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Appendix V

Biological Assessment

Chatfield Reservoir Storage Reallocation Project

Biological Assessment

February 2013

Prepared for: U.S. Army Corps of Engineers, Omaha District

For Submission to: U.S. Fish and Wildlife Service, Region 6 Ecological Services, Lakewood, CO

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ATTACHMENTS

Attachment 1: PRRIP BA

Acronyms

BA	Biological Assessment
CDOW	Colorado Division of Wildlife
cfs	Cubic feet per second
CMP	Compensatory Mitigation Plan
CWCB	Colorado Water Conservation Board
DWD	Denver Water Department
EFUs	Ecological Functional Units
EIS	environmental impact statement
ESA	Endangered Species Act
FEIS	Final Environmental Impact Statement
FR/EIS	feasibility report and environmental impact statement
LPN	listing priority number
M&I	Municipal and industrial
msl	mean sea level
NEPA	National Environmental Policy Act
NGPC	Nebraska Game and Parks Commission
NTGW	nontributary groundwater
OHWM	Ordinary High Water Mark
P&Gs	Principles and Guidelines
PBO	Programmatic Biological Opinion
PCEs	Primary Constituent Elements
PRRIP	Platte River Recovery Implementation Program
SFU	State Fish Unit
SMWSA	South Metro Water Supply Authority
SPWRAP	South Platte Water Related Activities Program, Inc.
T&E	threatened, endangered, and candidate species
ULTO	Ute ladies'-tresses orchid
USACE	U.S. Army Corps of Engineers
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
WCD	Central Colorado Water Conservancy District
WSD	Water and Sanitation District

1.0 Introduction

The U.S. Army Corps of Engineers (USACE) is preparing a Feasibility Report and Environmental Impact Statement (FR/EIS) for the proposed Chatfield Reservoir Storage Reallocation project. As an appendix of the FR/EIS and in compliance with Section 7(b) of the Endangered Species Act (ESA), this Biological Assessment (BA) has been prepared to address potential effects to federally-listed threatened, endangered, and candidate species (T&E species), and their critical habitat, from construction, operation, and maintenance of the Proposed Action (i.e., Alternative 3 of the FR/EIS). The ESA requires federal agencies to consult with U.S. Fish and Wildlife Service (USFWS) on actions that have the potential to affect federally-listed species or their designated critical habitat. The Proposed Action would allow for a maximum reallocation of 20,600 acre-feet, representing a maximum increase in the elevation of the permanent pool from 5,432 feet above mean sea level (msl) to 5,444 feet msl (see Section 2 for additional discussion of the Proposed Action). Whereas, the FR/EIS addresses the Proposed Action and three alternatives to the proposed action, this BA specifically addresses the Proposed Action.

The BA includes a description of the Proposed Action (Section 2), a description of the study area for the Chatfield Reservoir Storage Reallocation project (Section 3), a description of the Biological Assessment process and T&E species evaluated (Section 4), an analysis of potential impacts of the Proposed Action on federally-listed species (Section 5), an effects determination for the T&E species (Section 6), and a description of proposed conservation measures (Section 7).

2.0 Proposed Action

The Proposed Action would grant reallocation of flood storage at Chatfield Reservoir to increase water storage capacity for 12 local water providers (Table 1). The Proposed Action would allow for a maximum reallocation of 20,600 acre-feet, representing a maximum increase in the elevation of the permanent pool of 12 feet, from 5,432 feet above mean sea level (msl) to 5,444 feet msl. The purpose of and need for the Proposed Action is to increase availability of water, sustainable over the 50-year period of analysis, in the greater Denver, Colorado Metropolitan Area so that a larger proportion of existing and future (increasing) water needs can be met (for further details on the Purpose and Need see Chapter 1 of the FR/EIS). The reallocated storage space in Chatfield Reservoir would be filled using existing or new water rights, including wastewater return flows and other decreed water rights, belonging to a consortium of water providers. The primary objective of the reallocation is to help enable water providers to supply water to local users, mainly for municipal and industrial (M&I), and agricultural needs, in response to rapidly increasing demand. Chatfield Reservoir is well placed to help meet this objective, because the reservoir provides a relatively immediate opportunity to increase water supply storage without the development of significant amounts of new infrastructure. It lies at the confluence of the South Platte River (efficient capture of runoff) and Plum Creek, and it provides an opportunity to gain additional use of an existing federal resource.

Chatfield Reservoir currently consists of four storage areas referred to as pools (i.e., inactive/sediment storage, multipurpose-conservation, flood control, and maximum surcharge/spillway design flood pools) that are used for different purposes. These pools are discussed in detail in Chapter 2 of the FR/EIS. The Proposed Action would reallocate storage from the flood control pool to the joint flood control-conservation pool. Space in the joint flood control-

conservation pool would be filled using water rights belonging to a consortium of water providers listed in Table 1. This reallocation would enable the water providers to supply water to local users for municipal, industrial, agricultural, recreational, and fish and wildlife needs in response to population growth in the Denver metropolitan area.

