RECLAMATION

Managing Water in the West

Windy Gap Firming Project

Wildlife Resources Technical Report

U.S. Department of the Interior
Bureau of Reclamation
Great Plains Region

August 2007

Wildlife Resources Technical Report

Windy Gap Firming Project

prepared by:

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WINDY GAP FIRMING PROJECT
WILDLIFE RESOURCES TECHNICAL REPORT

1.0 INTRODUCTION

The Bureau of Reclamation (Reclamation) has received a proposal from the Municipal Subdistrict, Northern Colorado Water Conservancy District, acting by and through the Windy Gap Firming Project Water Activity Enterprise (Subdistrict) to improve the firm yield from the existing Windy Gap Project water supply by constructing the Windy Gap Firming Project (WGFP). The proposal includes a connection of WGFP facilities to the Colorado-Big Thompson Project. For more information on the background and purpose of the WGFP see the Windy Gap Firming Project Purpose and Need Report (ERO 2005a). This technical report was prepared to address the potential environmental effects on wildlife associated with the alternatives described below and will be used in the preparation of the Environmental Impact Statement (EIS).

2.0 ALTERNATIVES

The Windy Gap Firming Project Alternatives Report (ERO 2005b) identified four action alternatives in addition to the No Action alternative for evaluation in the EIS. All action alternatives include development of 90,000 acre-feet (AF) of new storage in either a single reservoir on the East Slope, or a combination of East Slope and West Slope reservoirs. The Subdistrict's Proposed Action is the construction of a 90,000-AF Chimney Hollow Reservoir with prepositioning. The alternatives are—

- Alternative 1 (No Action) – Continuation of existing operations and agreements between Reclamation and the Subdistrict for conveyance of Windy Gap water through the Colorado-Big Thompson facilities including the enlargement of Ralph Price Reservoir by the City of Longmont
- Alternative 2 (Proposed Action) – Chimney Hollow Reservoir (90,000 AF) with prepositioning
- Alternative 3 – Chimney Hollow Reservoir (70,000 AF) and Jasper East Reservoir (20,000 AF)
- Alternative 4 – Chimney Hollow Reservoir (70,000 AF) and Rockwell/Mueller Creek Reservoir (20,000 AF)
- Alternative 5 – Dry Creek Reservoir (60,000 AF) and Rockwell/Mueller Creek Reservoir (30,000 AF)

Prepositioning, under the Proposed Action, involves the storage of Colorado-Big Thompson (C-BT) water in Chimney Hollow Reservoir. Windy Gap water pumped into Lake Granby would then be exchanged for C-BT water stored in Chimney Hollow Reservoir. Windy Gap water stored in Chimney Hollow Reservoir would be delivered and allocated to the WGFP Participants. This arrangement ensures temporary space in Lake Granby to introduce and store Windy Gap water. Total allowable C-BT storage would not change and the existing C-BT water rights and diversions would not be

expanded. To prevent the C-BT Project from expanding their diversions through prepositioning, total modeled C-BT storage in Lake Granby and Chimney Hollow Reservoir was limited to the capacity of Lake Granby, which is 539,758 AF. If this capacity limitation is reached, the model forces the C-BT Project to bypass water at Lake Granby. This water is then available for diversion at Windy Gap. Therefore, under prepositioning, C-BT diversions would not be expanded with respect to their current water rights and capacity limitations.

In addition to the action alternatives, a No Action alternative was identified based on what is reasonably likely to occur if Reclamation does not approve the connection of the new Windy Gap Firming Project facilities to C-BT facilities. Under this alternative, the existing contractual arrangements between Reclamation and the Subdistrict for storage and transport of Windy Gap water through the C-BT system would remain in place. All WGFP Participants in the near term would maximize delivery of Windy Gap water according to their demand, Windy Gap water rights, and C-BT facility capacity constraints, including availability of storage space in Lake Granby and the Adams Tunnel conveyance constraints. The City of Longmont would develop storage independently for firming Windy Gap water if the WGFP is not implemented. Most WGFP Participants indicate that, in the long term, they would seek other storage options, individually or jointly, to firm Windy Gap water because of their need for reliable Windy Gap deliveries and the substantial investment in existing infrastructure.

Those WGFP Participants that do not have a currently defined storage option would take delivery of Windy Gap water whenever it is available within the capacity of their existing water systems and delivery points under the terms of the existing Carriage Contract with Reclamation and the Northern Colorado Water Conservancy District (NCWCD). The WGFP Participants that would operate under this scenario include Broomfield, Central Weld County Water District, Erie, Evans, Fort Lupton, Greeley, Little Thompson Water District, Louisville, Loveland, Platte River Power Authority, and Superior. The City of Lafayette anticipates that it would withdraw from participating in the WGFP and dispose of existing Windy Gap units, and not pursue acquisition of future units if the WGFP is not constructed.

The City of Longmont indicates that it would develop storage facilities for Windy Gap water independently if Reclamation does not approve a connection of WGFP facilities to C-BT facilities. Longmont would evaluate the enlargement of the existing Ralph Price Reservoir (Button Rock Dam) located on North St. Vrain Creek, or Union Reservoir located east of Longmont. The enlargement of Ralph Price Reservoir by 13,000 AF would be Longmont's preferred option because Union Reservoir would not have sufficient capacity for Windy Gap water, and conveyance and distribution would be more efficient from a higher elevation reservoir.

Middle Park Water Conservancy District (MPWCD), under No Action, would continue to use Windy Gap water to provide augmentation flows for other water diversions in a manner similar to current operations. MPWCD can store up to 3,000 AF of Windy Gap water in Lake Granby each year if Windy Gap water can be diverted and storage space is available.

Detailed descriptions of the components and operation of the alternatives are included in the Draft Windy Gap EIS Alternatives Descriptions report (Boyle 2005).

3.0 STUDY AREAS

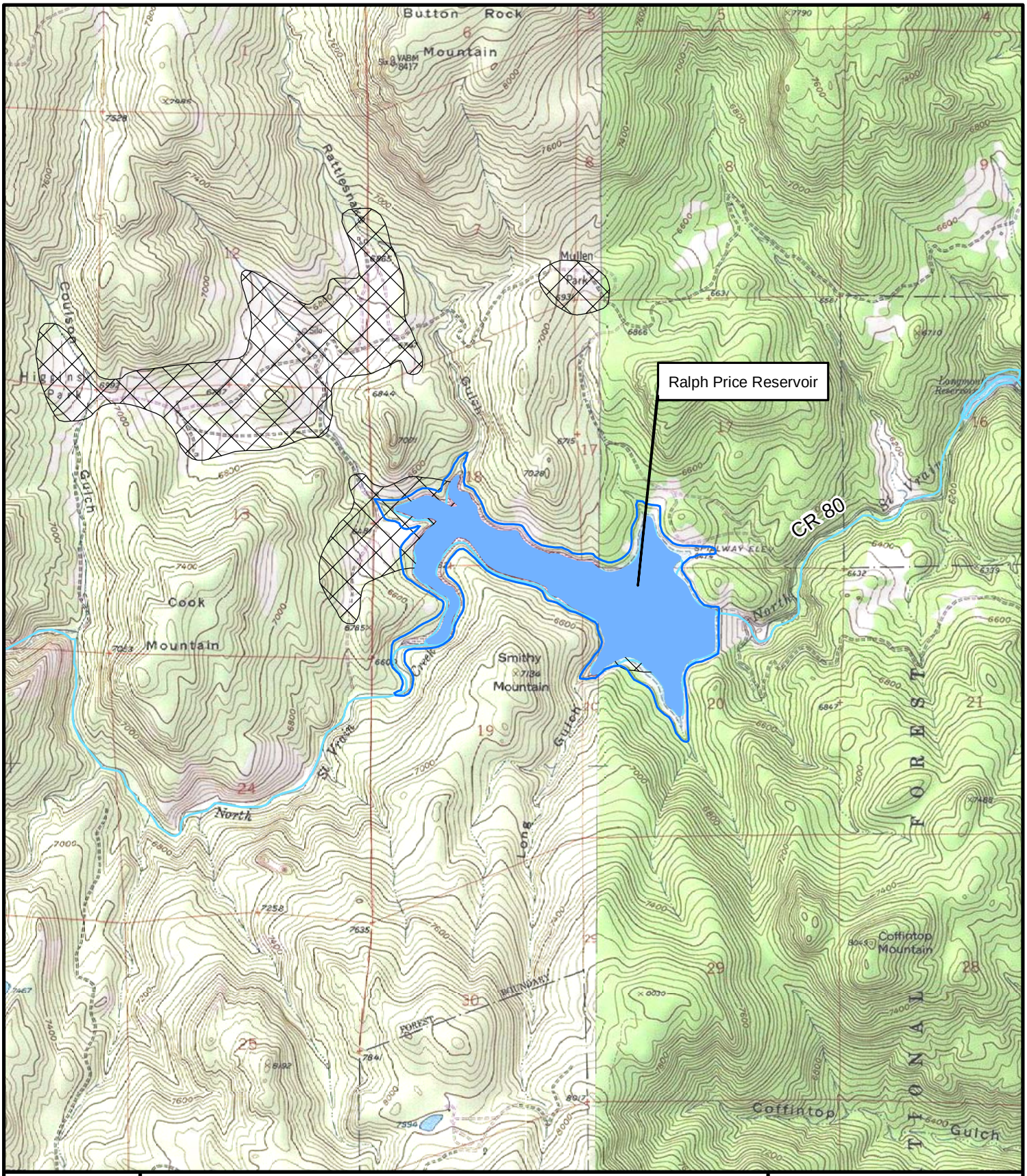
3.1. Ralph Price Reservoir Study Area

As part of the No Action alternative, Longmont has indicated that they would develop additional storage by enlarging Ralph Price Reservoir. Ralph Price Reservoir (Button Rock Dam) is located on North St. Vrain Creek, west of the town of Lyons in Boulder County in Sections 17, 18, 19, and 20, T5N, R70W in the Lyons, Colorado USGS Quadrangle (Figure 1) at an elevation of about 6,500 feet. Currently, the reservoir has a storage capacity of about 16,000 AF. The study area for the enlargement of Ralph Price Reservoir includes the potential area of additional inundation surrounding the reservoir including an enlarged dam, new spillway, and possible borrow areas that could provide material for dam enlargement. No new pipelines or other infrastructure is needed. The study area consists mostly of a mixture of ponderosa pine and Douglas-fir forest. North St. Vrain Creek, which flows into the reservoir from the west, is the primary source of water to the reservoir. Other small drainages, including Rattlesnake Gulch from the north and Long Gulch from the south, flow into the reservoir.

3.2. Chimney Hollow Study Area

The Chimney Hollow study area is in Larimer County in Section 33, T5N, R70W and Sections 4, 5, and 9 of T4N, R70W in the Carter Lake Reservoir, Colorado USGS Quadrangle map (Figure 2). The study area includes the Chimney Hollow Valley where the reservoir, dam, pipelines, roads, relocated transmission line, and other disturbances would occur. Chimney Hollow flows into Flatiron Reservoir located at the northeastern end of the site and Carter Lake is directly east on the other side of a hogback ridge. Average elevation at the Chimney Hollow study area is about 5,700 feet.

The Chimney Hollow study area occurs in a long north-south trending valley between a hogback ridge to the east and foothills to the west. Chimney Hollow is a small intermittent creek that flows through the center of the valley. Several ephemeral to intermittent tributaries drain from the west into the Chimney Hollow Creek. Ponderosa pine forests cover the foothills to the west with mostly native grasslands occurring in openings within the forest. Native and non-native grasslands cover the valley floor with riparian woodlands and shrublands occurring along the drainages. Native shrublands cover the slopes on the rocky hogback to the east. All water from Chimney Hollow Reservoir would go to either Carter Lake or Flatiron Reservoir for delivery to Horsetooth Reservoir through Colorado-Big Thompson canals. Outside of the direct effects of reservoir construction, there would be no effects on flows downstream of the reservoir or downstream riparian habitat.



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Ralph Price Reservoir Enlargement

Potential Borrow Areas

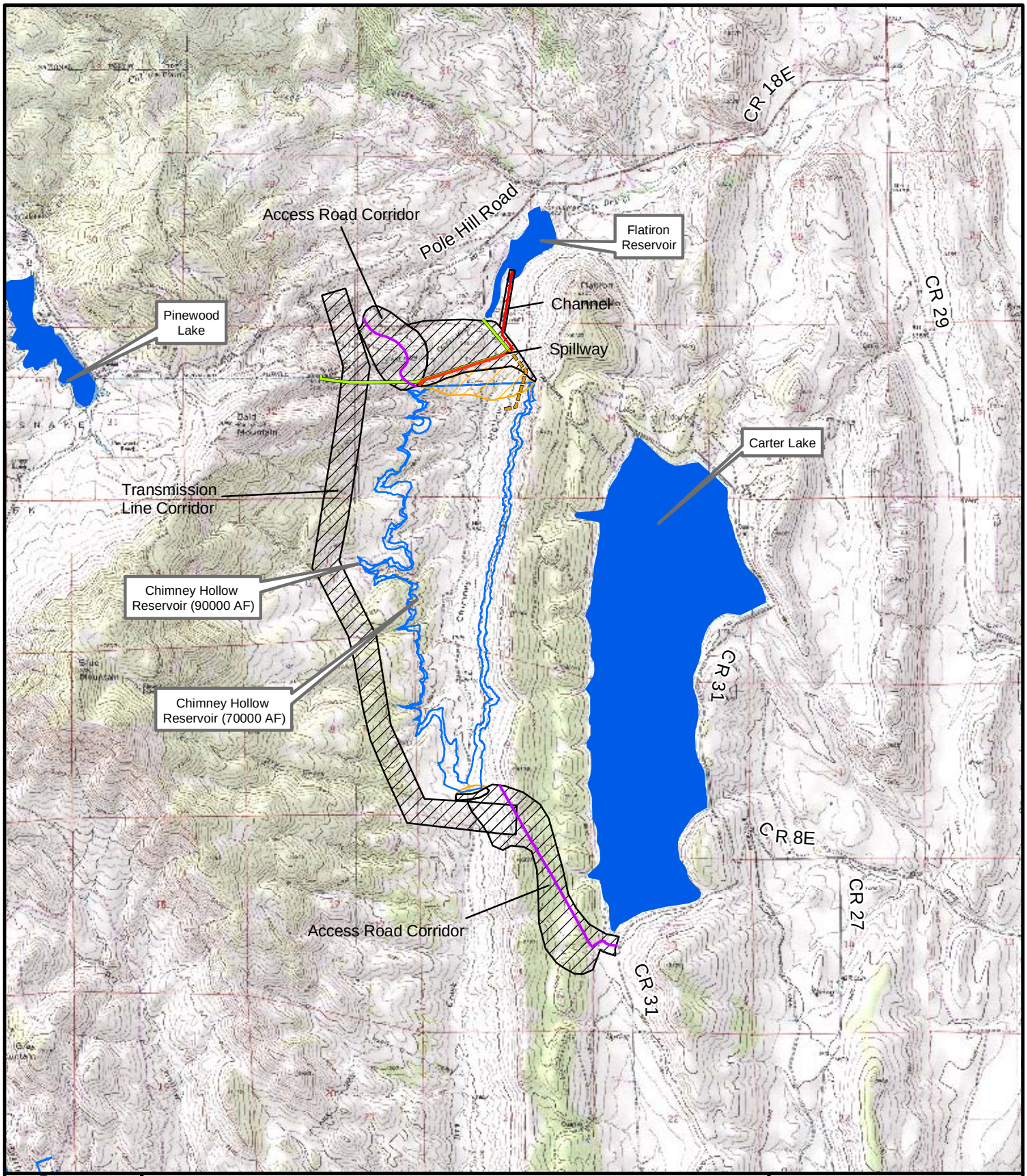
0 1,300 2,600 Feet

1 Inch = 2600 Feet

N

Figure 1
Ralph Price Reservoir Study Area

Prepared for: Windy Gap Firming Project
File: Ralph_Price_Reservoir_Study_Area.mxd
Date: March 2006



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New or Improved Access Road
Inlet - Outlet
Spillway/Channel
Pipeline
Potential Area of Disturbance
Reservoir
Dam

0 2,000 4,000 Feet

1 Inch = 4,000 Feet

N

Figure 2
Chimney Hollow Study Area

Prepared for: Windy Gap Firming Project
File: Chimney_Hollow_Wildlife_Study_Area.mxd
Date: March 2006

3.3. Dry Creek Study Area

The Dry Creek study area is located in Sections 16, 20, 21, and 28 in Larimer County on the Carter Lake Reservoir, Colorado USGS Quadrangle map (Figure 3). The study area includes the reservoir and dam and spillway, as well as pipeline connections to C-BT facilities through the Chimney Hollow Reservoir site and across the hogback to Carter Lake, and proposed access roads.

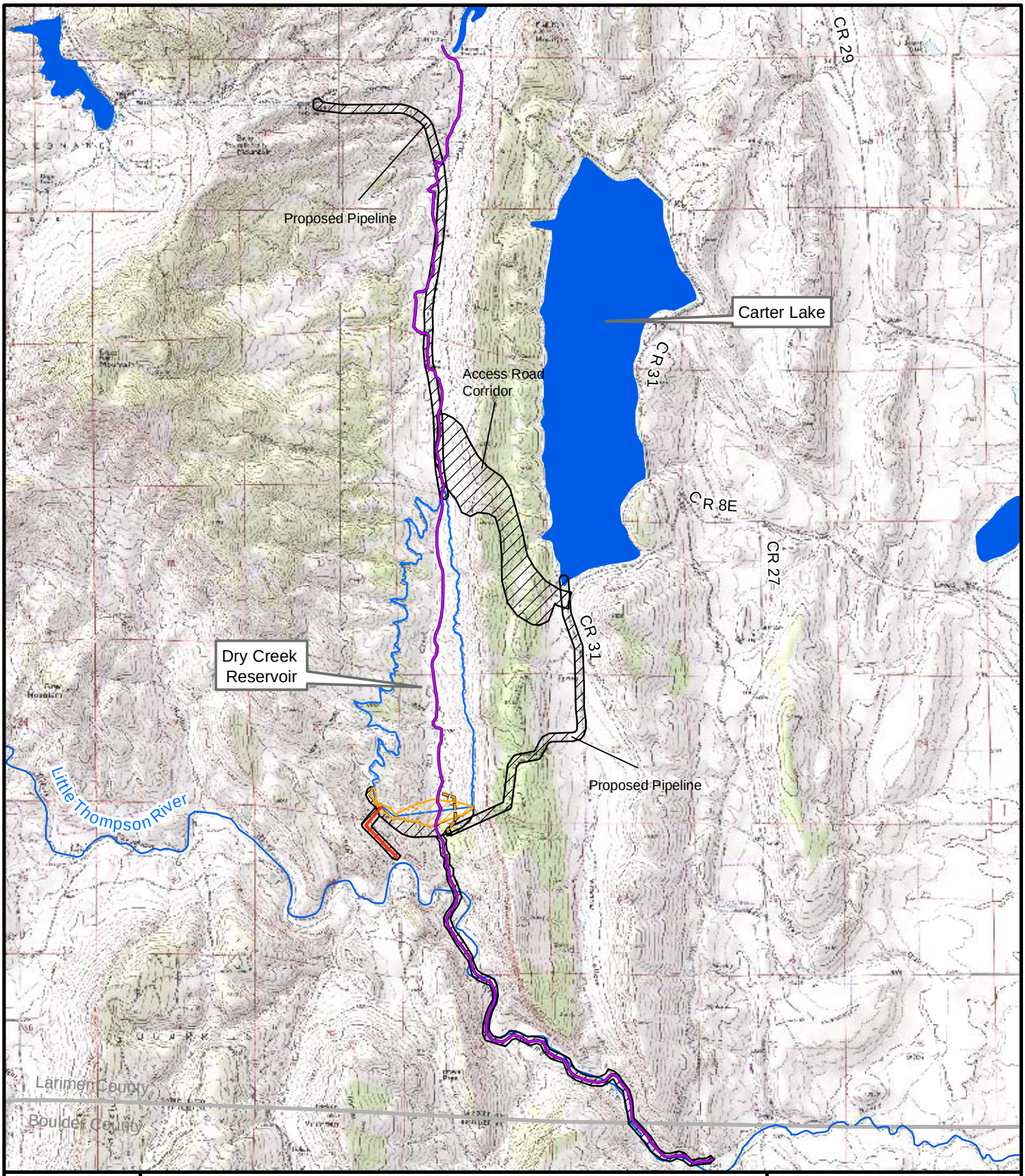
The Dry Creek study area is located in the valley south of the Chimney Hollow Reservoir site separated by a gentle saddle. Dry Creek, a tributary to the Little Thompson River, flows south through the center of the valley. Several small, intermittent or ephemeral tributaries from the foothills to the west and the hogback to the east flow into Dry Creek. The forests, shrublands, and grassland vegetation in the Dry Creek study area are similar to the Chimney Hollow study area.

3.4. Jasper East Study Area

The Jasper East study area is located in Grand County in Sections 8, 9, 16, and 17, T2N, R76W on the Trail Mountain, Colorado Quadrangle at elevations ranging from about 8,100 feet to 8,200 feet (Figure 4). The study area for the Jasper East Reservoir includes the area encompassing the project facilities including the new reservoir, dam and spillway, a new pipeline to the existing Windy Gap pipeline, the relocation of the Willow Creek pump station, canal and forebay, and new or realigned roads. Also included are the immediately adjacent lands that would be temporarily affected during construction. The Jasper East study area consists mainly of flood-irrigated meadows bordered by areas of sagebrush shrublands and stands of lodgepole pine at higher elevations. An intermittent unnamed tributary to Church Creek flows from east to west through the Jasper East study area. Natural flows in the tributary are supplemented by irrigation return flow and seepage from the Willow Creek Pump Canal and forebay. The property is currently used for livestock grazing and hay production.

3.5. Rockwell/Mueller Creek Study Area

The Rockwell/Mueller Creek study area is located in Grand County in Section 1 of T2N, R77W, and Sections 1 and 12 of T1N, R76 ½W, and an unsurveyed area (Figure 5). The study area for the Rockwell/Mueller Creek Reservoir includes the area encompassing the project facilities, including a pipeline to Windy Gap Reservoir and immediately adjacent lands that would be temporarily affected during construction. Elevations in the study area range from about 8,000 feet to about 8,200 feet. The Rockwell/Mueller Creek study area consists mainly of big sagebrush shrublands, with areas of lodgepole pine forest, meadow, and wetland and riparian areas. Two reservoir sizes, 20,000 AF and 30,000 AF, were investigated in the Rockwell/Mueller Creek study areas.



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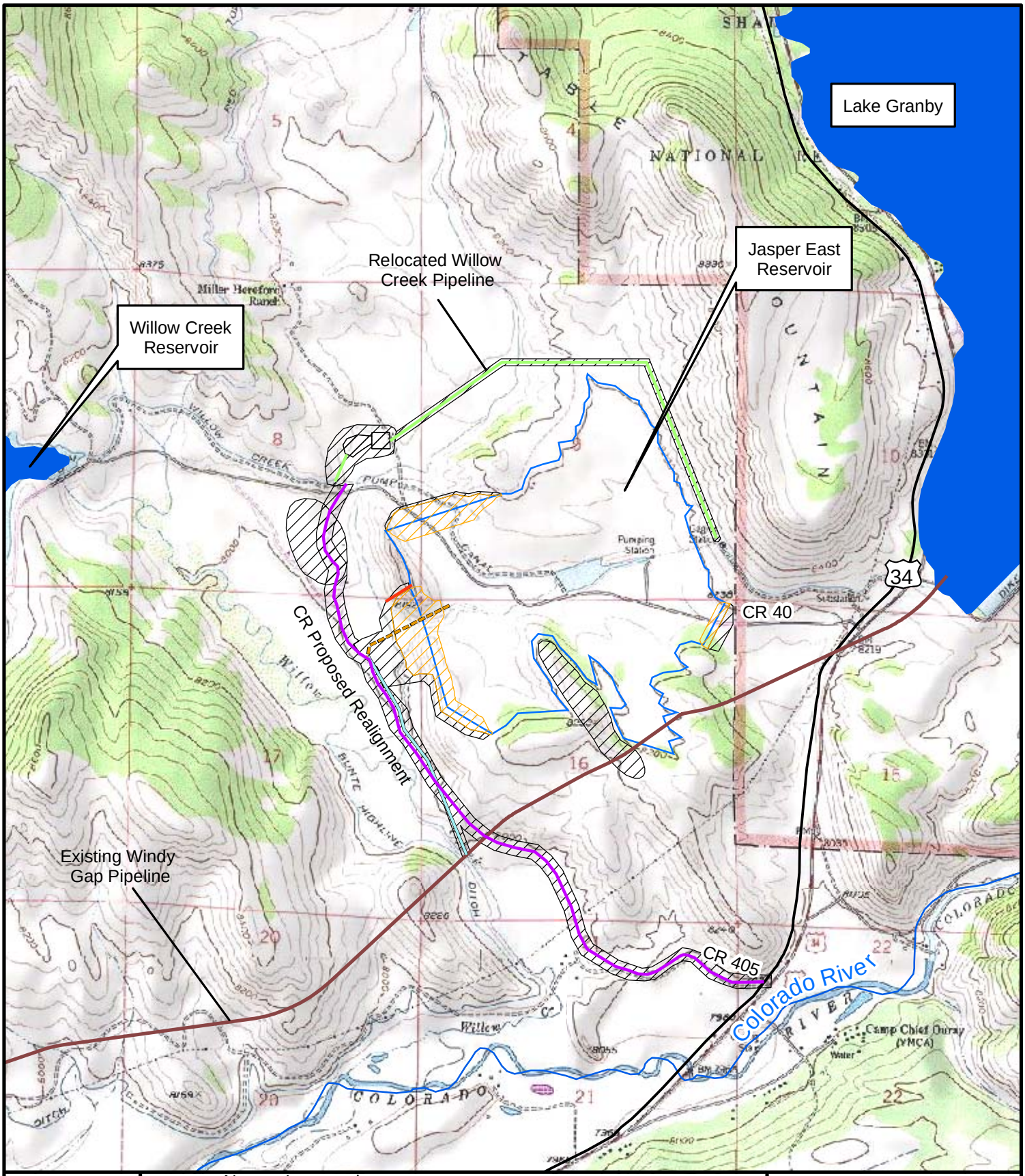
New or Improved Access Road
Inlet - Outlet
Spillway
Potentail Area of Disturbance
Reservoir
Dam
County Boundary

0 2,300 4,600 Feet
1 Inch = 4,600 Feet
N

Figure 3
Dry Creek Study Area

Prepared for: Windy Gap Firming Project
File: Dry_Creek_Wildlife_Study_Area.mxd
Date: March 2006



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New or Improved Access Road
New Pipeline
Inlet - Outlet
Spillway
Potential Area of Disturbance
Reservoir
Dam

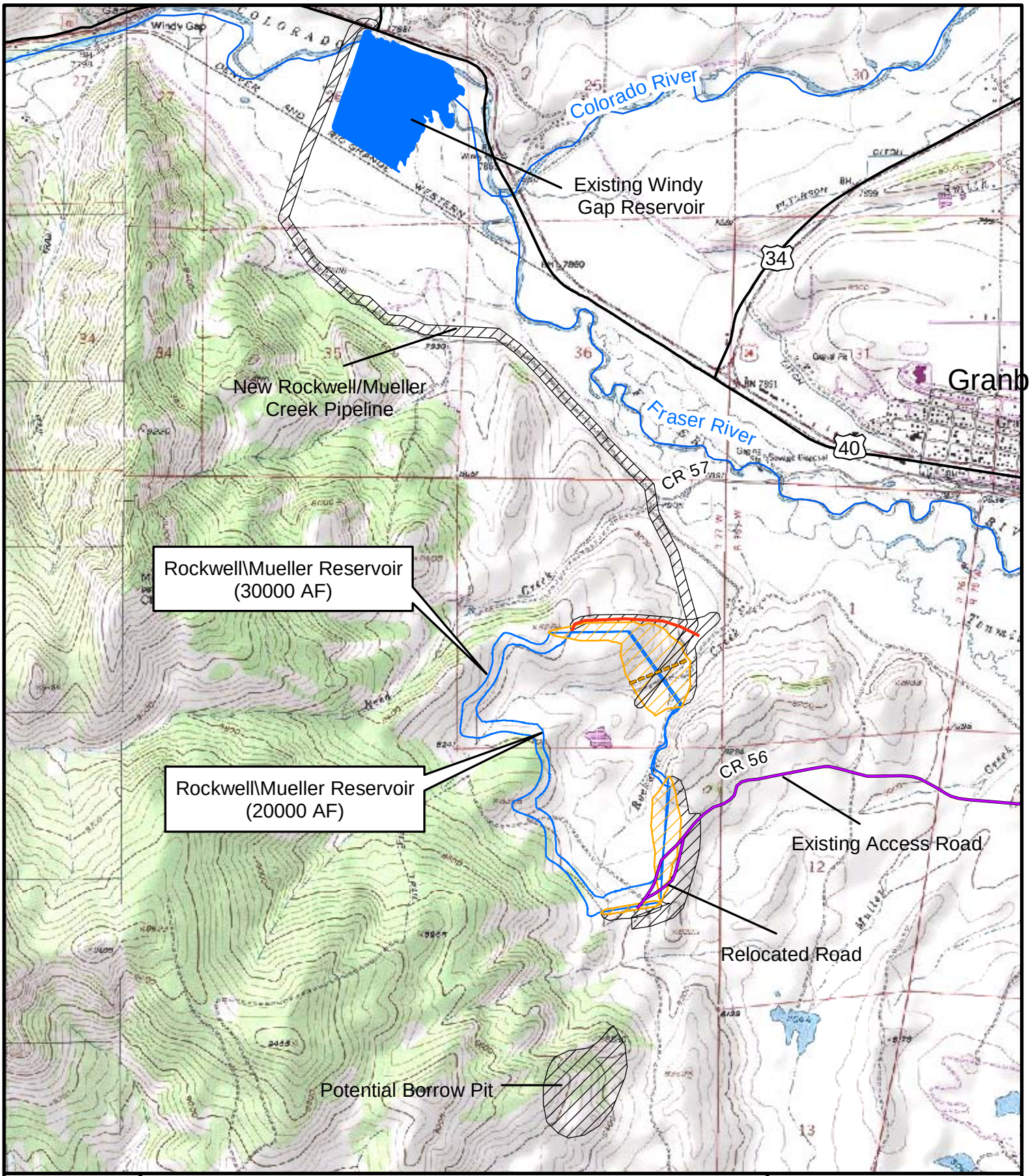
0 1,100 2,200 Feet

1 Inch = 2,200 Feet

N

Figure 4
Jasper East Study Area

Prepared for: Windy Gap Firming Project
File: Jasper_East_Wildlife_Study_Area.mxd
Date: March 2006



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New or Improved Access Road
Inlet - Outlet
Spillway
Potential Area of Disturbance
Reservoir
Dam

0 1,300 2,600 Feet

1 Inch = 2,600 Feet

N

Figure 5
Rockwell/Mueller Creek Study Area

Prepared for: Windy Gap Firming Project
File: Rockwell_Wildlife_Study_Area.mxd
Date: March 2006

4.0 OBJECTIVES

The purpose of this wildlife technical report is to characterize the affected environment and identify potential environmental effects to terrestrial wildlife resources associated with the proposed Windy Gap Firming Project alternatives. Aquatic resources are addressed in the Aquatic Resource Technical Report (Miller 2007). Plant species are addressed in the Vegetation Resources Technical Report (ERO 2006a). The information gathered in the technical report will be summarized in the EIS for the proposed project.

5.0 REGULATORY FRAMEWORK

Federally threatened and endangered species are protected under the Endangered Species Act (ESA) of 1973 as amended (16 U.S.C. 1531 et seq.). The ESA defines an endangered species as "a species in danger of becoming extinct throughout all or a large portion of its range" and a threatened species as "a species likely to become endangered in the foreseeable future" (ESA 50 CFR 17.3). Section 4 of the ESA prohibits "take" of any federally listed species. Take is defined as to harm, harass, pursue, hunt, shoot, wound, kill, trap, capture, or collect wildlife being addressed. Potential effects to a federally listed species or its habitat resulting from a project with a federal action require consultation with the U.S. Fish and Wildlife Service (FWS) under Section 7 of the ESA.

Wildlife species not listed as federally threatened or endangered are not protected under any federal jurisdiction, but are protected under Colorado Statute 33 (Colo. Rev. Stat. Ann. §§ 33-1-101-124), which defines the state's policy to protect, preserve, enhance, and manage wildlife and their environment. According to Statute 33, which is regulated by the Colorado Division of Wildlife (CDOW), the state must maintain a list of species determined to be threatened or endangered within the state. The CDOW also maintains a list of species of concern, but these are not protected under Statute 33. Also under Statute 33, the Colorado Wildlife Commission issues regulations and develops management programs for Colorado species, both game and non-game, which are then implemented by the CDOW. Take of game species, such as deer, elk, pheasant, quail, and some species of waterfowl, is permitted through a hunting license. Take of non-game species, such as small mammals, birds, and reptiles, is permitted for specific activities such as scientific collecting. Bats, mice (except federally listed species), possums, voles, rats, and ground squirrels may be captured or killed when creating a nuisance or causing property damage.

Migratory birds, including raptors, and any active nests are protected under the Migratory Bird Treaty Act (MBTA). The MBTA prohibits activities that may harm or harass migratory birds. While destruction of a nest by itself is not prohibited under the MBTA, nest destruction that results in the unpermitted take of migratory birds or their eggs is illegal and fully prosecutable under the MBTA (Migratory Bird Permit Memorandum, U.S. Fish and Wildlife, April 15, 2003). The regulatory definition of a take under the MBTA means to pursue, hunt, shoot, wound, kill, trap, capture, or collect; or attempt to pursue, hunt, shoot, wound, kill, trap, capture, or collect. In Colorado, most birds except for European starling (*Sturnus vulgaris*), house sparrow (*Passer domesticus*), rock dove (*Columbia livia*) (pigeon), and grouse or pheasant species (Order: *Galliformes*) are

protected under the MBTA (§§ 703-712). Additionally, Executive Order 13186, signed by President Clinton in 2001, directs federal agencies to take certain actions to implement the MBTA (86 FR 3853). Compliance with the MBTA requires the following:

- While destruction of a nest by itself is not prohibited under the MBTA, nest destruction that results in the unpermitted take of migratory birds or their eggs is illegal and fully prosecutable under the MBTA (Migratory Bird Permit Memorandum: Steve Williams, Director U.S. Fish and Wildlife Service, April 15, 2003). Thus, the nest or nest trees cannot be removed or destroyed during the breeding season (generally March through July).
- Take of an active nest site requires obtaining a nest depredation permit from the Migratory Bird Office of the U.S. Fish and Wildlife Service.
- Nests or nest trees that will eventually be removed can be removed during the non-breeding season to preclude nesting.
- Habitat-disturbing activities (such as tree removal, grading, scraping, and grubbing) should be conducted in the non-breeding season (August through February) to avoid disturbing (or take) of a migratory bird nest, including ground-nesting species.

Originally passed in 1940, the Bald Eagle Protection Act (Act) includes several prohibitions not found in the MBTA, such as molestation or disturbance. In 1962, the Act was amended to include the golden eagle. Currently, the Act imposes criminal and civil penalties on anyone (including associations, partnerships, and corporations) in the United States or within its jurisdiction who, unless excepted, takes, possesses, sells, purchases, barters, offers to sell or purchase or barter, transports, exports, or imports at any time or in any manner a bald or golden eagle, alive or dead; or any part, nest, or egg of these eagles.

