



USDA Forest Service  
Colorado State Forest Service  
Denver Water

Biological  
Assessment  
for the  
Upper South Platte  
Watershed Protection  
and  
Restoration  
Project



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# TABLE OF CONTENTS

<b>Table of Contents</b> .....	<b>i</b>
<b>Introduction</b> .....	<b>1</b>
<b>Project Area</b> .....	<b>1</b>
<b>Project Description</b> .....	<b>3</b>
USFS Proposed Actions.....	3
Colorado State Forest Service Projects .....	5
<b>Methods</b> .....	<b>8</b>
Threatened and Endangered Animal Species.....	8
Threatened, Endangered, and Candidate Plant Species .....	8
<b>Threatened and Endangered Species Known From or Potentially Occurring within the Project Area</b> .....	<b>9</b>
Federally Listed Threatened Species .....	9
Pawnee Montane Skipper ( <i>Hesperia leonardus montana</i> ) .....	9
Mexican Spotted Owl ( <i>Strix occidentalis lucida</i> ) .....	15
Bald Eagle ( <i>Haliaeetus leucocephalus</i> ) .....	17
Preble’s meadow jumping mouse ( <i>Zapus hudsonius preblei</i> ) .....	18
Ute ladies’ tresses orchid ( <i>Spiranthes diluvialis</i> ).....	21
<b>References</b> .....	<b>22</b>
<b>List of Preparers and Consultants</b> .....	<b>24</b>

## LIST OF TABLES

<b>Table 1. Land Ownership, Potential Treatment Areas, and Skipper Habitat.</b> .....	<b>11</b>
<b>Table 2. Land Ownership, Potential Treatment Areas, and Proposed Owl Critical Habitat</b> .....	<b>17</b>

## LIST OF MAPS

<b>Map 1. Upper South Platte Project Area and Vegetation Treatment Areas.</b> .....	<b>2</b>
<b>Map 2. Occupied Pawnee Montane Skipper Habitat.</b> .....	<b>10</b>
<b>Map 3. Mexican Spotted Owl PACs and Proposed Critical Habitat</b> .....	<b>16</b>





## INTRODUCTION

The U.S. Forest Service (USFS), Colorado State Forest Service (CSFS), and Denver Water have proposed a series of actions with the goal of forest restoration in the Upper South Platte Watershed within the Pike National Forest and on private, state, and Denver Water lands. The proposed action also has a goal of improving Pawnee montane skipper habitat. These actions would include timber harvesting, prescribed burning, revegetation in the Buffalo Creek burn area, obliteration and reclamation of unnecessary roads, and trail improvements. The USFS has prepared an Environmental Assessment (EA) that discloses the environmental consequences of implementing the proposed actions on National Forest lands.

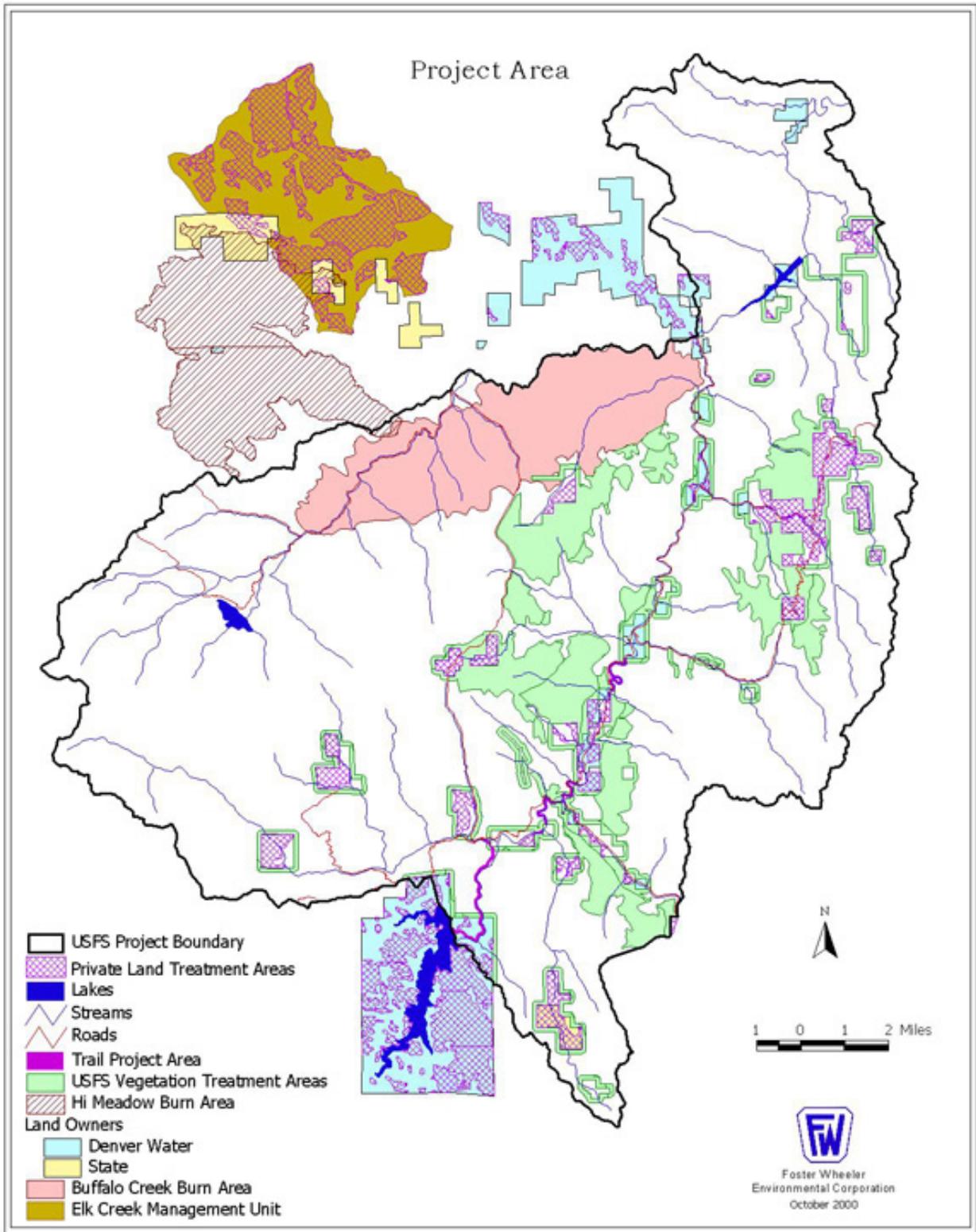
In conjunction with the National Environmental Policy Act (NEPA) process, the USFS is required to comply with Section 7 on the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 et seq.) by consulting with the U.S. Fish and Wildlife Service (USFWS) prior to release of the EA. The purpose of this consultation is to ensure that the proposed action does not preclude or threaten the continued existence of any federally listed threatened or endangered species or adversely affect designated critical areas (50 Code of Federal Regulations [CFR] 17). In accordance with regulations in 50 CFR 402, the USFS initiated informal consultation with the USFWS on June 1, 2000. Activities on private, state, and Denver Water lands also have to comply with the ESA. Denver Water and the CSFS joined the USFS in informal consultations with the USFWS.

