 2005.
Recovery Plan for the Mexican spotted owl. Albuquerque, N.M.

FWS, 2005.
Conceptual Management Plan for the Baca National Wildlife Refuge. May 2005. 41 pp.

Ganey et al. 2000.
Roost sites of radio-marked Mexican spotted owls in Arizona and New Mexico: sources of variability and descriptive characteristics. Journal of Raptor Research. 34:270–278.

Hawks Aloft, 2002.
Southwestern willow flycatcher surveys

J. Burns, CSFS, pers comm. 2007.
Telephone conversation with Cay Ogden to clarify data

K Murphy, BLM, pers comm. 2006.
Telephone conversation with Mike Artmann

K. Page, State Land Board, pers comm.. 2006.
Series of email correspondence and telephone conversations with Mike Artmann and Cay Ogden

Kingery, 1998.
Colorado Breeding Bird Atlas. Colorado Division of Wildlife, Denver, CO. 636 pp.

Koehler and Aubry 1994
Pages 74-98 *In* Ruggiero and others 1994. The scientitifc basis for conserving forest carnivores: American marten, fisher, lynx, wolverine in the western United States. USDA Forest Service, Ocky Mountain Forest and Range Experimental Station. GTR RM-254. 184 pp.

L. Ellwood, FWS, pers comm. 2006
Series of discussions with Mike Artmann and Cay Ogden

M. Garcia, BLM, pers comm. 2006.
Written peer review comments on draft BA

M. Garcia, BLM, pers comm. 2007.
Telephone conversations with Mike Artmann and Cay Ogden

McCord and Cordoza 1982
Bobcat and lynx. Pages 728-766 In J. A. Chapman and G.A. Feldhamer (eds.). Wild Mammals of North America. Johns Hopkins University Press, Baltimore, MD.

Mowat et al. 2000
Ecology of lynx in northern Canada and Alaska. Chapter 9 *In* Ruggiero et al. tech eds. Ecology and conservation of lynx in the United States. Univ. Press of Colorado. Boulder, CO. 480 pp.

NWRS Improvement Act of 1997
National Wildlife Refuge System Improvement Act of 1997. Public Law 105-57

P. Robertson, TNC, pers comm. 2006

Telephone conversation with Cay Ogden regarding parcels 15 and 16

Phillips, Marshall and Monson, 1964

The birds of Arizona. Univ. of Arizona Press, Tucson, AZ. 212 pp.

PL 106-530: PPA 2000.

Great Sand Dunes National Park and Preserve Act of 200. Public Law 106-530. 106th Congress. Washington D.C.

Poole, 1997.

Dispersal patterns of lynx in the Northwest Territories. J. Wildl. Manage. 61(2):497-505.

Rawinski, 2004.

Birds of the Rio Grande National Forest and San Luis Valley Area: A summary of bird observations. Produced for Rio Grande National Forest.

Reeve, et al. 1986.

Pages 11-26 *In* Historic and recent distribution of lynx in Wyoming. Wyoming Cooperative Fishery and Wildlife Research Unit, Laramie, WY. 55pp.

Ruediger, et al. 2000.

Canada lynx conservation assessment and strategy. USDA Forest Service Publication #R1-00-53, Missoula, MT. 142 pp.

Segland et al. 2005.

….Gunnison's Prairie Dog Conservation Assessment. Western Association of Fish and Wildlife Agencies. Lamarie, Wyoming. Unpublished Report. 88pp.

Shenk, 2006.

Lynx Fact Sheet, November 8, 2006

Slough and Mowat, 1996.

Lynx population dynamics in an untrapped refugium. J. Wildl. Manage. 60:946-961.

Squires and Laurion, 2000.

Lynx home range and movements in Montana and Wyoming: preliminary results. Pages 337-349 *In* Ruggiero et al. tech eds. Ecology and conservation of lynx in the United States. Univ. Press of Colorado. Boulder, CO. 480 pp.

T. Ireland, FWS, pers comm. 2006

Telephone conservations and email with Mike Artmann.

USDI, 1995.

Recovery Plan for the Mexican spotted owl. Albuquerque, N.M.

W. Anderson, BLM, pers comm. 2006.

Telephone conversation with Cay Ogden

Warren, Thomas. 2003.

Integrated Natural Resource Management Plan and Environmental Assessment, Fort Carson and Pinon Canyon Maneuver Site, 7th Infantry Division and Fort Carson. 2002 -2006.