Potential removal or disturbance of any active raptor or migratory bird nests may require consultation with the FWS.

The Colorado Natural Heritage Program (CNHP) maintains a list and ranking of rare and imperiled wildlife and plant species in Colorado. CNHP-monitored species generally include federal- and state-listed endangered species, as well as other species of concern. CNHP-listed species have no formal regulatory status or protection.

6.0 METHODS

ERO Resources Corporation (ERO) biologists conducted site reviews of the Ralph Price Reservoir, Jasper East, Chimney Hollow, and Dry Creek study areas for wildlife resources between August 2003 and August 2005. Information on the Rockwell/Mueller Creek study area was gathered from secondary sources and observations from public roads because access to the privately owned property was denied. Wildlife resource data were gathered on field observations and from consultation with various agencies (FWS, CDOW, and U.S. Forest Service). Potential habitat was identified on aerial photography, published reports, and database searches (Colorado Natural Diversity Information Source

(CNDIS) and CNHP). The study area included a 3-mile buffer around potential reservoir sites and project facilities.

ERO has divided wildlife resources addressed in this technical report into five categories: federal endangered, threatened, and candidate species; state endangered and threatened species, and species of special concern; CNHP-listed species; migratory birds and raptors; and large game and other wildlife. These categories are outlined below. Appendix A includes a list of common and scientific species names.

6.1. Federally Listed Endangered, Threatened, and Candidate Species, and Designated Critical Habitat

ERO identified potential habitat for federal endangered, threatened, and candidate terrestrial wildlife species in the study areas protected under the ESA. Data on federally listed species with potential to occur in the study areas were gathered from the FWS (2006). The FWS maintains lists of the federally listed threatened, endangered, proposed, and candidate species with potential to occur in each county along with maps of designated and proposed critical habitat.

6.2. State-Listed Endangered and Threatened Species, and Species of Special Concern

ERO identified potential habitat for state endangered and threatened species, and species of special concern with potential to occur in the study areas. Data on state species of special concern with potential to occur in the study areas were gathered from the CDOW.

6.3. Colorado Natural Heritage Program Species

ERO identified potential habitat for species identified by the CNHP as rare or imperiled. CNHP-tracked wildlife species are ranked according to their relative abundance in Colorado and globally, and includes species not included on state and federal lists of threatened or endangered species. A CNHP database search was conducted to identify records of CNHP-tracked species near the study areas.

6.4. Migratory Birds and Raptors

ERO mapped visible migratory bird and raptor nests within the study areas. Trees within the study areas that could be directly disturbed by construction or inundation were searched for raptor nests using binoculars or a spotting scope. Nests were evaluated based on size, nest materials, location within trees, overall nest condition, and nest construction characteristics to provide an indication of recent activity and species occupancy. The potential for ground- and shrub-nesting species to occur within the study areas was addressed based on habitat and vegetation mapping. Although a survey was conducted, it is possible that raptors and other migratory birds may build new nests and abandon nests over time. ERO also evaluated existing C-BT reservoirs and potential new reservoir sites and associated facilities for impacts—both beneficial and adverse—to waterfowl, shorebirds, and other migratory birds associated with lake shore and riverine vegetation and habitats.

6.5. Large Game and Other Wildlife

ERO reviewed the potential reservoir sites and associated facilities for large game, small game, and non-game wildlife resources. Information on wildlife resources was based on field observations and potential wildlife habitat identified on aerial photography, published reports, discussions with CDOW District Wildlife Managers, and CNDIS database searches.

Important seasonal habitat, wildlife migration corridors, and concentration areas for game and non-game wildlife were determined for the study areas using the CNDIS database. Large game mammals in Colorado evaluated included mule deer, elk, white-tailed deer, black bear, mountain lion, bighorn sheep, moose, and pronghorn.

The effects to waterbirds (waterfowl, wading birds, and shorebirds) and aquatic and riverine mammals from changes in flows or fluctuating water levels in reservoirs and rivers were based on expected changes in riparian vegetation presented in the Vegetation Technical Report (ERO 2006a). Effects to riparian vegetation from changes in streamflow focused primarily on changes in streamflow on the Colorado River and Willow Creek below Willow Creek Reservoir. Changes in reservoir water levels at Lake Granby, Horsetooth Reservoir, and Carter Lake were evaluated for the potential effect on shoreline riparian vegetation. Water surface elevations at Shadow Mountain Reservoir, Grand Lake, and Willow Creek Reservoir would not vary from Existing Conditions under any alternative; therefore, no analysis of effects to riparian vegetation and associated wildlife communities at these three reservoirs was conducted. The projected changes in riparian vegetation on East Slope streams from additional wastewater return flows, and changes in streamflow in the Big Thompson River below Lake Estes, North St. Vrain Creek, and St. Vrain Creek were evaluated based on available hydrologic data.

7.0 AFFECTED ENVIRONMENT

7.1. Federally Listed Endangered, Threatened, and Candidate Species, and Designated Critical Habitat

Federally listed threatened and endangered species and designated critical habitat are protected under the Endangered Species Act of 1973 as amended (16 U.S.C. 1531 et seq.). Adverse effects to a federally listed species would require consultation with the FWS under Section 7 of the ESA.

Table 1 includes federally listed threatened, endangered, and candidate species that the FWS has identified as potentially occurring in Grand, Larimer, and Boulder counties (FWS 2006; CDOW 2007a). ERO evaluated the suitability of habitat at each study area and then rated the potential for a species to occur. The following sections discuss the potential for threatened or endangered species to occur within the West Slope study areas (Jasper East and Rockwell/Mueller Creek) and East Slope study areas (Chimney Hollow, Dry Creek, and Ralph Price Reservoir) (Table 1).

Table 1. Federally listed endangered, threatened, and candidate terrestrial species in Boulder, Grand, and Larimer counties potentially occurring in each study area.

Common Name	Habitat in County‡	Federal Status	Suitable Habitat Present				
			Jasper East	Rockwell/ Mueller Creek	Chimney Hollow	Dry Creek	Ralph Price
Birds							
Bald eagle	B, G, L	Delisted	2	2	2	2	2
Least tern†	B, L	Endangered	0	0	0	0	0
Mexican spotted owl	B, L	Threatened	0	0	0	0	0
Piping plover†	B, L	Threatened	0	0	0	0	0
Whooping crane†	B, L	Endangered	0	0	0	0	0
Yellow-billed cuckoo	G	Candidate	0	0	0	0	0
Mammals							
Black-footed ferret	L	Endangered	0	0	0	0	0
Canada lynx	B, G, L	Threatened	0	1	0	0	0
Preble's meadow jumping mouse	B, L	Threatened	0	0	0	0	0

0 – No habitat
1 – Limited habitat present, species unlikely to occur
2 – Potential summer or winter foraging habitat
3 – Potential breeding and foraging habitat
†Water depletions in the South Platte River may affect species or habitat downstream on the Platte River in Nebraska
‡B = Boulder County; G = Grand County; L = Larimer County
Source: FWS 2006.

The interior least tern, piping plover, and whooping crane are species that are potentially affected by water depletions of the South Platte River. All of the WGFP alternatives import water from the West Slope to the East Slope, which potentially increase flows in the South Platte River. Critical habitat has been designated for the whooping crane and piping plover, but no designated or proposed critical habitat exists within the study areas (43 FR 36588, 67 FR 57637). No critical habitat has been designated for the least tern. Because none of the alternatives would result in water depletions in the South Platte River, there would be no effect to any of these species or their designated critical habitat.

7.1.1. Bald Eagle

7.1.1.1. Species Background

The bald eagle is a large North American bird with a historical distribution throughout most of the United States. The bald eagle was listed as an endangered species in 1978. Population declines were attributed to habitat loss, the use of organochlorine pesticides, and mortality from shooting. Since listing, the population trend for the bald eagle has been increasing. The FWS delisted the bald eagle on August 8, 2007 because

the population is recovering. It will continue to be protected under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. There is no critical habitat designated or proposed for the bald eagle. Essential breeding habitat and wintering areas have been defined and described in the Northern States Bald Eagle Recovery Plan (NSBERT 1983).

Bald eagles are primarily winter residents in Colorado; however, nesting in Colorado has steadily increased in recent years. Most nesting in Colorado occurs near lakes or reservoirs or along rivers. Typical bald eagle nesting and roosting habitat consists of forests or wooded areas that contain many tall, aged, dying, and dead trees (Martell 1992).

7.1.1.2. Potential Habitat

West Slope Study Areas

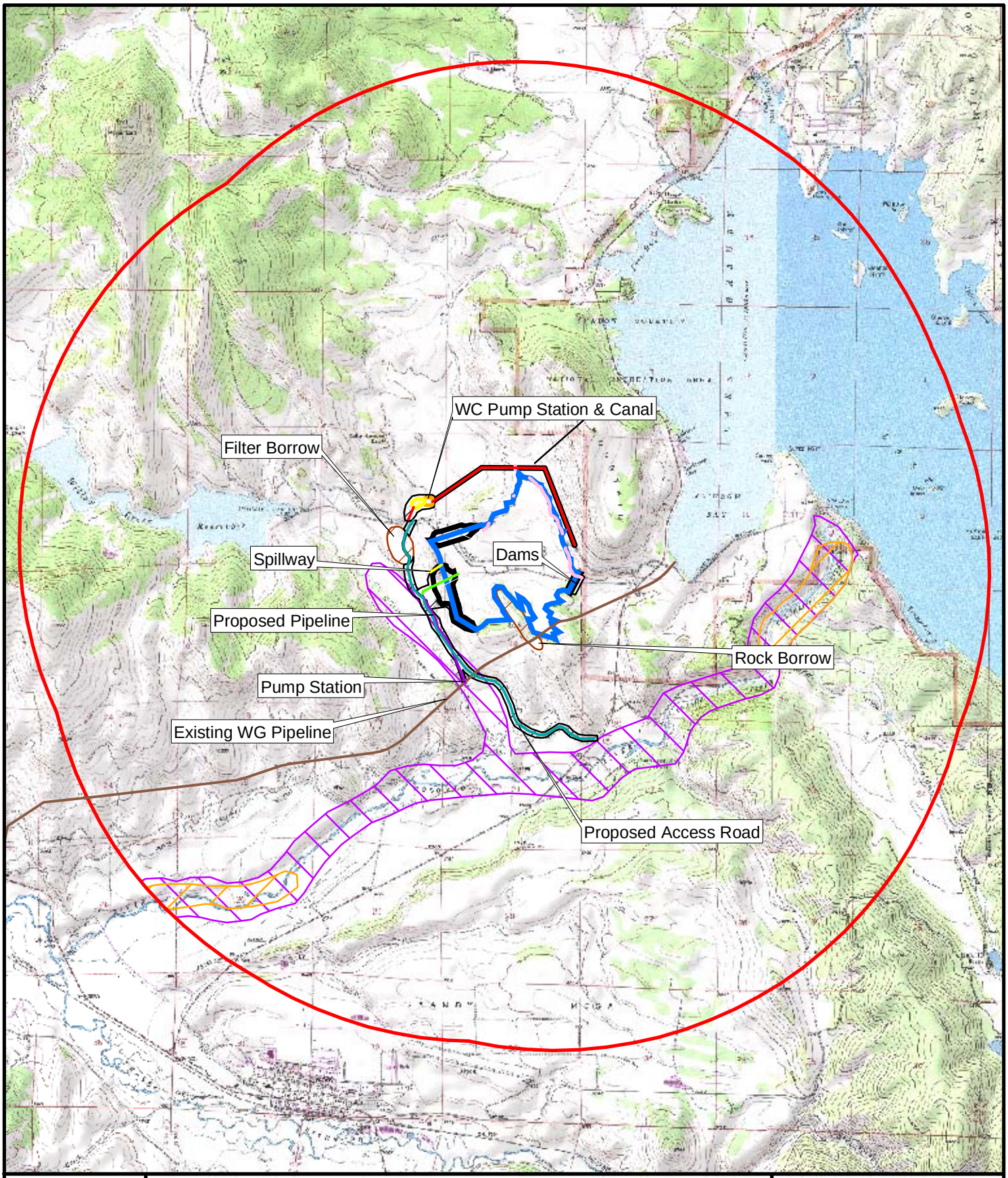
Jasper East. The CNDIS has identified two active nests along Lake Granby, east of the Jasper East study area (CNDIS 2007). Winter concentration and winter foraging areas have been identified along the Colorado River and Willow Creek west and south of the Jasper East study area (Figure 6). No eagle nests were observed at the Jasper East study area during site visits conducted by ERO in 2004 and 2005. Although bald eagles may occasionally forage on the site, no nesting habitat or large trees suitable for winter roost sites for the bald eagle are present in the Jasper East study area.

Rockwell/Mueller Creek. Known winter ranges and winter concentration areas occur north of the study area along portions of the Fraser and Colorado rivers (Figure 7). No habitat suitable as winter roost sites, nest sites, important foraging areas, or essential eagle habitat exists within the Rockwell/Mueller Creek study area although bald eagles could occasionally forage in the area.

East Slope Study Areas

Chimney Hollow and Dry Creek. Known bald eagle winter concentration areas occur on larger streams in the region, and winter roost sites occur at several locations about 15 miles from these sites along the Cache la Poudre River, Saint Vrain Creek, and Boulder Creek (CNDIS 2007). Winter range habitat exists immediately adjacent to the Chimney Hollow study area and along the eastern edge of the Dry Creek study area (Figure 8 and Figure 9) (CNDIS 2007). Bald eagle winter concentration areas occur along the Little Thompson River immediately south of Dry Creek dam and spillway (Figure 9). Because no perennial streams or large bodies of water occur within the Chimney Hollow or Dry Creek study areas, it is unlikely that bald eagles would use the sites for winter roosting or nesting. Individual bald eagles may occasionally forage in the Chimney Hollow and Dry Creek study areas.

Ralph Price Reservoir. Known bald eagle active nesting, winter roosting, and summer foraging areas have been identified near the town of Lyons and along the St. Vrain River east of Lyons about 6 miles east of Ralph Price Reservoir (CNDIS 2007). Ralph Price Reservoir is not within any active nest site, winter range, winter roost site, or winter concentration area or associated buffers (CNDIS 2007).



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Wildlife

- Bald Eagle Winter Concentration
- Bald Eagle Winter Range

Structures

- Access Road
- Inlet - Outlet
- Spillway
- Jasper East Pipeline
- WC Pipeline
- Existing Windy Gap Pipeline
- 3 Mile Buffer
- Jasper East Reservoir
- Jasper East Dam

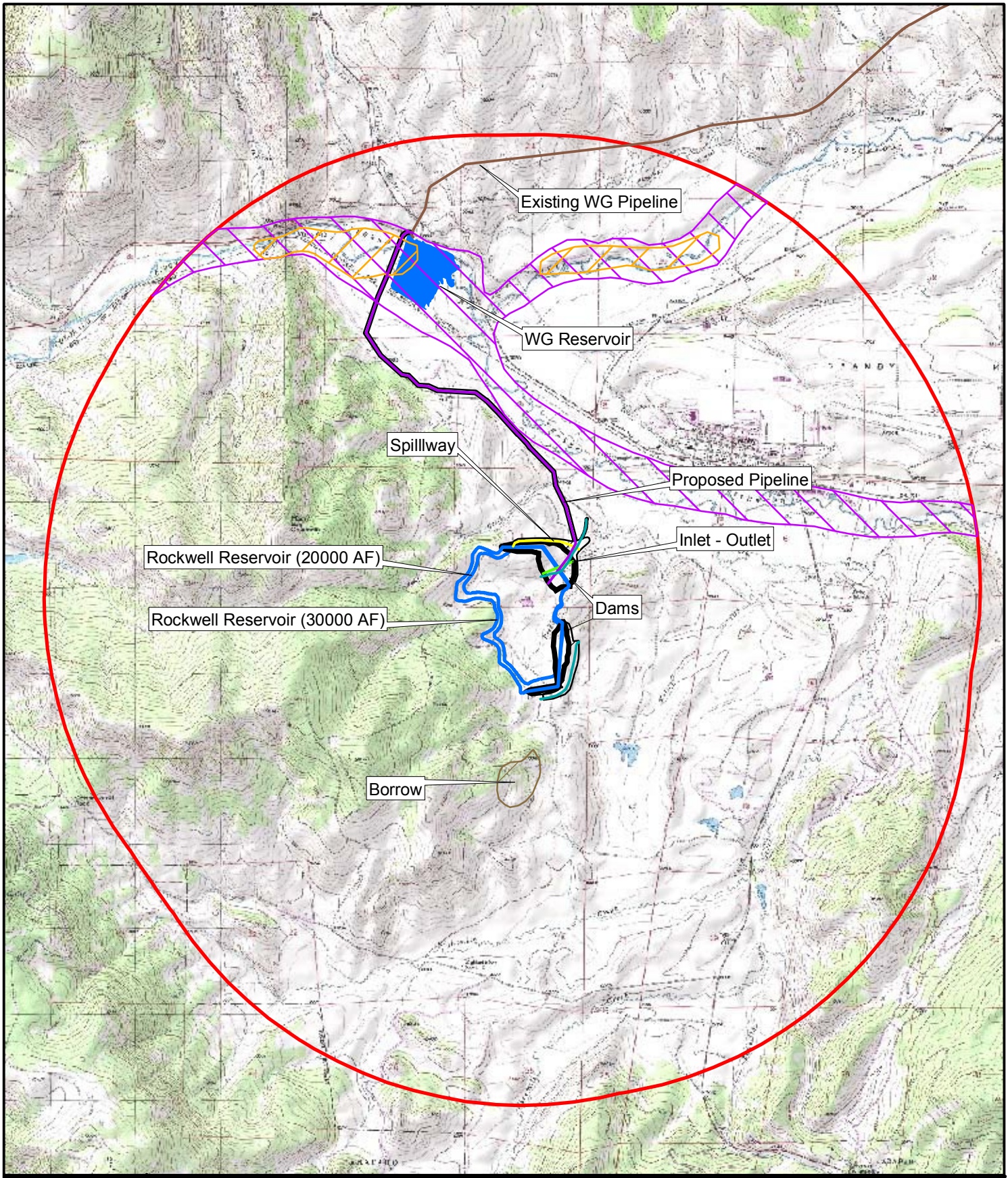
0 2,500 5,000 Feet

1 Inch = 5000 Feet

N

Figure 6
Jasper East Study Area
Bald Eagle Habitat

Prepared for: Windy Gap Firming Project
File: W/Jaspereast_Wildlife_BE8x11.mxd
Date: January 2006



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Wildlife

- Bald Eagle Winter Concentration
- Bald Eagle Winter Range

Structures

- Access Road
- Inlet - Outlet
- Spillway
- Rockwell Pipeline
- Existing Windy Gap Pipeline
- 3 Mile Buffer
- Rockwell Reservoir
- Rockwell Dam

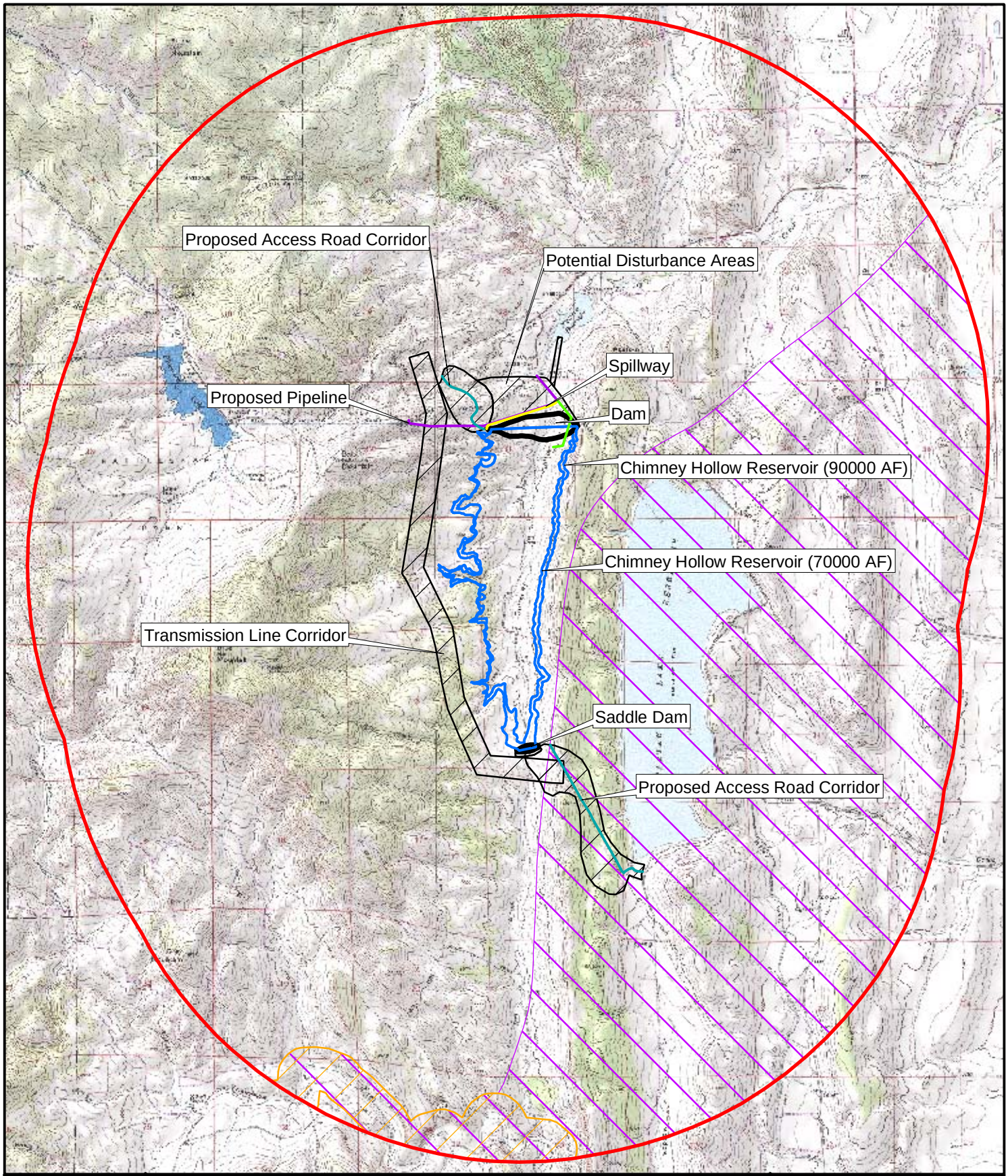
0 2,500 5,000 Feet

1 Inch = 5000 Feet

N

Figure 7
Rockwell/Mueller Creek Study Area Bald Eagle Habitat

Prepared for: Windy Gap Firming Project
File: W/Rockwell_Wildlife_BE8x11.mxd
Date: January 2006



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Wildlife

- Bald Eagle Winter Concentration
- Bald Eagle Winter Range

Structures

- Access Road
- Inlet - Outlet
- Spillway
- Chimney Hollow Pipeline
- 3 Mile Buffer
- Chimney Hollow Reservoir
- Chimney Hollow Dam

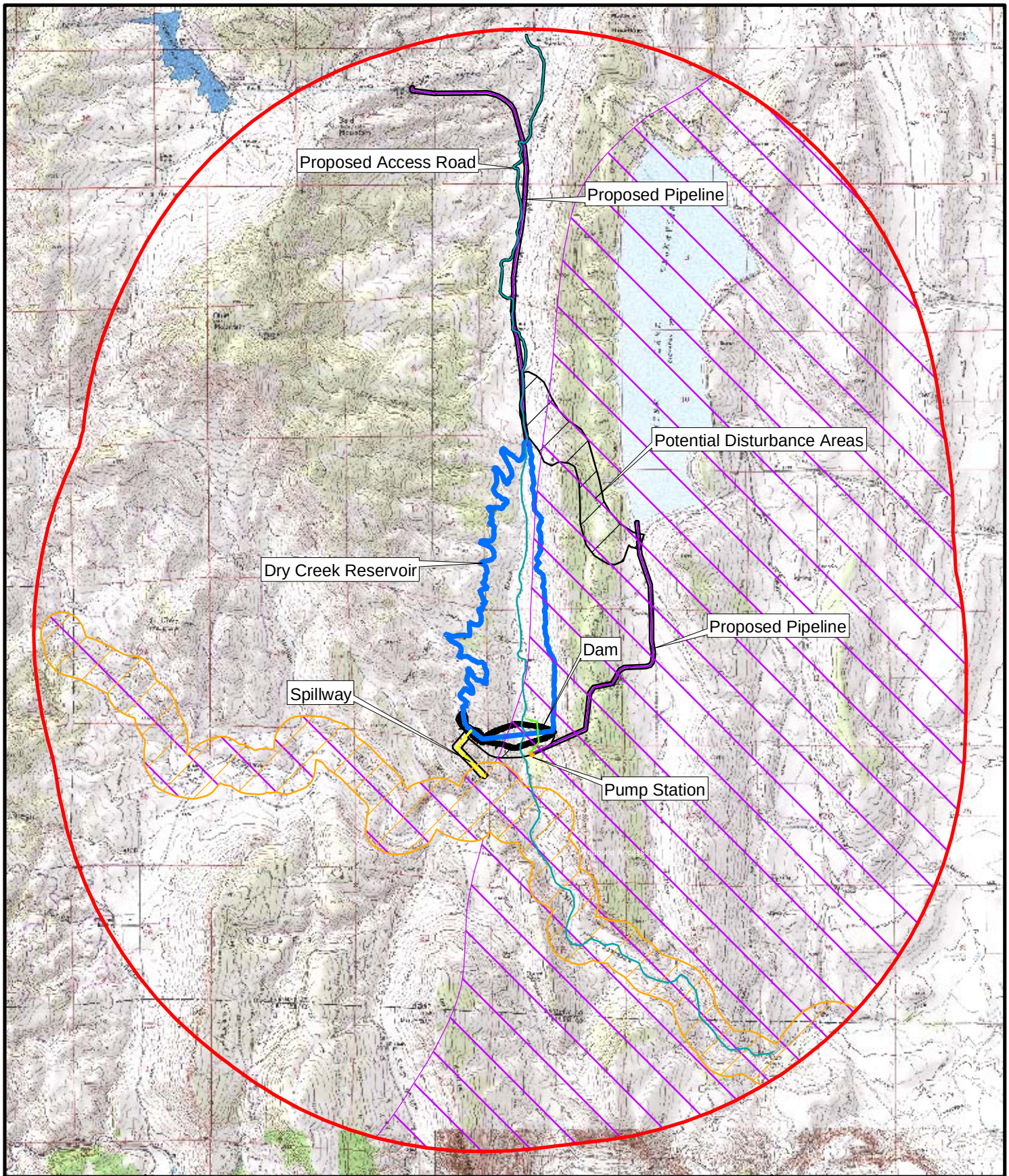
0 2,500 5,000 Feet

1 Inch = 5000 Feet

N

Figure 8
Chimney Hollow Study Area Bald Eagle Habitat

Prepared for: Windy Gap Firming Project
File: W/Chimney_Hollow_Wildlife_BE8x11.mxd
Date: January 2006



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Fax: 830-1199

Wildlife

- Bald Eagle Winter Concentration
- Bald Eagle Winter Range

Structures

- Access Road
- Inlet - Outlet
- Spillway
- Dry Creek Pipeline
- 3 Mile Buffer
- Dry Creek Reservoir
- Dry Creek Dam

0 2,500 5,000 Feet

1 Inch = 5000 Feet

N

Figure 9
Dry Creek Study Area
Bald Eagle Habitat

Prepared for: Windy Gap Firming Project
File: W/Dry_Creek_Wildlife_BE8x11.mxd
Date: January 2006

7.1.2. Mexican Spotted Owl

7.1.2.1. Species Background

The Mexican spotted owl is federally listed as threatened. It is found from central Colorado and Utah through portions of New Mexico, Arizona, Texas, south to central Mexico. This species typically inhabits areas with steep, exposed cliffs and canyons that are characterized by piñon-juniper and old-growth forests with mixed Douglas-fir, ponderosa pine, and white fir (Andrews and Righter 1992). Spotted owls have been found in western El Paso County and Douglas County. Critical habitat has been designated in the Pike National Forest in rugged canyon habitat and foothills south of the Denver-metro area. No critical habitat has been designated in Boulder, Larimer, or Grand counties (66 FR 8530).

7.1.2.2. Potential Habitat

West Slope Study Areas

The Jasper East and Rockwell/Mueller Creek study areas do not contain suitable old-growth Douglas-fir and ponderosa pine forests or rocky cliffs that this species typically inhabits. This species has never been recorded in this portion of the state (Andrews and Righter 1992).

East Slope Study Areas

No habitat suitable to support the Mexican spotted owl occurs within the Chimney Hollow, Dry Creek, and Ralph Price Reservoir study areas. The Chimney Hollow and Dry Creek study areas do not contain old-growth coniferous forests that this species typically favors. Although mixed Douglas-fir and ponderosa pine forests surround the Ralph Price Reservoir study area, only one occurrence of Mexican spotted owl has been observed in Boulder County, about 8 miles south of Ralph Price Reservoir near Lefthand Canyon (BCAS 2005). No critical habitat is designated near any of the study areas and no Mexican spotted owls have been documented in the vicinity of any of the study areas.

7.1.3. Western Yellow-billed Cuckoo

7.1.3.1. Species Background

In 1998, a petition was filed with the FWS to list the western subspecies of yellow-billed cuckoo as a threatened subspecies or a distinct population segment. The FWS determined in 2001 that listing as a distinct vertebrate population segment west of the Continental Divide was warranted, but precluded the listing due to higher priority listing actions (66 FR 38611, July 25, 2001). The western yellow-billed cuckoo was probably never common in Colorado and is now rare (Kingery 1998). This species is listed as a Colorado state species of special concern. A neo-tropical migrant bird, the yellow-billed cuckoo inhabits old-growth riparian areas with thick understories. This species once ranged from British Columbia to Mexico. By the 1950s, the subspecies had been extirpated from British Columbia, Washington, and Oregon. Breeding pairs have been confirmed in the state recently along the Yampa River near Hayden and in the San Luis Valley (Kingery 1998).

7.1.3.2. Potential Habitat

West Slope Study Areas

No habitat suitable for the western yellow-billed cuckoo occurs within the Jasper East or Rockwell/Mueller Creek study areas. These sites do not contain riparian forests that this species typically favors.

East Slope Study Areas

The Chimney Hollow, Dry Creek, and Ralph Price Reservoir study areas occur outside the known elevation and geographical range of the western yellow-billed cuckoo. The Chimney Hollow and Dry Creek study areas do not contain potentially suitable habitat for the eastern yellow-billed cuckoo.

7.1.4. Black-Footed Ferret

7.1.4.1. Species Background

The black-footed ferret is federally listed as endangered. Black-footed ferrets are associated with prairie dog colonies because they depend on prairie dogs for food and shelter. Historically, this species occurred in prairie dog colonies in lower elevations of eastern and western Colorado. Over the past century, prairie dog distribution has been substantially reduced due to habitat loss, plague, poisoning practices, and loss of prairie dog habitat (FWS 1993). Current FWS guidelines for potential black-footed ferret habitat require surveys for any black-tailed prairie dog town or complex greater than 80 acres (FWS 1989).

7.1.4.2. Potential Habitat

West Slope and East Slope Study Areas

Prairie dogs—the primary source of food and burrows for shelter for black-footed ferrets—do not occur within any of the study areas.

7.1.5. Canada Lynx

7.1.5.1. Species Background

The Canada lynx is a federally threatened species. Lynx historically ranged through mountainous areas of Colorado. Lynx habitat in Colorado has been lost due to fragmentation by forestry, roadways, agriculture, and development. Fire suppression and trapping in the 1970s also reduced populations (Finch 1992). The CDOW has led re-introduction efforts in central and southern Colorado beginning in 1999 and continuing through 2006. As of August 2005, a total of 204 adult Canada lynx have been released with at least 101 kittens born (Shenk 2006). Radio-collared lynx tracked by the CDOW have traveled widely into northern Colorado and Wyoming, including a few scattered locations in Grand County (Shenk 2005).

In Colorado, this species typically forages in spruce/fir forests surrounded by lodgepole pine, with uneven-aged stands, open canopies, and mature understories at higher elevations. Foraging and denning habitat for this species closely follows that of the snowshoe hare—the species' primary food source in Colorado, although alternative prey including grouse, voles, and squirrels will be taken (Fitzgerald et al. 1994; Ruggiero et al. 2000; NatureServe 2006). Denning habitat has been linked to high-elevation

spruce-fir forests that provide cover and habitat for the snowshoe hair. Lynx rarely venture into openings wider than 300 feet (Ruggiero et al. 2000; Ruediger 2000).

7.1.5.2. Potential Habitat

West Slope Study Areas

Jasper East. No potential habitat for lynx has been mapped in the Jasper East study area (Figure 10) (CNDIS 2007). The CNDIS database identifies potential lynx habitat on forested lands near the study area. It is possible that lynx could occasionally travel through the site; however, no large stands of coniferous forests that this species typically favors for breeding or foraging exist in the Jasper East study area. The Jasper East study area also lacks suitable habitat for snowshoe hare, the primary prey of lynx, and contains open meadows that this species typically avoids.

Rockwell/Mueller Creek. The western half of the Rockwell/Mueller Creek study area and lands to the west have been identified by the CNDIS database as potential lynx habitat (Figure 11). It is possible that individuals may occasionally venture onto the site. However, the site contains limited coniferous forest habitat that lynx typically favors. Furthermore, the Rockwell/Mueller Creek study area does not contain habitat for the snowshoe hare, the lynx's primary prey.

East Slope Study Areas

The Chimney Hollow, Dry Creek, and Ralph Price Reservoir study areas are located below the known lower elevation limits for lynx.