Data was obtained from existing and available information, including resource management plans and other environmental documents prepared for similar proposed actions in the project study area. These documents were reviewed to determine the locations and types of biological resources that could exist in the project study area. Information on species occurrence was also gathered from the statewide database through contact with the Colorado Natural Heritage Program (CNHP). Contacts were made with species experts and resource specialists from the USFS, Colorado Division of Wildlife (CDOW), and USFWS to gather file information on biological resources in the project study area, including maps and database information. This Biological Assessment (BA) provides an analysis of the potential effects of the project on these species and, with the concurrence of the USFWS, satisfies the ESA requirement for preparation of a BA (50 CFR 402.112). The list of species considered for this document includes two birds, one invertebrate, one small mammal, and one plant.

## PROJECT AREA

For the purposes of the BA, the USFS Project Area is defined as three sub-watersheds of the Upper South Platte watershed. The Upper South Platte watershed is located within the foothills of the Colorado Front Range of the Rocky Mountains. It is a large, important watershed that is a critical water supply for the city of Denver, providing 70 percent of the city's water. Due to its proximity to the city, it contains a large urban-wildlands interface and provides easy access to fishing, hiking, and other outdoor pursuits. A portion of the South Platte River is a gold medal trout fishery. The CSFS and Denver Water are proposing vegetation treatment activities on private land. Some of the activities proposed on private land fall outside the boundaries of the USFS Project Area. All activities described in this BA are part of the proposed action to be covered by this BA. Activities at Cheesman Lake and in the Lower Elk Creek Project are included in the proposed action, as are some private lands north of the USFS Project Area (see Map 1).





**Map 1. Upper South Platte Project Area and Vegetation Treatment Areas.**



## Biological Assessment

The term “project area” includes state, private, and National Forest lands, unless specifically identified, as USFS Project Area or CSFS Project Area.

The USFS Project Area is approximately 140,000 acres in total extent (public and private lands) and encompasses three sub-watersheds of the Upper South Platte River watershed including Horse Creek, Waterton/Deckers, and Buffalo Creek sub-watersheds. This area was selected based on recommendations from the Landscape Assessment of the Upper South Platte Watershed (Foster Wheeler Environmental Corporation, 1999). The CSFS Project Area would include all private and state lands within the Waterton/Deckers/Horse Creek Watershed (USFS Project Area) and the Lower Elk Creek Management Unit, Denver Water land surrounding Cheesman Reservoir, and Denver Water and state lands along the North Fork of the South Platte between Pine, Colorado, and Strontia Springs Reservoir. These watersheds are located in Jefferson and Douglas Counties, west of Denver.

Elevations within the USFS Project Area range from approximately 6,000 feet along the South Platte River to more than 9,000 feet at some of the higher peaks. The terrain is extremely varied and includes deep, narrow canyons; flat river-valley bottoms; broad meadows; rugged mountain foothills; steep slopes; rounded granite peaks; and scattered, rugged granite outcroppings. Portions of the Waterton/Deckers and Buffalo Creek watersheds are within the Lost Creek Wilderness Area.

A portion of the USFS Project Area was burned in the 1996 Buffalo Creek fire. This large, hot fire resulted in loss of forest cover on 12,000 acres. Summer storms in the area of the burn caused catastrophic erosion and sediment deposition into the watershed’s streams. Flooding events following the fire destroyed much of the stream channels and riparian zones along Buffalo and Spring Creeks.

## PROJECT DESCRIPTION

### USFS Proposed Actions

The USFS proposed actions presented here represent the first phase of work that the USFS and its partners would implement under the Upper South Platte Watershed Protection and Restoration Project. The proposed actions were developed with consideration of USFS management policies, legislative mandates, and approved forest management plans. An EA has been prepared for NEPA compliance.

The USFS proposal is designed to achieve the stated goals of the Upper South Platte Watershed Protection and Restoration Project through four forest restoration subprojects. The actions or subprojects that are proposed include vegetation treatments, road reclamation, trail improvements, and burn area revegetation. The specific USFS actions proposed would:

- ❖ **Treat 17,400 acres of dense forest with thinning and created openings**
- ❖ **Reclaim 25 miles of unclassified roads**
- ❖ **Improve 7.5 miles of South Platte River access trails**
- ❖ **Plant 60 acres of riparian and 1,000 acres of upland habitat in the Buffalo Creek burn area**



## VEGETATION TREATMENT

The USFS proposes to treat 17,400 acres of dense forest vegetation (Map 1). The forest would be thinned to a canopy closure of 25 percent on 13,000 acres. On the remaining 4,400 acres of treatment area, openings of 1 to 40 acres would be created. These openings would be dispersed within the thinned areas and would not be revegetated. The openings would be maintained by prescribed burns every 10 to 30 years, as appropriate. The thinning would be selective by age class and species to emulate the types of conditions found historically. In all areas, the larger, more mature trees would typically be left. In most treated areas, ponderosa pine would be selected to remain, although some larger Douglas-fir may also be selected. The exception would be the Christmas tree cutting area near Highway 126 where Douglas-fir are produced for Christmas trees.

Logs would be removed from approximately 11,600 acres of the treated area. Logs would not be removed from slopes that are too steep, too far from existing roads, or have trees that are of little or no economic value. The areas where trees would be left on-site would be determined on the ground before harvest activities. Logs and slash left on-site would be partially crushed by the harvesting and yarding equipment. The slash and logs would then be allowed to dry for 1 to 2 years. At that time, burning would be prescribed to consume most of the remaining downed materials. The USFS's proposed vegetation treatment would take up to 12 years to complete.

The logging systems used would include both conventional systems and forwarders. Conventional systems would be used where there are existing roads (approximately 8,600 acres). In these areas, skidders would be used to yard the downed trees off the site. Skidders drag the trees, creating skid trails. Forwarders would be used in areas without existing roads that meet the criteria for removal discussed above (approximately 3,000 acres). Forwarders are larger machines that have six or more wheels. They pick the trees up off the ground and place them in a bunk so they do not drag on the ground. They can carry approximately 20 times the load of a skidder. This reduces the number of trips and associated disturbance. They do create paths or trails, similar to a skidder. Because of the way they can pick up and transport downed trees, forwarders create less disturbance than skidders, particularly where there are no roads to use as skid trails. However, forwarders are more expensive to use than skidders.

Private landowners would be consulted to determine if they are interested in having the National Forest land harvested around their property. If so, a 500-foot strip around their land would be treated using the above techniques. Landowners may be responsible for removing the trees, if they so choose. To be conservative in the analysis of effects, it is assumed that all property owners will choose this option. However, it is likely that many will choose not to have the harvest completed.

## ROAD RECLAMATION

The USFS proposes to reclaim and make impassible 25 miles of nonsystem roads that are currently closed. These roads were built for various purposes, including historic logging and mining. The origins of some roads are unknown. Some are two-track roads with no drainage systems and no apparent standards. Because of the low standards with which many of these roads were built and poor or nonexistent drainage systems, these types of roads on the area's highly erodible soils are a particular problem for erosion.

The roads would be reclaimed by ripping and seeding the roadbeds, both for erosion control and to encourage revegetation. Biosolids would be used to increase soil fertility. Existing culverts would be removed and self-maintaining drainage would be created. The first ¼ mile of each road may be obliterated and recontoured if needed to further discourage any use. Finally, trees may be felled across the roads throughout their length.