Table 1. Colorado Water Providers Requesting Storage Space in Chatfield Reservoir

Entity Requesting Storage	Nature of Entity	Purpose of Use of Storage	Maximum Storage Reallocation (acre-feet)	Percent of Costs and Storage Reallocation
Downstream Providers				
Unassigned ¹	TBD	Unassigned	3,561	17.3
Central Colorado Water Conservancy District (WCD)	Agricultural	Agricultural	2,849	13.8
Colorado Parks and Wildlife ^{6,7}	Governmental: State Agency	Recreation	1,000	4.9
Denver Botanic Gardens at Chatfield	Governmental: City and County of Denver	Recreation and Agriculture	40	0.2
Western Mutual Ditch Company	Agricultural	Agricultural	1,425	6.9
Upstream Providers				
Unassigned ¹	TBD	Unassigned	564	2.7
Castle Pines Metropolitan District ³	Local government serving Denver suburban area	Municipal and Industrial	785.6	3.8
Castle Pines North Metropolitan District (MD) ³	Local government serving Denver suburban area	Municipal and Industrial	941.5	4.6
Town of Castle Rock ³	Municipality	Municipal and Industrial	1,013.16	4.9
Centennial Water and Sanitation District (WSD) ³	Local government serving Denver suburban area	Municipal and Industrial	6,434.9	31.2
Center of Colorado Water Conservancy District (WCD)	Governmental: Park County	Municipal and Industrial	131.32	0.6
Colorado Water Conservation Board	Governmental: State Agency	Recreation	100	0.49
Mount Carbon Metropolitan District (MD)	Local government serving Denver suburban area	Municipal and Industrial	400	1.9
Perry Park Country Club ¹	Private	Municipal	100	0.5
South Metro Water Supply Authority (SMWSA) ³ Includes storage for the following entities:	Local governments providing water supplies to Denver suburbs	Municipal and Industrial	1354.3	6.6
Arapahoe County Water and Wastewater Authority			121.6	0.59
Castle Pines North MD			64.3	0.31
Castle Pines MD			1.1	0.005
Centennial WSD			487.2	2.37
Cottonwood WSD			64.3	0.31
Pinery WSD ⁴			64.3	0.31
Stonegate Village MD			64.3	0.31
Town of Castle Rock			487.2	2.37
Total			20,600	100%

¹The City of Aurora and Roxborough WSD are in the process of withdrawing from the Project. Their combined share of the reallocated storage of 4,125.3 acre-feet is designated as "unassigned" and will be reassigned to one or more of the water providers or others at a future date.

²Municipal and Industrial uses may include domestic, mechanical, manufacturing, and industrial uses; power generation; fire

Table 1. Colorado Water Providers Requesting Storage Space in Chatfield Reservoir

Entity Requesting Storage	Nature of Entity	Purpose of Use of Storage	Maximum Storage Reallocation (acre-feet)	Percent of Costs and Storage Reallocation
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protection; sewage treatment; street sprinkling; irrigation of parks, lawns, gardens, and grounds; and augmentation and replacement, recharge, use as a substitute water supply, and exchange for water supplies also dedicated to these types of uses.

³Note that these entities are requesting their own storage space in Chatfield Reservoir, and are also seeking storage space as members of the South Metro Water Supply Authority. Their portion of SMWSA's storage space would be allotted as described below in note 4.

⁴The South Metro Water Supply Authority is an entity that provides coordination of regional planning efforts to develop renewable water supplies for its members. The SMWSA is requesting storage space in Chatfield Reservoir that would be used by eight of its members, these are: Arapahoe County Water and Wastewater Authority, Castle Pines Metropolitan District, Castle Pines North Metropolitan District, Town of Castle Rock, Centennial WSD, Cottonwood WSD, Stonegate Village Metropolitan District, and Denver Southeast Suburban Water and Sanitation District doing business as Pinery Water and Wastewater District. SMWSA's storage space would be allocated among these eight members as shown in the table. Note that some of these SMWSA members are also seeking storage space as their own entity (i.e., not under SMWSA); these are shown in the table and include Castle Pines MD, Castle Pines North MD, Centennial WSD, and Town of Castle Rock.

⁵The Pinery WSD is also known as Denver Southeast Suburban Water and Sanitation District.

⁶The Colorado Water Conservation Board (CWCB) is temporarily holding the shares of Colorado Parks and Wildlife (CPW).

⁷On July 1, 2011, Colorado State Parks and the Colorado Division of Wildlife merged to form Colorado Parks and Wildlife.

MD = Metropolitan District

WSD = Water and Sanitation District

While water supply remains primarily a non-federal responsibility, based on current federal authorities, the federal government should participate and cooperate with states and local interests in developing such water supplies in connection with multi-purpose projects. The federally owned Chatfield Reservoir provides an opportunity to help local communities meet the growing demand for water. Although Chatfield Reservoir does provide promise to help meet a portion of the local need, it does not preclude the consideration of all potential alternatives to solve the problems and meet the needs. Therefore, it is the purpose of the FR/EIS study to identify alternatives, compare those alternatives, and select the best alternative for meeting the needs based on solid planning principles. The Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies (P&Gs) (U.S. Water Resources Council 1983) establish the standards and procedures that USACE and other federal water resources agencies use for planning and evaluating the merits of water projects.