7.1.6. Preble's Meadow Jumping Mouse

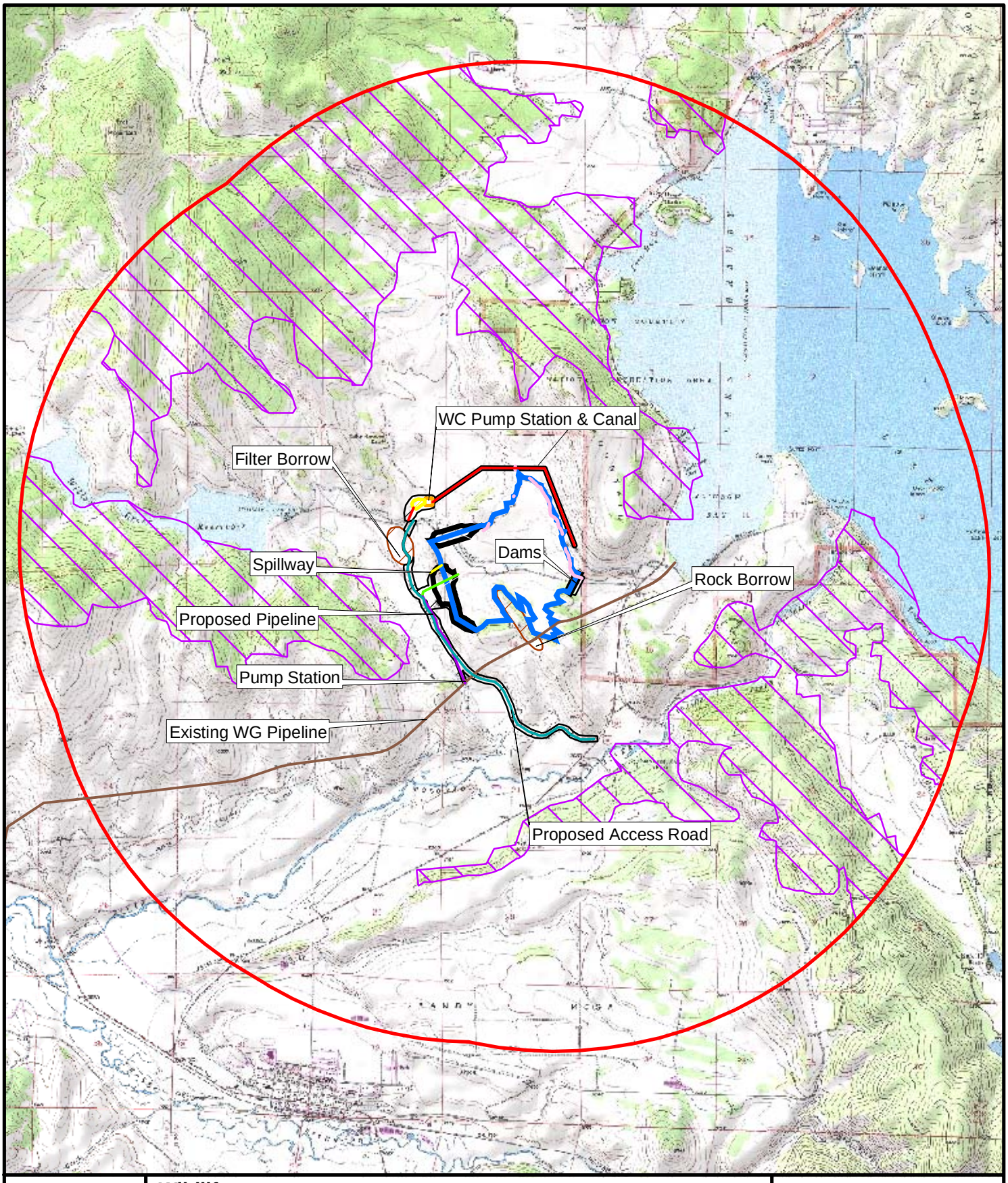
7.1.6.1. Species Background

The Preble's meadow jumping mouse (Preble's) is federally listed as threatened. Typically, Preble's is located in riparian corridors near forests, or where tall shrubs and low trees provide adequate cover with low undergrowth consisting of grasses and forbs in wet meadows. Along Colorado's Front Range, Preble's is generally found between 5,000 and 7,600 feet in elevation, generally in lowlands with medium to high moisture along permanent or intermittent streams and irrigation canals (FWS 1999; Meaney et al. 1997). There is no designated critical habitat within or downstream of any of the study areas (68 FR 37276). Areas designated as critical habitat within the Cache la Poudre River Basin are all above Horsetooth Reservoir and/or the confluence of the Poudre and North Poudre rivers, and are outside of any area of influence from project components or potential changes in surface water flows.

7.1.6.2. Potential Habitat

West Slope Study Areas

The Jasper East and Rockwell/Mueller Creek study areas are located out of the known geographic range for this species.



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Wildlife

- Potential Lynx Habitat

Structures

- Access Road
- Inlet - Outlet
- Spillway
- Jasper East Pipeline
- WC Pipeline
- Existing Windy Gap Pipeline
- 3 Mile Buffer
- Jasper East Reservoir
- Jasper East Dam

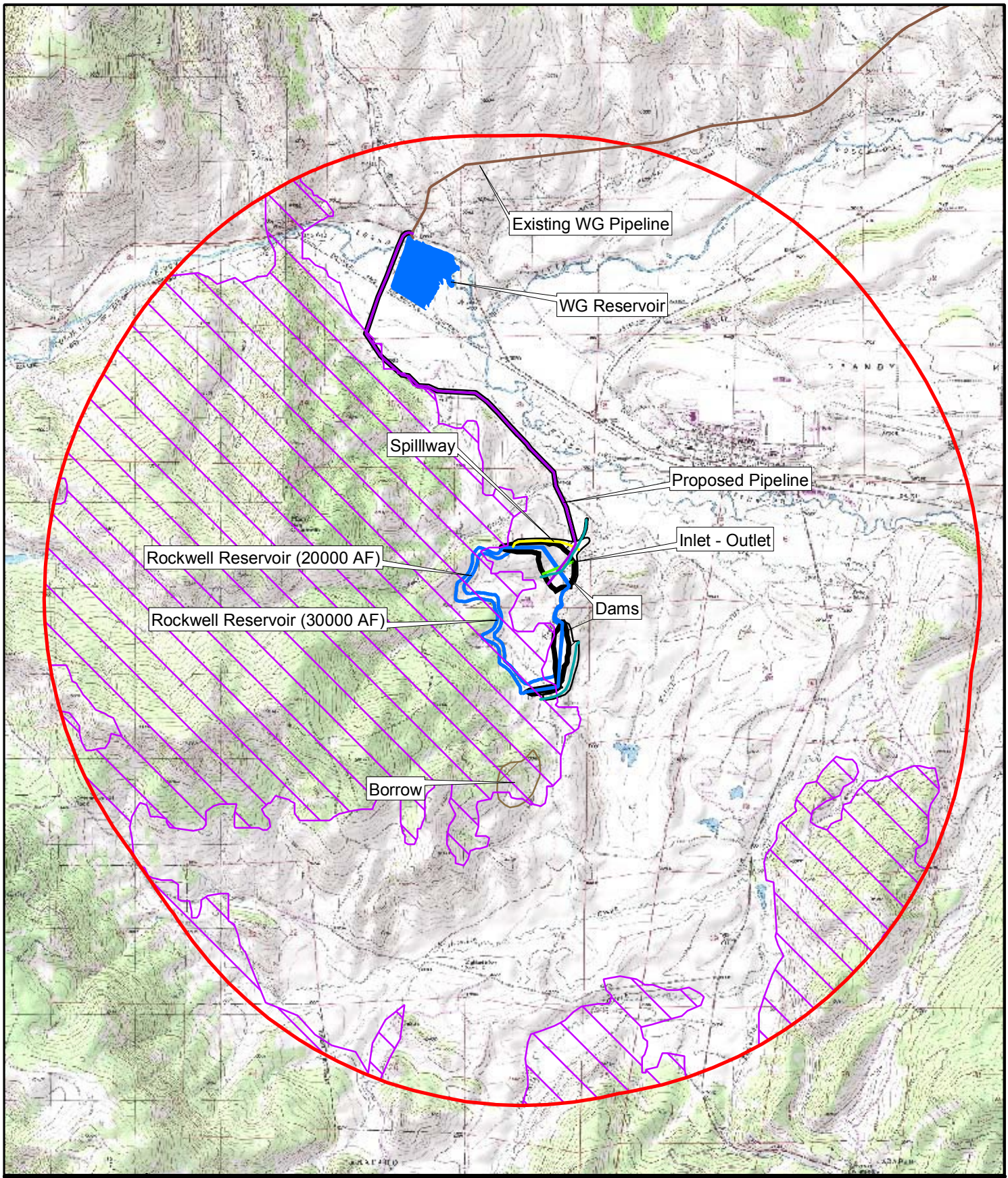
0 2,500 5,000 Feet

1 Inch = 5000 Feet

N

Figure 10
Jasper East Study Area
Potential Lynx Habitat

Prepared for: Windy Gap Firming Project
File: W/Jaspereast_Wildlife_LX8x11.mxd
Date: January 2006



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Wildlife

- Potential Lynx Habitat

Structures

- Access Road
- Inlet - Outlet
- Spillway
- Rockwell Pipeline
- Existing Windy Gap Pipeline
- 3 Mile Buffer
- Rockwell Reservoir
- Rockwell Dam

0 2,500 5,000 Feet

1 Inch = 5000 Feet

N

Figure 11
Rockwell/Mueller Creek Study Area Potential Lynx Habitat

Prepared for: Windy Gap Firming Project
File: W/Rockwell_Wildlife_LX8x11.mxd
Date: January 2006

East Slope Study Areas

Chimney Hollow. In 1997, the CNHP conducted a presence/absence survey for Preble's at the Chimney Hollow study area. Additionally, in 2000, ERO conducted a presence/absence survey for Preble's at the site (ERO 2000). Neither of these surveys found Preble's. Following the 2000 survey, the FWS concluded that a population of Preble's was not likely to be present within the Chimney Hollow study area and that development or other actions on the site should not directly affect the Preble's. The reservoir footprint was expanded since the survey conducted in 2000 and, as part of the environmental investigation of the Windy Gap Firming Project, ERO performed a habitat assessment for Preble's in October 2003 (ERO 2003). The assessment was conducted within the proposed expanded Chimney Hollow study area, including all previously surveyed areas and any additional potential habitat within the footprint of the proposed reservoir.

The 2003 habitat assessment concluded that no suitable habitat is present in previously surveyed areas or the expanded area (ERO 2003). On November 18, 2003, the FWS concurred with the habitat assessment. The FWS did request that one more habitat assessment be conducted prior to construction. A clearance letter from the FWS for Chimney Hollow is included in Appendix B.

Dry Creek. In September 2004, ERO conducted a presence/absence survey for Preble's at the Dry Creek study area (ERO 2004). No Preble's were captured in 1,000 trap nights of effort. The FWS concurred with the negative findings, but requested that the area be surveyed again prior to construction of the reservoir. The FWS response letter is attached in Appendix B.

Ralph Price Reservoir. Ralph Price Reservoir does not contain the shrub and riparian habitat that this species typically inhabits, and therefore Preble's is not likely to occur in the area. Preble's have been captured about 5 miles downstream of the reservoir near the town of Lyons (FWS 1999).

7.2. State-Listed Endangered and Threatened Species, and Species of Special Concern

Table 2 includes species that the State of Colorado has listed as threatened or endangered, or species of special concern potentially occurring in Grand, Larimer, and Boulder counties (CDOW 2007a). ERO evaluated the habitat at each of the study areas and rated the potential for a species to occur as noted in Table 2. The following sections discuss the potential for state endangered and threatened species, and species of special concern to occur in East Slope and West Slope study areas. Only those species with potentially suitable habitat in the study areas are discussed. Potentially suitable habitat does not exist for the burrowing owl, swift fox, and wolverine in any of the West Slope or East Slope study areas. None of the proposed alternatives would impact these species; therefore, these species are not discussed in the text.

Table 2. State endangered and threatened species, and species of special concern potentially occurring in each study area.

Common Name	State Status*	Jasper East	Rockwell/ Mueller Creek	Chimney Hollow	Dry Creek	Ralph Price
Amphibians						
Boreal toad	SE	1	1	0	0	0
Northern leopard frog	SOC	1	1	3	3	1
Wood frog	SOC	1	1	0	0	0
Reptiles						
Common garter snake	SOC	0	0	3	3	0
Birds						
Burrowing owl	ST	0	0	0	0	0
Ferruginous hawk	SOC	1	1	1	1	0
Greater sandhill crane	SOC	1	1	0	0	0
Peregrine falcon	SOC	1	0	3	3	1
Greater Sage grouse	SOC	2	3	0	0	0
Mammals						
Northern river otter	ST	1	0	0	0	0
Swift Fox	SOC	0	0	0	0	0
Townsend's big-eared bat	SOC	0	0	1	1	1
Wolverine	SE	0	0	0	0	0

0– No habitat
1 – Limited habitat present, species unlikely to occur
2 – Potential foraging habitat
3 – Potential breeding and foraging habitat
*SE = State Endangered ST = State Threatened SOC = State Species of Special Concern
Source: CDOW 2007a.

7.2.1. Boreal Toad

7.2.1.1. Species Background

The boreal toad is currently listed as a state endangered species. The species was recently removed as a federal candidate species (FWS 2006). Boreal toad populations began declining in the 1970s. Currently, the toad is believed to have disappeared from 85 percent of its range in Colorado and Wyoming, and is likely extinct from New Mexico. The boreal toad inhabits wetland areas consisting of beaver ponds, wet meadows, kettle ponds, and slow moving streams in Colorado's higher terrain, at elevations above 7,800 feet (Hammerson 1999).

7.2.1.2. Potential Habitat

West Slope Study Areas

Jasper East. Wetland habitat at the Jasper East study area does not contain foraging and breeding habitat suitable for the boreal toad. The boreal toad is known to occur

along Willow Creek in Grand County (USFS 2005). An unnamed tributary to Willow Creek enters the Jasper East study area; however, no toads were observed during 2004 site visits, and a boreal toad survey conducted by ERO in June 2005 yielded no toads, tadpoles, or egg masses.

Habitat for this species does not occur along the Willow Creek Pump Canal and forebay. These areas have been altered by human activity and do not contain shallow, marshy areas with dominant wetland cover typically favored by the boreal toad.

Rockwell/Mueller Creek. One small pond and two drainages occur in the Rockwell/Mueller Creek study area. The pond was not surveyed during site visits because access to the site was not granted by landowners. Because no nearby records of boreal toad exist in the area, it is unlikely that the toad exists in the Rockwell/Mueller Creek study area. It is recommended that the site be surveyed for this species during the spring and summer breeding season prior to disturbance.

East Slope Study Areas

The Chimney Hollow, Dry Creek, and Ralph Price Reservoir study areas are all below the boreal toad's known elevation range and therefore do not contain any habitat for this species.

7.2.2. Northern Leopard Frog

7.2.2.1. Species Background

The northern leopard frog is found from Canada south to Maryland and west to California. This species has recently been listed by the CDOW as a species of special concern. It occupies much of Colorado with the exception of the southeastern part of the state. Typical habitat includes irrigation ditches, streams, wet meadows, marshes, ponds, lakes, and glacial kettle ponds (Hammerson 1999). The northern leopard frog is becoming scarce in many areas of Colorado. The reason for this decline is not entirely known. Some regional declines have been associated with the increasingly abundant bullfrog and habitat loss (Hammerson 1999). However, the northern leopard frog is also disappearing from areas where the habitat remains intact and there are no bullfrogs. The CDOW lists the northern leopard frog as uncommon in Boulder and Larimer counties and rare in Grand County (CNDIS 2007).

7.2.2.2. Potential Habitat

West Slope Study Areas

Jasper East. Potentially suitable habitat exists within wetland areas in the Jasper East study area. Historically, the northern leopard frog was recorded along all of the major drainages in Grand County. In June 2005, ERO conducted a survey for this species in conjunction with the boreal toad survey. No leopard frogs, tadpoles, or egg masses were found.

Rockwell/Mueller Creek. Potentially suitable habitat exists in and near wetland areas associated with the pond and tributary in the Rockwell/Mueller Creek study area. The nearest capture site is along the Colorado River about 3 miles northwest of the site (CDOW 2007b). No surveys were conducted in the Rockwell/Mueller Creek study area because of a lack of access.

East Slope Study Areas

Chimney Hollow. Suitable habitat for this species exists in wetland areas within the Chimney Hollow drainage although no leopard frogs were observed during field surveys in 2004. Because the leopard frog was observed at the Dry Creek study area, leopard frogs may be present in the Chimney Hollow study area; however, the Dry Creek study area contains more riparian wetlands and several small ponds that provide better habitat than the Chimney Hollow study area.

Dry Creek. One adult leopard frog was observed in July 2005 along Dry Creek within the reservoir footprint. It is likely that small breeding populations exist along wetter areas of the Dry Creek study area.

Ralph Price Reservoir. Due to the steep, rocky areas along the current reservoir, it is unlikely that the northern leopard frog occurs at the Ralph Price Reservoir study area; however, this species may be present upstream and downstream of the reservoir along shallow areas of North St. Vrain Creek.

7.2.3. Wood Frog

7.2.3.1. Species Background

The wood frog is a small frog that ranges farther north than any other North American amphibian (Hammerson 1999). In Colorado, this species is only known in Larimer, Jackson, and Grand counties. This species typically inhabits high mountain marshes, bogs, beaver ponds, willow thickets, and stream borders. This species was listed as a state threatened species in 1979; however, surveys revealed that known populations were relatively stable. The Colorado Wildlife Commission removed the wood frog from the state endangered species list in 1998 (Hammerson 1999); however, due to the limited range in Colorado, it remains a species of special concern in Colorado. The CDOW lists the wood frog as common in Grand County (CNDIS 2007).

7.2.3.2. Potential Habitat

West Slope Study Areas

Jasper East. The nearest known population of the wood frog occurs along the Colorado River near Grand Lake. Potentially suitable habitat for the wood frog exists within wetland areas within the Jasper East study area; however, wood frogs have never been recorded on the site (CDOW 2007b). An amphibian survey was conducted at the Jasper East study area in June 2005 by ERO and yielded no adult wood frogs, tadpoles, or egg masses.

Rockwell/Mueller Creek. It is unlikely that the wood frog occurs in the Rockwell/Mueller Creek study area. A small amount of potentially suitable habitat exists for this species in wetland areas associated with a small pond and tributary; however, the nearest known population of this species exists to the north near Grand Lake (CDOW 2007b). The pond and wetlands present at the Rockwell/Mueller Creek study area do not provide the type of habitat favored by the wood frog.

East Slope Study Areas

No potential habitat exists for the wood frog in the Chimney Hollow, Dry Creek, or Ralph Price Reservoir study areas. All three sites are located below the elevation range for this species in Colorado.

7.2.4. Common Garter Snake

7.2.4.1. Species Background

The common garter snake ranges throughout most of the United States and Canada. Recent population declines in Colorado have prompted the CDOW to list this species as a species of special concern. The common garter snake distribution includes northeastern Colorado and it is associated with the South Platte River and its tributaries at elevations below 6,000 feet (Hammerson 1999). As with other garter snakes, this snake is essentially restricted to aquatic and riparian habitats within floodplains and inhabits marshes, ponds, and stream edges. The common garter snake diet in Colorado can include small fish, bullfrogs, and other larval and adult amphibians (Hammerson 1999). The CDOW lists the common garter snake as sparsely common in Boulder County and uncommon in Larimer County (CNDIS 2007).

7.2.4.2. Potential Habitat

West Slope Study Areas

The Jasper East and Rockwell/Mueller Creek study areas are both located outside the known range and above the upper elevation limits of the common garter snake in Colorado.

East Slope Study Areas

Chimney Hollow and Dry Creek. The Chimney Hollow and Dry Creek study areas contain suitable habitat for the common garter snake. The common garter snake was observed near the Chimney Hollow drainage by ERO biologists during August 2004 site visits. It is likely that this species inhabits the wetland and riparian areas within both study areas.

Ralph Price Reservoir. Ralph Price Reservoir is located above the upper elevation limit for this species and is therefore unlikely to occur within the study area. This species may occur downstream of the reservoir along North St. Vrain Creek.

7.2.5. Ferruginous Hawk

7.2.5.1. Species Background

The ferruginous hawk is the largest hawk in North America and is a state species of special concern. This species inhabits open prairie and desert habitats and is strongly associated with primary prey species such as ground squirrels and jackrabbits. Ferruginous hawks are relatively common winter residents in eastern Colorado, particularly in association with the black-tailed prairie dog (Kingery 1998). Conversion of native shortgrass prairie to urban development or grazed rangeland has posed a significant threat to populations of this species in Colorado. The CDOW lists the ferruginous hawk as an uncommon to rare breeder in Boulder, Larimer and Grand counties (CNDIS 2007).

7.2.5.2. Potential Habitat

West Slope Study Areas

The ferruginous hawk is an unknown breeder in Grand County (Andrews and Righter 1992), and recent breeding bird surveys do not document any nesting of this species in the county (Kingery 1998). However, the Colorado River Basin within Grand County is considered winter migration habitat (Andrews and Righter 1992). ERO has observed low numbers of this species in recent years near the Jasper East and Rockwell/Mueller Creek study areas. Wintering ferruginous hawks could possibly roost within or near the study areas.

East Slope Study Areas

There are no current records of ferruginous hawks nesting in central or western Larimer or Boulder counties (Kingery 1998). This species is a common migrant along the Front Range and has been recorded roosting along the Dakota Hogback in Jefferson County in the spring. Although it is possible that this species may occasionally venture into the Chimney Hollow, Dry Creek, and Ralph Price Reservoir study areas, it likely does not nest in any of the three study areas because more suitable habitat is available to the east.

7.2.6. Greater Sandhill Crane

7.2.6.1. Species Background

Greater sandhill cranes range from Arizona to Canada. In Colorado, this species nests west of the Continental Divide. Typically this species nests near flooded wetlands or beaver ponds. Wet meadows and marshes have been used as well. Crane numbers have dropped in recent years in part due to alterations to river systems. The CDOW has listed this species as a species of special concern due to the low number of breeding pairs in the state. The CDOW lists the northern sandhill crane as an unknown breeder in Boulder and Larimer counties and uncommon in Grand County (CNDIS 2007).

7.2.6.2. Potential Habitat

West Slope Study Areas

Jasper East. Greater sandhill cranes have been recorded nesting in the northwestern portion of Grand County. No breeding populations have been noted within or near the Jasper East study area (Kingery 1998). The Jasper East study area contains irrigated wet meadows that could be used for foraging, but is unlikely to provide nesting habitat for sandhill cranes because the area is regularly mowed.

Rockwell/Muller Creek. The Rockwell/Mueller Creek study area contains a small amount of wetland and open water habitat. However, due to the lack of large areas of wet meadow and wetland habitat in the Rockwell/Mueller Creek study area, it is unlikely that this species would use this site for foraging or nesting.

East Slope Study Areas

No suitable nesting or foraging habitat for this species exists within the Chimney Hollow, Dry Creek, or Ralph Price Reservoir study areas.

7.2.7. Peregrine Falcon

7.2.7.1. Species Background

The peregrine falcon has made a remarkable recovery from the brink of extinction and has recently been removed from both the State of Colorado and federal endangered species lists. Currently the peregrine falcon is listed as a state species of special concern (CDOW 2007a). Peregrines nest on high, steep cliffs generally along stream courses. Peregrine falcons migrate through eastern Colorado and nest in canyons and cliffs along the Front Range (Craig and Enderson 2004).

7.2.7.2. Potential Habitat

West Slope Study Areas

Jasper East. Although nesting has never been documented in Grand County, breeding populations of this species have been noted in nearby Jackson County (Kingery 1998). The Jasper East study area does not contain suitable nesting habitat for the peregrine falcon. Although some of the nearby rocky outcrops to the northeast provide some potential habitat for this species, the U.S. Forest Service (USFS) has never recorded them in the area (Sumerlin pers. comm. 2005).

Rockwell/Mueller Creek. No rocky cliffs or canyon habitat that this species typically favors occurs on or near the Rockwell/Mueller Creek study area.

East Slope Study Areas

Limited potentially suitable habitat exists in the Chimney Hollow, Dry Creek, and Ralph Price Reservoir study areas. Although no nests or individuals have been recorded in the areas, rocky outcrops and cliff areas located on the hogbacks and rocky outcrops in the three study areas contain potentially suitable habitat. The cliffs along the hogbacks in the Chimney Hollow and Dry Creek study areas are relatively small and provide habitat more suitable for prairie falcons. No peregrine falcons were observed at the Chimney Hollow or Dry Creek study areas during field surveys by ERO in 2004 and 2005.

7.2.8. Greater Sage Grouse

7.2.8.1. Species Background

The greater sage grouse is the largest grouse in North America. This species depends on habitat dominated by sagebrush and ranges from southwestern North Dakota, northwestern South Dakota, westward to California, Nevada, Utah, and Colorado. In North Park and Middle Park, they typically occur in sagebrush habitats between 7,000 and 9,500 feet (Kingery 1998). The Greater Sage Grouse Conservation Plan – Middle Park (CDOW 2001) states that habitat requirements shift from sage-dominated habitat in winter to more variable mountain-shrub habitat in summer. In the spring, male grouse congregate in courtship displays in flat, open areas dominated by sagebrush (leks). Nesting usually occurs near leks.

In recent years, drastic declines have been noted in Colorado and throughout the western United States (Kingery 1998). Once present in 27 Colorado counties, populations are now present in only 11 counties (Kingery 1998). Loss of sagebrush habitat to agriculture and development are the primary causes of declines in sage grouse populations. The FWS listed this species as a federal candidate for listing as threatened

or endangered in 2000. However, in January 2005, the FWS concluded that listing was not warranted. This species remains a state species of special concern. Sage grouse do not occur in Boulder or Larimer counties. Sage grouse are common in western Grand County and uncommon in eastern Grand County with only two leks remaining (CNDIS 2007).

7.2.8.2. Potential Habitat

West Slope Study Areas

Jasper East. Vegetation mapping and site reconnaissance visits indicate that habitat preferred by sage grouse is present in the Jasper East study area. The CDOW recorded breeding activity in drier habitat west of the Jasper East study area in 2004 (Cowardin 2006). In 2005, the Horn lek (above the intersection of Highways 34 and 40) was active once again with five males on the lek in 2005 and 2006 and only one male in 2007 (Cowardin 2006, 2007). This lek is about 1 mile from the Jasper East study area.

Rockwell/Mueller Creek. Nesting and year-round habitat for the greater sage grouse occurs on the Rockwell/Mueller Creek study area. A search of the CNDIS database revealed that a designated sage grouse production area (lek) includes the eastern half of the study area (CDOW 2001; CNDIS 2007). A sage grouse brood-rearing area also has been identified north and east of the study area. Due to the amount of sagebrush on the property, it is likely that this species uses the property for foraging and possible nesting. Typically, 80 percent of sage grouse forage within 4 miles of a lek. Sage grouse have experienced population declines in eastern Grand County and recent residential development in the Granby area has severely restricted available habitat for sage grouse in the Rockwell/Mueller Creek study area. The highest number of males counted on the Linke lek, east of the Rockwell/Mueller Creek study area, was 26 in 1990. The decline has been significant over the last few years—20 males in 2004 to 5 in 2005, 3 in 2006, and then 1 in 2007 (Cowardin 2006, 2007).

East Slope Study Areas

The Chimney Hollow, Dry Creek, and Ralph Price Reservoir study areas do not contain suitable sage-dominated habitat that this species typically inhabits.

7.2.9. Northern River Otter

7.2.9.1. Species Background

The river otter species is apparently globally secure, but suffered declines in Colorado and is listed as a state threatened species in Colorado. River otters historically have ranged throughout North America, but have been extirpated in most of the United States in the last century. They inhabit riparian habitats across a variety of ecosystems ranging from semi-desert shrublands to montane and subalpine forests. River otters require clear, permanent water with an abundant food base of fish and crustaceans. Other habitat requirements include ice-free water in winter, water depth, stream width, and suitable access to shoreline (Fitzgerald et al. 1994). They occur in the Colorado, Gunnison, Piedra, and Dolores rivers. Tracks and other signs of otters have also been found in the Poudre and Laramie drainages in Larimer County (CNDIS 2007).

7.2.9.2. Potential Habitat

West Slope Study Areas

River otters occur in all the larger streams of eastern Grand County, including the Colorado and Fraser rivers and Willow Creek, both above and below Willow Creek Reservoir. Otters may occasionally visit the Jasper East study area, but both proposed reservoir sites lack suitable habitat for this species including permanent water of relatively high quality and an abundant food base.

East Slope Study Areas

No known populations of otters occur near any of the three East Slope study areas. Although tracks and other signs of otters have been found in the Poudre and Laramie drainages in Larimer County, the nearest location is more than 15 miles east, near Windsor (CNDIS 2007). The Chimney Hollow and Dry Creek study areas also lack suitable habitat for this species including permanent water of relatively high quality and an abundant food base.

7.2.10. Townsend's Big-eared Bat

7.2.10.1. Species Background

The Townsend's big-eared bat is a medium-sized bat that occurs over the western two-thirds of the state. This species is apparently globally secure, but is becoming increasingly rare along the periphery of its range, including Colorado where the species is listed as a state species of special concern. The CNHP has listed this species as imperiled in Colorado (CNHP 2005). The Townsend's big-eared bat is a year-round resident in the western two-thirds of Colorado, and often does not move much from winter hibernaculum to summer roost sites (Fitzgerald et al. 1994). This species is extremely sensitive to human activity and is susceptible to die-offs during hibernation if disturbed. Townsend's big-eared bats inhabit woodland areas with rocky outcrops, vacant buildings, caves, and old mine shafts (Fitzgerald et al. 1994). The CDOW lists the Townsend's big-eared bat as uncommon in Boulder and Larimer counties and has no records of occurrence for Grand County (CNDIS 2007).

7.2.10.2. Potential Habitat

West Slope Study Areas

Due to the lack of large rocky outcrops and vacant mines or buildings on both West Slope study areas, it is unlikely that this species occurs in either the Jasper East or Rockwell/Mueller Creek study areas. However, this bat may intermittently forage in these study areas.

East Slope Study Areas

The Chimney Hollow, Dry Creek, and Ralph Price Reservoir study areas all contain potentially suitable habitat for the Townsend's big-eared bat. This species could potentially roost or hibernate in rocky areas along the hogbacks and foothill areas, as well as in old buildings or small caves.

7.3. Colorado Natural Heritage Program Species

Table 3 identifies species tracked by the CNHP that potentially occur in Grand, Larimer, and Boulder counties (CNHP 2004a; CNHP 2004b). ERO evaluated the habitat at each of the study areas and rated the potential for a species to occur as noted in Table 3. The following sections discuss the potential for CNHP species to occur in the East Slope and West Slope study areas. Only those species with potentially suitable habitat in the study areas are discussed. Potentially suitable habitat for Barrow's goldeneye, black-necked stilt, boreal owl, McCown's longspur, smoky-eyed brown butterfly, and two-spotted skipper does not exist in any of the West Slope or East Slope study areas. None of the potential alternatives would impact any of these species; therefore, these species are not discussed in the text.

Table 3. Colorado Natural Heritage Program-tracked species potentially occurring in the West Slope and East Slope study areas.

Common Name	CNHP Ranking[1]	Jasper East	Rockwell/ Mueller Creek	Chimney Hollow	Dry Creek	Ralph Price
Birds						
Barrow's goldeneye	G5 , S2	0	0	0	0	0
Black-necked stilt	G5, S3	0	0	0	0	0
Boreal owl	G5, S2	0	0	0	0	0
McCown's longspur	G5, S2	0	0	0	0	0
Sage sparrow	G5, S3	3	3	0	0	0
Insects						
Arogos skipper	G3/G4, S2	0	0	3	3	0
Cross-line skipper	G5, S3	0	0	3	3	0
Dusted skipper	G4/G5, S2	0	0	3	3	0
Moss' elfin	G3/G4/T3, S2/S3	0	0	3	3	3
Mottled duskywing	G3/G4, S2/S3	0	0	3	3	0
Ottoe skipper	G3/G4, S2	0	0	3	3	0
Rhesus skipper	G4, S2/S3	0	0	3	3	0
Simius roadside skipper	G4, S3	0	0	3	3	0
Smokey eyed brown butterfly	G5/T3/T4, S1	0	0	0	0	0
Two-spotted skipper	G4, S2	0	0	0	0	0

0– No habitat
1 – Limited habitat present, species unlikely to occur
2 – Potential foraging habitat
3 – Potential breeding and foraging habitat
[1]*Source:* CNHP 2005.

CNHP Ranks:
G1 = Critically imperiled globally because of extreme rarity (5 or fewer occurrences, or very few remaining individuals) or because of some factor of its biology making it especially vulnerable to extinction. (Critically endangered throughout its range.)
G2 = Imperiled globally because of rarity (6 to 20 occurrences) or because of other factors demonstrably making it very vulnerable to extinction throughout its range. (Endangered throughout its range.)
G3 = Vulnerable throughout its range or found locally in a restricted range (21 to 100 occurrences). (Threatened throughout its range.)
G4 = Apparently secure globally, though it might be quite rare in parts of its range, especially at the periphery.
G5 = Secure – Common; widespread and abundant.
GU = Unable to assign rank due to lack of available information.
S1 = Critically imperiled in state because of extreme rarity (5 or fewer occurrences, or very few remaining individuals) or because of some factor of its biology making it especially vulnerable to extirpation from the state. (Critically endangered in state.)
S2 = Imperiled in state because of rarity (6 to 20 occurrences) or because of other factors demonstrably making it very vulnerable to extirpation from the state. (Endangered or threatened in state.)
S3 = Vulnerable in state (21 to 100 occurrences).
S4 = Apparently secure in the state, though it might be quite rare in parts of its range, especially at the periphery.
B = Breeding season imperilment, not permanent residents.
T(1-5) = Trinomial Rank – Used for subspecies. These species are ranked on the same criteria as G1 to G5.

7.3.1. Sage Sparrow

7.3.1.1. Species Background

The sage sparrow is globally secure but becoming rare in Colorado (CNHP 2005). Sage sparrows begin to return from their wintering grounds to Colorado in February through mid-April (Kingery 1998). The sage sparrow is a local and irregular summer resident in western Colorado (CNDIS 2007). This sparrow has a narrow habitat requirement for nesting, but tends to be associated with sagebrush. In Colorado, sagebrush and plains sandsage is plentiful, but does not necessarily make suitable habitat. Plant species, stand size, and elevation are important characteristics for nesting (Kingery 1998; Andrews and Righter 1992). Most of the confirmed nests for sage sparrow in Colorado were in Moffat County (Potter 1998). The CDOW lists the sage sparrow as unknown in Boulder, Larimer, and Grand counties (CNDIS 2007).

7.3.1.2. Potential Habitat

West Slope Study Areas

Both study areas on the West Slope contain potentially suitable nesting habitat for the sage sparrow. However, based on museum records and state-wide breeding bird surveys, no documented nesting has been recorded in Grand County (Andrews and Righter 1992; Kingery 1998). This species may occasionally visit the Jasper East or Rockwell/Mueller Creek study areas during migration.

East Slope Study Areas

Neither the Chimney Hollow study area nor the Dry Creek study area contains sage habitat that this species typically favors. Furthermore, the sage sparrow has not been documented nesting in Boulder and Larimer counties (Kingery 1998).

7.3.2. Arogos Skipper

7.3.2.1. Species Background

The arogos skipper is a small, yellow-orange butterfly widespread from the Rocky Mountains eastward; however, it is uncommon to rare in much of its range. It is found in undisturbed grasslands, prairies, and other open areas. In Colorado, the arogos skipper occurs in relatively undisturbed, moist, sloping prairie meadows in foothills canyons and ridges up to 6,200 feet in elevation. This species' preferred habitat is dominated by tall and broad-blade grasses, particularly big bluestem (NatureServe 2006). Big bluestem and probably other native grasses are the caterpillar hosts for this species (USGS 2005).

7.3.2.2. Potential Habitat

West Slope Study Areas

The Jasper East and Rockwell/Mueller Creek study areas are located outside the known geographic range for this species.

East Slope Study Areas

Chimney Hollow and Dry Creek. This butterfly has been found in the grasslands and foothills near the Chimney Hollow and Dry Creek study areas (CNHP 2005). Potentially suitable habitat for this species exists on the relatively undisturbed, grassy slopes of the hogbacks within the Chimney Hollow and Dry Creek study areas, although the dominant host species, big bluestem, is not abundant in these areas.

Ralph Price Reservoir. Most of the Ralph Price Reservoir study area consists of a mixed ponderosa pine and spruce/fir forest with no areas of big bluestem or large open meadow. It is unlikely that this species occurs in or near the Ralph Price Reservoir study area.