## SOUTH PLATTE RIVER ACCESS TRAIL IMPROVEMENTS

The objective of this proposed action is to improve 7.5 miles of existing trail along the South Platte River to increase safety for hikers and anglers, to create conditions that are sustainable for the trail system, and to reduce soil erosion and vegetation loss. Many of the improvements would encourage hikers to remain along established trails and discourage use of social trails to access favorite areas. The actions that are proposed include:

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- ❖ **Expand the existing trailhead and parking space at Wigwam Campground.**
  - ❖ **Construct new trail between the end of the Gill Trail and Cheesman Dam.**
  - ❖ **Upgrade the original Gill Trail to safer and sustainable conditions.**
  - ❖ **Construct safe and sustainable river access trails to the South Platte River. This would include constructed stairways or hardened trails on the steepest trail sections.**
  - ❖ **Construct barrier-free accessible fishing sites and trails from parking areas near the river.**
  - ❖ **Reclaim existing social trails using conventional methods.**
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## BUFFALO CREEK BURN AREA REVEGETATION

The objective of this USFS proposed action is to reestablish vegetation on riparian and upland forested areas that have not successfully regenerated following the 1996 wildfire. Successful completion of this revegetation would reduce erosion from the exposed areas and subsequent stream sediment loading. The proposed activities would occur in Buffalo Creek and/or Spring Creek.

In the riparian areas, 60 acres of exposed sediments along streams and washes would be planted using certified weed-free indigenous plant material. Woody debris and boulders would be selectively placed in the stream channel to help stabilize the channel. The sediment deposits in the riparian zones would be reshaped as needed to facilitate plant reestablishment. Conventional equipment would be used to complete this task. The riparian habitat that would be created would consist primarily of willows. Willow cuttings and transplants from nearby riparian areas may be used.

In the upland areas, 1,000 acres of the burn area that have not successfully revegetated would be planted with ponderosa pine seedlings. In both the upland and riparian areas, appropriate types of biosolids would be used as a soil amendment to improve conditions for revegetation.

Suction dredging is also proposed in the Buffalo Creek stream channel as part of the monitoring program. A 100-meter section of the channel would be dredged to remove and measure accumulated sediments. The structure and composition of the stream channel would be assessed, both in the dredged area and in adjacent undredged areas. The objective would be to measure the effects of sediment on stream habitat. The removed sediments could possibly be used for road reclamation or would be disposed of off-site. The material would not be deposited on vegetation or wetlands.

## Colorado State Forest Service Projects

### COLORADO STATE FOREST SERVICE VEGETATION TREATMENTS

The CSFS proposes treatment activities similar to the USFS proposal, with the following differences:

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- ❖ **Vegetation treatments would occur only on state or private land.**
  - ❖ **New temporary roads may be built to access unroaded private or state treatment areas. No new roads would be built across USFS land.**
  - ❖ **The CSFS project area would include all private and state lands within the Waterton/Deckers/Horse Creek Watershed (USFS Project Area) and the Lower Elk Creek Management Unit, Denver Water land surrounding Cheesman Reservoir, and Denver Water and state lands along or near County Road 96 and State Highway 126 Pine Junction, Colorado, and Strontia Springs Reservoir.**
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The CSFS would focus treatment activities on Denver Water and state property. New roads would only be built if there were no existing roads to treatment areas and the roads would be reclaimed immediately after work was completed. These new roads would typically be short spurs less than 500 feet long. However, some areas on Denver Water property surrounding Cheesman Reservoir may require longer roads.

## DENVER WATER

Denver Water owns approximately 30,000 acres within the Upper South Platte Watershed. Within the project area, they are second only to the federal government in land ownership, with 14,168 acres. These lands are in various-sized parcels scattered along the main stem of the South Platte River and the North Fork of the South Platte River (Map 1).

Denver Water's interest and concern about fire and the need for vegetation and restoration management was graphically brought to point by the 1996 Buffalo Creek Fire and the ensuing floods. Their Strontia Springs reservoir received much of the sediment flowing from the burned landscape. They face future costs in the millions of dollars to restore the reservoir.

Denver Water became one of the founding partners in the development of the Upper South Platte Project. In March 1999, Denver Water contracted with the CSFS for the vegetation management of all of their lands within Colorado, approximately 55,000 acres. The contract prioritized management of Denver Water's lands within the Upper South Platte Watershed.

Denver Water's management objectives for their lands include reducing wildfire hazards, reducing loss from insects and disease, improving forest health through harvest and prescribed fire, reestablishing forest stands to better reflect historic conditions, and enhancing habitat conditions for the threatened Pawnee montane skipper (skipper).

Denver Water anticipates that proposed thinning of dense stands of trees and creating open stands with an average of 30 percent tree canopy cover or less will generally improve habitat for the skipper. Specifically, Denver Water's actions under the Proposed Action will result in the enhancement of 2,709 acres of area already designated as occupied skipper habitat. Denver Water believes that the enhancements are adequate to offset the disturbances associated with Denver Water's operation, maintenance, and improvement (OM&I) activities that will result in a maximum disturbance of 100 acres. These OM&I activities are included in the Proposed Action and therefore covered by this federal action. These OM&I activities include the following projects:



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- ❖ **Pipeline, pump house construction, and development of defensible space around structures at Cheesman Reservoir for fire protection measures**
  - ❖ **Construction of a boathouse and ramp at Cheesman Reservoir**
  - ❖ **Upstream control gate outlet work**
  - ❖ **Fire defenses around houses and structures owned by Denver Water that are not part of the Upper South Platte Watershed Restoration and Protection project**
  - ❖ **Noxious weed control (Note that weeds will be controlled in accordance with the approved USFS and BLM Integrated Weed Management Plan and associated conservation measures for protecting federally listed species [USFS and BLM 1998])**
  - ❖ **Installation of six vault toilets along the North Fork of the South Platte and the South Platte River corridors**
  - ❖ **Parking lot and new boat take-out at the confluence of the North Fork and South Platte River**
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The USFWS, USFS, Denver Water, and CSFS are willing to collectively look at the enhanced skipper habitat (7,165 acres) to offset potential impacts for future ESA consultations (Section 7 or Section 10). However, these future actions would be required to undergo separate ESA compliance evaluations at a later date. The parties involved in this project agree to enter into discussions to determine how the enhanced acres might be used to offset future actions. However, this position has no bearing on this present ESA consultation.

These actions could potentially include:

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- ❖ **Strontia Springs Reservoir sediment control project**
  - ❖ **Other sediment control projects in existing or future burn areas**
  - ❖ **Recreation or other enhancements envisioned in the Wild and Scenic Rivers Alternatives analysis**
  - ❖ **Recreational trail construction**
  - ❖ **Other activities that are not anticipated at this time**
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## ROAD DEFINITIONS

For this report, the following definitions apply to road-related activities.

### **Road Maintenance**

This activity could include blading the surface of the road, but not expanding the width of the running surface beyond that what original existed, or changing the grade of the road. It would also include cleaning road drainage features such as culverts, ditches, and waterbars. Replacing culverts and surfacing materials would also be considered road maintenance.

### **Road Upgrading**

This activity would include changing from a dirt to gravel running surface, changing the grade with fill, creating pullouts, widening the road surface, and increasing the radius of turns. Adding culverts and other drainage structures, such as waterbars and ditches, would also be considered upgrading.

## METHODS

Review of literature and databases was conducted to assess the status of species identified by the USFS, USFWS, CNHP, and CDOW as potentially occupying the project area. Contacts with species experts were made to augment published information and database records of species occurrence. Federal, state, and CNHP database listings of special-status species and their habitats were reviewed to identify those species potentially occurring within the project area. Based on these lists, plants and wildlife species were carefully identified to eliminate or confirm the occurrence of special-status species.

### THREATENED AND ENDANGERED ANIMAL SPECIES

Information on species occurrence was gathered from the statewide database through contact with the CNHP and USFS personnel. Contacts were made with species experts and resource specialists from the U.S. Geological Service Biological Service, USFS personnel, and USFWS personnel to gather file information on wildlife resources in the project study area, including mapped and database information. One invertebrate, two birds, and one mammal were identified for analysis for this BA.