3.0 Action Area

Chatfield Reservoir is located at the confluence of the South Platte River and Plum Creek within the South Platte River Basin. The reservoir itself is located southwest of Denver in Douglas, Jefferson, and Arapahoe Counties. The drainage area for the South Platte River Basin upstream of the reservoir encompasses 3,018 square miles and originates at the headwaters of the North Fork of the South Platte and the South Fork of the South Platte in Park County, Colorado. The U.S. Forest Service (USFS) manages most of the lands along the main stem of the South Platte River upstream of the reservoir. Plum Creek, the second largest of the reservoir's tributaries, flows through a mixture of rangelands and suburban areas. The Buffalo Creek and Hayman fires burned large areas within the South Platte Watershed, resulting in the deposition of sediments into the South Platte River drainage. Reservoirs located upstream of Chatfield include Strontia Springs, Cheeseman Lake, Elevenmile Canyon, Spinney Mountain, and Antero Reservoir. Downstream, the South Platte River

joins with the North Platte River in western Nebraska to form the Platte River. The Platte River ultimately joins the Missouri River at the Nebraska/Iowa border.

The Chatfield Reservoir study area (Figure 1) defined for analyzing the effects of the Proposed Action encompasses Chatfield Reservoir and the USACE property (approximately 5,300 acres) surrounding the reservoir, including Chatfield State Park and extends downstream along the South Platte River to where the river intersects the Adams/Weld County line (Figure 1). It includes those portions of the South Platte River, Plum Creek, Deer Creek, Willow Creek, and Massey Draw from the points where they enter USACE property to their confluence with Chatfield Reservoir. Chatfield Reservoir and the surrounding USACE property occupies portions of Jefferson and Douglas Counties, and the study area's downstream reach of the South Platte River crosses portions of Arapahoe, Denver, and Adams Counties.

The Proposed Action would require a change in the operations of the reservoir and would require the construction of additional recreational infrastructure and relocation of some of the existing park roads and facilities. The land affected by construction and operation of the project would be land immediately around Chatfield Reservoir.

Water providers would be able to use existing infrastructure to divert their portion of the stored water into their water systems, and therefore providers would not need to construct new delivery facilities to deliver their new water supplies from Chatfield Reservoir. ▲

Operations at Chatfield Reservoir would be based on the four pools described for the Proposed Action. The base elevation of the flood control pool would be raised from 5,432 ft to 5,444 feet msl, and the State Engineer would be responsible for managing discharges for water levels within the joint flood control-conservation pool. During forecast high runoff years when Chatfield pool elevation is forecast to exceed 5,444 feet, USACE and the state of Colorado would jointly operate the joint flood control-conservation pool. During the joint operation, Chatfield Reservoir could be drawn down while the surface elevations are still within the joint flood control-conservation pool to accommodate the anticipated high volume of runoff. This would provide benefits during high runoff years such as a lower maximum release resulting in less downstream impacts and possibly fewer in-pool impacts because of less need for exclusive flood control storage. These operations are detailed in the Water Control Plan, Appendix B of this FR/EIS. As under current conditions, USACE would take control of discharges once the water level reached the exclusive flood control pool elevation, in this case 5,444 feet msl. The pool elevation of 5,444 feet msl would not be achieved every year due to fluctuations in the amount of upstream runoff.

Under the proposed action the number of entities with storage rights within the reservoir would increase from 1 (Denver Water) to 13 (see Table 1 for the proposed new users). While the state engineer would continue to manage the discharge within the joint flood control-conservation pool, the demand on the additional storage rights would change the volume and pattern of the discharge from that observed under current conditions. The result is that the pool level could fluctuate more widely than under current conditions.

4.0 Federally-Listed Threatened, Endangered, and Candidate Species Potentially Affected by the Proposed Action

4.1 Biological Assessment Process

This BA addresses T&E species and their habitats that are known to occur or could possibly occur in the Chatfield Reservoir study area (as described in Section 3.0).. T&E species lists from USFWS were used to identify the species to be considered in this BA (USFWS 2010a).