7.3.3. Cross-line Skipper

7.3.3.1. Species Background

The cross-line skipper is listed as vulnerable to population losses in Colorado (CNHP 2005). This species is characterized as a small dark brown butterfly with orange markings. This species ranges from Florida and Maine, westward to the Front Range of Colorado. According to the Northern Prairie Wildlife Research Center, this species tends to inhabit areas characterized by little bluestem and favors mid-grass to tallgrass prairies.

7.3.3.2. Potential Habitat

West Slope Study Areas

The Jasper East and Rockwell/Mueller Creek study areas are located outside the known geographic range for this species.

East Slope Study Areas

Chimney Hollow and Dry Creek. Although little bluestem is not abundant in the Chimney Hollow and Dry Creek study areas, some patches occur especially along the lower slopes of the hogbacks. This species has not been documented in or near the Chimney Hollow or Dry Creek study areas (CNHP 2005).

Ralph Price Reservoir. No large areas of little bluestem or mid-grass to tallgrass prairie exist within or adjacent to the Ralph Price Reservoir study area. Therefore, it is unlikely this species occurs in or near the Ralph Price Reservoir study area.

7.3.4. Dusted Skipper

7.3.4.1. Species Background

The dusted skipper is a small, white-spotted brown butterfly found in disjunct regions from the Rocky Mountains eastward. In Colorado, it is considered imperiled (CNHP 2005). The dusted skipper occurs in a wide variety of open lands including abandoned agricultural fields, open woodlands, and mid-grass to tallgrass prairies. In the West, this species tends to inhabit relatively undisturbed canyons and open woodlands from 5,300 feet to 7,200 feet. Caterpillars feed on big bluestem and little bluestem. Adults feed on a wide variety of forbs; in the western United States, penstemons are a preferred food. The key habitat feature is a cluster of the food plant usually intermixed with patches of bare sand or rock (NatureServe 2006).

7.3.4.2. Potential Habitat

West Slope Study Areas

The Jasper East and Rockwell/Mueller Creek study areas are located outside the known geographic range for this species.

East Slope Study Areas

Chimney Hollow and Dry Creek. Although big and little bluestem is not abundant in either study area, some patches surrounded by bare spots occur especially along the lower slopes of the hogbacks.

Ralph Price Reservoir. Most of the Ralph Price Reservoir study area consists of a mixed ponderosa pine and spruce/fir forest with no areas of abundant big bluestem or little bluestem. It is unlikely that this species occurs in or near the Ralph Price Reservoir study area.

7.3.5. Moss' Elfin

7.3.5.1. Species Background

The Moss' elfin butterfly occurs in the western mountain chains from British Columbia to southern California and southern Colorado. Generally, the species is uncommon throughout its range, and is considered imperiled to vulnerable in Colorado (CNHP 2005). This grayish brown butterfly occurs in moist slopes and canyons usually with steep topography on thin-soiled or rocky, north-facing slopes. The caterpillar feeds on yellow stonecrop and other members of the stonecrop family. Adults feed on the nectars of a variety of flowers (CNHP 2005).

7.3.5.2. Potential Habitat

West Slope Study Areas

The Jasper East and Rockwell/Mueller Creek study areas are located outside of the known geographic range for this species.

East Slope Study Areas

Rocky canyons with thin-soiled or rocky, north-facing slopes occur on the western edge of the Chimney Hollow and Dry Creek study areas and throughout the Ralph Price Reservoir study area. Although it is not known if yellow stonecrop occurs in the area, these canyons may provide potentially suitable habitat for the Moss' elfin's caterpillar host plant.

7.3.6. Mottled Duskywing

7.3.6.1. Species Background

The mottled duskywing is a butterfly widespread across the eastern United States with disjunct populations in the eastern foothills of the Rocky Mountains and elsewhere. In Colorado, mottled duskywing is considered imperiled to vulnerable. Generally, it occurs in hilly, open woodlands, including scrub oak woodlands in Colorado. The caterpillar host species are various buckbrush shrubs including Fendler's ceanotus (*Ceanothus fendleri*) and redroot (*C. herbaceous)* (NatureServe 2006). This species has been found in central Larimer County (CNHP 2005).

7.3.6.2. Potential Habitat

West Slope Study Areas

The Jasper East and Rockwell/Mueller Creek study areas are located outside the known geographic range for this species.

East Slope Study Areas

Chimney Hollow and Dry Creek. Potentially suitable habitat for mottled duskywing is found in mountain mahogany along with scattered buckbrush within the foothills on the western edges of the Chimney Hollow and Dry Creek study areas.

Ralph Price Reservoir. The pine and spruce/fir forests that dominate areas around Ralph Price Reservoir do not provide suitable habitat for this species. It is unlikely this species occurs around Ralph Price Reservoir.

7.3.7. Ottoe Skipper

7.3.7.1. Species Background

The ottoe skipper inhabits mid-grass and tallgrass prairies throughout the central United States. In Colorado, this species of butterfly appears to be associated with populations of big bluestem (NatureServe 2006) and occurs along the Front Range foothills.

7.3.7.2. Potential Habitat

West Slope Study Areas

The Jasper East and Rockwell/Mueller Creek study areas are located outside the known geographic range for this species.

East Slope Study Areas

Chimney Hollow and Dry Creek. Although big bluestem is not abundant in the Chimney Hollow and Dry Creek study areas, some patches occur especially along the lower slopes of the hogbacks.

Ralph Price Reservoir. No large areas of big bluestem occur around Ralph Price Reservoir. Therefore, it is unlikely that populations of this species exist within the Ralph Price Reservoir study area.

7.3.8. Rhesus Skipper

7.3.8.1. Species Background

The rhesus skipper is considered imperiled in Colorado (CNHP 2005). This species ranges throughout the Great Plains of the United States and favors shortgrass prairie dominated by blue grama grass. The host species for caterpillars is blue grama grass.

7.3.8.2. Potential Habitat

West Slope Study Areas

The Jasper East and Rockwell/Mueller Creek study areas are located outside the known geographic range for this species.

East Slope Study Areas

Chimney Hollow and Dry Creek. Blue grama grassland habitat for this species is common along the lower slopes and valleys within the Chimney Hollow and Dry Creek study areas.

Ralph Price Reservoir. Most of the Ralph Price Reservoir study area consists of a mixed ponderosa pine and spruce/fir forest with very little blue grama habitat available. Therefore, it is unlikely that this species occurs in or near the Ralph Price Reservoir study area.

7.3.9. Simius Roadside Skipper

7.3.9.1. Species Background

A small, brownish butterfly, the simius roadside skipper occurs sporadically in the Central Great Plains and eastern United States and Canada. The CNHP considers this species imperiled in Colorado. The simius roadside skipper occurs on shortgrass and mixed-grass prairie, where the male perches on hillocks and other high ground within the prairie. The larvae feed on blue grama, one of the dominant species in these prairies (NatureServe 2006). The nearest recorded population is in the foothills adjacent to the Chimney Hollow and Dry Creek study areas (CNHP 2005).

7.3.9.2. Potential Habitat

West Slope Study Areas

No habitat for this species occurs within the Jasper East or Rockwell/Mueller Creek study areas. Furthermore, the study areas are located outside the known geographic range of this species.

East Slope Study Areas

Chimney Hollow and Dry Creek. Blue grama grassland habitat for this species is common along the lower slopes and valleys within the Chimney Hollow and Dry Creek study areas.

Ralph Price Reservoir. Most of the Ralph Price Reservoir study area consists of a mixed ponderosa pine and spruce/fir forest with very little blue grama habitat available.

Therefore, it is unlikely that this species occurs in or near the Ralph Price Reservoir study area.

7.4. Migratory Birds and Raptors

Nearly all non-gallinaceous (grouse-like) bird species potentially present in the Jasper East, Rockwell/Mueller Creek, Chimney Hollow, Dry Creek, and Ralph Price Reservoir study areas are protected under the Migratory Bird Treaty Act (MBTA). Waterbirds, including ducks, geese, and herons are also protected under the MBTA and are managed in Colorado in accordance with federal laws regulating migratory birds. Unprotected species include non-native species such as the house sparrow, European starling, and rock dove (pigeon).

7.4.1. Ralph Price Reservoir Study Area

The Ralph Price Reservoir study area is dominated by mixed ponderosa pine and Douglas-fir forest. No nests were seen, but several migratory birds were observed during the August 2005 site visit. Species observed by reservoir management staff and during the August 2005 site visit include bald eagle, osprey, great blue heron, cormorant, and gadwall. Northern goshawks also have been observed in the area (Jones 2006).

The Ralph Price Reservoir study area provides breeding and foraging habitat for several species of waterfowl including several duck species, great blue heron, and white pelican. Upland bird species occurring in the Chimney Hollow and Dry Creek study areas are also likely to occur near Ralph Price Reservoir.

7.4.2. Chimney Hollow Study Area

Several nests were observed within the Chimney Hollow study area during the 2003 site visits. Small nests were observed in riparian areas along Chimney Hollow Creek and adjacent tributaries. Three large nests were present during the July 2003 site visit on rocky overhangs and cliffs on the eastern ridgeline. Two of these large nests appeared to be inactive during the July 2003 site visit. Adult and fledgling golden eagles were observed in a third nest. All large nests on the ridgeline are likely used as alternative nests for golden eagles in the area, although no long-term monitoring of the nests has been conducted to confirm this.

Several migratory bird species were observed foraging within the Chimney Hollow study area during the July 2003 site visit. Ground-nesting species observed within the study area include spotted towhee, savannah sparrow, western meadowlark, and mourning dove. Species observed in riparian and wetland habitat include Bullock's oriole, American goldfinch, and yellow warbler. Additional species observed were barn swallow, eastern kingbird, American robin, American kestrel, and chipping sparrow. Riparian and ridge areas, combined with ponderosa pine forests in the higher elevations of the site, contain potentially suitable nesting habitat for several bird species such as dark-eyed junco, pygmy nuthatch, western tanager, American crow, and red-tailed hawk.

7.4.3. Dry Creek Study Area

The Dry Creek study area contains similar habitat and bird species as the Chimney Hollow study area. Two large nests were observed during the January 2005 site visit.

One red-tailed hawk nest was noted in a stand of cottonwood trees in the southern portion of the study area. A large golden eagle nest was also noted along the eastern ridgeline on the northern end of the study area. Both nests appeared to be active in 2005. Several smaller nests were observed along the Dry Creek riparian corridor. Many of the nests were identified as oriole and magpie nests.

7.4.4. Jasper East Study Area

Because most raptors exhibit strong site fidelity and return to the same nest year after year, field surveys concentrated on large stick nests in trees and rock outcrops suitable for hawks and eagles or cliff face ledges and cavities suitable for nesting falcon species. Other migratory birds often construct new nests even when returning to the same breeding territory. No potentially suitable raptor nests were identified directly within the Jasper East study area during the 2004 and 2005 site visits. A series of three alternate golden eagle nests are located on Table Mountain, northeast of the potential reservoir. Information gathered from the USFS indicates that one of the nests on Table Mountain was active in 2007 (Sumerlin pers. comm. 2007). An osprey nest is located on a platform about 1,000 feet east of the potential reservoir. Foraging osprey were observed during the 2004 site visit along the Willow Creek Pump Canal within the potential reservoir footprint.

Raptors and migratory birds likely forage throughout the Jasper East study area. Ground-nesting birds observed at the site, such as green-tailed towhee, savannah sparrow, and killdeer are likely to inhabit pasture or meadow habitat in the area. Species such as golden eagle, cliff swallow, common raven, American kestrel, and red-tailed hawk are likely to nest along the rocky ridges of the hogbacks northeast of the reservoir footprint. Wetland and riparian species such as red-winged blackbird, yellow-headed black bird, and song sparrow are likely to nest in cattail stands or along the edge of wet areas. Several generalist species such as American robin, violet-green swallow, and American crow may nest in forested or wetland areas.

Waterbirds including Canada Geese, mallards, and common merganser breed near reservoirs, rivers and streams, and wetlands in eastern Grand County (Kingery 1998). Great blue heron are an uncommon breeder in Grand County, although the CDOW has recorded at least three heron rookeries on islands in Lake Granby (CNDIS 2007). Numerous waterfowl, herons, and an occasional migrant sandhill crane have been observed in wetlands and open water habitats at the Jasper East study area (Sumerlin pers. comm. 2005).

7.4.5. Rockwell/Mueller Creek Study Area

The Rockwell/Mueller Creek study area contains habitat similar to that of the Jasper East study area except for irrigated meadows. Although the site is generally drier than the Jasper East study area, the stock pond in the center of the property and the drainages on the site provide habitat for wetland bird species. Various waterfowl such as gadwall, American wigeon, and mallard may use the stock pond during different times of the year. Dry meadow and sagebrush habitat dominate most of the study area. Small ground-nesting species such as killdeer, Brewer's sparrow, and vesper sparrow may inhabit these areas.

7.5. Large Game and Other Wildlife

Large game wildlife such as deer, elk, pronghorn, bighorn sheep, mountain lion, and black bear are considered economically important species in Colorado. Large game species are not protected under any federal jurisdictions. However, Colorado Title 33 regulates wildlife, parks, and outdoor recreation including activities of the CDOW that protect all large game species unless a take is permitted with a hunting license.

No major large game migration routes identified by the CDOW (CNDIS 2007) or the Southern Rockies Ecosystem Project (SREP 2005) exist within the study areas, although ridgelines and drainages often serve as smaller movement corridors for game species as well as other wildlife species. The CDOW has identified and mapped winter ranges, winter concentration areas, and severe winter ranges for several large game species within the study areas. Winter range is defined as an area of land necessary for winter survival of large game species; severe winter range is defined as "winter range where 90 percent of the individuals are located when the annual snow pack is at its maximum and/or temperatures are at a minimum in the two worst winters out of ten"; winter concentration area is defined as "that part of the winter range where densities are at least 200 percent greater than the surrounding winter range density" (CNDIS 2007). Summaries describing big game species and other wildlife and their potential habitat in the study area are provided below.

7.5.1. Elk

7.5.1.1. Species Background

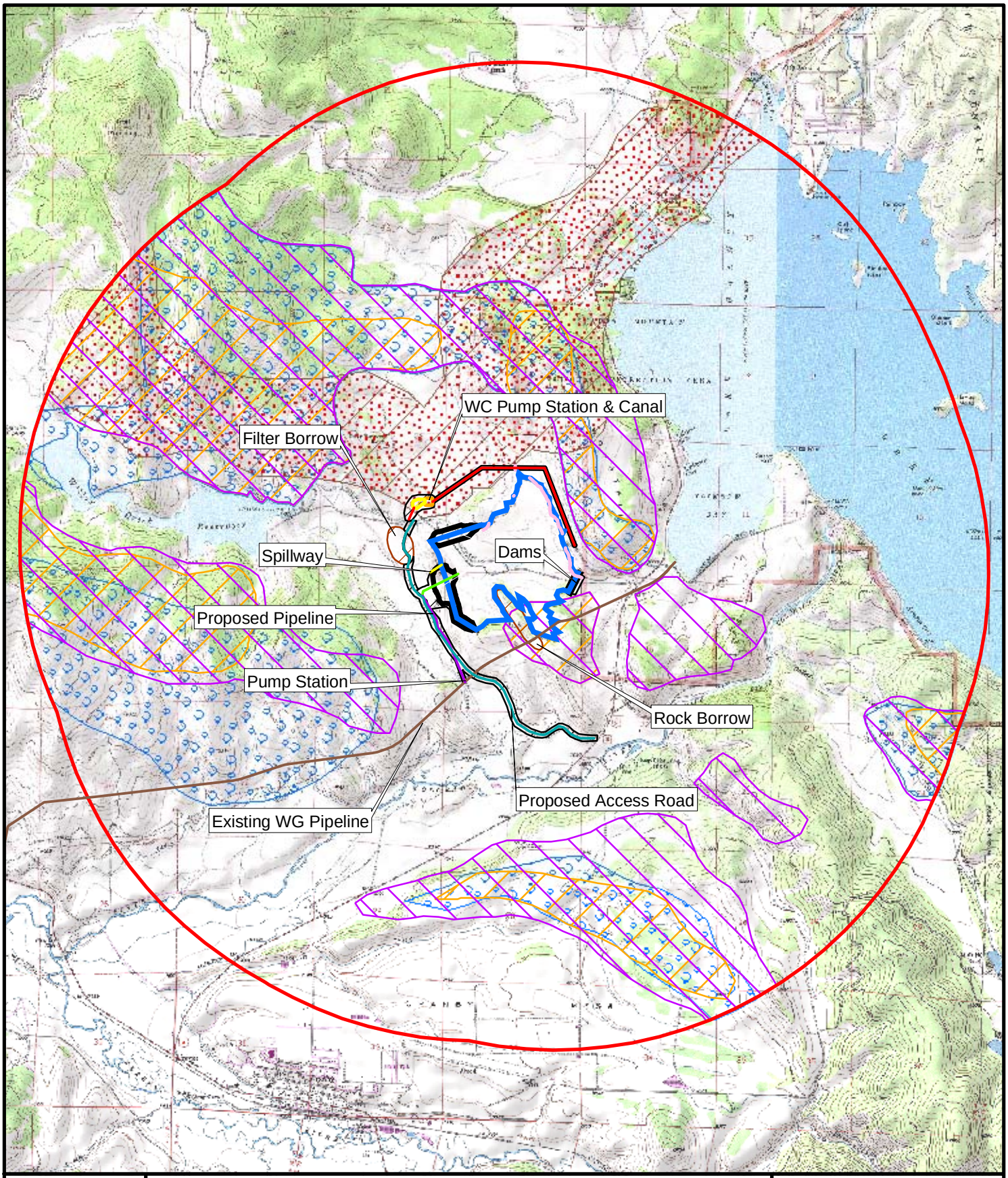
Elk are an important big game species in Colorado. This species primarily inhabits the western two-thirds of the state, but is occasionally found east of the Front Range foothills (Fitzgerald et al. 1994). Elk are generally associated with forested areas adjacent to meadows, open parks, and tundra in the warmer months.

7.5.1.2. Potential Habitat

West Slope Study Areas

The Jasper East and Rockwell/Mueller Creek study areas contain the scattered meadow/forest habitat generally associated with elk. CNDIS data indicate that both the Jasper East and Rockwell/Mueller Creek study areas are located within elk overall range.

Jasper East. There are no known elk migration routes located on the Jasper East study area although elk move across a broad front that includes the Willow Creek - Jasper East area. Major seasonal elk movement occurs north of the Jasper East study area with numerous road kills occurring along U.S. 34 (Oldham pers. comm. 2007). Elk winter range and concentration areas occur at the southern side of the Jasper East study area. Nearby lands bordering the Jasper East study area also provide winter range, severe winter range, and winter concentration areas for elk (Figure 12).



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Wildlife

- Moose Winter Concentration
- Moose Winter Range
- Elk Winter Concentration
- Elk Winter Range
- Elk Severe Winter

Structures

- Access Road
- Inlet - Outlet
- Spillway
- Jasper East Pipeline
- WC Pipeline
- Existing Windy Gap Pipeline
- 3 Mile Buffer
- Jasper East Reservoir
- Jasper East Dam

0 2,500 5,000 Feet

1 Inch = 5000 Feet

N

Figure 12
Jasper East Study Area
Moose & Elk Habitat

Prepared for: Windy Gap Firming Project
File: W/Jaspereast_Wildlife_EK_M08x11.mxd
Date: January 2006

Rockwell/Mueller Creek. The Rockwell/Mueller Creek study area provides summer range for elk. Winter range is located on the northwestern side of the Rockwell/Mueller Creek study area and on lands to the west (Figure 13). Elk severe winter range and winter concentration areas occur to the northwest and southeast of the Rockwell/Mueller Creek study area. There are no known elk migration routes that traverse the Rockwell/Mueller Creek study area.

East Slope Study Areas

Chimney Hollow and Dry Creek. The Chimney Hollow and Dry Creek study areas contain foraging habitat for elk in meadow and riparian areas. Herds of 50 or more were observed during field surveys. CNDIS data indicate that the Chimney Hollow and Dry Creek study areas are located within the overall range and winter range for elk (Figure 14 and Figure 15). Elk winter concentration areas are located in the Chimney Hollow and Dry Creek study areas and in surrounding areas north and east of the study areas. In recent years, this herd has wandered considerably all around this area of the foothills and out onto the plains into residential and agricultural areas. No summer concentration ranges occur near either study area. The CNDIS database did not identify any elk migration routes or seasonal concentration areas on the Chimney Hollow or Dry Creek study areas. Ridgelines and drainages often serve as smaller movement corridors for game species including white-tailed deer, mule deer, and elk.

Ralph Price Reservoir. The Ralph Price Reservoir study area is located within the overall range of the elk. The northern side of Ralph Price Reservoir serves as a winter concentration area and the entire reservoir site is located within a winter and severe winter range for this species (Figure 16). The area does not provide any important summer concentration areas, summer range areas, or migration corridors (CNDIS 2007).

7.5.2. Mule Deer

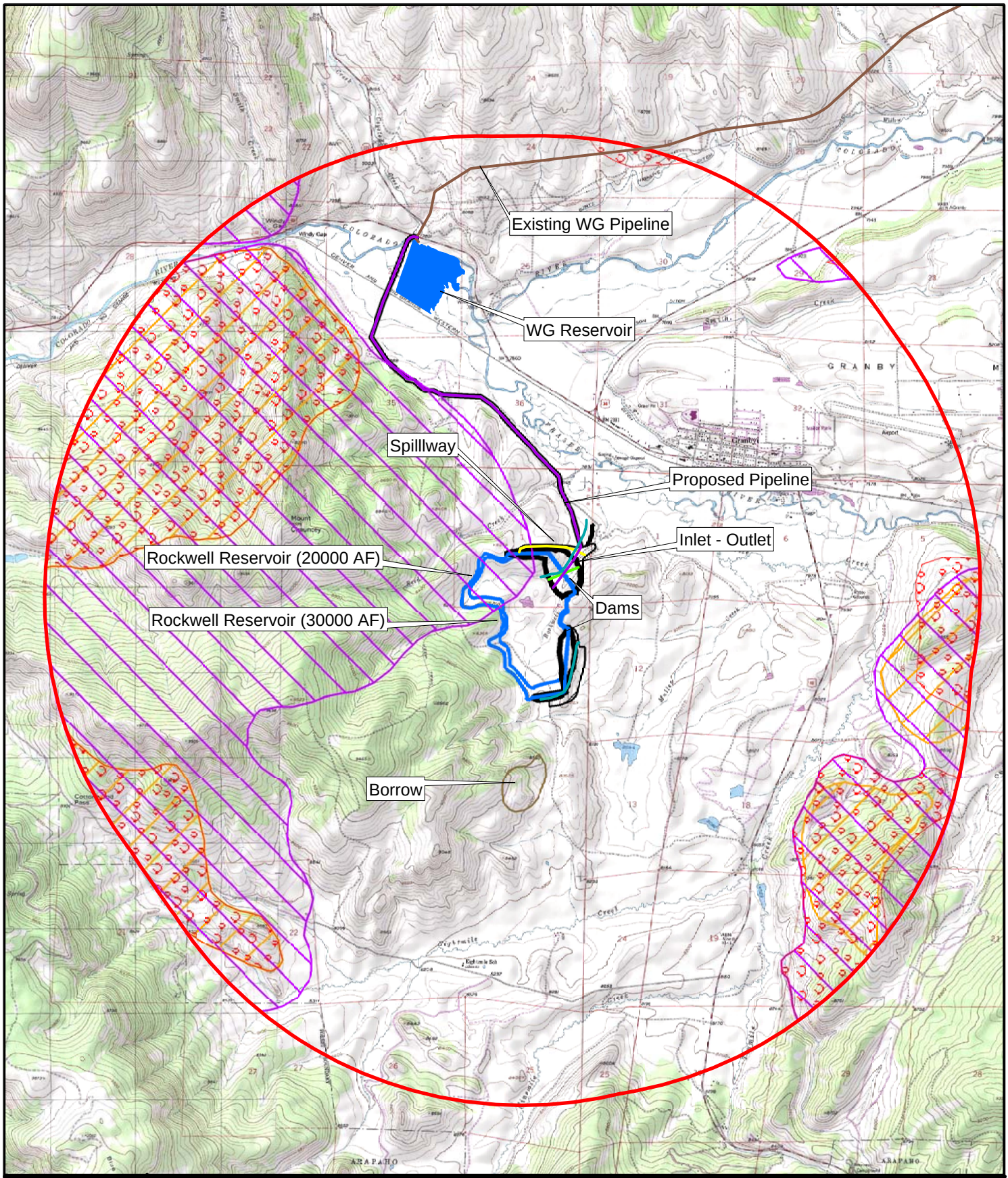
7.5.2.1. Species Background

The mule deer also is an important big game species in Colorado that occupies all ecosystems in Colorado from grasslands to alpine tundra (Fitzgerald et al. 1994). This species reaches it greatest densities in shrublands that provide abundant forage and cover.

7.5.2.2. Potential Habitat

West Slope Study Areas

Jasper East and Rockwell/Mueller Creek. CNDIS data indicate that both the Jasper East and Rockwell/Mueller Creek study areas are located in mule deer summer range. However, mule deer likely visit the Jasper East and Rockwell/Mueller Creek study areas during all seasons. Mule deer winter range occurs just southeast of the Jasper East study area and a small portion of the Jasper East study area falls within the severe winter range (Figure 17). Winter mule deer range is located east and west of the Rockwell/Mueller Creek study area.



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Wildlife

- Elk Winter Concentration
- Elk Winter Range
- Elk Severe Winter

Structures

- Access Road
- Inlet - Outlet
- Spillway
- Rockwell Pipeline
- Existing Windy Gap Pipeline
- 3 Mile Buffer
- Rockwell Reservoir
- Rockwell Dam

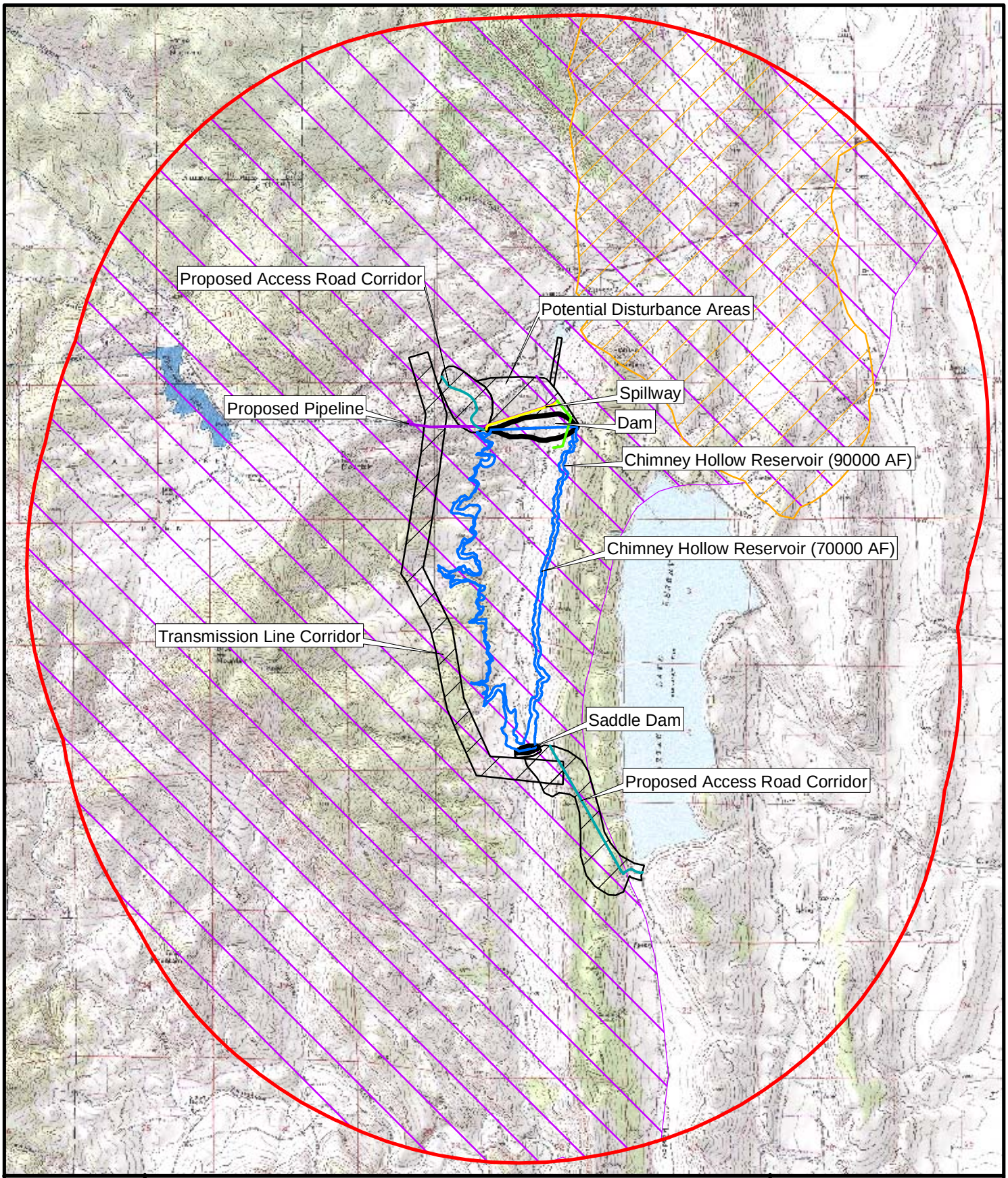
0 2,500 5,000 Feet

1 Inch = 5000 Feet

N

Figure 13
Rockwell/Mueller Study Area Elk Habitat

Prepared for: Windy Gap Firming Project
File: W/Rockwell_Wildlife_EK_M08x11.mxd
Date: January 2006



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Wildlife
- Elk Winter Concentration
- Elk Winter Range

Structures
- Access Road
- Inlet - Outlet
- Spillway
- Chimney Hollow Pipeline
- 3 Mile Buffer
- Chimney Hollow Reservoir
- Chimney Hollow Dam

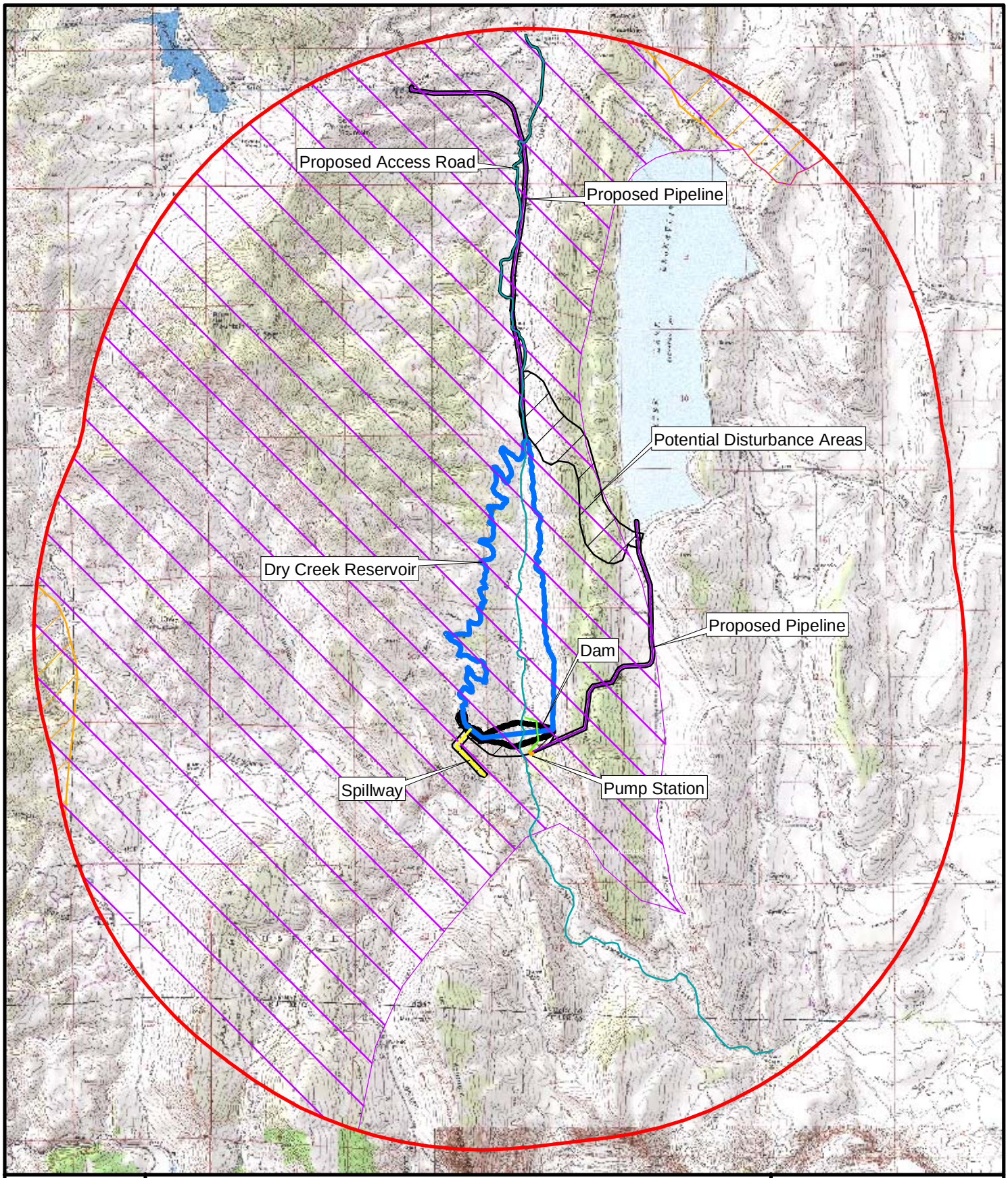
0 2,500 5,000 Feet

1 Inch = 5000 Feet

N

Figure 14
Chimney Hollow Study Area Elk Habitat

Prepared for: Windy Gap Firming Project
File: W/Chimney_Hollow_Wildlife_EK_MO.mxd
Date: January 2006



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Wildlife

- Elk Winter Concentration
- Elk Winter Range

Structures

- Access Road
- Inlet - Outlet
- Spillway
- Dry Creek Pipeline
- 3 Mile Buffer
- Dry Creek Reservoir
- Dry Creek Dam