### THREATENED, ENDANGERED, AND CANDIDATE PLANT SPECIES

Information on occurrences of federally protected plants in the Project Area was obtained initially from the CNHP and through consultation with USFS personnel. Additional information on species' habitat requirements, blooming periods, and field identifying characteristics was obtained from state flora guides (Weber, 1996; Spackman et al., 1997). Federal and state resource specialists, including the USFS and USFWS, were also contacted to obtain information on threatened and endangered plants. One plant species is evaluated in this BA.



## THREATENED AND ENDANGERED SPECIES KNOWN FROM OR POTENTIALLY OCCURRING WITHIN THE PROJECT AREA

### FEDERALLY LISTED THREATENED SPECIES

#### **Pawnee Montane Skipper (*Hesperia leonardus montana*)**

The Pawnee montane skipper is found in sparsely wooded grasslands and open pine forests at elevations from 6,000 to 7,500 feet. They are dependent on two plant species, the prairie gayfeather (*Liatris punctata*), which flowers late summer through early fall, and blue grama (*Bouteloua gracilis*). The butterfly uses prairie gayfeather for its nectar and the blue grama as larval plant food (US Fish and Wildlife Service, 1998). The butterfly has a very limited distribution occurring along a 12-mile stretch of the South Platte River. The Pawnee montane skipper is known to occur in Douglas, Jefferson, Park, and Teller Counties in Colorado (US Forest Service, 1994). Distribution information from CNHP indicates that the Pawnee montane skipper has been identified at two locations in the Waterton/Deckers Composite watershed and one location near the southeastern corner of the Horse Creek watershed.

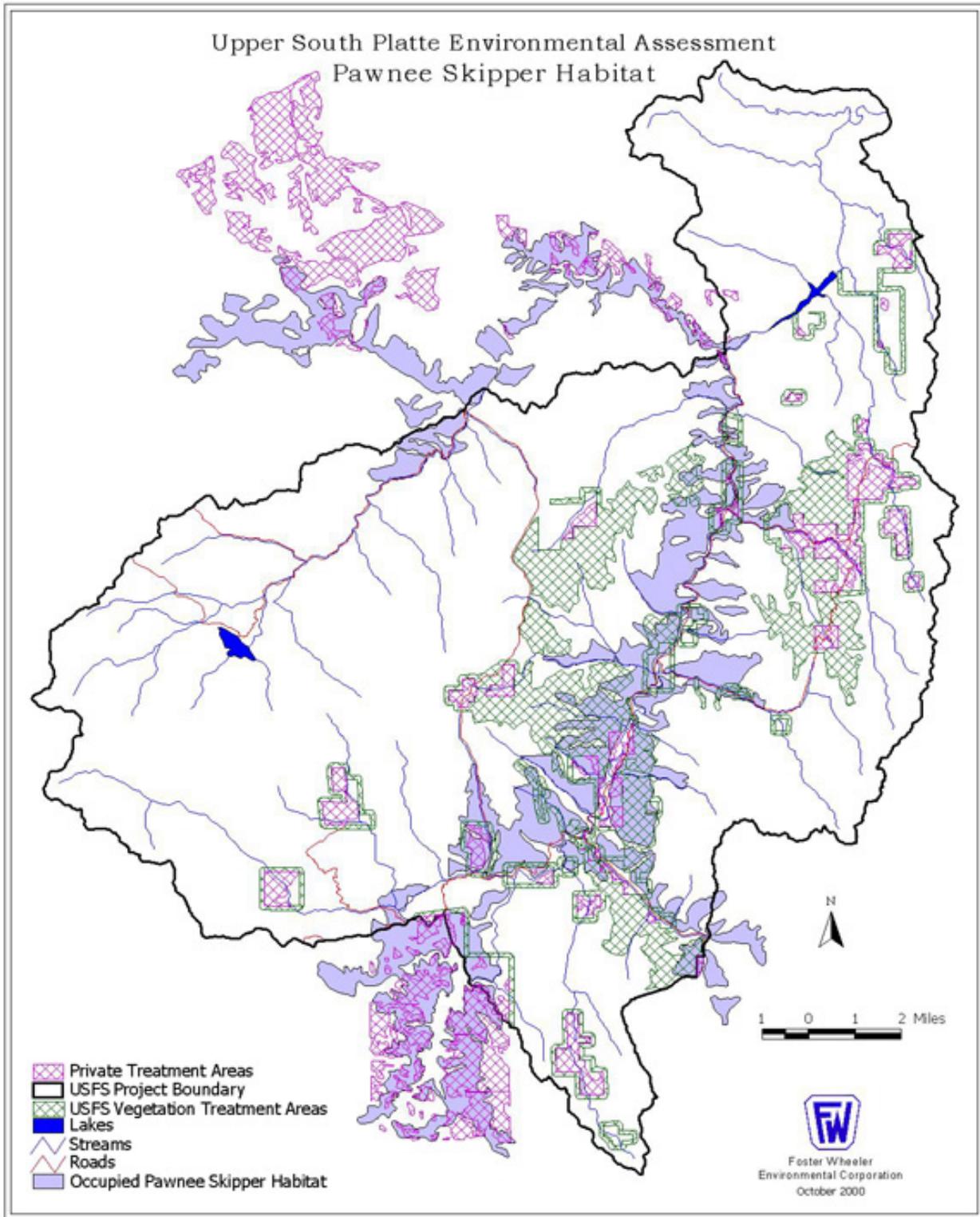
An extensive study of skipper presence and habitat was conducted in 1986 for the proposed Two Forks Reservoir (ERT, 1988; PEST and ERT, 1986). The Two Forks study area was stratified into 160-acre sampling blocks for distribution sampling. There were 310, 160-acre blocks that were available for sampling. Skipper presence was confirmed in 161 sampling blocks. The occupied skipper habitat identified from the 1986 study is shown with the vegetation treatment areas on Map 2. The total occupied skipper habitat identified in the 1986 study is 24,831 acres. Much of this identified habitat is considered suboptimal because of the dense canopy cover and sparse ground cover that resulted from past forest management activities. The occupied habitat in the USFS Project Area is 14,010 acres. Habitat for the skipper occurs in the USFS and CSFS Vegetation Treatment Areas.

#### **USFS PROPOSED ACTION**

The USFS Proposed Action (Alternative B from the EA) would create open ponderosa pine stands on 17,400 acres, of which 3,846 acres would be occupied skipper habitat (Table 1). The vegetation treatments and prescribed burning would also reduce the wildfire risk and the resulting open ponderosa pine stands would provide favorable habitat conditions for the skipper.

#### **PROPOSED ACTIONS ON OTHER LANDS**

Vegetation treatments include activity in skipper habitat by Denver Water, CSFS, and other private landowners. The distribution of ownership and activity proposed in skipper habitat is displayed in Table 1. An area of 3,319 acres of vegetation treatment may occur in skipper habitat. This acreage is inclusive of vegetation treatment to occur on Denver Water, state, and private lands. The CSFS has treated 215 acres of forest on Denver Water land in skipper habitat near at Cheesman Reservoir, in Deckers, and near Trumbull. The proposed activities would affect roughly 29 percent of the total skipper habitat.



Map 2. Occupied Pawnee Montane Skipper Habitat.