USFWS has determined that historical and new depletions to the Platte River may adversely affect, but would not likely jeopardize federally-listed species and their designated critical habitat along the Platte River in Nebraska. A separate program BA process, the Platte River Recovery Implementation Program (PRRIP), addresses T&E species associated with the central and lower Platte River in Nebraska and is included as an Attachment to this BA (see “PRRIP BA”, Attachment 1). The “target species” addressed under the PRRIP are the whooping crane (*Grus americana*) (and its designated critical habitat), the interior least tern (*Sternula antillarum*), the northern Great Plains population of the piping plover (*Charadrius melodus*), and the pallid sturgeon (*Scaphirhynchus albus*). The PRRIP also addresses the western prairie fringed orchid (*Platanthera praeclara*), the American burying beetle (*Nicrophorus americanus*) and the Eskimo curlew (*Numenius borealis*). The PRRIP was established in 2006 to protect and recover the federally-listed Platte River species and to offset the depletive effects of existing and new water related activities in Colorado and the other basin states. The PRRIP is implemented through a basin-wide cooperative approach agreed to by the States of Colorado, Nebraska, Wyoming, and the U.S. Department of the Interior. In Colorado, individual water projects, such as the Chatfield Reservoir reallocation project, may rely on the PRRIP for ESA compliance purposes through the participants’ membership and financial participation in the South Platte Water Related Activities Program, Inc. (SPWRAP) a water provider’s organization. The SPWRAP assists in fulfilling Colorado’s programmatic contributions to the PRRIP. The water providers participating in the Chatfield Reservoir storage reallocation study are all members of SPWRAP. All of the water providers who are planning to remain involved in the study have renewed their memberships for 2012. Copies of the 2012 Certificates of Membership in SPWRAP are included in Attachment A of the PRRIP BA. By agreeing to participate in the PRRIP, proponents of the Chatfield Reservoir storage reallocation project, which is subject to Section 7 ESA consultation, can ensure compliance relative to the Platte River target species, can avoid the potential for prohibited “take” of these species under ESA Section 9, and can take advantage of predefined procedures and expectations going into the ESA consultation process. The PRRIP benefits Platte River species by creating offsetting measures, including measures that will substantially reduce shortages to target flows in the central Platte River, and that will obtain and restore habitat for the target species. Therefore, net impacts to these species are not expected to be significant as a result of depletions from the proposed Chatfield Reservoir storage reallocation project. The potential effects of project depletions on the Platte River T&E species (listed above) are addressed in the streamlined PRRIP BA (Attachment 1) submitted by the federal action agency to USFWS and will be covered through a “tiered” Biological Opinion confirming the project is in compliance with the ESA based on implementation of the PRRIP.

For federal actions and projects participating in the PRRIP, the Platte River Recovery Implementation Program Final Environmental Impact Statement (FEIS) and the June 16, 2006 Programmatic Biological Opinion (PBO) serve as the description of the environmental baseline and

environmental consequences for the effects of the Federal actions on the listed target species, whooping crane designated critical habitat, and other listed species associated with the Platte River and addressed in the PBO. These documents are hereby incorporated into this BA by this reference.

4.2 Habitat Types in the Study Area

The Chatfield Reservoir study area includes many different habitat types, such as grasslands, shrublands, open water, rocky areas, landscaped/disturbed areas, and riparian areas. Despite the diversity of habitats and wildlife in the Chatfield Reservoir study area, the habitat quality, especially in uplands is typically degraded by the presence and even dominance of non-native plant species. Increasing the water level of Chatfield Reservoir to 5444 ft msl (as in the Proposed Action) could result in the loss of approximately 586 acres of wildlife habitat from inundation. Table 2 shows the number of acres of each of the habitat types that could be lost. In addition, approximately 2.5 acres of riparian habitat would be lost due to relocation of the recreation trail at the Plum Creek Day Use Area.

A range of vegetation communities exists within the study area, including upland, wetland, and open water communities (Burns and McDonnell 1998). Upland vegetation communities include mixed-grass prairie, woodlands, scrub-shrub, open fields, and pastures. Wetlands include emergent wetlands, riparian shrublands, and riparian cottonwood forest. Open water habitats include streams, rivers, borrow ponds, and reservoirs. ▲

Table 2. Estimate of Acres of Wildlife Habitats at Chatfield Reservoir Inundated Beyond Current Operations

Habitat Type	Proposed Action
Mature Cottonwood	43
Other Trees	211
Shrub	53
Upland	222
Wetland/Non-woody	57
Total	586

4.3 Species Evaluated

The Proposed Action could have potential impacts on T&E species primarily through inundation of wetland, riparian, and upland areas currently used by T&E species. Table 3 includes a list of T&E species that are known to occur or could occur in the Chatfield Reservoir study area. The list of T&E species in Table 3 was developed from current lists from USFWS, including the County Lists for each of the counties in the study area (USFWS 2010a). The black-footed ferret (*Mustela nigripes*) was not included in Table 3 because it is not on the County Lists and all of the project components are within the 2009 black-footed ferret block-clearance area where USFWS has determined that ferrets are unlikely to occur (USFWS 2009a). Therefore, the black-footed ferret is not further addressed in the BA.

The Platte River T&E species that occur in Nebraska but not in the Chatfield Reservoir study area are addressed under the PRRIP program (Attachment 1) and are not included in this section; this includes the pallid sturgeon, the western prairie fringed orchid, the American burying beetle, and the Eskimo curlew. The whooping crane, interior least tern, and piping plover, are Platte River T&E species that occur in Nebraska and also have the potential to occur in the Chatfield Reservoir study area, therefore these species are discussed in this section, as well as in the PRRIP BA (Attachment 1).