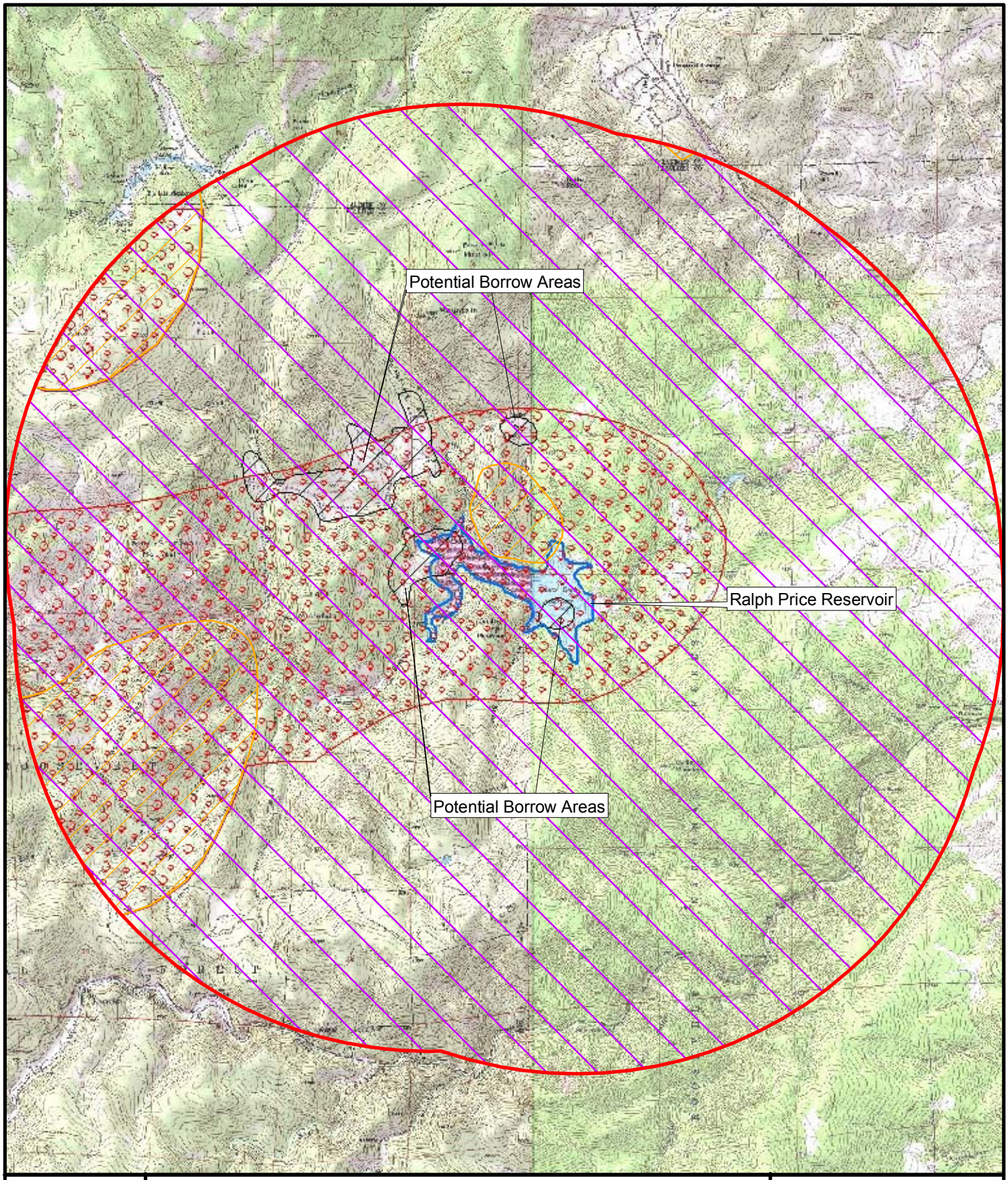
0 2,500 5,000 Feet

1 Inch = 5000 Feet

N

Figure 15
Dry Creek Study Area
Elk Habitat

Prepared for: Windy Gap Firming Project
File: W/Dry_Creek_Wildlife_EK8x11.mxd
Date: January 2006



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Wildlife

- Elk Winter Concentration
- Elk Winter Range
- Elk Severe Winter

Structures

- 3 Mile Buffer
- Ralph Price Reservoir

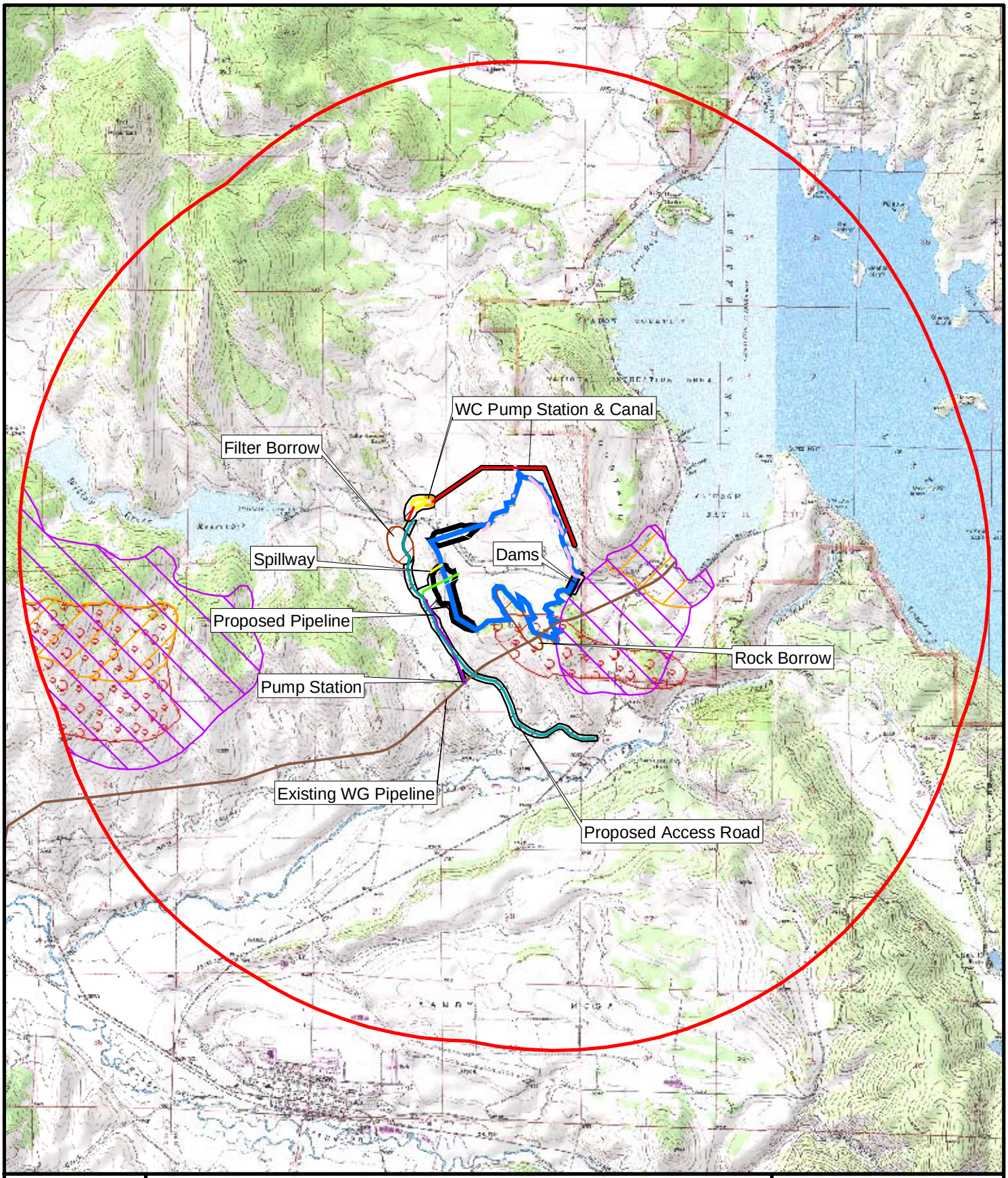
0 2,500 5,000 Feet

1 Inch = 5000 Feet

N

Figure 16
Ralph Price Reservoir Study Area Elk Habitat

Prepared for: Windy Gap Firming Project
File: W/Ralph_Price_Wildlife_EK_MO8x11.mxd
Date: January 2006



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Wildlife

- Mule Deer Winter Concentration
- Mule Deer Winter Range
- Mule Deer Severe Winter

Structures

- Access Road
- Inlet - Outlet
- Spillway
- Jasper East Pipeline
- WC Pipeline
- Existing Windy Gap Pipeline
- 3 Mile Buffer
- Jasper East Reservoir
- Jasper East Dam

0 2,500 5,000 Feet

1 Inch = 5000 Feet

N

Figure 17
Jasper East Study Area
Mule Deer Habitat

Prepared for: Windy Gap Firming Project
File: W/Jaspereast_Wildlife_MD8x11.mxd
Date: January 2006

East Slope Study Areas

Chimney Hollow and Dry Creek. CNDIS data indicate that the Chimney Hollow and Dry Creek study areas both are located in mule deer overall and summer range. Additionally, both study areas and surrounding lands within 3 miles of the study areas are located within winter concentration areas and overall winter range for mule deer. It is likely that mule deer visit both the Chimney Hollow and Dry Creek study areas during all seasons.

Ralph Price Reservoir. The Ralph Rice Reservoir study area provides overall summer and winter range for mule deer. Winter concentration areas occur to the east of the study area (**Error! Reference source not found.**). The site is located in year-round range for this species.

7.5.3. White-tailed Deer

7.5.3.1. Species Background

White-tailed deer are less widespread and more secretive than mule deer. The white-tailed deer occupies shrublands that provide plentiful forage and cover. White-tailed deer are often seen in riparian areas bordering larger streams and rivers. This species does not migrate in large numbers, like mule deer, but will move seasonally up and down river corridors in small numbers.

7.5.3.2. Potential Habitat

West Slope Study Areas

Jasper East and Rockwell/Mueller Creek. CNDIS data do not show any white-tailed deer concentration areas within the Jasper East or Rockwell/Mueller Creek study areas. White-tailed deer occur along the Colorado River about 1 mile south of the Jasper East study area, and along the Fraser River approximately ½ mile north of the Rockwell/Mueller Creek study area. No seasonal migration corridors for white-tailed deer exist near either site; however, this species may occasionally forage on both sites.

East Slope Study Areas

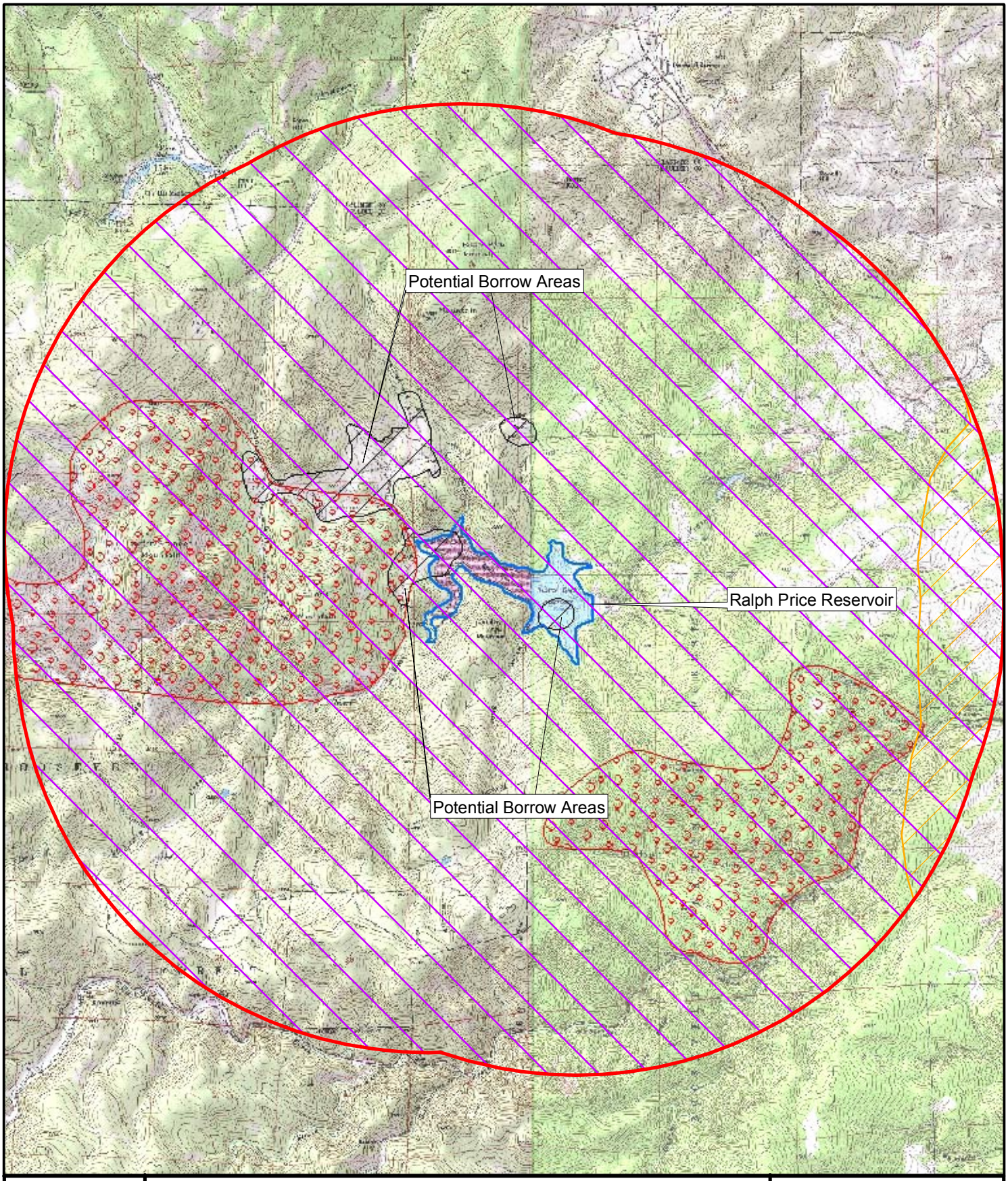
Chimney Hollow and Dry Creek. CNDIS data indicate that both the Chimney Hollow and Dry Creek study areas fall within the overall range for the white-tailed deer. No white-tailed deer winter concentration areas, or winter or summer ranges occur within the Chimney Hollow or Dry Creek study areas.

Ralph Price Reservoir. CNDIS data indicate that the Ralph Price Reservoir study area does not fall within the overall range for white-tailed deer. No seasonal migration corridors or concentration areas for white-tailed deer exist near Ralph Price Reservoir.

7.5.4. Moose

7.5.4.1. Species Background

Moose are the largest cervid in Colorado. Prior to the CDOW moose introductions into the state in 1978, no documented breeding of moose had ever been recorded in Colorado. This species inhabits high-elevation meadows and boreal forest edges in northern and central Colorado.



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Wildlife

- Mule Deer Winter Concentration
- Mule Deer Winter Range
- Bighorn Sheep Winter Range

Structures

- 3 Mile Buffer
- Ralph Price Reservoir

0 2,500 5,000 Feet

1 Inch = 5000 Feet

N

Figure 18
Ralph Price Reservoir Study Area Mule Deer & Bighorn Sheep Habitat

Prepared for: Windy Gap Firming Project
File: W/Ralph_Price_Wildlife_MD_BH8x11.mxd
Date: January 2006

7.5.4.2. Potential Habitat

West Slope Study Areas

Jasper East and Rockwell/Mueller Creek. CNDIS data indicate that moose overall range includes the Jasper East and Rockwell/Mueller Creek study areas. Moose winter ranges and winter concentration areas occur directly north of the Jasper East study area (Figure 12).

There are no seasonal ranges or concentration areas within 5 miles of the Rockwell/Mueller Creek study area. Winter ranges and winter concentration areas have been identified by the CNDIS about 8 miles southwest of the Rockwell/Mueller Creek study area.

East Slope Study Areas

Chimney Hollow, Dry Creek, and Ralph Price Reservoir. The Chimney Hollow, Dry Creek, and Ralph Price Reservoir study areas are all located outside of the overall range for moose in Colorado.

7.5.5. Pronghorn

7.5.5.1. Species Background

The American pronghorn is an important big game species in Colorado that inhabits grasslands and semi-desert shrublands on rolling topography that provides good visibility (Fitzgerald et al. 1994). Pronghorn tend to favor vast expanses of open areas and are typically sensitive to human presence.

7.5.5.2. Potential Habitat

West Slope Study Areas

Jasper East and Rockwell/Mueller Creek. A review of the CNDIS mapping revealed that the Jasper East and Rockwell/Mueller Creek study areas fall within the overall range for this species. However, there are no identified seasonal ranges, migration corridors, or seasonal concentration areas in either study area.

East Slope Study Areas

Chimney Hollow and Dry Creek. A review of the CNDIS mapping revealed that both the Chimney Hollow and Dry Creek study areas fall within the overall range for the pronghorn. However, there are no identified seasonal ranges, migration corridors, or seasonal concentration areas in either study area.

Ralph Price Reservoir. No records of pronghorn exist in the Ralph Price Reservoir study area. No large areas of open meadow or prairie that this species typically favors exist in the study area. No seasonal concentration areas or migration corridors exist within the Ralph Price Reservoir study area.

7.5.6. Bighorn Sheep

7.5.6.1. Species Background

Bighorn sheep inhabit steep, rocky areas in the mountains of Colorado (Fitzgerald et al. 1994). Bighorn sheep are an important game species in Colorado and is also the official “state mammal.” The sheep are heavily built mammals characterized by large

curling horns on males, with females having shorter horns. Once thought to have ranged throughout the Colorado foothills and mountains, the sheep currently have sporadic distribution in locations throughout the higher mountains.

7.5.6.2. Potential Habitat

West Slope Study Areas

Jasper East and Rockwell/Mueller Creek. The nearest sheep population is located north of the Jasper East and Rockwell/Mueller Creek study areas near the Grand County boundary with Jackson and Larimer counties. It is unlikely that bighorn sheep migrate onto either study area because of a lack of suitable habitat.

East Slope Study Areas

Chimney Hollow and Dry Creek. The nearest sheep population is located south and west of the Chimney Hollow and Dry Creek study areas within Big Thompson Canyon and the western Larimer County boundary with Jackson County. It is unlikely that bighorn sheep migrate onto either study area because of the distance to the nearest populations and a lack of suitable habitat.

Ralph Price Reservoir. Bighorn sheep have been observed about 5 miles west of the current reservoir (CNDIS 2007). It is possible that bighorn sheep could wander into areas near the reservoir. CNDIS data indicate that winter ranges for bighorn sheep occur on the western side of the Ralph Price Reservoir study area and to the southeast of the current reservoir (**Error! Reference source not found.**).

7.5.7. Black Bear

7.5.7.1. Species Background

The black bear is Colorado's largest carnivore and inhabits montane shrublands and forests. It also is found in subalpine forests at moderate elevations, and even ranges from the edge of the alpine tundra to canyon country and lower foothills (Fitzgerald et al. 1994).

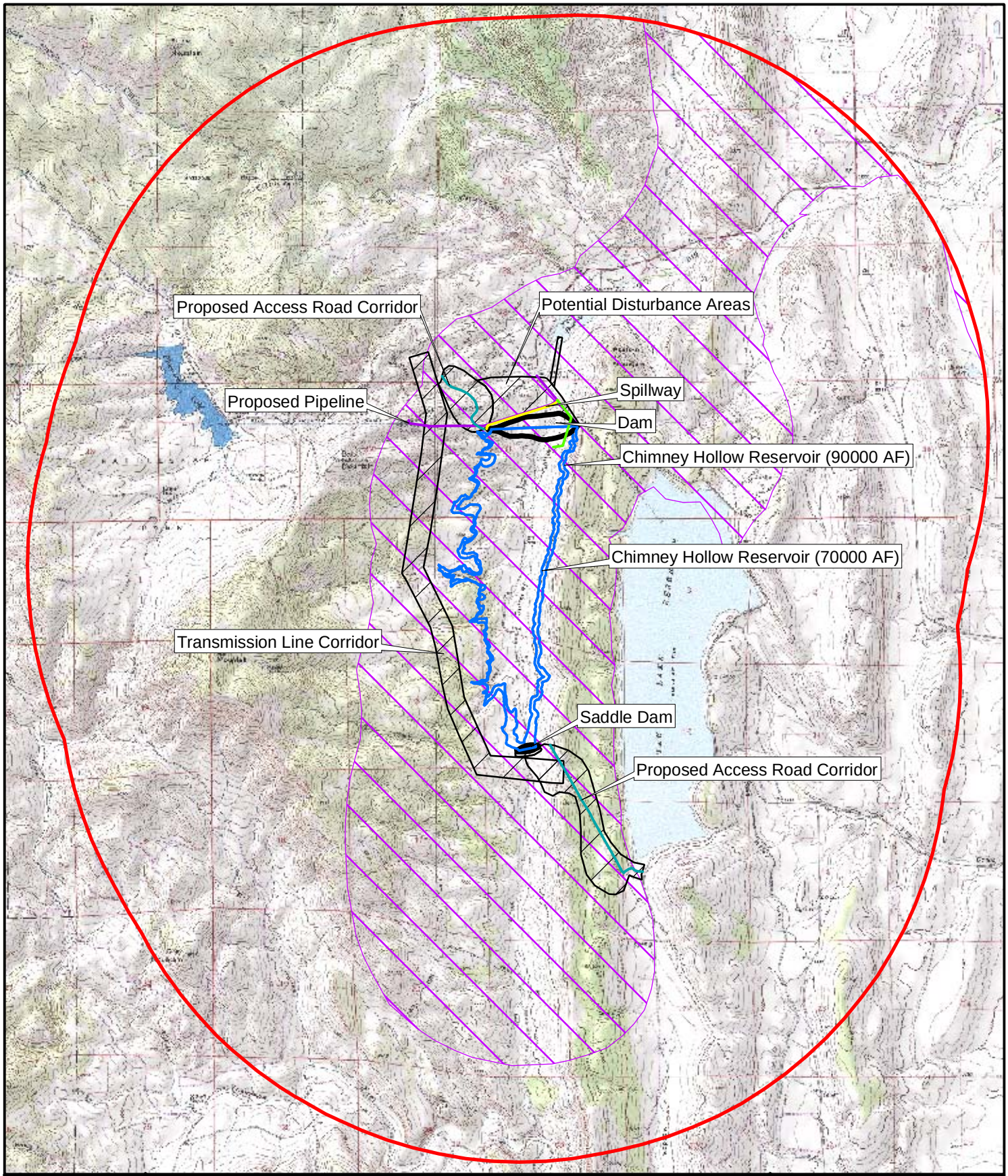
7.5.7.2. Potential Habitat

West Slope Study Areas

Jasper East and Rockwell/Mueller Creek. CNDIS data indicate that the Jasper East and Rockwell/Mueller Creek study areas are located within the overall range for black bear. A portion of the proposed Jasper East Reservoir footprint overlaps a black bear summer concentration area.

East Slope Study Areas

Chimney Hollow and Dry Creek. CNDIS data indicate that the Chimney Hollow and Dry Creek study areas are located within the overall range for black bear. Because of the large number of human residences and recreation areas, the CDOW has identified Carter Lake, located to the east and northeast of both study areas, as a black bear/human conflict area. Both study areas also are located within a black bear fall concentration area (Figure 19 and Figure 20). Black bear may occasionally forage on both sites at all times of the year.



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Wildlife

Black Bear Fall Concentration

Structures

- Access Road
- Inlet - Outlet
- Spillway
- Chimney Hollow Pipeline

- 3 Mile Buffer
- Chimney Hollow Reservoir
- Chimney Hollow Dam

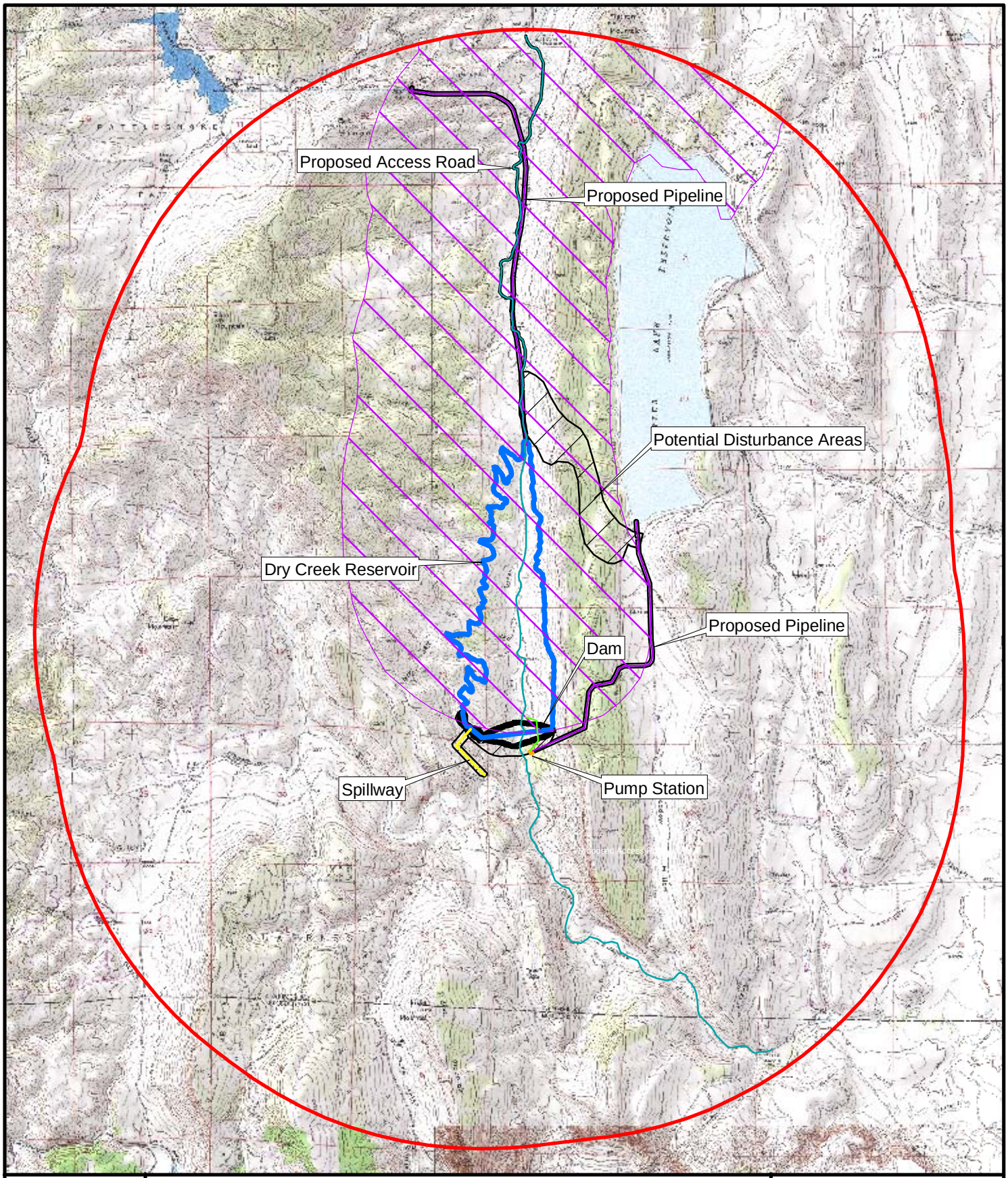
0 2,500 5,000 Feet

1 Inch = 5000 Feet

N

Figure 19
Chimney Hollow Study Area Black Bear Fall Concentration

Prepared for: Windy Gap Firming Project
File: W/Chimney_Hollow_Wildlife_BB8x11.mxd
Date: January 2006



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Wildlife

Black Bear Fall Concentration

Structures

- Access Road
- Inlet - Outlet
- Spillway
- Dry Creek Pipeline

- 3 Mile Buffer
- Dry Creek Reservoir
- Dry Creek Dam

0 2,500 5,000 Feet

1 Inch = 5000 Feet

N

Figure 20
Dry Creek Study Area
Black Bear Fall Concentration

Prepared for: Windy Gap Firming Project
File: W/Dry_Creek_Wildlife_BB_ML8x11.mxd
Date: January 2006

Ralph Price Reservoir. CNDIS data indicate that the Ralph Price Reservoir study area does fall into the overall range for black bear. No human conflict areas or seasonal concentration areas occur immediately adjacent to Ralph Price Reservoir. The CNDIS database does identify a summer concentration area approximately 2.5 miles west of the reservoir along the upper North St. Vrain Creek drainage. It is possible that black bear occasionally forage near the reservoir.

7.5.8. Mountain Lion

7.5.8.1. Species Background

The CDOW considers the mountain lion a game species. This species typically inhabits rocky outcroppings and ridges near the foothill and mountain areas of the state. Mountain lions prey mainly on deer, as well as elk and other ungulates in North America, and their distribution and movements correspond to their ungulate prey (Fitzgerald et al. 1994).

7.5.8.2. Potential Habitat

West Slope Study Areas

Jasper East and Rockwell/Mueller Creek. CNDIS data indicate that both the Jasper East and Rockwell/Mueller Creek study areas occur within the overall range for the mountain lion. Mountain lions could forage on either site especially if large mammalian prey are in the area; however, this species typically favors rocky outcroppings, not the open meadow and sage habitat located in the study areas.

East Slope Study Areas

Chimney Hollow and Dry Creek. CNDIS data indicate that both the Chimney Hollow and Dry Creek study areas occur within the overall range for the mountain lion and tracks of a female lion with two cubs were observed in the Chimney Hollow study area. Mountain lions typically favor rocky outcroppings, such as the hogbacks west and east of each site. It is likely that this species preys on mule deer and other animals near and in the Chimney Hollow and Dry Creek study areas. Because of the density of human residences and recreation areas, human conflict areas occur around Carter Lake Reservoir and Flatiron Reservoir north and east of the Chimney Hollow study area. Human conflict areas also occur south of the Dry Creek study area.

Ralph Price Reservoir. CNDIS data indicate that the existing reservoir is located within the mountain lion overall range. No concentration areas or human conflict areas are located near the Ralph Price Reservoir study area. It is likely that this species inhabits the area surrounding Ralph Price Reservoir.

7.5.9. Other Wildlife

7.5.9.1. Jasper East and Rockwell/Mueller Creek Study Areas

Both the Jasper East and Rockwell/Mueller Creek study areas provide habitat for high-elevation and wide-ranging species. Larger mammals likely to use habitat in either study area include coyote, red fox, badger, raccoon, porcupine, and bobcat. Smaller mammals such as deer mice, mountain cottontail, montane vole, and northern pocket

gopher are likely to be present in the study areas. Bird species likely to be found in the wet meadow and sagebrush communities at these sites include Brewer's sparrow, vesper sparrow, song sparrow, western meadowlark, and migrant northern harrier.

7.5.9.2. Chimney Hollow, Dry Creek, and Ralph Price Reservoir Study Areas

The Chimney Hollow, Dry Creek, and Ralph Price Reservoir study areas provide habitat for species similar to those mentioned for the Jasper East and Rockwell/Mueller Creek study areas. Coyote, red fox, raccoon, bobcat, and porcupine all likely occur on the Chimney Hollow, Dry Creek, and Ralph Price Reservoir study areas. Smaller mammals, such as cottontail rabbits, deer mice, northern pocket gophers, and amphibians and reptiles, including Woodhouse toads and bullsnakes potentially use habitat within these study areas. Wildlife endemic to ponderosa pine or Front Range canyon habitats includes flammulated owl, long-eared myotis, rock squirrel, northern rock mouse, and Mexican woodrat.

8.0 ENVIRONMENTAL CONSEQUENCES

8.1. Introduction

The potential direct, indirect, and cumulative environmental consequences on wildlife resources was evaluated for each WGFP alternative. Cumulative effects are discussed in Section 9.0. Potential effects to wildlife are discussed by alternative. Potential effects to threatened or endangered plant species are included in the Vegetation Technical Report (ERO 2006a). Potential effects to threatened or endangered aquatic species, including Colorado River endangered fish species are addressed in the Aquatics Technical Report (Miller 2007).

8.2. Methods

Potential effects to wildlife resources were assessed using several information sources including field surveys for some species, an assessment on the suitability of habitat, and available data on known populations or suitable habitat. Information on wildlife species' habitat ranges and distribution were obtained from the CNDIS website and overlaid on maps showing project features to determine the potential loss of habitat. Information on wildlife species' relative abundance within individual counties also was obtained from the CNDIS. Additional information on wildlife species' distribution was obtained from the Colorado Breeding Bird Atlas (Kingery 1998), Colorado Birds (Andrews and Righter 1992), Mammals of Colorado (Fitzgerald et al. 1994), and Amphibians and Reptiles in Colorado (Hammerson 1999).

Permanent impacts to wildlife habitat could occur in areas that are inundated or permanently filled by project features such as the dam footprints, access roads, and pump stations. Temporary impacts to habitat could occur in areas that would be returned to their approximate original contour and vegetation following construction, such as pipeline routes and staging areas. Potential effects were evaluated for the loss or disturbance of habitat and potential for affecting species population, viability, distribution, travel, and reproduction.

Summaries of the direct and indirect effects of each alternative on federally listed wildlife species with suitable habitat in the study areas are provided in Table 4, and summaries of the direct and indirect effects of each alternative on state-listed wildlife species are provided in Table 5. Findings on the potential effect to federally listed species were based on the determination language used by the FWS (FWS 1998). Possible determinations include—

No effect — The action would not affect listed species or critical habitat.

Is not likely to adversely affect — The effect on listed species is expected to be discountable, insignificant, or completely beneficial.

Likely to adversely affect — The action would have a direct or indirect adverse effect to listed species as a result of the proposed action, or its interrelated or interdependent actions, and the effect is not discountable, insignificant, or beneficial.

Table 4. Summary of direct and indirect effects to federally listed species of special concern from all alternatives.

Species	Alternative 1 No Action	Alternative 2 Proposed Action	Alternative 3 Chimney Hollow Reservoir (70,000 AF) and Jasper East Reservoir (20,000 AF)	Alternative 4 Chimney Hollow Reservoir (70,000 AF) and Rockwell/Mueller Creek Reservoir (20,000 AF)	Alternative 5 Dry Creek Reservoir (60,000 AF) and Rockwell/Mueller Creek Reservoir (30,000 AF)
	Determination of Potential Effect and Rationale				
Preble's meadow jumping mouse	**No effect** No suitable habitat around reservoir perimeter; no impacts to potential habitat downstream of Ralph Price Reservoir from changes in streamflow.	**No effect** Past trapping surveys have yielded negative capture results. Determination of no habitat in study area accepted by the FWS, although FWS requested an additional survey prior to construction.	**No effect** Past trapping surveys have yielded negative capture results and a determination of no habitat in the Chimney Hollow study area accepted by FWS, although FWS requested an additional survey prior to construction. Jasper East study area is outside of known range.	**No effect** Past trapping surveys have yielded negative capture results, and a determination of no habitat in the Chimney Hollow study area accepted by FWS, although FWS requested an additional survey prior to construction. Rockwell/Mueller Creek study area outside of known range.	**May affect, not likely to adversely affect** Past trapping survey at Dry Creek study area yielded negative capture results; FWS requests an additional trapping survey prior to construction. No suitable habitat at Rockwell/Mueller Creek study area.
Canada lynx	**No effect** No suitable habitat.	**No effect** No suitable habitat.	**No effect** No suitable habitat at the Chimney Hollow study area. No potential habitat at Jasper East study area.	**May affect, not likely to adversely affect** No suitable habitat at the Chimney Hollow study area. Temporary impact to 14 acres of forest and permanent impacts to 5 acres of fragmented forest within potential lynx habitat at the Rockwell/Mueller Creek study area.	**May affect, not likely to adversely affect** No suitable habitat at the Dry Creek study area. Temporary impact to 14 acres of forest and permanent impact to 9 acres of fragmented forest within potential lynx habitat at the Rockwell/Mueller Creek study area.

Table 5. Summary of direct and indirect effects to state threatened and endangered species, and species of special concern from all alternatives.