**Table 1. Land Ownership, Potential Treatment Areas, and Skipper Habitat.**

	Area in Skipper Habitat (acres)	Total Potential Treatment Areas (acres)
<b>Occupied Skipper Habitat</b>	24,831	NA
<b>USFS Vegetation Treatment Area</b>	3,846	17,400
<b>Potential Other Private Treatment Areas</b>	564	8,894
<b>Potential Denver Water Department Treatment Areas</b>	2,709	4,764
<b>Potential Treatment on State Lands</b>	46	243
<b>Total Potential Treatment</b>	7,165	31,364

## EFFECTS DISCUSSION

In 1998, the USFWS developed a recovery plan for the skipper (US Fish and Wildlife Service, 1998). The recovery plan lists general characteristics of skipper habitat as:

- ❖ **Tree canopy cover of 30 percent**
- ❖ **Ponderosa pine crown cover of 25 percent, Douglas fir crown cover of 5 percent**
- ❖ **Tree density of less than 120 trees/acre in the smallest size class (0 to 5 inches diameter breast high); overall tree density of less than 200 per acre**
- ❖ **Shrub and grass cover generally less than 10 percent**
- ❖ **Prairie gayfeather flower stem density ranging from 50 to 500/acre**
- ❖ **Blue grama cover 5 percent or less, present nearly everywhere**

The vegetation treatments would move forest conditions to more favorable habitat based upon the general habitat characteristics listed above. The vegetation treatments would convert areas of more closed (40–70 percent closure) tree canopy to 30 percent or less. The general habitat characteristics indicate that Douglas fir would be a minor component. The vegetation treatments would create mostly pure ponderosa pine stands and would target Douglas fir for removal. Tree density would be less than 100 trees per acre and only 25 small trees per acre. The shrub, grass cover, and flower densities would vary depending upon the site conditions following the vegetation treatments. However, the site conditions would be more favorable for establishment of good skipper habitat than the current condition. The vegetation treatments would have a risk of introduction or expansion of noxious and invasive weeds that would exclude prairie gayfeather and blue grama.

An examination of current skipper habitat conditions, the vegetation treatment areas, and the completed vegetation treatment area at Trumbull was conducted on July 19, 2000, to formulate conservation measures. The following conservation measures would minimize potential impacts to skippers and their habitat:

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- ❖ **Restrict openings in skipper habitat to 5 acres or less in size**
  - ❖ **Fell trees off of blue grama/prairie gayfeather areas where possible**
  - ❖ **Minimize the disturbance area with a prelogging survey to determine the best skid trails and forwarder routes; routes would be designated to avoid blue grama/prairie gayfeather areas**
  - ❖ **Limit blading of existing roads or access routes that are vegetated and within skipper habitat to a maximum of 4.0 acres (about 3 miles of road) on USFS land and 4.0 acres on private and state lands. To ensure that blading disturbs less than 8.0 acres of skipper habitat at any one time, bladed areas would be reclaimed immediately after treatments are completed.**
  - ❖ **Minimize slash on blue grama/prairie gayfeather areas**
  - ❖ **Minimize machine operations on blue grama/prairie gayfeather areas**
  - ❖ **Limit prescribed burning to 1,000 acres per year in skipper habitat with no more than 500 acres per year of contiguous skipper habitat.; stagger timing so that adjacent areas are burned with a minimum 2-year window for recovery time**
  - ❖ **Noxious weed treatments will include**
    - **Identifying weed concentration areas in and near harvest units**
    - **Pretreating weed concentrations mechanically or with herbicide during the optimum life stage for treatment, typically spring or fall**
    - **Washing equipment before it is brought into the harvest area**
    - **Avoiding machine operations through weed areas**
  - ❖ **Noxious weeds will be managed in accordance with the approved Integrated Weed Management Plan and associated conservation measures for protecting federally listed species (USFS and BLM 1998)**
  - ❖ **Use blue grama seed in the seed mixture used for road reclamation**
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The above conservation measures will help minimize the vegetation treatment effects on skippers. Females typically deposit their eggs in open areas with existing low tree cover and larger patches of blue grama. If harvesting equipment is kept off of these areas, then there would be minimal impacts. Prescribed burning would have the highest potential for effects.

The egg stage occurs in the summer when no prescribed burning would occur. Early spring would be best for prescribed burning because larval stage is down in the soil or in the basal clump of blue grama and therefore would have some thermal protection, and soil temperatures are low. Fall-prescribed burning would also allow similar protection of the larval stage. The blue grama/prairie gayfeather areas have few trees. Therefore, if slash is kept off blue grama/prairie gayfeather areas, the prescribed fire would not burn hot, or at all, because of lack of fuel.

Road reclamation activities present an opportunity to improve skipper habitat and populations. These roads likely do not currently function as skipper habitat. The use of blue grama seed in the revegetation effort would increase skipper habitat. Another potential benefit would be that if blue grama were established on these reclaimed roads they could serve as possible habitat connections between better habitat islands. The use of biosolids would help promote the establishment of blue grama (which is difficult to establish).

The Gill Trail project would have both positive and negative effects on skipper habitat. The expansion of the parking lot at the trailhead would permanently remove about 1 acre of skipper habitat. This habitat is



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## Biological Assessment

disturbed and is not high quality. A portion of the social trails that would be rerouted is in skipper habitat. The trail rerouting would minimize current human impacts to that habitat.

The Buffalo Creek burn area revegetation and riparian rehabilitation efforts proposed would have minimal but positive effects on skipper habitat. Areas that are proposed for ponderosa pine planting may become skipper habitat in the future. The use of biosolids would help promote revegetation efforts.

The proposed action would be consistent with the skipper recovery plan because skipper habitat would be created or marginal habitat improved on about 29% of the habitat known to be occupied by skippers. The long-term habitat trend would be positive; however, there may be some short-term impacts. During implementation of the vegetation treatments, falling trees and vehicle tires may crush larvae or adult butterflies and skidding may pull up or crush blue grama and gayfeather plants. The burning of slash may kill individual adult butterflies and larvae (particularly if the fire is a hot ground fire).

## MONITORING

Monitoring the effects of burns on known skipper areas would provide the feedback needed for adaptive management. The Buffalo Creek burn and the Trumbull site should be reviewed during the summer of 2000 flight season and in subsequent years. There is a monitoring opportunity because one of the 1986 transects appears to be partially in the Trumbull area where Denver Water completed vegetation treatments during the winter and early spring of 1999–2000. This area should be resurveyed to compare the conditions before and following treatment. Additional 1986 transects exist in proposed vegetation treatment areas on National Forest land.

A monitoring study was designed for the summer of 2000. The details of the plan are presented here, but subsequent monitoring may be modified to better meet the objectives.

### **Objectives, Study Area, and Study Design**

The objective of this study is to compare skipper butterfly use (measured by the number of adult butterflies seen within a known area) of untreated ponderosa pine woodland with butterfly use in thinned ponderosa pine woodland. Other habitat measurements (e.g., tree density, blue grama grass ground cover, prairie gayfeather density) will be conducted by the USFS to provide other indicators of habitat quality for this species.

The study area is defined as suitable skipper habitat within 3 square miles (T9S, R70W, Sections 15, 16, and 22) near the community of Trumbull. Portions of this study area were thinned during 2000, and these 3 square miles include more than 600 acres of suitable skipper habitat, based on the skipper habitat map included in the PEST and ERT (1986) skipper survey report. The study design consists of sampling skipper in treated, soon to be treated, and untreated habitat for statistical analysis purposes. Within each treatment type, three permanent 400-meter transects will be established. Each transect will be sampled once each day on three consecutive days. The total year 2000 sampling program consists of 27 sampling points (3 treatments × 3 transects per treatment × 3 sampling days per transect). To minimize potential habitat interactions on skipper behavior, the entire length of untreated transects will be located at least 400 feet away from treated (thinned) area boundaries.