Table 3. Federal Threatened, Endangered, and Candidate Species Known to Occur or with the Potential to Occur in the Study Area of the Chatfield Reservoir Storage Reallocation Project

Common Name	Scientific Name	Federal Status
Mammals		
Gunnison's prairie dog	<i>Cynomys gunnisoni</i>	C
Canada lynx	<i>Lynx canadensis</i>	T
Preble's meadow jumping mouse	<i>Zapus hudsonius preblei</i>	T
Birds		
Interior least tern ¹	<i>Sterna antillarum athalossos</i>	E
Mexican spotted owl	<i>Strix occidentalis lucida</i>	T
Piping plover ¹	<i>Charadrius melodus circumcinctus</i>	T
Whooping crane ¹	<i>Grus americana</i>	E
Fish		
Greenback cutthroat trout	<i>Oncorhynchus clarki stomias</i>	T▲
Insects		
Pawnee montane skipper	<i>Hesperia leonardus montana</i>	T
Plants		
Colorado butterfly plant	<i>Guara neomexicana</i> ssp. <i>coloradensis</i>	T
Ute ladies'-tresses orchid	<i>Spiranthes diluvialis</i>	T

Key: E = Endangered, T = Threatened, C = Candidate for Listing.

¹ Water quality or depletions may affect the species and critical habitat in downstream reaches in Nebraska, therefore this species is also addressed in the PRRIP BA (Attachment 1).

4.3.1 Federally-Listed Endangered Species

4.3.1.1 Interior Least Tern

Interior least terns were federally-listed as endangered in 1985 (50 Federal Register 21784). They are highly dependent on the presence of dry exposed sandbars and favorable river flows that support a forage fish supply and isolate the sandbars from the riverbanks. Characteristic riverine nesting sites are dry, flat, sparsely vegetated sand and gravel bars within a wide, unobstructed, water-filled river channel. Nests are initiated only after spring and early summer flows recede and dry areas on sandbars are exposed, usually at higher elevations away from the water's edge (NGPC 2005).

Following regulation of the Platte River that decreased flows, the establishment of trees and shrubs on the floodplain greatly reduced the habitat for the least tern (Currier et al. 1985). In Nebraska, interior least terns currently breed at the following locations: along the Platte River from its mouth, west to the town of North Platte; along the South Platte River at one or two isolated sites; along the

lower reaches of the Niobrara River; along reaches of the Loup and Elkhorn Rivers; and on the unchannelized section of the Missouri River below the Fort Randall and Gavins Point Dams. A few least terns nest on the shoreline of Lake McConaughy on the North Platte River, usually in years when low lake levels expose wide sandy beaches (NGPC 2005). Based on 10 years of observations at Chatfield (1996 to 2006), this species was observed only during July 1998, when a single bird was observed near the marina (Kellner 2006). Although it may be rarely, this species has the potential to occur in the Chatfield Reservoir study area during migration.

4.3.1.2 Whooping Crane

The whooping crane was federally-listed as endangered in 1970 (35 Federal Register 8495). They migrate through Nebraska twice each year on their way to and from wintering grounds in the Aransas National Wildlife Refuge in Texas to summer grounds on freshwater marshes in Alberta, Canada. The primary migration route through Nebraska is approximately 140 miles wide; the Big Bend Region of the Platte River in Nebraska is an important stopover area (NGPC 2005). This area was designated as critical habitat in 1978 (43 Federal Register 20938).

The occurrence of whooping cranes in Colorado is extremely rare, and they have not been seen in Colorado since 2002 (CDOW 2009b). They have never been reported from Jefferson or Douglas Counties (Andrews and Righter 1992) where Chatfield Reservoir is located. In addition, they have never been reported at Chatfield Reservoir based on available records (Colorado State Parks 1998, Kellner and Spencer 2006, Kellner 2006). In 1975 an experiment was initiated to establish a flock of whooping cranes that would migrate from Gray's Lake Idaho to Bosque Del Apache National Wildlife Refuge in New Mexico, with stopovers in Colorado's San Luis Valley. Eggs from whooping crane nests in Canada were transferred to sandhill crane nests in Idaho, and the sandhill cranes raised the whooping cranes and taught them the migration route. However, the whooping cranes failed to form pair bonds and had high mortality rates. In 1989 the program was discontinued and no whooping cranes survived in this population (International Crane Foundation 2012).

4.3.2 Federally-Listed Threatened Species

4.3.2.1 Canada Lynx

The federally-listed threatened Canada lynx (65 Federal Register 16051) is a medium-sized cat that inhabits boreal forests of northern North America. The principal food of the lynx is snowshoe hare (*Lepus americanus*), which comprises 80 percent of the lynx's diet. In Colorado, lynx habitat includes dense spruce-fir stands in association with rock outcrops and large boulders in the subalpine zone and timberline where lynx use caves, rock crevices, overhanging banks, or hollow logs for denning. The Canada lynx was historically found in high-elevation forested areas in Colorado in the late 1800s; by 1930, however, they were considered rare. By the mid-1970s, the lynx population in Colorado was extirpated or reduced to a few animals. In 1999, CDOW began a reintroduction program using lynx from Alaska and Canadian provinces for release in the San Juan Mountains of southwestern Colorado. As of 2007, a total of 218 adult lynx have been released in the mountains of Colorado. Most of the lynx released remain in the core release area: New Mexico north to Gunnison, west as far as Taylor Mesa, and east to Monarch Pass. Some movement of lynx into Arizona, Idaho, Iowa, Kansas, Montana, Nebraska, Nevada, New Mexico, South Dakota Utah, and Wyoming has also occurred (CDOW 2008a). Monitoring continues to determine whether Colorado

can support sufficient recruitment to offset annual mortality for a viable lynx population over time (Shenk 2008). There is no suitable habitat for the Canada lynx in the Chatfield Reservoir study area.