Species	Alternative 1 No Action	Alternative 2 Proposed Action	Alternative 3 Chimney Hollow Reservoir (70,000 AF) and Jasper East Reservoir (20,000 AF)	Alternative 4 Chimney Hollow Reservoir (70,000 AF) and Rockwell/Mueller Creek Reservoir (20,000 AF)	Alternative 5 Dry Creek Reservoir (60,000 AF) and Rockwell/Mueller Creek Reservoir (30,000 AF)
Boreal toad	No effect; no suitable habitat; outside of known geographic and elevation range.	No effect; no suitable habitat; outside of known geographic and elevation range.	No effect; Chimney Hollow study area is outside of known range; negative survey results at the Jasper East study area.	Chimney Hollow study area is outside of known range; loss of potential habitat at Rockwell/Mueller Creek study area.	Dry Creek study area outside of known range; loss of potential habitat at the Rockwell/Mueller Creek study area.
Wood frog	No effect; outside of known geographic range.	No effect; outside of known geographic range.	No effect; Chimney Hollow study area outside of known range; negative survey results at the Jasper East study area.	No effect; Chimney Hollow study area outside of known range; unlikely to occur on the Rockwell/Mueller Creek study area; lack of suitable habitat.	Dry Creek study area outside of known range. Unlikely to occur at the Rockwell/Mueller Creek study area; lack of suitable habitat.
Northern leopard frog	Would inundate potential habitat upstream of the reservoir on North St. Vrain Creek.	Would affect 2.5 acres of potential habitat.	Chimney Hollow study area would affect 2.3 acres of potential habitat. Negative survey results at Jasper East study area, but loss of 22 acres of potential habitat. Both new reservoirs may create potential habitat.	Chimney Hollow study area would affect about 2.3 acres of potential habitat; loss of 17 acres of potential habitat in the Rockwell/Mueller Creek study area.	Dry Creek would affect about 8.5 acres of suitable habitat; loss of about 22 acres of potential habitat at the Rockwell/Mueller Creek study area.

Species	Alternative 1 No Action	Alternative 2 Proposed Action	Alternative 3 Chimney Hollow Reservoir (70,000 AF) and Jasper East Reservoir (20,000 AF)	Alternative 4 Chimney Hollow Reservoir (70,000 AF) and Rockwell/Mueller Creek Reservoir (20,000 AF)	Alternative 5 Dry Creek Reservoir (60,000 AF) and Rockwell/Mueller Creek Reservoir (30,000 AF)
Common garter snake	No effect; site located above upper elevation limit for this species in Colorado.	Would affect about 50 acres of potential habitat for this species; suitable habitat may develop along new reservoir shoreline.	Would affect about 49 acres of potential habitat at the Chimney Hollow study area; suitable habitat may develop along new reservoir shoreline. Jasper East study area outside of known geographic range.	Would affect about 49 acres of potential habitat at the Chimney Hollow study area; suitable habitat may develop along new reservoir shoreline. Rockwell/Mueller Creek study area is outside of known geographic range.	Would affect about 30 acres of potential habitat at Dry Creek study area; suitable habitat may develop along new reservoir shoreline. Rockwell/Mueller Creek study area is outside of known geographic range.
Ferruginous hawk	No effect; no suitable habitat.	Would reduce potential foraging habitat, although no record of presence.	No breeding records exist for either study area. Chimney Hollow Reservoir would reduce potential prey availability. No effect on any known populations at either reservoir site.	No breeding records exist for either study area. Chimney Hollow Reservoir would reduce potential prey availability. No effect on any known populations at either reservoir site.	No breeding records exist for either study area. Dry Creek Reservoir would reduce potential prey availability, but no effect on any known populations at either reservoir site.
Peregrine falcon	No effect; potential habitat near study area would not be impacted.	No effect on any known populations.	No effect on any known populations.	No effect on any known populations for either study area.	No effect on any known populations for either study area.
Greater sandhill crane	No effect; no suitable habitat.	No effect; no suitable habitat.	Unlikely to affect; limited suitable habitat at the Jasper East study area. No suitable habitat at the Chimney Hollow study area.	No effect; no suitable habitat.	No effect; no suitable habitat.

Species	Alternative 1 No Action	Alternative 2 Proposed Action	Alternative 3 Chimney Hollow Reservoir (70,000 AF) and Jasper East Reservoir (20,000 AF)	Alternative 4 Chimney Hollow Reservoir (70,000 AF) and Rockwell/Mueller Creek Reservoir (20,000 AF)	Alternative 5 Dry Creek Reservoir (60,000 AF) and Rockwell/Mueller Creek Reservoir (30,000 AF)
Greater sage grouse	No effect; outside of known geographic range.	No effect; outside of known geographic range.	Chimney Hollow study area is outside of known geographic range. No effect on known populations, but loss of suitable habitat at Jasper East study area.	Chimney Hollow study area is outside of known geographic range. Would adversely affect a known lek and foraging habitat in the Rockwell/Mueller Creek study area.	Dry Creek study area is outside of known geographic range. Would adversely affect known lek and foraging habitat in the Rockwell/Mueller Creek study area.
Townsend's big-eared bat	Known record of occurrence near the study area; potential habitat could be present.	Unlikely to affect because of the lack of quality habitat, no record of occurrence, and on the edge of known range.	Unlikely to affect because of the lack of quality habitat at the Chimney Hollow study area, no record of occurrence, and on the edge of known range. No suitable habitat at the Jasper East study area.	Unlikely to affect because of the lack of quality habitat at the Chimney Hollow study area, no record of occurrence, and on the edge of known range. No suitable habitat at the Rockwell/Mueller Creek study area.	Unlikely to affect because of the lack of quality habitat at the Dry Creek study area, no record of occurrence, and on the edge of known range. No suitable habitat at the Rockwell/Mueller Creek study area.
Northern river otter	No effect; outside of known geographic range.	No effect; outside of known geographic range.	Unlikely to affect because of the lack of quality habitat at the Jasper East study area.	No effect; Chimney Hollow study area is outside of known geographic range. No suitable habitat at the Rockwell/Mueller Creek study area.	No effect; Dry Creek study area is outside of known geographic range. No suitable habitat at the Rockwell/Mueller Creek study area.

8.2.1. Effects to Federally Listed Threatened, Endangered, and Candidate Species Common to All Alternatives

8.2.1.1. Species Potentially Affected by Platte River Depletions

The least tern, piping plover, pallid sturgeon, and whooping crane are species that could be affected by depletions in the South Platte River. Because all of the alternatives would result in some level of accretions to the South Platte River, these species would not be adversely affected by any of the potential alternatives and are not discussed in the remaining text in this technical report. Increased flows in the South Platte may help maintain habitat to threatened and endangered species along the Platte River in Nebraska.

8.2.1.2. Mexican Spotted Owl, Black-footed Ferret, and Western Yellow-billed Cuckoo

The Mexican spotted owl, black-footed ferret, and western yellow-billed cuckoo would not be affected by this project because there is no potentially suitable habitat in any of the study areas. Changes in flows to the Colorado River would not adversely affect riparian vegetation (ERO 2006a) and thus would not adversely affect any potential yellow-billed cuckoo habitat. These species are not discussed in the remaining text of this technical report.

8.3. Alternative 1 — No Action, Ralph Price Reservoir Enlargement

8.3.1. Federal Threatened and Endangered Species

8.3.1.1. Bald Eagle

Alternative 1 would not result in any adverse impacts to bald eagle nesting or roosting sites from expansion of Ralph Price Reservoir. No summer or winter concentration areas or important foraging habitat exists within the Ralph Price Reservoir study area. Construction activities, including the draining of Ralph Price Reservoir would temporarily reduce available foraging habitat for bald eagles, but over the long-term, expansion of Ralph Price Reservoir would result in a net increase of available foraging habitat for bald eagles. An increase in bald eagle presence at Ralph Price Reservoir is possible because they tend to nest and forage near large water bodies. There are currently no records of eagles nesting or winter roosting at the reservoir. Expansion of Ralph Price Reservoir is not likely to adversely affect bald eagles.

8.3.1.2. Preble's Meadow Jumping Mouse

Alternative 1 would not result in any direct adverse impacts to populations of Preble's because no suitable shrub and riparian habitat exists adjacent to the current reservoir. Indirect impacts to potential Preble's habitat downstream of the reservoir on North St. Vrain Creek could occur if changes in stream flow significantly altered riparian vegetation. Riparian vegetation on North St. Vrain Creek is limited to a narrow band along the often incised stream channel providing very limited suitable habitat for Preble's. Up to a 25 percent decrease in streamflow on North St. Vrain Creek between Ralph Price Reservoir and Longmont Reservoir would occur during July under

Alternative 1, but there would be less than a 1 percent change in streamflow during the peak runoff period in June. These changes, plus increased flows in most other months, are not expected to affect the riparian and wetland vegetation found primarily along the banks of the stream. Average monthly streamflow in North St. Vrain Creek below Longmont Reservoir would decrease less than 5 percent during the growing season, and St. Vrain Creek above the St. Vrain Feeder Canal would decrease less than 2 percent. These small changes in flow are unlikely to measurably affect riparian vegetation (ERO 2006a) and thus are unlikely to indirectly affect potential Preble's habitat including Preble's recorded 5 miles downstream of the town of Lyons.

Alternative 1 would have no effect on Preble's or Preble's critical habitat.

8.3.1.3. Lynx

The Canada lynx would not be affected by expansion of Ralph Price Reservoir because the reservoir is below the elevation range for this species.

8.3.2. State Threatened and Endangered Species, and Species of Special Concern

8.3.2.1. Species Evaluated and Discounted

The Ralph Price Reservoir study area is outside the geographic and elevation range for the boreal toad, wood frog, common garter snake, northern river otter, greater sandhill crane, and greater sage grouse. This study area contains no suitable habitat for the ferruginous hawk.

8.3.2.2. Northern Leopard Frog and Common Garter Snake

The existing Ralph Price Reservoir is a deep reservoir with very few wetlands with rooted vegetation that could provide suitable habitat for leopard frogs. Expansion of the reservoir would directly impact about 500 square feet (0.1 acre) of riparian vegetation upstream of the reservoir along North St. Vrain Creek that could provide leopard frog and garter snake habitat. The minor changes in North St. Vrain Creek streamflow described above would not adversely impact potential leopard frog or garter snake habitat downstream of the reservoir.

8.3.2.3. Peregrine Falcon

No breeding or nest sites have been recorded near the Ralph Price Reservoir study area. Cliffs and rocky areas above the reservoir are generally low and lack suitable peregrine falcon nesting habitat; however, as peregrine populations continue to expand in Colorado, future nesting could occur. Expansion of Ralph Price Reservoir would not impact any potentially suitable nesting habitat. Thus, Alternative 1 would have no effect on peregrine falcons.

8.3.2.4. Townsend's Big-eared Bat

This species may inhabit rocky areas within the Ralph Price Reservoir study area. CNHP data indicate one occurrence of this species in T3N, R70W, Section 18, near the Ralph Price Reservoir study area. The exact location of this occurrence is unknown. It is unknown as to whether small populations of this species exist near Ralph Price Reservoir.

It is possible that expansion of Ralph Price Reservoir would affect potential habitat for Townsend's big-eared bat.

8.3.3. Colorado Natural Heritage Program Species

The host plant for Moss' elfin is yellow stonecrop, which potentially occurs on stony ground in canyon areas. Expansion of Ralph Price Reservoir would not inundate canyon habitat potentially suitable for the host species and is unlikely to adversely affect Moss' elfin. Alternative 1 would not impact the simius roadside skipper; arogos skipper; dusted skipper; mottled duskywing; ottoe skipper; cross-line skipper; or rhesus skipper because of a lack of suitable habitat.

Habitat for sage sparrow does not exist in the Ralph Price Reservoir study area. This species would not be affected by this alternative.

8.3.4. Migratory Birds and Raptors

Effects to migratory birds from the expansion of Ralph Price Reservoir include the loss of potential foraging and nesting habitat for ground- and shrub-nesting birds. Reservoir expansion also would affect tree-nesting bird species with the loss of about 77 acres of forest habitat. Tree-nesting species would be displaced and forced to relocate to other nearby suitable habitat common in the lands surrounding the reservoir.

There are no known raptor nests that would be affected by reservoir expansion, but suitable habitat is present for several species including the northern goshawk, Cooper's hawk, and red-tailed hawk in the forested areas bordering the reservoir. Bald eagles and osprey could benefit from the additional forage habitat created by an enlarged reservoir.

Expansion of Ralph Price Reservoir could provide some additional open water habitat for waterfowl, such as ducks and Canada Geese, but an appreciable increase in the number of breeding or over-wintering waterfowl is unlikely.

8.3.5. Large Game and Other Wildlife Species

8.3.5.1. Elk, Mule Deer, and Bighorn Sheep

Expansion of Ralph Price Reservoir would permanently impact about 77 acres of elk and mule deer winter range (Figure 16 and Figure 18), and mule deer summer range. This also includes about 4 acres of elk winter concentration area. Seasonal winter ranges for elk and mule deer are widespread throughout Boulder County; therefore, it is unlikely that they would be adversely affected by the loss of habitat.

Temporary impacts associated with excavation from borrow areas could occur within elk winter range, elk severe winter range, mule deer summer range, mule deer winter range, and bighorn sheep summer and winter range, depending on which borrow areas would be used.

8.3.5.2. White-tailed Deer, Pronghorn, Moose, Black Bear, and Mountain Lion

Alternative 1 would result in the loss of about 77 acres of overall range for the white-tailed deer, black bear, and mountain lion. This is a very small portion of the thousands of acres of overall range for these species and long-term adverse effects would be minor.

No seasonal ranges or concentration areas for black bear, mountain lion, or white-tailed deer would be affected by reservoir expansion. The Ralph Price Reservoir study area is located outside of the known range for pronghorn and moose, and reservoir expansion would have no effect on habitat used by these species.

8.3.5.3. Other Wildlife

Expansion of Ralph Price Reservoir would inundate a relatively small area of shoreline and canyon habitat. However, this expansion combined with disturbance associated within potential borrow areas would displace some widely dispersed wildlife species, such as coyote, red fox, and cottontail rabbit, as well as species endemic to ponderosa pine/canyon habitats, such as long-eared myotis, rock squirrel, northern rock mouse, Mexican woodrat, and flammulated owl. The flammulated owl is considered uncommon in Boulder County, while most other endemic canyon species are fairly common to common within the county (CNDIS 2007).

8.4. Alternative 2 — Chimney Hollow Reservoir (90,000 AF) (Proposed Action)

8.4.1. Federal Threatened and Endangered Species

8.4.1.1. Bald Eagle

Construction of Chimney Hollow Reservoir and associated facilities would not adversely affect existing bald eagle nesting or roosting sites or essential eagle habitat as defined by the Northern States Bald Eagle Recovery Plan. About 7 acres of winter range would be disturbed from construction of a southern access road (Figure 8). This road would be located within an existing transmission line maintenance road and may be partially reclaimed following construction. Because of the proximity of other foraging areas, such as Carter Lake near the project area, the minor loss of foraging habitat is not likely to adversely affect bald eagles. In addition, the new reservoir would result in a beneficial long-term effect by creating open water foraging habitat once fish populations are established. An increase in bald eagle presence is possible because this species tends to nest and forage near large water bodies.

The loss of winter range would have a minor effect on bald eagles, while the construction of new open water habitat would have a long-term beneficial effect.

8.4.1.2. Preble's Meadow Jumping Mouse

The Chimney Hollow study area has been trapped to determine the presence of Preble's meadow jumping mouse twice in past years (ERO 2000) and assessed again for potentially suitable habitat (ERO 2003). Each trapping survey resulted in no mice being captured. In November 2003, the FWS concurred that a population of Preble's does not likely occur within the Chimney Hollow study area. There would be no changes in stream flow below Chimney Hollow Reservoir that would affect potential downstream Preble's habitat. Based on negative survey findings, lack of potentially suitable habitat, and past FWS concurrence, construction of Chimney Hollow Reservoir would have no effect on Preble's meadow jumping mouse (Table 4).

8.4.1.3. Lynx

The Canada lynx would not be affected by the construction or operation of Chimney Hollow Reservoir because the site lacks suitable habitat and is below the elevation range for this species (Table 4).

8.4.2. State Threatened and Endangered Species, and Species of Special Concern

8.4.2.1. Species Evaluated and Discounted

The Chimney Hollow study area is outside the geographic and elevation range for the boreal toad, wood frog, northern river otter, greater sandhill crane, and greater sage grouse.

8.4.2.2. Northern Leopard Frog

Although no leopard frogs were observed during site visits to the Chimney Hollow study area, wetland and stream habitat suitable for this species are present. About 2 acres of wetlands and 0.5 acre of waters of the U.S. associated with the Chimney Hollow Creek would be permanently impacted by construction of Chimney Hollow Reservoir (ERO 2006a). Construction of Chimney Hollow Reservoir and dam would result in inundation and fill of less than 2.5 acres of wetland and stream habitat potentially used by this species.

8.4.2.3. Common Garter snake

Common garter snakes were observed in riparian areas within the Chimney Hollow study area. Approximately 2.5 acres of wetland and stream habitat and 48 acres of mesic native woodlands and mesic native shrublands potentially inhabited by this species would be affected by construction of Chimney Hollow Reservoir and dam (ERO 2006a). Establishment of wetland and riparian areas along the shoreline of the new reservoir may create habitat for this species.

8.4.2.4. Ferruginous Hawk and Peregrine Falcon

No nesting or roosting activity for either species has been recorded in the area (CNHP 2005). Both the ferruginous hawk and peregrine falcon have been known to nest in similar habitats in other areas of Colorado. The loss of grassland and shrubland habitat would reduce potential foraging habitat for prey species of both species. Potential nest habitat for peregrines on the hogback east of the Chimney Hollow study area would not be affected. The reduction in potential foraging habitat is unlikely to adversely affect these species because of the lack of documented activity in the study area and the presence of foraging habitat in other areas of Larimer County.

8.4.2.5. Townsend's Big-eared Bat

No records of this species exist within the Chimney Hollow study area although it has been documented to the west (CNHP 2005). The Chimney Hollow study area occurs on the eastern periphery of this species' range and does not provide quality habitat. For these reasons, it is unlikely that Alternative 2 would affect the Townsend's big-eared bat.

8.4.3. Colorado Natural Heritage Program Species

The simius roadside skipper and rhesus skipper are associated with blue grama grasslands and shrublands. Construction of Chimney Hollow Reservoir would permanently impact about 127 acres of upland native grassland and about 261 acres of upland native shrubland habitat that provide potentially suitable habitat for these butterflies (ERO 2006a).

The arogos skipper, dusted skipper, ottoe skipper, and cross-line skipper are associated with grasslands. Larva of these species feed on big bluestem and have been confirmed in Larimer County. Most of the big bluestem in the Chimney Hollow study areas occurs in woodlands mixed with ponderosa pine and mountain mahogany. Alternative 2 would permanently impact about 135 acres of forest habitat containing scattered populations of big bluestem. The above species could occur in the forested areas with big bluestem, but are more often associated with prairie habitat (USGS 2005). The loss of big bluestem would reduce available habitat for these butterfly species.

The mottled duskywing has been recorded in shrublands within the Front Range foothill communities. Alternative 2 would permanently impact about 8 acres of mesic native shrublands and 261 acres of upland native shrublands potentially inhabited by the species.

Moss' elfin inhabits rocky cliffs and canyons dominated by yellow stonecrop – the dominant host species used by Moss' elfin. Suitable habitat exists for yellow stonecrop and Moss' elfin in higher areas surrounding the reservoir site. Construction of the Chimney Hollow Reservoir would not impact high cliffs and canyons in the area that could potentially support this species. Therefore, it is unlikely that Alternative 2 would adversely affect Moss' elfin.

Habitat for sage sparrow does not exist in the Chimney Hollow study area. The site does not contain large areas of shortgrass prairie or sage-dominated shrublands for the sage sparrow and thus it would not be affected by Alternative 2.

8.4.4. Migratory Birds and Raptors

Construction of Chimney Hollow Reservoir would affect nesting and foraging habitat for a variety of migratory birds and raptors. Permanent losses to about 396 acres of upland forest and shrub habitat, in which raptors such as Swainson's hawk and red-tailed hawk and other species such as black-billed magpie and American crow nest, could occur. The loss of 40 acres of mesic native woodland habitat and riparian areas along the Chimney Hollow study area would reduce potential foraging and breeding habitat for migratory bird species such as American robin, red-winged and yellow-headed blackbirds, and Bullock's oriole. About 340 acres of upland and mesic grassland habitat would be permanently impacted, which would reduce habitat for ground-nesting species such as killdeer, mourning dove, and western meadowlark. The loss of habitat would displace species that have historically nested in these habitats.

The disturbance of about 150 acres from pipeline construction, staging areas, and other activities would have a short-term effect on potential bird habitat until sites are

revegetated. Clearing of about 43 acres of forest under the transmission line would reduce available habitat for tree- and cavity-nesting birds.

Construction of Chimney Hollow Reservoir would have no direct affect on golden eagle nest sites located on the hogback ridge to the east. Foraging habitat for golden eagles would be reduced with the loss of terrestrial habitat that supports small mammal prey species. No known raptor nests would be affected, but the loss of riparian woodlands along the Chimney Hollow drainage would eliminate potential nest and roost sites for raptors and other birds.

Bald eagles, osprey, and waterfowl, such as mallard, double-crested cormorant, and gadwall, would benefit from additional open water habitat. Improved waterfowl habitat could increase the production of nuisance wildlife, such as Canada Geese. Conversely, increased waterfowl populations could indirectly provide improved waterfowl hunting opportunities; however, hunting or trapping of wildlife is prohibited on all lands and water administered by Larimer County. The lack of hunting waterfowl on new reservoir sites would have the effect of creating refugia that could further increase conflicts with nuisance geese.

8.4.5. Large Game and Other Wildlife Species

8.4.5.1. Elk and Mule Deer

Construction of Chimney Hollow Reservoir would permanently impact about 800 acres of elk winter range (Figure 14), mule deer summer range, winter range, and winter concentration area. Access roads would also impact between 3 and 8 acres of elk winter range, mule deer summer range, winter range, and winter concentration area depending on width and alignment. The loss of elk and mule deer winter range represents approximately a 0.2 percent impact on available winter range within CDOW Game Management Unit 20, which encompasses Larimer County and portions of Boulder County. Pipeline construction and other temporary disturbances would temporarily impact about 150 acres of elk and mule deer seasonal ranges. Forest clearing of about 43 acres under the transmission line may improve the quality of foraging habitat for elk and deer.

8.4.5.2. Black Bear and Mountain Lion

Alternative 2 would permanently impact about 800 acres of black bear fall concentration area, which is present throughout the Chimney Hollow study area (Figure 19). Loss of this habitat and the forage resources that attract black bears could displace bears to lower quality forage resources or force bears to nearby residential areas increasing human/black bear conflicts. Temporary impacts from pipelines and staging areas would impact about 150 acres of black bear fall concentration area.

Alternative 2 would not impact mountain lion seasonal concentration or special activity areas. Existing mountain lion/human conflict areas at the northern end of the Chimney Hollow study area and black bear/human conflict areas around Carter Lake could require special management and education for recreation activities at Chimney Hollow Reservoir.

8.4.5.3. White-tailed Deer, Pronghorn, Moose, and Bighorn Sheep

The Chimney Hollow study area occurs within the overall range of white-tailed deer, but there would be no effect to winter or summer ranges. Chimney Hollow Reservoir would have no effect on pronghorn, bighorn sheep, or moose because no seasonal ranges or concentration and production areas have been identified for these species.

8.4.5.4. Other Wildlife

Construction of Chimney Hollow Reservoir would displace some widely dispersed wildlife species, such as coyote, red fox, and cottontail rabbit, as well as species endemic to ponderosa pine/canyon habitats, such as long-eared myotis, rock squirrel, northern rock mouse, Mexican woodrat, and flammulated owl. The flammulated owl is considered uncommon in Larimer County, while most other endemic canyon species are fairly common to common within the county (CNDIS 2007). Creation of Chimney Hollow Reservoir would displace some common endemic species associated with the narrow strip of riparian vegetation and the surrounding grassland and shrubland habitats. The flammulated owl is not likely to be directly affected by Chimney Hollow Reservoir; however, hiking trails and other recreational activities occurring in the surrounding ponderosa forest could disturb potential owl habitat.

8.5. Alternative 3 — Chimney Hollow Reservoir (70,000 AF) and Jasper East Reservoir (20,000 AF)

Construction of a 70,000-AF Chimney Hollow Reservoir in Alternative 3 would result in the same or similar effects as those described for Alternative 2 for all species. The following discussion focuses on the proposed Jasper East Reservoir and any significant differences in environmental consequences at Chimney Hollow Reservoir from Alternative 2.

8.5.1. Federal Threatened and Endangered Species

8.5.1.1. Bald Eagle

No bald eagle summer or winter concentration areas or important foraging areas occur within the Jasper East study area. Road construction would affect about 3 acres of bald eagle winter range, and pipeline construction would temporarily affect about 5 acres of bald eagle winter range (Figure 6). The temporary disturbance of winter range would have a short-term minor effect on bald eagles. Construction of new open water habitat would have a long-term beneficial effect on bald eagles providing an increase in foraging habitat.

8.5.1.2. Preble's Meadow Jumping Mouse

The Jasper East study area is outside the geographic range of Preble's meadow jumping mouse.

8.5.1.3. Canada Lynx

Areas of potentially suitable lynx habitat (contiguous coniferous forest) do not exist in the Jasper East study area. Construction of the Jasper East Reservoir, access roads, pump station, and associated pipelines would permanently impact about 13 acres of

patchy native forest habitat. The areas of impacted forest consist of small, isolated stands that are typically not suitable for lynx habitat and are unlikely to be used by lynx (Figure 10). Therefore, the Jasper East Reservoir would have no effect on the Canada lynx.

8.5.2. State Threatened and Endangered Species, and Species of Special Concern

8.5.2.1. Boreal Toad and Wood Frog

Surveys conducted for amphibians, including the boreal toad in June 2005 within the Jasper Reservoir study area and in 2004 within Church Creek and irrigated fields east of the study area yielded no egg masses, tadpoles, juvenile, or adult of any amphibian species. The USFS has also conducted surveys near the Jasper East study area in previous years and has not recorded any evidence of boreal toads or wood frogs (Sumerlin pers. comm. 2005). Because of the lack of documented occupied boreal toad or wood frog habitat on or near the study area, construction of the Jasper East Reservoir would have no effect on these species.

8.5.2.2. Northern Leopard Frog

Construction of a 70,000-AF Chimney Hollow Reservoir would affect approximately 2.3 acres of wetland and creek habitat suitable for this species. Extensive surveys of Grand County found that outside of the Kremmling area, leopard frogs are rare (CNHP 2006). No northern leopard frogs were observed during surveys at the Jasper East study area in June 2005 or within Church Creek and irrigated fields east of the study area in 2004. Also, surveys performed by the USFS for wetland and stream areas near the Jasper East study area yielded no leopard frogs (Sumerlin pers. comm. 2005). Due to the lack of occurrence of this species in the study area, construction of the Jasper East Reservoir would be unlikely to affect this species although there would be a loss of about 22 acres of potential habitat in drainages and wetlands.

8.5.2.3. Common Garter Snake

There would be a slight reduction in impacts to common garter snake habitat at Chimney Hollow Reservoir under Alternative 3. Approximately 2.3 acres of wetlands and streams and 47 acres of mesic native woodlands and mesic native shrublands potentially inhabited by this species would be affected by construction of Chimney Hollow Reservoir and dam for this alternative. The Jasper East study area is located out of the known geographic range for the common garter snake.

8.5.2.4. Ferruginous Hawk and Peregrine Falcon

Winter migration habitat has been identified along the upper Colorado River Basin in Grand County for ferruginous hawk. No known nesting records for either the ferruginous hawk or the peregrine falcon exist in the Jasper East study area or within Grand County (Andrews and Righter 1992; Kingery 1996; Sumerlin pers. comm. 2005). Construction of the Jasper East Reservoir would not affect any populations or potential breeding habitat of either of these species.

8.5.2.5. Greater Sandhill Crane

Large areas of marshland suitable for sandhill cranes do not exist within the Jasper East study area; however, this species has been recorded west of the study area. Irrigated

hay meadows on the study area could provide marginally suitable foraging habitat; however, these hayfields are unlikely to provide the grains and high protein invertebrates needed to attract cranes. Construction of the Jasper East Reservoir is unlikely to adversely affect sandhill cranes because of limited habitat.

8.5.2.6. Greater Sage Grouse

About 123 acres of native shrublands would be permanently impacted by construction of the Jasper East Reservoir, with 35 acres of shrublands temporarily impacted by access roads and pipelines (ERO 2006a). A small population of greater sage grouse exists immediately west of the Jasper East study area; however, no populations or occurrences of sage grouse have been recently recorded within the Jasper East study area. Alternative 3 would not effect any known populations of sage grouse, but would result in a loss of potentially suitable habitat and potentially preclude eastward expansion of the existing population.

8.5.2.7. Townsend's Big-eared Bat

No habitat for this species exists within the Jasper East study area. Construction of the Jasper East Reservoir would have no effect on this species.

8.5.2.8. Northern River Otter

Otters may occasionally visit the Jasper East study area, but the area lacks suitable habitat for this species. Construction of the Jasper East Reservoir would have no measurable effect on this species.

8.5.3. Colorado Natural Heritage Program Species

Impacts to CNHP-listed butterflies would be similar to those discussed for the 90,000-AF Chimney Hollow Reservoir. However, permanent impacts to upland native grasslands potentially used by the simius roadside skipper, rhesus skipper, dusted skipper, ottoe skipper, and cross-line skipper, would be reduced to about 100 acres. Permanent impacts to upland native shrublands would be reduced to 204 acres and mesic native shrublands used by the mottled duskywing would be reduced to about 8 acres. Permanent impacts to upland native forest that contain big bluestem used by the simius roadside skipper and rhesus skipper would be reduced to 117 acres.

No CNHP-listed butterfly species would be impacted by the construction of the Jasper East Reservoir because of a lack of potentially suitable habitat.

The sage sparrow has not been recorded nesting in Grand County; however, this species is an occasional spring migrant through the county (Andrews and Righter 1992; Kingery 1996). It is possible that sage sparrows migrate through sage-dominated shrublands in the Jasper East study area. The loss of sagebrush would reduce suitable migration and foraging habitat for sage sparrow, but because this species is only known to migrate through the area, it is unlikely that construction of the Jasper East Reservoir would adversely affect sage sparrow.

8.5.4. Migratory Birds and Raptors

Potential effects to migratory birds and raptors from construction of a 70,000-AF Chimney Hollow Reservoir would be similar to those described for Alternative 2, although about 124 acres less habitat would be lost.

Potential effects to migratory birds and raptors at the Jasper East study area are related to the loss of terrestrial habitat and an increase in open water habitat. The loss of about 190 acres of grasslands and 129 acres of shrublands would reduce available foraging and nesting habitat for birds such as spotted towhee, savannah sparrow, and other ground-nesting birds. The loss of about 14 acres of upland forest would reduce habitat for tree-and cavity-nesting species. The disturbance to about 128 acres from pipelines and construction staging would temporarily displace birds from potential foraging and nesting sites.

There would be no direct effect to the active golden eagle nest site or two alternate nest sites located on Table Mountain to the east of the Jasper East study area. Golden eagles prey largely on mammals (Kochert et al. 2002), and creation of the Jasper East Reservoir would reduce the available foraging area for nesting eagles. No other known raptor nest would be affected.

Creation of a new reservoir in eastern Grand County would provide additional habitat for nesting and migrating waterfowl and shorebirds. Improved waterfowl habitat could increase the production of waterfowl and increase conflicts with nuisance wildlife, such as Canada Geese. Conversely, increased waterfowl populations could indirectly provide improved waterfowl hunting opportunities; however, it is not anticipated that hunting would be permitted on reservoir property. The lack of hunting waterfowl on new reservoir sites would have the effect of creating refugia that could further increase conflicts with nuisance geese.

The new reservoir would likely provide additional foraging habitat for great blue herons nesting at Lake Granby. The Jasper East Reservoir would provide additional foraging habitat for osprey in the area, as well as bald eagles.

8.5.5. Large Game and Other Wildlife Species

8.5.5.1. Elk, Mule Deer, and Moose

Construction of a 70,000-AF Chimney Hollow Reservoir and dam under this alternative would have similar effects to Alternative 2 with slightly less effects to elk and mule deer range. Permanent impacts include the loss of about 675 acres of elk winter range (Figure 14), mule deer summer range, winter range, and winter concentration area. The loss of elk and mule deer winter range represents a loss of less than 0.2 percent of available winter range within CDOW Game Management Unit 20, which encompasses Larimer County and portions of Boulder County. Pipeline construction and other temporary disturbances would temporarily impact about 150 acres of elk and mule deer seasonal ranges.

Construction of the Jasper East Reservoir, dam, and pump station would permanently impact about 480 acres of moose and mule deer summer range. This loss of non-urban habitat could force both deer and moose to move into residential and more urban areas to

forage creating potential human/wildlife conflicts. About 16 acres of moose winter range and winter concentration area would be impacted by the relocated Willow Creek pump station and canal (Figure 12). The reservoir would also permanently impact about 24 acres of elk winter range creating some additional fragmentation of the winter habitat and slightly reducing the overall value of the winter range. There are no elk migration corridors that would be impacted by the Jasper East Reservoir, but important seasonal movements occur across a broad front in the Willow Creek – Jasper East area and the new reservoir could displace or shift elk movement toward U.S. 34 or residential development. Temporary impacts from borrow areas and pipelines would affect about 85 acres of moose and mule deer summer range and 17 acres of elk winter range and winter concentration area.

8.5.5.2. Black Bear and Mountain Lion

Construction of a 70,000-AF Chimney Hollow Reservoir would permanently impact about 675 acres of black bear fall concentration area and temporarily impact about 145 acres (Figure 19). There would be no impact on mountain lion seasonal ranges or concentration areas.

Construction of the Jasper East Reservoir would result in permanent impacts to about 93 acres of black bear summer concentration area. Construction of the Jasper East pipeline would temporarily impact about 19 acres of the same habitat. There would be no effect to mountain lion seasonal ranges or concentration areas.

8.5.5.3. White-tailed Deer, Pronghorn, and Bighorn Sheep

The Chimney Hollow and Jasper East study areas occur within the overall range of white-tailed deer, but would not affect any seasonal ranges or concentration areas for this species. The Chimney Hollow and Jasper East study areas are located outside of the known range for pronghorn and bighorn sheep.

8.5.5.4. Other Wildlife

Construction of the Jasper East Reservoir would displace some widely dispersed wildlife species, such as coyote, red fox, and cottontail rabbit. Impacts to species endemic to ponderosa pine/canyon habitats from the construction of a smaller Chimney Hollow Reservoir would be similar to Alternative 2, with slightly lower magnitude due to the smaller reservoir footprint.

8.6. Alternative 4 — Chimney Hollow Reservoir (70,000 AF) and Rockwell/Mueller Creek Reservoir (20,000 AF)

Construction of a 70,000-AF Chimney Hollow Reservoir would result in the same effects to federal threatened and endangered species as described for Alternatives 2 and 3. The following discussion focuses on the Rockwell/Mueller Creek study area.

8.6.1. Federal Threatened and Endangered Species

8.6.1.1. Bald Eagle

Construction of Rockwell/Mueller Creek Reservoir would not adversely affect bald eagle habitat. No summer or winter concentration areas or important foraging areas

identified by the CDOW occur within the Rockwell/Mueller Creek study area (CNDIS 2007).

The pipeline connection to Windy Gap Reservoir would cross bald eagle winter ranges and winter concentration areas along the Colorado River and could temporarily impact foraging areas (Figure 7). Construction of new open water habitat at Rockwell/Mueller Creek Reservoir would have a long-term beneficial effect by increasing bald eagle foraging habitat.