### **Sampling Methods**

Skipper counts will follow the same sampling protocol used for the 1986 skipper census surveys. All skippers in the genus *Hesperia* (Pawnee montane skipper, comma skipper) will be counted within a belt transect 400 meters long by 10 meters wide (5 meters each side of the centerline). The centerline will be flagged frequently so that the observer can stay on the centerline. The belt will be subdivided into eight 50-meter subplots (staked or flagged at each 50-meter interval) so that skipper dispersion in the habitat



can be examined. The number of individual skippers observed in each subplot within the overall transect will be counted and entered onto a data sheet. The sex of each skipper individual, skipper behavior, and the microhabitat where the individual was observed will also be recorded. Skippers observed outside the belt plot will also be recorded.

Two observers will count skippers on three transects each per day between the hours of 0900 and 1300 under good weather conditions (sunny to light overcast, temperature between 70 and 85°F). Each observer will conduct trial transect walks to calibrate the distance between the centerline and the outer plot boundary so that a consistent sampling area can be maintained and to reliably identify skippers seen within the plot. Each observer will sample all six transects at least once and three transects twice. Documentary color photographs will be taken of each 400-meter plot at the beginning and mid point.

### Data Analysis

The primary statistical analysis will be to determine whether there are statistically significant differences ( $p = 0.05, 0.10$ ) in skipper numbers between treated and untreated plots. Depending on the outcome of the primary comparison, an analysis of the sources of variation in the data may be conducted to account for anomalies or to make recommendations for future changes in the program. The vegetation data collected by the USFS from each transect will be examined to identify factors that may have influenced the presence or absence of skippers (e.g., tree canopy cover and prairie gayfeather or other nectar plant occurrence).

## ADDITIONAL SKIPPER CONSERVATION MEASURES FOR CSFS VEGETATION TREATMENT AREAS

In addition to other conservation measures and design criteria that apply to all treatment areas, the following would apply to state and private treatment areas:

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- ❖ **New road construction to treatment areas within habitat occupied by Pawnee montane skipper would be limited to less than 4 miles of road that averages 12-foot wide (6 acres maximum disturbance). New roads would be aligned to avoid high-quality skipper habitat wherever possible. USFWS review of new roads within skipper habitat would be obtained before construction. The USFWS would be notified about construction of any short spur roads that are less than 500 feet long.**
  - ❖ **To ensure that new roads disturb less than 6 acres of skipper habitat at any one time, treatment area roads would be reclaimed immediately after treatments are completed. Reclamation would include grading to natural contours and seeding. Seed mix will be certified as being weed free and include blue grama. Roads would be considered reclaimed after 50 percent of potential ground cover is achieved.**
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## ANNUAL MEETING

An annual meeting would take place in the fall. The meeting would be a forum for discussion and coordination regarding the activities and the species addressed in this BA. All parties completing or planning to work on activities covered by this BA would be required to send a representative to this meeting. Agenda items would, at a minimum, include:



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- ❖ **Monitoring evaluation**
  - ❖ **Prescribed burning scheduling**
  - ❖ **Maintenance scheduling**
  - ❖ **Adaptive management lessons learned**
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## DETERMINATION

While the proposed action is likely to adversely affect skippers, the application of conservation measures is expected to offset these effects. Over the long term, the proposed action would have a very beneficial effect leading to habitat expansion and potential delisting of the skipper.

## Mexican Spotted Owl (*Strix occidentalis lucida*)

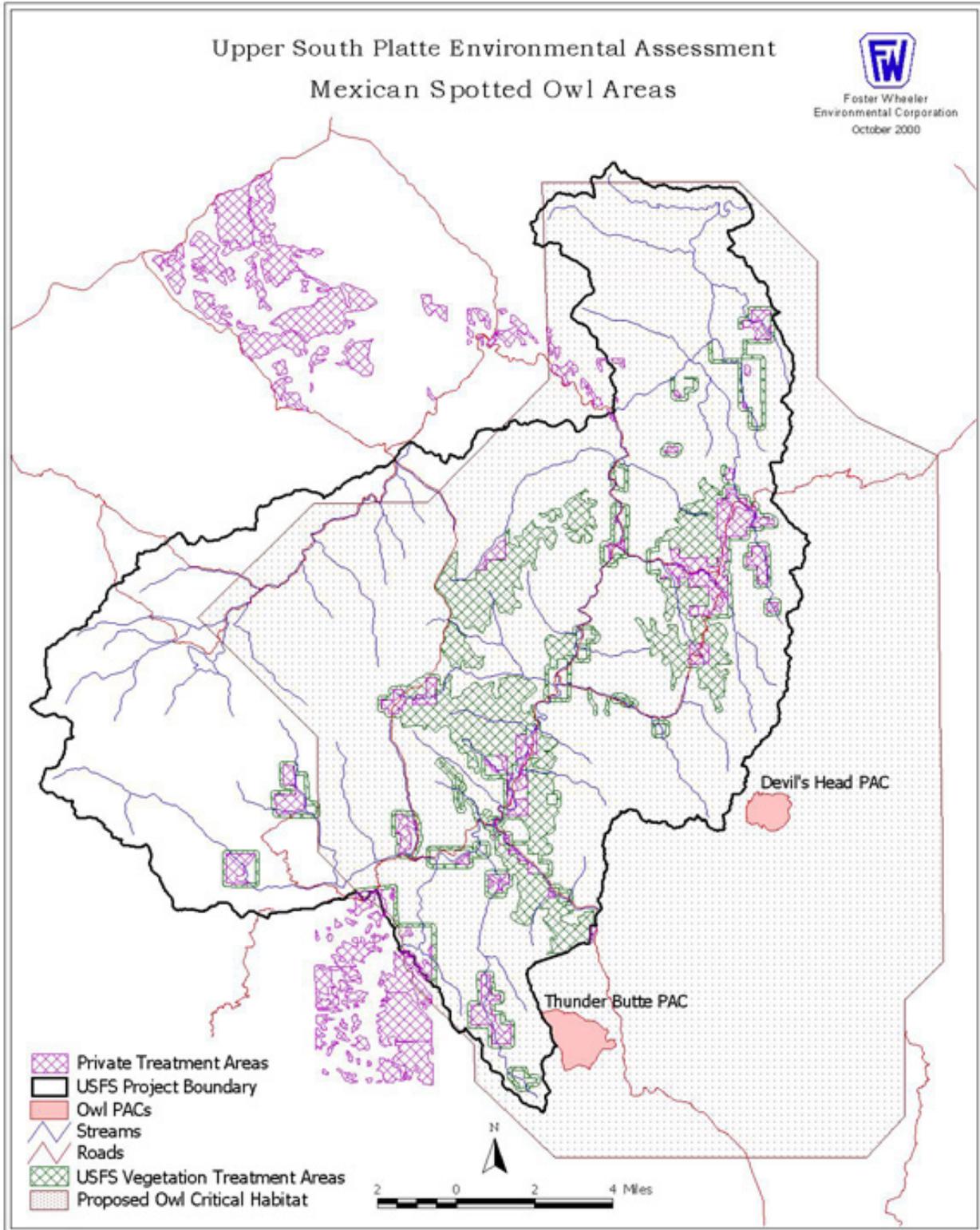
The Upper South Platte Watershed is at the northern extent of the range of the Mexican spotted owl. In this area, the owl occurs primarily in steep-walled, rocky canyons (USDI Fish and Wildlife Service, 1995). Further south in the owl's range, it occupies more diverse habitats. Nesting habitat also changes from caves and cliff ledges in steep-walled canyons in Colorado to mostly forested stands further south in New Mexico and Arizona (USDI Fish and Wildlife Service, 1995). All nests in Colorado found to date occur on cliff ledges or caves along canyon walls (USFS, 1994).