4.3.2.2 Mexican Spotted Owl

The federally-listed threatened (58 Federal Register 14248) Mexican spotted owl has been observed in the Pikes Peak, South Platte, and San Carlos Ranger Districts of the Pike National Forest. All nests found in Colorado to date occur on cliff ledges or in caves along canyon walls (USFS 1994). This species occupies either large, steep canyons with exposed cliffs and dense old-growth mixed forest of Douglas-fir, white fir, and ponderosa pine or canyons in pinyon-juniper areas with small and widely scattered patches of mature Douglas-fir. In 2004, USFWS designated 8.6 million acres of critical habitat within the owl's geographic range, including 322,326 acres in Colorado (69 Federal Register 53181). The nearest Critical Habitat Unit (CHU) is located in the southern areas of Douglas and Jefferson counties on land managed by USFS. However, this owl is not expected to occur within the Chatfield Reservoir study area because there is a lack of suitable habitat and the area lies at the edge of the owl's geographic distribution.

4.3.2.3 Piping Plover

The northern Great Plains breeding population of the piping plover was federally-listed as threatened in 1985 (50 Federal Register 50726). It is found in Nebraska along the Platte River, preferring riverine island habitat that is largely unvegetated sands, sediments, and gravels (Currier et al. 1985). In Nebraska, the Platte River was included in the critical habitat designated in 2002 (67 Federal Register 57638). This species has been affected through habitat loss by woody plant encroachment as a result of decreased flows in the Platte River (NGPC 2005). An October 11, 2005 court ruling vacated critical habitat for the piping plover in Nebraska; it has been recommended to USFWS for possible rededication (USFWS 2006). In Colorado, piping plovers occur as migrants, arriving around the first of April. Most have passed through by the end of May. They can be found in the eastern part of the state. The Arkansas and South Platte River drainages are the best areas to find these birds. Nesting habitat in Colorado is on sandy lakeshore beaches, sandbars within riverbeds or even sandy wetland pastures. An important aspect of this habitat is that of sparse vegetation (CDOW 2008b). Based on 10 years of observations at Chatfield (1996 to 2006), this species was observed only once (in September 2001) (Kellner 2006). Although it may be rarely, this species has the potential to occur in the Chatfield Reservoir study area during migration as it is attracted to gravelly or sandy shorelines.

4.3.2.4 Pawnee Montane Skipper

The Pawnee montane skipper (*Hesperia leonardus montana*) was federally-listed as a threatened species in 1987 (52 Fed. Reg. 36176 (September 25, 1987)). The Pawnee montane skipper (skipper) is a small brownish-yellow butterfly with a wingspan slightly more than 1 inch. It inhabits dry, open ponderosa pine woodlands with sparse understory at 6,000 to 7,500 feet msl with moderately steep slopes and soils derived from Pikes Peak granite. Blue grama grass (*Bouteloua gracilis*), the larval food plant, and the prairie gayfeather (*Liatris punctata*), the primary nectar plant, are two necessary components of the ground cover. Small clumps of blue grama occur throughout the warm, open slopes inhabited by skippers. Prairie gayfeather occurs throughout the ponderosa pine woodlands. The vegetative community preferred by the skipper is a northernmost extension of the Ponderosa pine/blue grama grass habitat type documented from southern Colorado and northern New Mexico.

However, the preferred nectar plant of the skipper, prairie gayfeather, does not occur in similar habitats to the south. The northeastern limit of the Ponderosa pine/blue grama grass community overlapping the southwestern limit of the prairie gayfeather may contribute to the maintenance of the species in this limited area. The recovery plan for the skipper (USFWS 1998a) established the following recovery criteria: 1) protect and maintain through proper vegetation management all of the defined skipper habitat on public land in the South Platte River drainage, 2) avoid habitat fragmentation, and 3) ensure that skippers are distributed throughout the range.

The Pawnee montane skipper occurs only on the Pikes Peak Granite Formation in the South Platte River drainage system in Colorado, involving portions of Jefferson, Douglas, Teller, and Park counties. An intensive distribution survey found the range of the skipper to be centered at Deckers, Colorado, and to extend northwest just beyond Pine, Colorado, and southward to the point where the Teller, Park, Jefferson, and Douglas county lines nearly converge (USFWS 1998a). This total area is roughly 23 miles long and 5 miles wide. The total known habitat within this range is estimated to be 37.9 square miles. Based on this habitat and distribution information, the Pawnee montane skipper is not expected to occur in the Chatfield Reservoir study area.▲