8.6.1.2. Canada Lynx

Lynx typically forage, reproduce, and travel in forested or densely wooded areas and rarely venture into open areas (Koehler and Aubry 1994). The majority of the Rockwell/Mueller Creek study area is open shrubland. Coniferous forest within potentially suitable lynx habitat is present along the western fringes of the Rockwell/Mueller Creek study area (Figure 11). Construction of Rockwell/Mueller Creek Reservoir, access roads, pump station, and associated pipelines would permanently impact about 5 acres of native forest and temporarily disturb about 14 acres of native forest within potential lynx habitat. Much of the forested area adjacent to the Rockwell/Mueller Creek study area has been previously fragmented by road construction and residential development. The loss of forest may affect, but is not likely to adversely affect lynx because this forest habitat is on the very margin of areas mapped as potentially suitable lynx habitat, is discontinuous and fragmented, and more continuous forest stands exist to the west within Arapaho National Forest and Bureau of Land Management lands.

8.6.2. State Threatened and Endangered Species, and Species of Special Concern

8.6.2.1. Boreal Toad

Construction of Rockwell/Mueller Creek Reservoir would affect about 17 acres of wetland and riparian habitat that could potentially be used by boreal toads. No surveys for the boreal toad were conducted, but the site is geographically separated from known populations.

8.6.2.2. Wood Frog

The loss of about 17 acres of wetland and riparian habitat in the Rockwell/Mueller Creek study area is unlikely to affect this species because it prefers higher elevation wetland marsh habitat.

8.6.2.3. Northern Leopard Frog

Construction of Rockwell/Mueller Creek Reservoir would affect about 17 acres of wetland and riparian habitat potentially used by the northern leopard frog.

8.6.2.4. Common Garter Snake

The Rockwell/Mueller Creek study area is located outside of the known geographic range for the common garter snake.

8.6.2.5. Ferruginous Hawk and Peregrine Falcon

Winter migration habitat has been identified along the upper Colorado River Basin in Grand County for ferruginous hawk. No known nesting records for either the ferruginous hawk or the peregrine falcon exist in the Jasper East study area or within Grand County (Andrews and Righter 1992; Kingery 1996; Sumerlin pers. comm. 2005). Construction of Rockwell/Mueller Creek Reservoir would not affect any known populations of ferruginous hawk or peregrine falcon.

8.6.2.6. Greater Sandhill Crane

Sandhill cranes have been recorded in Grand County. The Jasper East study area is dominated by sagebrush shrublands with limited meadow and wetland vegetation. The Jasper East study area is unlikely to provide the grains and high protein invertebrates need to attract cranes. Construction of Rockwell/Mueller Creek Reservoir would not adversely affect sandhill cranes because of the lack of suitable habitat.

8.6.2.7. Greater Sage Grouse

The Rockwell/Mueller Creek study area contains habitat for the greater sage grouse including a known lek and foraging habitat. This lek has experienced sharp population declines since 2000 (Cowardin 2006). Construction of Rockwell/Mueller Creek Reservoir would permanently impact 290 acres of sage habitat (ERO 2006a) within sage grouse production and brood-rearing areas (CNDIS 2007). Thus, construction of Rockwell/Mueller Creek Reservoir would adversely affect an already declining sage grouse population.

8.6.2.8. Townsend's Big-eared Bat

No habitat for this species exists within the Rockwell/Mueller Creek study area. Construction of the Rockwell/Mueller Creek Reservoir would have no effect on this species.

8.6.2.9. Northern River Otter

The Rockwell/Mueller and Chimney Hollow study areas lack suitable habitat for this species. Construction of the Rockwell/Mueller and Chimney Hollow reservoirs would have no measurable effect on this species.

8.6.3. Colorado Natural Heritage Program Species

No CNHP-listed butterfly species would be impacted by the construction of Rockwell/Mueller Creek Reservoir because of the lack of potentially suitable habitat.

The sage sparrow has not been recorded nesting in Grand County. This species is an occasional spring migrant through Grand County (Andrews and Righter 1992). It is possible that sage sparrows forage in sage-dominated shrublands in the Rockwell/Mueller Creek study area. The loss of sagebrush would reduce suitable migration and foraging habitat for sage sparrow, but because this species is only known to migrate through the area, it is unlikely that construction of Rockwell/Mueller Creek Reservoir would adversely affect sage sparrow.

8.6.4. Migratory Birds and Raptors

The loss of shrubland habitat (297 acres) at the Rockwell/Mueller Creek study area would reduce foraging and nesting habitat for species such as Brewer's sparrow and vesper sparrow. The loss of about 14 acres of lodgepole pine forest would reduce habitat for cavity-nesting species. The loss of about 17 acres of riparian habitat along Rockwell/ Mueller Creek would reduce habitat for species, such as pine siskin, white-crowned sparrow, and western wood pewee. Pipeline construction and staging areas would temporarily disturb about 105 acres of potential habitat used by various bird species.

No known raptor nests would be affected at the Rockwell/Mueller Creek study area, but suitable foraging habitat is present, and forested areas provide roost and perch sites. Bald eagles and various waterfowl would benefit from the foraging habitat created by a new reservoir. A new reservoir would provide suitable breeding habitat for waterfowl and other waterbirds. Conflicts with nuisance Canada Geese could be greater at Rockwell/Mueller than at Jasper East due to the close proximity of golf courses that provide ideal foraging habitat for geese.

8.6.5. Large Game and Other Wildlife Species

8.6.5.1. Elk, Mule Deer, and Moose

Construction of Rockwell/Mueller Creek Reservoir and dam would permanently impact about 312 acres of moose and mule deer summer range. This loss of non-urban habitat could force both deer and moose to move into residential and more urban areas to forage creating potential human/wildlife conflicts. The reservoir would also permanently impact about 73 acres of elk winter range (Figure 13) and 82 acres of summer range. The loss of elk winter range represents a loss of less than 0.1 percent of available winter range within CDOW Game Management Unit 18 in Grand County. Temporary impacts from borrow areas and pipeline alignments would affect about 156 acres of moose and mule deer summer range, 56 acres of elk summer range, and 9 acres of elk winter range. Roadways would impact 2 acres or less of moose and mule deer summer range depending on alignment and width.

8.6.5.2. Black Bear and Mountain Lion

Construction of Rockwell/Mueller Creek Reservoir would not impact any black bear or mountain lion seasonal ranges or seasonal concentration areas, although they may occasionally use habitat in the area.

8.6.5.3. White-tailed Deer, Pronghorn, and Bighorn Sheep

The Rockwell/Mueller Creek study area occurs within the overall range of white-tailed deer, but would not affect any seasonal ranges or concentration areas for this species. The Rockwell/Mueller Creek study area is located outside of the known range for pronghorn and bighorn sheep.

8.6.5.4. Other Wildlife

Construction of the Rockwell/Muller Creek Reservoir would displace some widely dispersed wildlife species, such as coyote, red fox, and cottontail rabbit. Impacts to

species endemic to ponderosa pine/canyon habitats from the construction of a smaller Chimney Hollow reservoir would be similar to Alternative 3.

8.7. Alternative 5 — Dry Creek Reservoir (60,000 AF) and Rockwell/Mueller Creek Reservoir (30,000 AF)

Construction of a slightly larger 30,000-AF Rockwell/Muller Creek Reservoir would have similar effects as described for the 20,000-AF reservoir in Alternative 4 except as noted below for lynx. The following discussion pertains to the Dry Creek study area.

8.7.1. Federal Threatened and Endangered Species

8.7.1.1. Bald Eagle

Construction of Dry Creek Reservoir would permanently affect about 165 acres of bald eagle winter range and temporarily affect 40 acres of winter range (Figure 9). Construction of the spillway would affect less than 1 acre of bald eagle winter concentration area. The loss of winter range would reduce terrestrial habitat for bald eagle foraging while the construction of a new reservoir would have a long-term beneficial effect by creating open water foraging habitat.

8.7.1.2. Preble's Meadow Jumping Mouse

No Preble's were captured during trapping in 2004 in the Dry Creek study area and the FWS agreed with the negative trapping results (letter provided in Appendix B). Based on the absence of any know populations of Preble's within the study area, construction of Dry Creek Reservoir would have no effect on Preble's; however, the FWS has requested an additional survey prior to construction.

8.7.1.3. Canada Lynx

The Dry Creek study area is below the elevation range for this species. Construction of Dry Creek Reservoir would have no effect on lynx.

Impacts to potentially suitable lynx habitat for the 30,000-AF Rockwell/Mueller Creek Reservoir would be slightly greater than impacts under Alternative 4, with the loss of about 9 acres of forested lynx habitat and the same temporary impact of about 14 acres of forested potential lynx habitat. The small loss of potentially suitable habitat may affect, but is unlikely to adversely affect lynx as discussed for Alternative 4.

8.7.2. State Threatened and Endangered Species, and Species of Special Concern

8.7.2.1. Boreal Toad and Wood Frog

The Dry Creek study area is below the elevation range for both the boreal toad and wood frog. Construction of the new reservoir would have no effect on these species.

8.7.2.2. Northern Leopard Frog

One leopard frog was observed within the Dry Creek study area during field surveys. Construction of Dry Creek Reservoir would permanently affect approximately 8.5 acres of wetlands and waters of the U.S. potentially used by this species.

8.7.2.3. Common Garter Snake

Common garter snakes likely inhabit riparian and wetland areas within the Dry Creek study area. Approximately 5.6 acres of wetland and 24 acres of mesic native woodland habitat potentially inhabited by this species would be impacted by construction of Dry Creek Reservoir and dam.

8.7.2.4. Ferruginous Hawk and Peregrine Falcon

No nesting or roosting activity for either species has been recorded in the Dry Creek study area. Both the ferruginous hawk and peregrine falcon have been known to nest in similar habitats in other areas of Colorado. The available grassland and cliff areas within and near the study area could provide nesting habitat; however, neither habitat is ideal for either of these species. Both species likely use wind currents along the hogback east of the proposed Dry Creek Reservoir during migration, and peregrines may use the cliffs as a migration stop-over or winter roost area. The loss of grassland and shrubland habitat would reduce habitat for prey species of both species. Potential nesting, migration, and winter roost habitat for peregrines on the hogback would not be affected. The reduction in habitat for potential prey is unlikely to adversely affect these species because of the lack of documented activity in the Dry Creek study area and the abundance of foraging habitat in other areas of Larimer County.

8.7.2.5. Greater Sandhill Crane

Sandhill cranes have been recorded in Grand County. Construction of Rockwell/Mueller Creek and Dry Creek reservoirs would not adversely affect sandhill cranes because of the lack of suitable habitat.

8.7.2.6. Greater Sage Grouse

The Dry Creek study area exists outside of the known range for this species.

The construction of the 30,000-AF Rockwell/Mueller Creek Reservoir would permanently impact 334 acres of sage grouse habitat and would affect the existing sage grouse population from loss of breeding and brood-rearing habitat as described in Alternative 4.

8.7.2.7. Townsend's Big-eared Bat

No known records for this species exist within the Dry Creek study area. The study area exists on the eastern periphery of this species' range and does not provide quality habitat. For these reasons, it is unlikely that construction of Dry Creek Reservoir would affect the Townsend's big-eared bat.

8.7.2.8. Northern River Otter

The Rockwell/Mueller and Dry Creek study areas lack suitable habitat for this species. Construction of the Rockwell/Mueller and Dry Creek reservoirs would have no measurable effect on this species.

8.7.3. Colorado Natural Heritage Program Species

The simius roadside skipper and rhesus skipper are associated with blue grama grasslands and shrublands. Construction of Dry Creek Reservoir would permanently

impact about 90 acres of upland native grassland and about 149 acres of upland native shrubland habitat that provide potentially suitable habit for these butterflies (ERO 2006a).

The arogos skipper, dusted skipper, ottoe skipper, and cross-line skipper are associated with grasslands. Larva of these species feed on big bluestem and have been confirmed in Larimer County. Most of the big bluestem in the study areas occurs in woodlands mixed with ponderosa pine and mountain mahogany. Dry Creek Reservoir would permanently impact about 200 acres of forest habitat containing scattered populations of big bluestem. The above species could occur in the forested areas with big bluestem, but are more often associated with prairie habitat (USGS 2005). The loss of big bluestem would reduce available habitat for these butterfly species.

The mottled duskywing has been recorded in shrublands within most counties along the Front Range (USGS 2005). Dry Creek Reservoir would permanently impact about 12 acres of mesic native shrublands and 149 acres of upland native shrublands potentially inhabited by this species.

Moss' elfin inhabits rocky cliffs and canyons dominated by yellow stonecrop—the dominant host species used by Moss' elfin. Suitable habitat exists for yellow stonecrop and Moss' elfin in higher areas surrounding the Dry Creek study area. Construction of the reservoir would not impact cliffs and canyons in the area that could potentially support this species. Therefore, it is unlikely that Dry Creek Reservoir would adversely affect this species.

Habitat for sage sparrow does not exist in the Dry Creek study area. The Dry Creek study area has limited shortgrass prairie or sage-dominated shrublands for the sage sparrow. This species is not likely to be affected by construction of Dry Creek Reservoir.

8.7.4. Migratory Birds and Raptors

Construction of Dry Creek Reservoir would affect potential nesting and foraging habitat for a variety of migratory birds and raptors. Permanent loss to about 200 acres of ponderosa pine forest would reduce habitat for American crow, pygmy nuthatch, and Steller's jay. The loss of about 400 acres of shrublands and grasslands would affect habitat used by western meadowlark, morning dove, savannah sparrow, and other ground-nesting birds. The loss of about 30 acres of riparian woodlands and wetlands along Dry Creek would affect potential habitat for raptors, magpies, robins, goldfinch, and a variety of small birds. A red-tailed hawk nest located along Dry Creek would be lost. There would be no affect to a golden eagle nest located on the hogback to the east, although there would be loss in foraging habitat.

The effect to migratory bird and raptor species at the Rockwell/Mueller Creek study area would be similar to those discussed for Alternative 4. The slightly larger reservoir under this alternative would result in the loss of about 90 additional acres of potential habitat for migratory birds.

Reservoirs at both locations would provide habitat for waterfowl and possibly foraging for bald eagles or osprey.

8.7.5. Large Game and Other Wildlife Species

Potential effects to large game in the Rockwell/Mueller Creek study area are the same as those discussed for Alternative 4, except as noted.

8.7.5.1. Elk, Mule Deer, and Moose

Construction of Dry Creek Reservoir and dam under this alternative would permanently impact about 630 acres of elk winter range (Figure 15), mule deer summer range, winter range, and winter concentration area. The loss of elk and mule deer winter range represents a loss of less than 0.2 percent of available winter range within CDOW Game Management Unit 20, which encompasses Larimer County and portions of Boulder County. Pipeline construction and construction staging would temporarily impact about 135 acres of the above habitats. New roads would impact about 20 acres of the above habitats depending on road alignment and width.

Permanent impacts from construction of a 30,000-AF Rockwell/Mueller Creek Reservoir would be similar to those under Alternative 4, but would be expanded to 393 acres of impacts to moose and mule deer summer range. The reservoir also would permanently impact about 97 acres of elk winter range (Figure 13) and 122 acres of summer range. The loss of elk winter range represents a loss of approximately 0.15 percent of available winter range within CDOW Game Management Unit 18 in Grand County. Temporary impacts from borrow areas and pipeline alignments would be the same as those under Alternative 4.

8.7.5.2. Black Bear and Mountain Lion

Dry Creek Reservoir and associated roadways, and dam and spillway would permanently impact about 619 acres of black bear fall concentration area (Figure 20) and overall mountain lion range. Temporary impacts would occur to about 69 acres of black bear fall concentration area. Displacement of mountain lion and black bear could increase human conflict areas near Dry Creek Reservoir, which could require special management and education for recreation activities at the reservoir.

8.7.5.3. White-tailed Deer, Pronghorn, and Bighorn Sheep

The Dry Creek study area occurs within the overall range of white-tailed deer, but would not affect any seasonal ranges or concentration areas for this species. The Dry Creek study area is located outside of the known range for pronghorn and bighorn sheep.

8.7.5.4. Other Wildlife

Construction of Dry Creek Reservoir would displace some widely dispersed wildlife species, such as coyote, red fox, and cottontail rabbit, as well as species endemic to ponderosa pine/canyon habitats, such as long-eared myotis, rock squirrel, northern rock mouse, Mexican woodrat, and flammulated owl. The flammulated owl is considered uncommon in Larimer County, while most other endemic canyon species are fairly common to common within the county (CNDIS 2007).

8.8. Potential Wildlife Effects from Hydrologic Changes (All Alternatives)

Each of the alternatives would result in changes in the operation of the primary C-BT reservoirs — Lake Granby, Carter Lake, and Horsetooth Reservoir. In addition, the action alternatives would create one to two new reservoirs and the no action alternative would enlarge an existing reservoir. All of the alternatives would result in changes in streamflow in the Colorado River below Lake Granby and small changes in streamflow to East Slope streams primarily from additional discharges at the WGFP Participants' wastewater treatment plants. Potential effects to wildlife are discussed for West Slope and East Slope streams and for existing and new reservoirs. The Aquatic Resource Technical Report (Miller 2007) discusses effects to aquatic species.

8.8.1. West Slope Streams

Each of the alternatives would result in increased stream diversions from the Colorado River and changes in the releases from Lake Granby. Changes in streamflow would have no direct effect on terrestrial wildlife or habitat. Potential indirect effects are possible if changes in streamflow result in a change in vegetation composition or characteristics in the riparian areas bordering the Colorado River or Willow Creek that are used by streamside or riparian wildlife communities. Based on the analysis of hydrologic changes in streamflow (ERO 2007; Boyle 2005) and the potential effect on riparian and wetland vegetation in the Vegetation Technical Report (ERO 2006a), minor changes in the magnitude, timing, and frequency of channel maintenance flows and streamflows are not expected to alter channel morphology or sediment movement in the Colorado River or Willow Creek for any of the alternatives. Thus, measurable changes in vegetation and wildlife community composition and structure are unlikely for any of the alternatives (ERO 2006a). Stream stage changes on the Colorado River average less than a 3-inch decrease for all the alternatives with the greatest changes occurring over a relatively short period during peak runoff. In addition, projected changes in streamflow in Willow Creek would not have a measurable effect to ground water levels for any of the alternatives. Therefore, it is unlikely that riparian vegetation and wildlife communities along Willow Creek, which is supported by irrigation return flows and ground water, would be adversely affected by the minor changes in streamflow (ERO 2006a).

8.8.2. East Slope Streams

Minor increases in streamflow would occur in several East Slope streams as the WGFP Participants use Windy Gap water and increase their wastewater treatment plant discharges. Many WGFP Participants reuse their Windy Gap water, which reduces the amount of flow making it back to the stream. Affected streams include the Big Thompson River, St. Vrain Creek, Coal Creek, and Big Dry Creek. Changes in streamflow would fall well within the range of historic flows for all of the streams for all of the alternatives and are unlikely to substantially change stream channel characteristics or vegetation composition (ERO 2006a, 2007).

8.8.3. Existing Colorado-Big Thompson Reservoirs

The availability of additional storage for Windy Gap water under all of the alternatives would reduce storage in Lake Granby, Carter Lake, and Horsetooth Reservoir by varying amounts. The largest change in storage would occur under Alternative 2, because prepositioning would allow storage of C-BT water in Chimney Hollow Reservoir. The smallest change would occur under the No Action Alternative, which has the smallest increase in storage with the enlargement of Ralph Price Reservoir. On average, Lake Granby would be approximately 2.1 feet lower from May to September under the No Action alternative than Existing Conditions, and the Proposed Action would be approximately 5.4 feet lower. For the other alternatives, the change in water levels would fall in between these values. The range of change in water levels in Horsetooth Reservoir would be similar to Lake Granby (ERO 2007; Boyle 2005). Existing reservoirs would continue to operate within the historical range of seasonal and annual variability depending on precipitation and water demand. Historically, Horsetooth Reservoir has fluctuated up to 45 feet, and Lake Granby water levels have fluctuated by nearly 90 feet. Lower water levels in Lake Granby and Horsetooth Reservoir are unlikely to substantially affect vegetation or associated wildlife communities for any of the alternatives because reservoir fluctuations would fall within the historical operations of the reservoir. Changes in reservoir levels in Carter Lake would be less than 2 feet for all of the alternatives under wet, dry, and average conditions and would fluctuate within the levels maintained as part of existing reservoir operations (ERO 2007; Boyle 2005). Terrestrial wildlife are not dependent on reservoir levels and would not be directly affected by fluctuations in reservoir elevations. Reduced reservoir levels would reduce the overall amount of open water habitat for waterfowl, but it is unlikely that this would adversely affect their breeding or foraging habitat. Shoreline habitat for shorebirds and other wildlife would likely increase over the short term, but would stabilize as habitat succession adjusts to the new water level regimen.

8.8.4. New Reservoirs

Enlargement of Ralph Price Reservoir or the construction of Chimney Hollow Reservoir, Dry Creek Reservoir, Jasper East Reservoir, or Rockwell/Mueller Creek Reservoir would increase open water habitat for waterfowl, bald eagles, and osprey. Chimney Hollow Reservoir in Alternative 2 and Dry Creek Reservoir in Alternative 5 would have the most stable lake levels, which would be beneficial to these species. West Slope reservoirs would fluctuate more on a seasonal and annual basis, but would still provide habitat beneficial to waterfowl and raptors that forage on fish. The development of riparian or wetland vegetation downstream from each of the potential reservoir sites at Chimney Hollow, Dry Creek, Jasper East, and Rockwell/Mueller Creek is possible. All of these drainages are on ephemeral channels, and releases would be made as necessary to bypass flows similar to existing conditions. However, seepage below the dam could result in greater streamflow or perennial flows below the dam that may enhance the habitat for riparian wetland wildlife communities.

9.0 CUMULATIVE EFFECTS

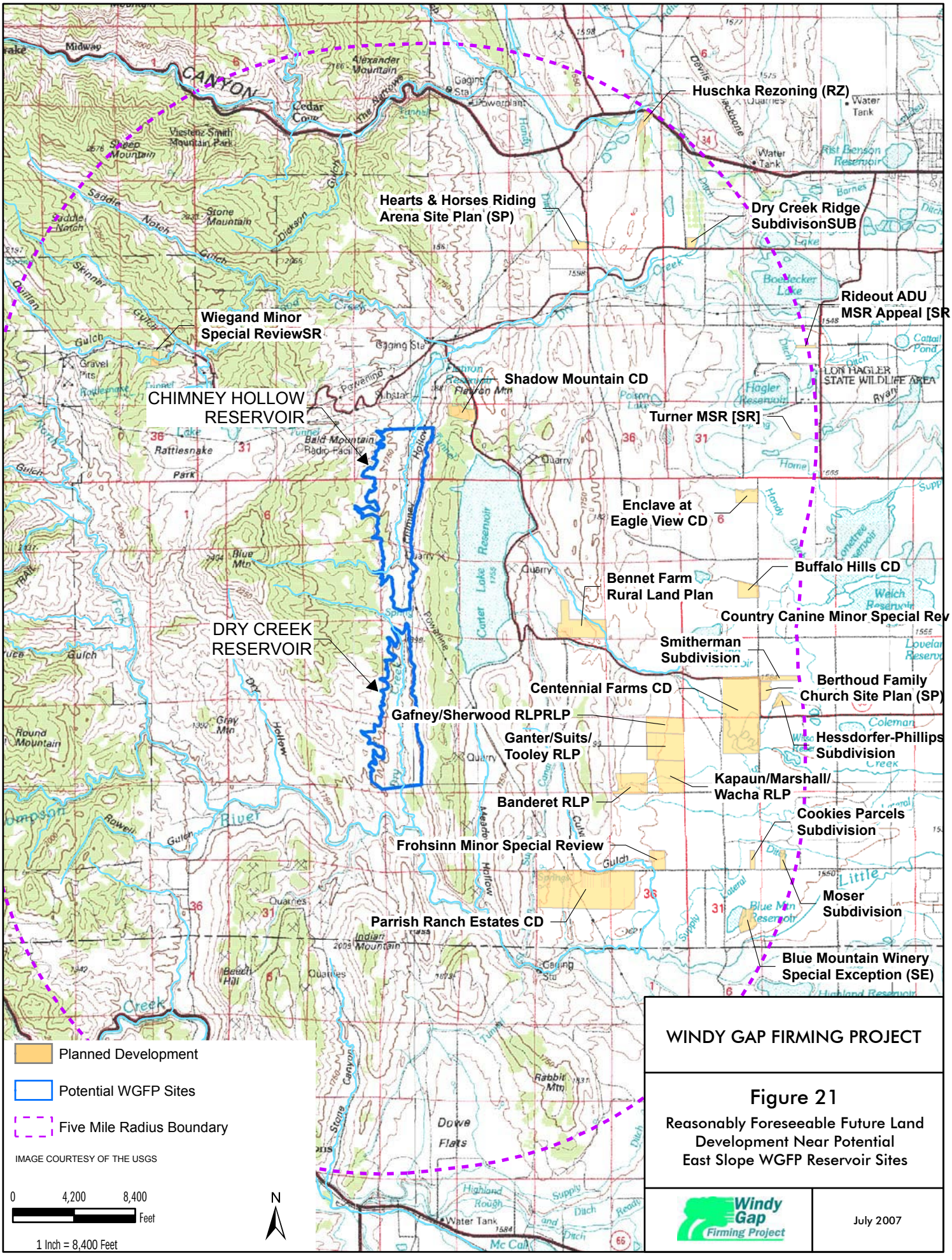
The assessment of cumulative effects to terrestrial wildlife resources is based on past, present, and reasonably foreseeable future actions in addition to the actions associated with each alternative. Reasonably foreseeable actions identified include water-based actions that affect streams and reservoirs on the East Slope and West Slope, and land-based actions include ground disturbances near potential WGFP facilities. Land-based and water-based reasonably foreseeable actions are described below.

9.1. Land-Based Reasonably Foreseeable Future Actions

- **Land Development.** A variety of new land developments are expected to occur in the vicinity of the potential reservoir sites in Larimer, Grand, and Boulder counties. This includes residential and commercial developments on the West Slope and primarily residential development on the East Slope (Figure 21 and Figure 22).
- **Larimer County Open Space.** Larimer County Parks and Open Lands acquired about 1,850 acres of land adjacent to the proposed Chimney Hollow Reservoir. Larimer County intends to manage this property for recreation use regardless of whether Chimney Hollow Reservoir is constructed.
- **Urban Growth in the Northern Front Range.** Continued population growth and development is expected to occur in communities along the northern Colorado Front Range, which are served by many of the WGFP Participants.

9.2. Water-Based Reasonably Foreseeable Future Actions

- **Denver Water Moffat Collection System Project.** The Moffat Collection System Project is currently proposed by Denver Water (DW) to develop 18,000 AF/year of new annual yield to the Moffat Treatment Plant to meet future raw water demands on the East Slope. This project is anticipated to result in additional diversions, primarily from the upper Fraser River and Williams Fork River basins. DW's proposed additional Fraser River diversions would be located upstream of the Windy Gap Project diversion site on the Colorado River and would directly affect the availability of water for the WGFP Participants. Because a Proposed Action has not been identified for the Moffat Collection System Project, a scenario for hydrologic modeling was considered that maximizes DW's future diversions from the Fraser River Basin. DW provided output from its Platte and Colorado Simulations Model (PACSM) run that includes DW's total system demand at about 393,000 AF/year, which would be full use of its existing system, plus 18,000 AF of new firm yield generated by the Moffat Collection System Project. DW's current demand is 285,000 AF/year; therefore, an increase in demand of 108,000 AF/year was considered for the cumulative effects analysis.


Huschka Rezoning (RZ)
Hearts & Horses Riding Arena Site Plan (SP)
Dry Creek Ridge SubdivisonSUB
Rideout ADU MSR Appeal [SR
Wiegand Minor Special ReviewSR
CHIMNEY HOLLOW RESERVOIR
Shadow Mountain CD
Turner MSR [SR]
Enclave at Eagle View CD
Buffalo Hills CD
Bennet Farm Rural Land Plan
Country Canine Minor Special Rev
DRY CREEK RESERVOIR
Smitherman Subdivision
Centennial Farms CD
Berthoud Family Church Site Plan (SP)
Gafney/Sherwood RLPRLP
Ganter/Suits/ Tooley RLP
Hessdorfer-Phillips Subdivision
Kapaun/Marshall/ Wacha RLP
Banderet RLP
Cookies Parcels Subdivision
Frohsinn Minor Special Review
Moser Subdivision
Parrish Ranch Estates CD
Blue Mountain Winery Special Exception (SE)
Planned Development
Potential WGFP Sites
Five Mile Radius Boundary
IMAGE COURTESY OF THE USGS
0 4,200 8,400
Feet
1 Inch = 8,400 Feet
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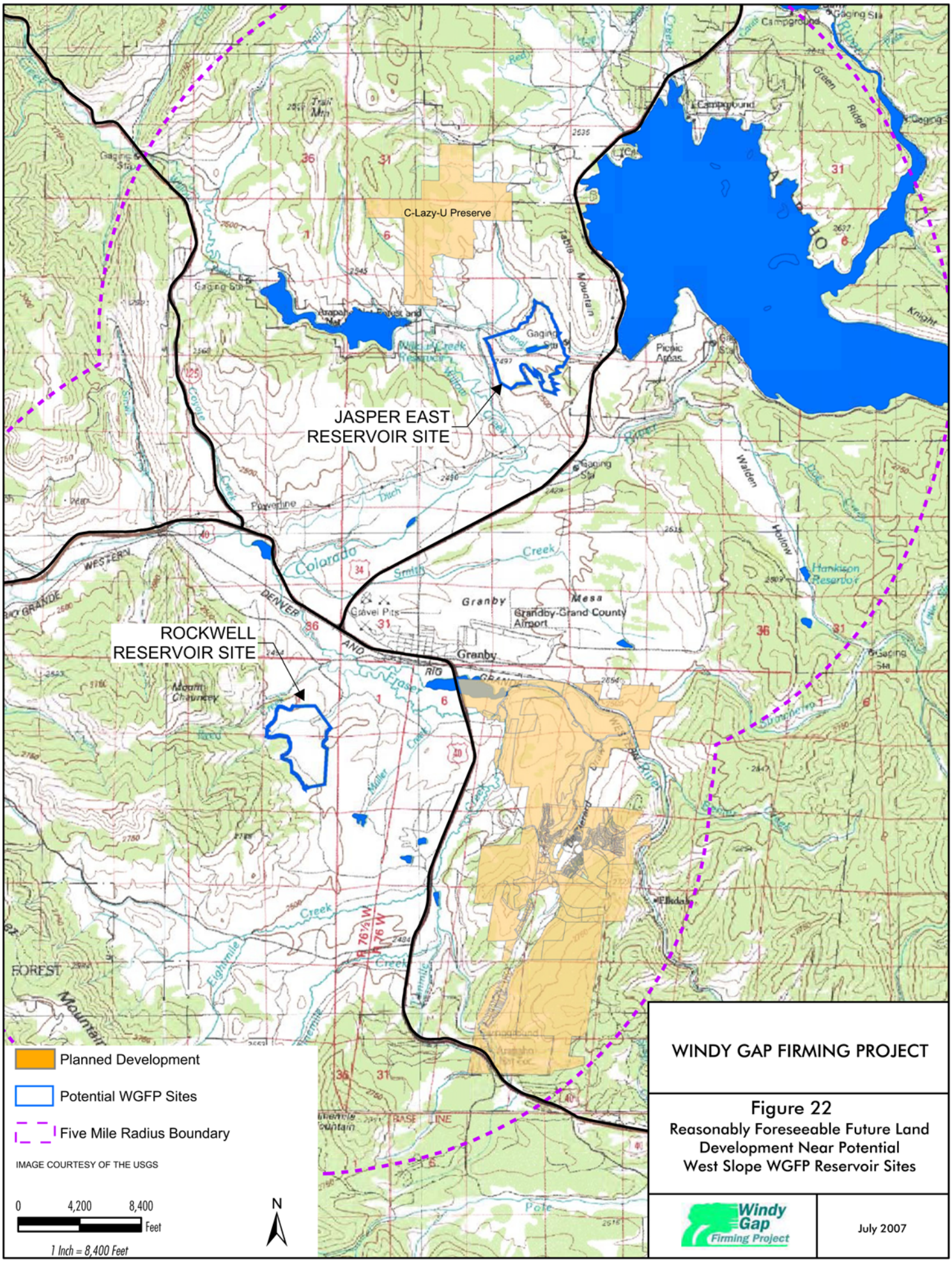
WINDY GAP FIRMING PROJECT
Figure 21
Reasonably Foreseeable Future Land Development Near Potential East Slope WGFP Reservoir Sites
Windy Gap Firming Project
July 2007



WINDY GAP FIRMING PROJECT

Figure 22
Reasonably Foreseeable Future Land Development Near Potential West Slope WGFP Reservoir Sites

Windy Gap Firming Project

July 2007

- **Urban Growth in Grand and Summit Counties.** The population in Grand and Summit counties is expected to more than double over the next 25 years, from a year-round population of about 39,000 in 2005 to about 79,000 in 2030 (ERO 2005a). Most growth in Grand County is likely to occur in the Fraser River Basin upstream of the Windy Gap Project diversion site on the Colorado River. Future increases in water use in Summit County would occur primarily in the Blue River Basin, a tributary to the Colorado River downstream of Windy Gap's point of diversion. Increased water use and wastewater discharges are expected to result in changes in streamflow and water quality and contribute to cumulative effects. Urban growth in Grand and Summit counties was based on build-out municipal and industrial demands of 16,168 AF for Grand County and 17,940 AF for Summit County as identified in the *Upper Colorado River Basin Study* (Hydrosphere 2003). Year 2000 water demand in Grand County was about 3,100 AF and in Summit County was about 7,700 AF.
- **Reduction of Excel Energy's Shoshone Power Plant Call.** DW and Excel Energy have negotiated an agreement to periodically invoke a relaxation of the junior Shoshone call for hydropower generation on the Colorado River.[1] The agreement to relax the call could result in a one-turbine call of 704 cubic feet per second (cfs), which would be managed in such a way to avoid a Cameo Call by the Grand Valley Water users[2]. The Shoshone call could be increased above 704 cfs as needed to keep the Cameo water rights satisfied. The Shoshone call relaxation could be invoked if, in March, DW predicts its total system storage to be at or below 80 percent on July 1 that year, and the March 1 Natural Resources Conservation Service (NRCS) forecast for Colorado River flows at Kremmling or Dotsero are at or below 85 percent of average. The Shoshone call relaxation could be invoked between March 14 and May 20. DW would make available 15 percent of the "net water" stored or diverted by DW by virtue of the call relaxation for Excel Energy. Net water is water stored less water subsequently spilled after filling. In addition, DW would make available 10 percent of the net water stored or diverted by DW by virtue of the call relaxation to West Slope entities. The West Slope beneficiaries and the timing and amount of deliveries are not specified, but would be determined by DW and the Colorado River Water Conservation District (CRWCD). The term of this agreement is from January 1, 2007 through February 28, 2032.

[1] The Shoshone Hydro Plant owned by Excel Energy is a large senior water right on the Colorado River 8 miles east of Glenwood Springs. At flows less than 1,408 cfs, it is the most senior water right on the Colorado River and can "call" water downstream from junior water rights upstream, including the Moffat Tunnel, C-BT Project, Windy Gap, and other water rights.