There have been some reports of mortality from great horned owls and golden eagles. However, it is not currently known what effects this predation may have on Mexican spotted owl populations (USDI Fish and Wildlife Service, 1995). The Mexican spotted owl has been observed in the Pikes Peak, South Platte, and San Carlos Ranger Districts. Preferred habitat includes deep rocky canyons, between bands of cliffs, steep slopes of mixed conifer or broad-leaf old-growth forest and sometimes in oak or spruce-fir forests (CBBA 1998). This species occupies two distinct habitats in Colorado (Reynolds, 1990): large, steep canyons with exposed cliffs and dense old-growth mixed forest of Douglas-fir, white fir, and ponderosa pine, and canyons in pinyon-juniper areas with small and widely scattered patches of old Douglas-firs (Barrows, 1981). Summer roost sites are in a cool microclimate, generally with a closed canopy and/or a north-facing slope (Andrew and Righter., 1992).

Mexican spotted owls were found adjacent to the Project Area in West Creek (Thunder Butte) and on Devils Head (Map 3) adjacent to the USFS Project Area. Distribution information from CNHP indicates that this owl has not been identified in any of the watersheds in the Project Area. However, suitable habitat for the species does occur within the project area. Critical habitat for the owl has been proposed and covers most of the USFS Project Area (Map 3). The western portion of the USFS Project Area is not designated as critical habitat.

Six distinct recovery units were designated in the recovery plan (USDI Fish and Wildlife Service, 1995). The Project Area for the Upper South Platte EA is in the Southern Rocky Mountains–Colorado recovery unit. Most of the Mexican spotted owl habitat in the Project Area fits into the ponderosa pine or mixed-conifer forest definitions in the recovery plan. Protected areas fall into three categories:

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- ❖ **Protected Activity Centers (PACs) for all known sites from 1989 through the life of the plan**
  - ❖ **All areas in mixed-conifer and pine-oak types with slopes >40 percent where timber harvest has not occurred in the past 20 years**
  - ❖ **All legally and administratively reserved lands**
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**Map 3. Mexican Spotted Owl PACs and Proposed Critical Habitat.**



## Biological Assessment

The USFS Proposed Action (Alternative B in the EA) would reduce the distribution of Douglas-fir and create more pure ponderosa pine stands. The Devil's Head and Thunder Butte PACs would not be affected. No legally or administratively reserved lands would be affected. The vegetation treatments would occur on moderate to flat slopes, and no cliffs or canyons would be impacted. There may be some areas of mixed-conifer on slopes greater than 40 percent where timber harvest has not occurred in the past 20 years in the vegetation treatment areas. However, these areas would not be harvested because they are on too steep of slopes.

The majority of the USFS vegetation treatments would occur in proposed owl critical habitat (Map 3 and Table 2). Within proposed critical habitat, no vegetation treatments (USFS or private) would be completed on ground that has greater than 40 percent average slope. However, there are small areas within the treatment area with greater than 40 slope that would be treated with prescribed fire. To increase prescribed fire effectiveness on these steeper slopes, some small trees may be felled to increase fuel levels. These fires would be ground fires that would not kill the large trees that create the microclimate that owls seem to prefer. Therefore, the proposed critical habitat would not be adversely impacted by the prescribed fires.

**Table 2. Land Ownership, Potential Treatment Areas, and Proposed Owl Critical Habitat.**

	Area in Owl Critical Habitat (acres)	Total Potential Treatment Areas (acres)
<b>USFS Vegetation Treatment Area</b>	16,880	17,400
<b>Potential Other Private Treatment Areas</b>	3,347	8,894
<b>Potential Denver Water Department Treatment Areas</b>	939	4,764
<b>Potential Treatment on State Lands</b>	0	243
<b>Total Potential Treatment</b>	21,166	31,364

## DETERMINATION

While the proposed vegetation treatment is likely to adversely affect Mexican spotted owls, the application of conservation measures is expected to offset these effects. Over the long term, the opening of the canopy would create better habitat for prey-base species, primarily small mammals such as rodents and rabbits, and would improve flight pathways and visual hunting zones for the birds. This proposed action also would decrease the long-term risk of catastrophic fire.

The road reclamation, trail access, and Buffalo Creek burn area rehabilitation subprojects would have no adverse effect on Mexican spotted owls or their habitat.

## Bald Eagle (*Haliaeetus leucocephalus*)

Habitats where bald eagles may occur include urban or built upland, cropland, orchards, tall grass prairie, grasslands, sagebrush, shrubland, aspen groves, Douglas-fir, lodgepole pine, ponderosa pine, blue spruce,



juniper woodland, open forest, wetlands, and subalpine meadows (Colorado Natural Diversity Information Service [NDIS], 1999). The bald eagle migrates in summer to northern breeding grounds but returns to lower latitudes during the winter. Winter habitat consists of roost trees along rivers and other large open bodies of ice-free waters that allow access to fish (USFS, 1994). Typical nesting sites include trees on reservoir edges, cottonwoods along rivers, and conifers near lakes or streams (CBBA, 1998). Bald eagles overwinter at Cheesman Lake and forage along the South Platte River.

Bald eagles have been observed roosting near Cheesman Reservoir. They generally roost in ponderosa pine or spruce-fir trees that are large and open enough for them to land on. Concentration areas have not been identified in the Cheesman area (Craig, 2000) but would consist of large trees on hillsides generally within ¼ mile of the reservoir. As a protective measure, vegetation treatment will not occur within a ½-mile buffer around the edge of the reservoir until better definitions of roost tree and concentration area characteristics are developed and appropriate roost avoidance and best management practices are defined and agreed upon by Denver Water and the USFWS.

## DETERMINATION

The eagle concentration areas surrounding Cheesman Reservoir need to be identified and temporarily buffered, as described above, until protective measures for eagle roost areas are established. Based on these considerations, the proposed action will have no effect on the bald eagle.

## **Preble's meadow jumping mouse (*Zapus hudsonius preblei*)**

The Preble's meadow jumping mouse (*Zapus hudsonius preblei*) is a small rodent in the family *Zapodidae* and is 1 of 12 recognized subspecies of the species *Z. hudsonius* (Federal Register, 1998a). All records of Preble's meadow jumping mouse are from southeastern Wyoming and eastern Colorado. Typically, the Preble's meadow jumping mouse subsists on seeds, small fruits, fungi, and insects and hibernates from October to May. This mouse is adapted for digging and creating nests of grasses, leaves, and woody material several centimeters below the ground. The Preble's meadow jumping mouse is primarily nocturnal or crepuscular but can be observed during daylight (Federal Register, 1998b).

Armstrong (1987) described typical Preble's meadow jumping mouse habitat as "well-developed plains riparian vegetation with relatively undisturbed grassland and a water source in close proximity." This mouse also shows a preference for "dense herbaceous vegetation consisting of a variety of grasses, forbs and thick shrubs" (Federal Register, 1998c).