4.3.2.5 Greenback Cutthroat Trout

The historical range of the federally-listed threatened greenback cutthroat trout (43 Federal Register 16343) includes much of the South Platte River drainage from its headwaters to the confluence with the Cache la Poudre River just upstream from Greeley, Colorado, and the headwaters of the Arkansas River upstream from Pueblo, Colorado. However, current distribution is limited to a few streams and lakes in the upper headwaters of these drainages. These sites are not currently within the Chatfield Reservoir study area or under project influences (USFWS 1998b). Introduction of nonnative trout species was the primary reason for the species' decline, but habitat degradation and over harvesting also contributed to the decline. Habitat requirements include clear, cold streams and lakes, and clean gravel in flowing streams during spring for spawning. The objective of the 1998 greenback cutthroat trout recovery plan included actions intended to allow removal of the species from the threatened list, which was to be accomplished by establishing 20 stable populations of this species. All areas identified in the 1998 plan for locating these 20 populations are in headwater areas of the South Platte and Arkansas River drainages, far upstream from the current Chatfield Reservoir study area (USFWS 1998b). Currently, greenback cutthroat trout occur in 58 lakes and streams and 23 of these water bodies meet the population criteria required by recovery goals. Many of the historic and restored populations are located in Rocky Mountain National Park (CDOW 2005b). None of the known populations occur within the Chatfield Reservoir study area or nearby (USFWS 1998b).

4.3.2.6 Colorado Butterfly Plant

The federally-listed threatened Colorado butterfly plant (65 Federal Register 62302) is endemic to southeastern Wyoming, western Nebraska, and northeastern Colorado, including Boulder, Douglas, Larimer, and Weld counties in Colorado (Spackman et al. 1997). This short-lived, perennial herb grows in moist soils in mesic or wet meadows of floodplain areas at elevations of 5,800 to 6,200 feet msl. The Colorado butterfly plant is found in low depressions along wide meandering streams at the interface between riparian meadows and dry grassland. In January 2005, USFWS designated 3,538

acres of critical habitat along approximately 50 stream miles within Platte and Laramie counties in Wyoming (70 Federal Register 1940).

Threats to this species include the use of broadleaf herbicides, grazing by cattle and horses, conversion of land for agriculture, and water development. Potential habitat is present within the Chatfield Reservoir study area. The transition zone between wetland communities and upland communities is where potential habitat for the Colorado butterfly plant occurs (USACE 2006). In 2004 and 2005, five general areas within the Chatfield Reservoir study were identified as potential habitat and were intensively surveyed for the Colorado butterfly plant. No individuals or populations of this species were found (USACE 2005a, 2006).

4.3.2.7 Ute Ladies'-tresses Orchid

The federally-listed threatened Ute ladies'-tresses orchid (ULTO) (57 Federal Register 2048) has limited distribution in the western U.S., including five counties in Colorado's front range (Jefferson, Boulder, El Paso, Larimer, and Weld counties) (Fertig et al. 2005). It is not currently reported from any locations along the South Platte River (Fertig et al. 2005). This orchid is found in seasonally moist soils and wet meadows near springs, lakes, or perennial streams and their associated flood plains below 6,500 feet msl. Potential habitat for the Ute ladies'-tresses orchid, as outlined in ▲ USFWS guidelines (USFWS 2007a), includes areas with moist soil conditions and wetland-type vegetation or drier areas where there are indications of seasonally high water tables or inundation. Typical sites include old stream channels, abandoned meanders, alluvial terraces, sub-irrigated meadows, and other sites where soils are saturated to within 18 inches of the surface, at least temporarily, during the spring and summer growing season (USFS 1994).

On October 12, 2004, USFWS announced the initiation of a 5-year review to assess the orchid's population abundance and distribution, recovery progress, and existing threats. Upon conclusion of the status review, USFWS will issue a finding regarding whether the orchid should remain listed or should be proposed for delisting (69 Federal Register 60605).

In a 1998 survey, five wetland areas around Chatfield Reservoir were considered to be potential Ute ladies'-tresses orchid habitat. All sites were surveyed for the orchid and no individuals or populations were found (Burns and McDonnell 1998). In 2004, six general areas were identified as potential orchid habitat around Chatfield Reservoir. These sites were surveyed and no individuals or populations were found (USACE 2005a). The surveys were conducted again in August 2005, and although potential habitat exists within the Chatfield Reservoir study area, no Ute ladies'-tresses orchid plants were found (USACE 2006).

4.3.2.8 Preble's Meadow Jumping Mouse

This mouse is a rare subspecies of the meadow jumping mouse (*Zapus hudsonius*) and was listed as a federally-listed threatened species in 1998 (63 Federal Register 26517). In February 2005, USFWS was petitioned to delist the Preble's mouse. On November 1, 2007, USFWS revised their proposed rule to amend the listing of the Preble's mouse to specify over what range the subspecies is threatened. Also noted, is the finding that the Preble's mouse (*Zapus hudsonius preblei*) is a valid subspecies and remains federally protected. On July 10, 2008, USFWS removed ESA protections for Preble's mouse populations in Wyoming and amended the listing for Preble's mouse to indicate the subspecies remains protected as a threatened species in the Colorado portion of its range. [USFWS](#)

▲ has determined the best commercial and scientific information available demonstrates that the Preble's mouse is a valid subspecies and should not be removed from the list of threatened and endangered species based on taxonomic revision (USFWS 2009b).