[2] The Cameo Call is a senior water right owned by five entities near Grand Junction. The water is used primarily for irrigation and power.

- Changes in Releases from Williams Fork and Wolford Mountain reservoirs to Meet FWS Flow Recommendations for Endangered Fish in the 15-Mile Reach. An agreement that extends through July 1, 2009 between the City and County of Denver, the Colorado Water Conservation Board (CWCB), and the FWS exists for the interim provision of water to the 15-Mile Reach of the Colorado River near Grand Junction as part of the Recovery Program to benefit endangered fish. A similar agreement exists between the CRWCD, CWCB, and the FWS. These agreements provide for the total release of 10,825 AF of water annually from both Williams Fork and Wolford Mountain reservoirs (5,412.5 AF from each reservoir) to meet FWS flow recommendations for the 15-Mile Reach. These contracts expire in 2009 and 2010, respectively, and both DW and the CRWCD have said they do not plan to continue making these releases from Williams Fork and Wolford Mountain reservoirs in the future. The source and location of future water releases of 10,825 AF/year has not been determined. For the purposes of this analysis, it was assumed that the releases would be made from a reservoir located downstream of Kremmling and outside the study area considered for the cumulative effects analysis.
- **Wolford Mountain Reservoir Contract Demand.** The CRWCD projects that the demand for contract water out of Wolford Mountain Reservoir will increase in the future. Currently there is about 8,750 AF/year of available contract water in Wolford Mountain Reservoir (Colorado Springs has a lease for contract water from Wolford Mountain Reservoir, which reduces the firm yield of the contract pool from 10,000 AF/yr to 8,750 AF/yr). The CRWCD indicates that the full 8,750 AF/year would likely be contracted for by 2030. In addition, MPWCD has 3,000 AF/yr of water from Wolford Mountain Reservoir, of which 613 AF/yr is owed to DW under the Clinton Reservoir Agreement. The CRWCD indicates that the remaining 2,387 AF/yr would likely be contracted for by 2030. Therefore, the total additional future demand for contract water from Wolford Mountain Reservoir is assumed to be 11,137 AF/yr by 2030.
- **Expiration of DW's Contract with Big Lake Ditch in 2013.** The Big Lake Ditch is a senior irrigation right in the Williams Fork River Basin that diverts below DW's Williams Fork collection system and above Williams Fork Reservoir. Big Lake Ditch diversions are currently delivered for irrigation above Williams Fork Reservoir and for use in the Reeder Creek drainage, which is a tributary of the Colorado River. Return flows associated with irrigation in the Reeder Creek drainage return to the Colorado River between the confluence with the Williams Fork River and the confluence with the Blue River. In 1963, DW entered into a contract with Bethel Hereford Ranch Inc., which owned and operated the Big Lake Ditch, whereby DW

purchased the Bethel Hereford Ranch Inc.'s water rights. Bethel Hereford Ranch Inc. was granted a 40-year lease to continue its operation under the condition that the Big Lake Ditch water rights are not called if needed by DW. The 1963 agreement was superseded by a 1998 agreement, which extended the operation of the Big Lake Ditch through 2013, and provided more detail on the conditions under which DW would need the water. The 1998 agreement expires November 1, 2013 and DW does not plan to extend the existing contract. After the contract expires in 2013, the Big Lake Ditch can no longer divert water under the enlargement decree for 111 cfs for irrigation in the Reeder Creek drainage. As a result, future Big Lake Ditch water right diversions to the Reeder Creek Basin would be abandoned, which would allow DW to capture additional water from the Williams Fork River and store the water in Williams Fork Reservoir during all years that its Williams Fork Reservoir water rights are in priority.

Reasonably foreseeable future actions that are most likely to affect wildlife resources are land-based actions in the vicinity of the potential reservoir sites. The suitability and value of wildlife habitat on lands identified as reasonably foreseeable future land development is based on generally available data for the region. Actual wildlife use and species composition on these lands are unknown. In some cases, these lands may include existing land uses that diminish their value for wildlife, but for the purpose of the cumulative effects analysis, it is assumed that all of these lands provide some level of wildlife benefit. Cumulative effects to wildlife focused on the loss of habitat associated with land-based developments within 5 miles of each of the alternative reservoir locations. Use of a 5-mile analysis area provides an indication of the cumulative regional impact to wildlife within about an 80-square-mile area surrounding each alternative reservoir site.

Indirect effects to terrestrial wildlife from water-based reasonably foreseeable future actions that result in changes in hydrologic conditions for streams and reservoirs would be similar to those discussed in Section 8.8. Changes in streamflow and reservoir operations for all of the alternatives are not expected to measurably affect riparian vegetation that provides habitat for some wildlife species (ERO 2006a).

9.3. Alternative 1 — No Action, Enlarge Ralph Price Reservoir

Wildlife habitat near Ralph Price Reservoir has been affected by the original reservoir construction, which inundated approximately 1.5 miles of North St. Vrain Creek and adjacent upland habitat and created about 220 acres of open water habitat. Reservoir management and operation have had a limited effect on wildlife using the reservoir or adjacent lands, although existing recreation use of the reservoir may influence wildlife use of the area. No reasonably foreseeable future land development activities within 5 miles of the Ralph Price Reservoir have been identified, thus there are no incremental future effects to wildlife resources, including federal or state threatened or endangered

species, state species of special concern, CNHP species, migratory birds, and game and non-game wildlife that add to the cumulative effects of enlarging Ralph Price Reservoir.

9.4. Alternative 2 — Chimney Hollow Reservoir (Proposed Action)

Wildlife resources and habitat near the Chimney Hollow study area have been affected by historic livestock operations and nearby land development including construction of Carter Lake, Flatiron Reservoir and other C-BT facilities, Bureau of Reclamation offices, rural residential development, and roads. Reasonably foreseeable future land development of about 1,440 acres of primarily residential development and other surface disturbances would occur within about 5 miles of the Chimney Hollow study area. The cumulative effect to wildlife resources from construction of an a 740-acre Chimney Hollow Reservoir, plus 60 acres for the dam and spillway and other permanent facilities, in addition to future land development in the region, would affect a total of about 2,242 acres of terrestrial wildlife habitat (Table 6). The net cumulative change in wildlife habitat includes the loss or reduction of wildlife value on about 1,500 acres of terrestrial habitat and the addition of about 740 acres of open water habitat at the Chimney Hollow study area. Reasonably foreseeable future land development is unlikely to completely eliminate existing wildlife habitat, but a reduction in wildlife value for some species is likely.

Table 6. Cumulative effects to wildlife habitat under the Proposed Action.

	Land Development	Water Development	Total
	Acres		
Chimney Hollow	60	742	802
Reasonably Foreseeable Actions	1,440	—	1,440
Total	1,500	742	2,242

Reasonably foreseeable future land development within about 5 miles of the Chimney Hollow study area could affect about 1,375 acres of bald eagle winter range. Construction of Chimney Hollow Reservoir would add about 7 acres of impact to bald eagle winter range for cumulative total impact of about 1,382 acres. Chimney Hollow Reservoir would provide about 742 acres of open water foraging habitat for bald eagles. There would be no cumulative effect to lynx because no suitable habitat would be impacted.

Potential habitat for several state threatened and endangered species, and species of special concern may be present at reasonably foreseeable future land developments near the Chimney Hollow study area based on the vegetation communities. The loss of grasslands at future developments could reduce potential foraging habitat for ferruginous hawk. A cumulative effect to other state species is unlikely because no suitable habitat is present in the region or because there would be no effect from construction of Chimney Hollow Reservoir.

The cumulative loss of undeveloped upland areas would reduce available habitat for migratory birds and in particular ground-nesting species, because most of the reasonably foreseeable future lands slated for development are open grasslands.

Reasonably foreseeable future land development within 5 miles of Chimney Hollow Reservoir would affect about 66 acres of elk winter range. The loss of about 800 acres of elk winter range with construction of Chimney Hollow Reservoir would result in a cumulative regional loss of about 866 acres of winter foraging habitat for elk. The loss of elk winter range represents approximately a 0.2 percent impact on available winter range within CDOW Game Management Unit 20, which encompasses Larimer County and portions of Boulder County. Cumulative effects to mule deer winter range would include a loss of 800 acres from construction of Chimney Hollow Reservoir and an impact of about 1,290 acres from reasonably foreseeable future land development in the region for a total cumulative effect of about 2,090 acres. This represents a cumulative effect to approximately 0.6 percent of available mule deer winter range within CDOW Game Management Unit 20.

There would be a cumulative loss of terrestrial non-game wildlife habitat for species such as coyotes, fox, skunk, rabbits, voles, and other small mammals from the cumulative loss of terrestrial wildlife habitat. The cumulative loss and change in wildlife habitat would fragment wildlife habitat, which could disrupt animal travel corridors, reduce available foraging and breeding habitat, and displace some wildlife species.

The future planned management of the Chimney Hollow study area as part of Larimer County's adjacent Chimney Hollow Open Space would regulate human activity and protect the area from future development, which would be beneficial to wildlife.

9.5. Alternative 3 — Chimney Hollow Reservoir (70,000 AF) and Jasper East Reservoir (20,000 AF)

9.5.1. Chimney Hollow Reservoir

The cumulative effect to wildlife habitat from construction of a 70,000-AF Chimney Hollow Reservoir would be similar to the larger 90,000-AF Chimney Hollow Reservoir. The total cumulative loss of terrestrial wildlife habitat would be about 2,115 acres (Table 7). This includes the loss of about 675 acres from construction of the reservoir, and dam and spillway, and 1,440 acres of reasonably foreseeable future land development within 5 miles of the Chimney Hollow study area. The net cumulative change in wildlife habitat includes a loss of about 1,490 acres of terrestrial habitat and the addition of about 625 acres of open water habitat at the Chimney Hollow study area. The potential effects to wildlife, including federal and state threatened and endangered species and migratory birds would be similar to Alternative 2.

Table 7. Cumulative effects to wildlife habitat under Alternative 3 for Chimney Hollow Reservoir.

	Land Development	Water Development	Total
	Acres		
Chimney Hollow	50	625	675
Reasonably Foreseeable Actions	1,440	—	1,440
Total	1,490	625	2,115

The cumulative loss of big game habitat would be about 741 acres of elk winter range including the loss of 675 acres with construction of Chimney Hollow Reservoir and 66 acres from reasonably foreseeable future land development nearby. Cumulative effects to mule deer winter range and winter concentration areas would include a loss of 675 acres from construction of Chimney Hollow Reservoir and an impact of about 1,290 acres from reasonably foreseeable future land development in the region for a total cumulative effect of about 1,965 acres. Cumulative impacts to available elk and mule deer winter range within CDOW Game Management Unit 20 would be similar to Alternative 2.

9.5.2. Jasper East Reservoir

The quality of the existing wildlife habitat at the Jasper East study area has been influenced by several disturbances and activities in the area including irrigation and mowing of pasture lands, construction of the Willow Creek Canal, pump station, and forebay, and the presence of County Road 40, which bisects the Jasper East study area. The Jasper East study area includes areas of native vegetation and irrigated pasture land that provides foraging, nesting, and breeding habitat for wildlife.

Reasonably foreseeable future land development within about 5 miles of the Jasper East study area includes about 1,590 acres of planned residential development southwest of the town of Granby and about 980 acres of planned residential development at the C-Lazy-U Preserves located just north of the Jasper East study area. The cumulative effect to wildlife resources from construction of an approximately 485-acre Jasper East Reservoir, including the dam and spillway, and future land development, would total about 3,005 acres of terrestrial wildlife habitat (Table 8). The cumulative loss of wildlife habitat in the region would reduce the availability of foraging and breeding habitat for wildlife and migratory birds in general and affect wildlife movement by fragmenting mostly undeveloped lands. However, reasonably foreseeable future land development would not completely eliminate existing wildlife habitat, but a reduction in wildlife value for some species is likely. For example, the planned C-Lazy-U Preserves includes low-density housing concentration in a portion of the 980-acre site with remaining lands designated as open space.

Table 8. Cumulative effects to wildlife habitat under Alternative 3 for Jasper East Reservoir.

	Land Development	Water Development	Total
	Acres		
Jasper East	50	435	485
Reasonably Foreseeable Actions	2,570	—	2,570
Total	2,620	435	3,005

Reasonable foreseeable future land development within 5 miles of Jasper East Reservoir would affect about 222 acres of bald eagle winter range. Construction of the Jasper East Reservoir would add about 3 acres to the cumulative effect on bald eagle winter range. Reasonably foreseeable future land development near the Jasper East Reservoir would affect about 586 acres of potential lynx habitat. Construction of the Jasper East Reservoir would not add to the cumulative effect to potential lynx habitat because no potential lynx habitat is present. There would be no cumulative effect to other federally listed species potentially occurring in the area.

Potential habitat for state threatened and endangered species, or species of special concern could be affected by reasonably foreseeable future land development near the Jasper East study area. To the extent that new developments affect riparian or wetland habitat, there could be a cumulative effect to potential habitat for northern leopard frog or boreal toad. Future developments that impact sagebrush could reduce potential sage grouse habitat. A cumulative effect to other state species is unlikely because no suitable habitat is present in the region or there would be no effect from construction of the Jasper East Reservoir.

Construction of the Jasper East Reservoir along with reasonably foreseeable future land development would result in a cumulative loss of habitat for several big game species. The cumulative loss in moose winter range would be about 327 acres including 16 acres from construction of the Jasper East Reservoir and 311 acres from nearby future land development. The cumulative effect to moose winter range in CDOW Game Management Unit 18 would be approximately 1.2 percent. Cumulative impacts to elk winter range include the loss of about 24 acres from reservoir construction and 1,230 acres from land development within 5 miles of the Jasper East study area. This represents a cumulative impact to approximately 1.5 percent of available elk winter range in CDOW Game Management Unit 18.

There would be a cumulative loss of terrestrial non-game wildlife habitat for species such as coyotes, raccoons, skunk, rabbits, voles, deer mice, and other small mammals associated with construction of Jasper East Reservoir and other nearby land development. The cumulative loss and change in wildlife habitat would fragment wildlife habitat, which could disrupt animal travel corridors, reduce available foraging and breeding habitat, and displace some wildlife species.

9.6. Alternative 4 — Chimney Hollow Reservoir (70,000 AF) and Rockwell/Mueller Creek Reservoir (20,000 AF)

9.6.1. Chimney Hollow Reservoir

The cumulative effect to wildlife resources at Chimney Hollow Reservoir under this alternative would be the same as described for Alternative 3.

9.6.2. Rockwell/Mueller Creek Reservoir

Wildlife habitat in the Rockwell/Mueller Creek study area has been affected by past development and activity in the area including low-density residential housing in the Rockwell/Mueller Creek study area and surrounding lands, property owner access roads, and adjacent county roads. Creation of pasture land and livestock grazing has also influenced vegetation composition and wildlife habitat in the Rockwell/Mueller Creek study area.

Reasonably foreseeable future land development within about 5 miles of the Rockwell/Mueller Creek study area includes about 4,770 acres of residential, commercial, and mixed development in the Granby Ranch area (Table 9). This includes areas of existing development, but further infill and development of these lands is expected in the future. The total cumulative regional effect on terrestrial wildlife habitat including reasonably foreseeable future land development and construction of Rockwell/Mueller Creek Reservoir would be about 5,105 acres. This includes the loss of about 335 acres from construction of the reservoir, and dam and spillway, and 4,770 acres of reasonably foreseeable future land development within 5 miles of the Rockwell/Mueller Creek study area. The net cumulative effect includes a loss of 4,811 acres of terrestrial habitat and the addition of about 294 acres of open water habitat at the Rockwell/Mueller Creek study area.

Table 9. Cumulative effects to wildlife habitat under Alternative 4 for Rockwell/Mueller Creek Reservoir.

	Land Development	Water Development	Total
	Acres		
Rockwell/Mueller Creek	41	294	335
Reasonably Foreseeable Actions	4,770	—	4,770
Total	4,811	294	5,105

Construction of Rockwell/Mueller Creek Reservoir would affect less than 20 acres of forest within potential lynx habitat. Identified reasonably foreseeable future land development within 5 miles would affect about 1,930 acres of potential lynx habitat. While much of the future development includes existing disturbances, the cumulative loss in potential lynx habitat would be about 1,950 acres. There would be no cumulative effect to other federally listed species.

Construction of Rockwell/Mueller Creek Reservoir would impact about 290 acres of sage grouse habitat. Other future land developments in sagebrush habitat would contribute to the loss of suitable habitat with the loss of about 1,473 acres of overall sage grouse range for a total cumulative effect of about 1,763 acres of habitat. A cumulative effect to other state species is unlikely because no suitable habitat is present in the region or there would be no effect from construction of Rockwell/Mueller Creek Reservoir.

A cumulative loss in elk winter range of about 3,173 acres would occur from the loss of about 73 acres from construction of Rockwell/Mueller Creek Reservoir and from development of 3,100 acres on nearby lands. The cumulative loss in elk winter range would affect approximately 4.1 percent of the available winter range in CDOW Game Management Unit 18.

Much of the land within areas of reasonably foreseeable future land development has already been disturbed, although additional development would further reduce its suitability for wildlife use. Construction of Rockwell/Mueller Creek Reservoir would contribute to the loss of upland terrestrial habitat, but would provide open water habitat for waterfowl and foraging habitat for bald eagles and osprey.

9.7. Alternative 5 — Dry Creek Reservoir (60,000 AF) and Rockwell/Mueller Creek Reservoir (30,000 AF)

9.7.1. Dry Creek Reservoir

The Dry Creek study area provides natural habitat for a variety of wildlife species. The land is mostly undeveloped land and currently supports a few scattered homes, unpaved roads, and a small llama ranch. Historically, livestock grazing also influenced the condition of the area. Reasonably foreseeable future land development within about 5 miles of Dry Creek Reservoir includes about 1,460 acres of land that is under county development review for subdivision, dispersed residential development, commercial development, and/or special review for a proposed change in land use.

The total cumulative loss of terrestrial wildlife habitat including reasonably foreseeable future land development and construction of Dry Creek Reservoir would be about 2,091 acres (Table 10). This includes the loss of about 630 acres from construction of the reservoir, and dam and spillway, and 1,460 acres of reasonably foreseeable future land development within 5 miles of the Dry Creek study area. The net cumulative effect includes a loss of about 1,502 acres of terrestrial habitat and the addition of about 589 acres of open water habitat at the Dry Creek study area. Reasonably foreseeable future land development is unlikely to completely eliminate existing wildlife habitat, but a reduction in wildlife value for some species is likely.

Table 10. Cumulative effects to wildlife habitat under Alternative 5 for Dry Creek Reservoir.

	Land Development	Water Development	Total
	Acres		
Dry Creek	42	589	631
Reasonably Foreseeable Actions	1,460	—	1,460
Total	1,502	589	2,091

Several developments east of the Dry Creek study area are located in bald eagle winter range and would affect about 1,409 acres of terrestrial habitat for bald eagle foraging. Construction of Dry Creek Reservoir would add 165 acres of impact to bald eagle winter range for a cumulative effect of 1,574 acres. There would be no cumulative effect to other federally listed species potentially occurring in the area.

Potential habitat for several state threatened and endangered species, and species of special concern at reasonably foreseeable future land development near the Dry Creek study area is possible based on the vegetation communities. The loss of grasslands at future developments could reduce potential foraging habitat for ferruginous hawk. A cumulative effect to other state species is unlikely because no suitable habitat is present in the region or there would be no effect from construction of Dry Creek Reservoir.

The cumulative loss of undeveloped upland areas would reduce available habitat for migratory birds and in particular ground-nesting species, because most of the land affected by reasonably foreseeable future land development is open grasslands.

Cumulative effects to elk winter range include 630 acres from construction of Dry Creek Reservoir and 52 acres from reasonably foreseeable future land development for a total impact of about 682 acres. The loss of elk winter range represents less than a 0.2 percent impact on available winter range within CDOW Game Management Unit 20, which encompasses Larimer County and portions of Boulder County. The cumulative effect on mule deer winter range would be about 1,934 acres including impacts of 630 acres from reservoir construction and 1,304 acres from adjacent lands. These impacts represent a cumulative effect to approximately 0.5 percent of available mule deer winter range within CDOW Game Management Unit 20.

The cumulative loss of terrestrial habitat for wildlife in the region would reduce available foraging and breeding habitat for upland species, as well as fragmenting existing areas of available wildlife habitat. The construction of Dry Creek Reservoir and the 300-acre planned reservoir to the east would result in a cumulative increase in open water habitat for waterfowl, shorebirds, bald eagles, and aquatic species.

9.7.2. Rockwell/Mueller Creek Reservoir

The cumulative effect to wildlife from constructing a 30,000-AF Rockwell/Mueller Creek Reservoir would be similar to the 20,000-AF reservoir in Alternative 4 with a slight increase in the area of impact. The total cumulative loss of terrestrial wildlife

habitat including reasonably foreseeable future land development and construction of Rockwell/Mueller Creek Reservoir would be about 5,196 acres. This includes the loss of about 425 acres from construction of the reservoir, and dam and spillway, and 4,770 acres of reasonably foreseeable future land development within 5 miles of the Rockwell/Mueller Creek study area. The net cumulative effect includes a loss of 4,848 acres of terrestrial habitat and the addition of about 350 acres of open water habitat at the Rockwell/Mueller Creek study area (Table 11).

Potential effects to federally listed threatened and endangered species would be similar to Alternative 4.

Construction of a 30,000-AF Rockwell/Mueller Creek Reservoir would impact about 334 acres of sage grouse habitat. Other future land developments in sagebrush habitat would contribute to the loss of suitable habitat with the loss of about 1,473 acres of sage grouse overall range for a total cumulative effect of about 1,807 acres of grouse habitat. A cumulative effect to other state species is unlikely because no suitable habitat is present in the region or there would be no effect from construction of Rockwell/Mueller Creek Reservoir.

A cumulative loss in elk winter range of about 3,197 acres would occur from the loss of about 97 acres from construction of Rockwell/Mueller Creek Reservoir and from development of 3,100 acres on nearby lands. The cumulative loss in elk winter range would affect approximately 4.2 percent of the available winter range in CDOW Game Management Unit 18.

Table 11. Cumulative effects to wildlife habitat under Alternative 5 for Rockwell/Mueller Creek Reservoir.

	Land Development	Water Development	Total
	Acres		
Rockwell/Mueller Creek	78	348	426
Reasonably Foreseeable Actions	4,770	—	4,770
Total	4,848	348	5,196

10.0 BEST MANAGEMENT PRACTICES

A number of actions could be used to reduce the potential impacts to wildlife from implementation of any of the alternatives under consideration. There also may be opportunities to enhance wildlife habitat. General recommendations common to all alternatives and specific recommendations for each reservoir site are listed below.

General Recommendations

- Habitat-disturbing activities (such as tree removal, grading, scraping, and grubbing) should be conducted outside of the nesting season for migratory birds (August through February) to avoid disturbing (or take) of a migratory bird nest,

including ground-nesting species, and surveys for nesting species should be conducted prior to disturbance during the nesting season.

- Minimize the area of disturbance and revegetate all temporary disturbances.
- Recreation facilities at new reservoirs should have bear proof trash cans and regular trash service to avoid attracting wildlife or creating conflicts with human use.
- Delineate project boundaries and reduce impacts to sensitive areas (i.e., wetlands and sage grouse habitat) outside of project disturbance limits.

Recommendations for Ralph Price Reservoir

- Use historical borrow areas or borrow areas within the reservoir footprint if feasible.
- Minimize the period of reservoir drawdown.

Recommendations for Chimney Hollow Reservoir

- Limit tree clearing under the relocated transmission line to the extent possible.

Recommendations for Dry Creek Reservoir

- Conduct a second survey for Preble's meadow jumping mouse prior to construction if this alternative is selected.

Recommendations for Rockwell/Mueller Creek Reservoir

- Pipeline construction across the Colorado River should be coordinated with the U.S. Army Corps of Engineers, CDOW, and FWS to minimize effects to wintering bald eagles. A late summer/early fall crossing would minimize water quality effects and effects to the eagles.
- Minimize disturbance to sage grouse habitat and limit activities to the extent possible near leks in the spring and summer.
- Conduct surveys for the boreal toad and the northern leopard frog.

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APPENDIX A.
COMMON AND SCIENTIFIC SPECIES NAMES

Federal Endangered, Threatened, and Candidate Species

Black-footed ferret – *Mustela nigripes*
Canada lynx – *Lynx canadensis*
Least tern – *Sterna antillarum*
Mexican spotted owl – *Strix occidentalis lucida*
Piping plover – *Charadrius melodus*
Preble's meadow jumping mouse – *Zapus hudsonius preblei*
Yellow-billed cuckoo – *Coccyzus americanus occidentalis*
Whooping crane – *Grus americana*

State Endangered and Threatened Species, and Species of Special Concern

Boreal toad – *Bufo boreas*
Burrowing owl – *Athene cunicularia*
Common garter snake – *Thamnophis sirtalis parietalis*
Ferruginous hawk – *Buteo regalis*
Greater sage grouse – *Centrocercus urophasianus*
Greater sandhill crane – *Grus canadensis tabida*
Northern leopard frog – *Rana pipiens*
Northern river otter – *Lutra canadensis*
Peregrine falcon – *Falco peregrinus*
Swift fox – *Vulpes velox*
Townsend's big-eared bat – *Corynorhinus townsendii pallescens*
Wolverine – *Gulo gulo*
Wood frog – *Rana sylvatica*

Species Tracked by the CNHP

Arogos skipper – *Atrytone arogos*
Barrow's goldeneye – *Bucephala islandica*
Black-necked stilt – *Himantopus mexicanus*
Boreal owl – *Aegolius funereus*
Cross-line skipper – *Polites origenes*
Dusted skipper – *Atrytonopsis hianna*
McCown's longspur – *Calcarius mccownii*
Moss' elfin – *Callophyrs mossi*
Mottled duskywing – *Erynnis maritialis*
Ottoe skipper – *Hesperia ottoe*
Rhesus skipper – *Polites rhesus*
Sage sparrow – *Amphispiza belli*
Simius roadside skipper – *Amblyscirtes simius*
Smokey-eyed brown butterfly – *Satyrodes Eurydice*
Two-spotted skipper – *Euphyes dimacula*

Other Species

American crow – *Corvus brachyrhynchos*
American goldfinch – *Carduelis tristis*

American kestrel – *Falco sparverius*
American robin – *Turdus migratorius*
American wigeon – *Anas americana*
Badger – *Taxidea taxus*
Bald eagle – *Haliaeetus leucocephalus*
Barn swallow – *Hirundo rustica*
Big bluestem – *Andropogon gerardii*
Bighorn sheep – *Ovis canadensis*
Black bear – *Ursus americanus*
Blue grama – *Bouteloua gracilis*
Bobcat – *Felis rufus*
Brewer's sparrow – *Spizella breweri*
Bullock's oriole – *Icterus bullockii*
Bullsnake – *Pituophis melanoleucus*
Canada Geese – *Branta canadensis*
Chipping sparrow – *Spizella passerina*
Cliff swallow – *Petrochelidon pyrrhonota*
Common merganser – *Mergus merganser*
Common raven – *Corvus corax*
Cooper's hawk – *Accipiter cooperii*
Cormorant – *Phalacrocoracidae*
Coyote – *Canis latrans*
Dark-eyed junco – *Junco hyemalis*
Deer mouse – *Peromyscus maniculatus*
Douglas-fir – *Pseudotsuga menziesii* var. *glauca*
Elk – *Cervus elaphus*
Eastern kingbird – *Tyrannus tyrannus*
Flammulated owl – *Otus flammeolus*
Gadwall – *Anas strepera*
Golden eagle – *Aquila chrysaetos*
Green-tailed towhee – *Pipilo chlorurus*
Killdeer – *Charadrius vociferus*
Little bluestem – *Schizachyrium scoparium*
Long-eared myotis – *Myotis evotis*
Magpie – *Pica hudsonia*
Mallard – *Anas platyrhynchos*
Mexican woodrat –*Neotoma mexicana*
Migrant northern harrier – *Circus cyaneus*
Moose – *Alces alces*
Mountain cottontail – *Sylvilagus nuttallii*
Mountain lion – *Felis concolor*
Mourning dove – *Zenaida macroura*
Montane vole – *Microtus montanus*
Mule deer – *Odocoileus hemionus*
Northern goshawk – *Accipiter gentilis*
Northern rock mouse – *Peromyscus nasutus*

Osprey – *Pandion haliaetus*
Pine siskin – *Carduelis pinus*
Pocket gopher – *Thomomys talpoides*
Ponderosa pine – *Pinus ponderosa*
Porcupine – *Erethizon dorsatum*
Pronghorn – *Antilocapra americana*
Pygmy nuthatch – *Sitta pygmaea*
Red fox – *Vulpes vulpes*
Raccoon – *Procyon lotor*
Red-tailed hawk – *Buteo jamaicensis*
Red-winged blackbird – *Agelaius phoeniceus*
Rock squirrel – *Spermophilus variegatus*
Savannah sparrow – *Passerculus sandwichensis*
Skunk – *Mephitis mephitis*
Song sparrow – *Melospiza melodia*
Spotted towhee – *Pipilo maculatus*
Steller's Jay – *Cyanocitta stelleri*
Swainson's hawk – *Buteo swainsoni*
Yellow-headed black bird – *Xanthocephalus xanthocephalus*
Yellow stonecrop – *Sedum lanceolatum*
Yellow warbler – *Dendroica petechia*
Vesper sparrow – *Pooecetes gramineus*
Violet-green swallow – *Tachycineta thalassina*
Western meadowlark – *Sturnella neglecta*
Western tanager – *Piranga ludoviciana*
Western wood pewee – *Contopus sordidulus*
White-crowned sparrow – *Zonotrichia leucophrys*
White pelican – *elecanus erythrorhynchos*
White-tailed deer – *Odocoileus virginianus*
Woodhouse toad – *Bufo woodhousii*

APPENDIX B.
U.S. FISH AND WILDLIFE EXCLUSION LETTERS FOR PREBLE'S MEADOW JUMPING MOUSE FOR THE CHIMNEY HOLLOW AND DRY CREEK STUDY AREAS

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
Colorado Field Office
755 Parfet Street, Suite 361
Lakewood, Colorado 80215

IN REPLY REFER TO:
ES/CO: T&E/PMJM/Survey
Mail Stop 65412

DEC - 6 2000

Steve Butler
ERO Resources
1842 Clarkson Street
Denver, CO 80218

Dear Mr. Butler:

Based on the authority conferred to the U.S. Fish and Wildlife Service (Service) by the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. 1531 *et seq.*), the Service reviewed the Preble's meadow jumping mouse, *Zapus hudsonius preblei,* (Preble's) survey report submitted with your letter of October 9, 2000. This report regards **Chimney Hollow** in Larimer County, Colorado (Section 33, Township 5 North, Range 70 West). The project, as proposed, may disturb wetlands and other riparian habitats.

Given your compliance with the Preble's survey guidelines, the Service finds the report acceptable and agrees that a population of Preble's is not likely to be present within the subject area. Thus, the Service concludes that development or other actions on this site should not directly affect the continued existence of Preble's. Should Preble's populations exist downstream from the site, actions on the site that result in significant modification of Preble's habitat downstream (for example, through alteration of existing flow regimes, or sedimentation) may be subject to provisions of the ESA.

If the Service can be of further assistance, please contact Peter Plage of my staff at (303) 275-2370.

Sincerely,

LeRoy W. Carlson
Colorado Field Supervisor

cc: U.S. Army COE, Littleton, CO
Plage

Reference:Peter/PMJM/2000.263

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
Colorado Field Office
755 Parfet Street, Suite 361
Lakewood, Colorado 80215

IN REPLY REFER TO:
ES/CO: T&E/PMJM/Other
Mail Stop 65412

NOV 18 2003

Ron Beane
ERO Resources Corporation
1842 Clarkson Street
Denver, Colorado 80218

Dear Mr. Beane:

Based on the authority conferred to the U.S. Fish and Wildlife Service (Service) by the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. 1531 *et seq.*), the Service reviewed the Preble's meadow jumping mouse, *Zapus hudsonius preblei* (Preble's), habitat assessment report submitted with your letter of October 22, 2003. This report regards the proposed site plan review for the **Chimney Hollow Reservoir Site** (within the Windy Gap Firming Project EIS) in Larimer County, Colorado. This project, as proposed, may disturb wetlands and other riparian habitats.

Based on the information provided, the Service finds the report acceptable and agrees that a population of Preble's is not likely to be present within the subject area due to the current site conditions, therefore, additional surveys or assessments are not needed at this time. Please note that the Service cannot provide long term clearance (through 2008) for this project site. Although the project site cannot be cleared for potential future presence, the Service will agree that future trappings surveys will be needed only if habitat conditions on site should improve and/or Preble's are captured within 1 mile upstream or downstream of the project site. The Service recommends that another habitat assessment be conducted at the project site within one year of the expected construction start date (2007 or 2008).

Should Preble's populations exist downstream from the site, actions on the site that result in significant modifications of Preble's habitat downstream (for example, through alteration of existing flow regimes, or sedimentation) may be subject to provisions of the ESA.

If the Service can be of further assistance, please contact Barbara Spagnuolo of my staff at (303) 275-2370.

Sincerely,

Susan C. Linner
Colorado Field Supervisor

cc: BOR/Eastern CO Project Ofc, Will Tully
NCWCD, Jeff Drager
NCWCD, Don Carlson
FWS/CFO Sandy Vana-Miller
FWS/CFO B. Spagnuolo

Reference: BJS\Larimer\CHres.wpd

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
Colorado Field Office
755 Parfet Street, Suite 361
Lakewood, Colorado 80215

IN REPLY REFER TO:
ES/CO: T&E/PMJM/Trap
Mail Stop 65412

DEC - 1 2004

Ronald Beane
ERO Resources Corporation
1842 Clarkson Street
Denver, Colorado 80218

Dear Mr. Beane:

We are responding to your letter of November 3, 2004, requesting clearance under the authority conferred to the U.S. Fish and Wildlife Service (Service) by the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. 1531 *et seq.*). The Service has reviewed the Preble's meadow jumping mouse, *Zapus hudsonius preblei* (Preble's), habitat assessment and trapping survey report for the potential **Dry Creek Reservoir Site for the Windy Gap Firming Project** (Sections 21 and 28, T4N, R70W) in Larimer County, Colorado. This project, as proposed, may disturb wetlands and other riparian habitats on Dry Creek.

Based on the information provided, the Service agrees with the negative trapping results conducted between September 12 - 17, 2004, for Preble's at the subject site. However, the Service, cannot, at this time, conclude that a population of Preble's is not likely to be present within the subject area and therefore, cannot issue a "long term clearance" of the site for Preble's. The Service recommends an additional trapping survey be conducted at the subject site in June 2005, and will review the 2005 trapping report results when submitted and make a determination under the ESA. It is also recommended that the proposed trapping plan and trapping locations for 2005 be submitted for Service review prior to survey initiation.

As a reminder, please use the *Survey Field Data Compilation Form* when submitting trapping reports. If we can be of further assistance, please contact Barbara Spagnuolo of my staff at (303) 275-2370.

Sincerely,

Susan C. Linner
Colorado Field Supervisor

cc: FWS/CFO: Pete Plage
FWS/CFO: Sandy Vana-Miller
FWS/CFO: B. Spagnuolo

Reference: BJS\Larimer\DryCrk_Res.wpd