Surveys conducted in 1999 by CNHP located the mouse at Ouzel Campground on the South Platte River and on Trout Creek, a tributary to the South Platte River (Schorr, 1999). A survey conducted along Bear Creek adjacent to and downstream from the Indian Creek Campground in the Pike National Forest in July 2000 showed presence of the Preble's meadow jumping mouse (Ruggles et al., 2000). Surveys were also conducted at the Wigwam Campground on September 9–11, 2000 (Meaney et al., 2000). One specimen has been tentatively identified as Preble's and was collected as a voucher specimen.

The USFWS proposed 4(d) regulations recommend a 300-foot buffer on each side of each stream's centerline or 300 feet from the exterior boundary of any contiguous wetlands, whichever is further (Federal Register, 1998d). It has been indicated that the 100-year floodplain may provide a more definitive boundary for protection of the Preble's meadow jumping mouse (Plage, 2000). Therefore, potential Preble's habitat within the project area will include all areas within a 300-foot buffer from the exterior boundary of the 100-year floodplain. This will include the South Platte River, perennial tributary streams, and intermittent streams that have well-developed riparian vegetation. Due to the potential presence of the Preble's meadow jumping mouse along the South Platte River and its main tributaries (Bear Creek), any proposed activity within the buffer would need to follow the conservation measures and



## Biological Assessment

design criteria presented below. The following conservation measures and design criteria would minimize or avoid potential impacts to the Preble's meadow jumping mouse and its habitat.

### CONSERVATION MEASURES FOR UPLAND PREBLE'S HABITAT

For treatment areas that contain suitable Preble's habitat, it will be assumed that the habitat is occupied. The following best management practices (BMPs) will be implemented to avoid harm of the species or its habitat:

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- ❖ **Treatment will occur during the Preble's hibernation period (October through April).**
  - ❖ **All shrub stands will be avoided by vehicles and associated logging equipment.**
  - ❖ **All riparian vegetation will be avoided.**
  - ❖ **Uprooting of trees by grubbing or other means will not take place.**
  - ❖ **During the annual meetings or prior to impact, USFS, Denver Water, CSFS, and USFWS will review treatment areas proposed for the upcoming season and identify any areas that are within potentially suitable or known occupied Preble's habitat. The USFWS, USFS, CSFS, and Denver Water will reach agreement on the habitat suitability prior to treatment of an area.**
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### CONSERVATION MEASURES FOR RIPARIAN PREBLE'S HABITAT

Disturbances to occupied riparian Preble's habitat shall not exceed 1 acre. To address potential access route impacts, the following steps shall be taken:

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- ❖ **Stream crossings will avoid riparian shrub habitat if possible.**
  - ❖ **If it is not possible to avoid riparian shrub habitat, efforts will be made to minimize disturbance of riparian shrub habitat.**
  - ❖ **Not more than 1/2 acre of riparian grass and shrub habitat types shall be impacted at any one time.**
  - ❖ **Once the access road is no longer needed to complete forest treatments, the access will be removed and the disturbance area reclaimed to predisturbance conditions within 3 years. If reestablishment of the natural vegetation on road areas is not completed in 3 years, further work may be needed and mutually coordinated at the annual meeting.**
  - ❖ **Willow cuttings used for riparian revegetation would only be cut and removed from Preble's habitat during their hibernation period. No willow clumps with roots will be removed from Preble's habitat.**
  - ❖ **During the annual meeting, Denver Water, USFWS, CSFS, and USFS will review any proposed access routes that would cause a disturbance to riparian Preble's habitat. The USFWS, Denver Water, CSFS, and USFS will come to a consensus on where the minimum impact to Preble's habitat for access routes will occur. It will be assumed that the riparian habitat is occupied unless trapping has been conducted that would indicate Preble's are not present.**
  - ❖ **If surveys are necessary, then they would be conducted in accordance with USFWS "Interim Survey Guidelines for Preble's Jumping Mouse," revised May 19, 1999.**
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The proposed parking area expansion at Wigwam Creek would impact approximately 0.3 acres of suitable Preble's habitat. To compensate for loss of habitat, the following conservation measures will be implemented before expanding the parking area:

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- ❖ **Revegetate all disturbed ground in the campground with plants that provide cover or food for Preble's**
  - ❖ **Design the parking lot to better use land adjacent to the existing paved highway and minimize the impact on land adjacent to Wigwam Creek**
  - ❖ **Restore damaged riparian vegetation on approximately 1 mile of Wigwam Creek upstream from the proposed parking area**
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The restoration site is located 3 miles upstream from the proposed parking area. It is at 7,400 feet in elevation. The riparian vegetation along this section has been damaged by forest visitors who park their vehicles close to the stream. The ground is compacted and denuded. Restoration will include fencing off the stream and riparian area to keep vehicles out, ripping compacted soil where needed, and revegetating disturbed sites with native vegetation. At least 0.45 acres of habitat will be restored. This provides a 1.5:1 ratio for mitigation.

#### DENVER WATER OPERATIONS, MAINTENANCE, AND IMPROVEMENT ACTIVITIES

Denver Water will install six toilets along the North Fork of the South Platte and the South Platte Rivers. Additionally, improvements to the parking lot and a boat take-out will be constructed at the confluence of the North Fork and the South Platte Rivers. Defensible space will be developed around the historic South Platte Hotel. Although trapping surveys at the confluence were negative for Preble's, these activities could disturb a maximum of 2,600 square feet of potential Preble's habitat. The following conservation measures will take place to minimize potential impacts to the Preble's:

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- ❖ **If suitable habitat is present at the ground disturbance areas, it will be assumed that the habitat is occupied.**
  - ❖ **Overall impacts will not exceed 2,600 square feet.**
  - ❖ **An attempt will be made to place infrastructure in areas that are not vegetated and therefore not habitat.**
  - ❖ **If this is not possible, attempts will be made to avoid shrub habitat.**
  - ❖ **After following these avoidance and minimization measures, any impacts to Preble's habitat will be mitigated at a 1.5:1 ratio. Mitigation will take place on site, if possible. If it is not possible to mitigate on site, Denver Water will locate the mitigation at another site on Denver Water property within the Upper South Platte watershed.**
  - ❖ **Any thinning of decadent willows conducted by the CSFS on Denver Water land will be done during the Preble's hibernation period. To protect any Preble's that may be present, willow roots and soils will not be disturbed by pruning activities.**
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#### DETERMINATION

While the proposed action is likely to adversely affect the Preble's meadow jumping mouse, the application of conservation measures is expected to offset these effects.



## **Ute ladies' tresses orchid (*Spiranthes diluvialis*)**

The Ute ladies' tresses orchid (*Spiranthes diluvialis*) is a federal threatened species. It has a flowering stalk about 14 inches tall rising from a basal rosette of leaves. At the upper few inches of the stalk are numerous small white flowers arranged in a helix (Colorado Native Plant Society, 1997). This orchid is found along the South Platte River drainage from the Front Range to the eastern plains. The orchid is found in seasonally moist soils and wet meadows near springs, lakes, or perennial streams and their associated floodplains below 6,500 feet elevation. Typical sites include old stream channels, abandoned meanders, alluvial terraces, subirrigated meadows, and other sites where soils are saturated to within 18 inches of the surface, at least temporarily, during the spring/summer growing season (USFS, 1994). Ute ladies' tresses orchids are not known to occur in the project area. The sandy well-drained soils common in the project area are considered poorly suited for Ute ladies' tresses orchid. Therefore, it is unlikely to be found within the project area (Johnston, 2000).

### **DETERMINATION**

Due to the lack of suitable soils, the Preble's conservation measures described above that would protect wet areas, and the lack of Ute ladies' tresses orchid observations in the project area, the proposed action would not affect the Ute ladies' tresses orchid.

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