In June 2003, USFWS designated critical habitat (68 Federal Register 37275-37332) for the mouse along 359 stream miles in Colorado and Wyoming. USFWS has designated approximately 297.3 acres of Preble's mouse critical habitat within the Chatfield Reservoir study area along the South Platte River upstream of Chatfield Reservoir (see Section 5.2 for additional details). This critical habitat falls within the Upper South Platte critical habitat unit (CHU). The approximately 297.3 acres of critical habitat are a subset of the 552 acres of potential Preble's habitat found within the Chatfield Reservoir study area. Critical habitat is defined by USFWS (68 Federal Register 37275-37332a) as extending 140 meters (460 feet) outward from normal high water on both sides of the South Platte River above Chatfield Reservoir.

In December 2010, USFWS designated revised critical habitat for Preble's mouse in Colorado. The revised critical habitat included a total of approximately 411 miles of rivers and streams and 34,935 acres within Boulder, Broomfield, Douglas, El Paso, Jefferson, Larimer, and Teller Counties (75 Fed. Reg. 78430 (December 15, 2010)). Unit 9 "West Plum Creek" (i.e., West Plum Creek CHU), ▲ was one of the critical habitat areas added in 2010, and it includes much of the Plum Creek/West Plum Creek Watershed (75 Fed. Reg. 78430). Unit 9 consists of 90.3 miles of streams. Plum Creek from Chatfield Lake upstream to its confluence with East Plum Creek and West Plum Creek is included in Unit 9, with the exception of 0.14 miles of Plum Creek at the Highline Canal crossing. Critical habitat on Plum Creek extends outward 140 meters from each side of the stream (75 Fed. Reg. 78430).

Preble's mouse habitat is comprised of well-developed plains riparian woodland and wetland areas with adjacent, relatively undisturbed grassland communities and a nearby water source. These riparian areas include a relatively dense combination of grasses, forbs, and shrubs. Preble's mice are known to regularly range outward into adjacent uplands to feed and hibernate. The Preble's mouse is found in and near shrub-dominated riparian (streamside) areas along Colorado's Front Range from Colorado Springs north into southeastern Wyoming. It hibernates from September or October until May. Preble's mouse occupied range (those areas where Preble's mice are known or very likely to occur) (NDIS 2006) within the Chatfield Reservoir study area is illustrated in Figure 2.

The primary constituent elements (PCEs) for Preble's mouse include (75 Fed. Reg. 78430):

- riparian corridors: (A) Formed and maintained by normal, dynamic, geomorphological, and hydrological processes that create and maintain river and stream channels, floodplains, and floodplain benches and that promote patterns of vegetation favorable to the Preble's meadow jumping mouse; (B) Containing dens, riparian vegetation consisting of grasses, forbs, or shrubs, or any combination thereof, in areas along rivers and streams that normally provide open water through the Preble's meadow jumping mouse's active season; and (C) Including specific movement corridors that provide connectivity between and within populations. This may include river and stream reaches with minimal vegetative cover or that are armored for erosion control; travel ways beneath bridges, through culverts, along canals and ditches, and other areas that have experienced substantial human alteration or disturbance.; and

- additional adjacent floodplain and upland habitat with limited human disturbance (including hayed fields, grazed pasture, other agricultural lands that are not plowed or disked regularly, areas that have been restored after past aggregate extraction, areas supporting recreation trails, and urban-wildland interfaces).

These primary constituent elements can be found within the Chatfield Reservoir study area.

In 1998, Preble's mouse surveys were conducted on USACE property in the area surrounding Chatfield Reservoir. The mouse was captured above the reservoir from survey transects on the South Platte River and Plum Creek. There were four captures along the South Platte River and nine captures along Plum Creek. Because the survey was conducted over multiple consecutive nights and individuals were not marked after capture, these captures could have included individuals that had been trapped multiple times. It is expected that the mouse populations in these areas extend beyond the survey area. Elevation of the South Platte River site was 5,440 feet msl and the elevation for the Plum Creek site was 5,460 feet msl (Burns and McDonnell 1998). No Preble's mice have been captured in the Chatfield Reservoir study area below Chatfield Reservoir or along Deer Creek (Burns and McDonnell 1998, 2001). ▲

A Preble's mouse habitat map was developed by Tetra Tech biologists for areas on Plum Creek and the South Platte River above Chatfield that could be inundated by the Proposed Action. The map identified four broad categories of habitat quality; these are shown in Figure 3 and defined as follows:

High Value Riparian Areas—stream-side habitats within the floodplain that contain dense stands of vegetation, spatially arranged in multiple strata, such as herbaceous ground cover, riparian shrub layers, and multiple-age-class tree layers.

Low Value Riparian Areas—stream-side habitats with limited vegetative cover. This includes mid-successional riparian forest lacking a shrub or grass/forb understory or recently inundated areas that may support vegetation but not enough to provide dense cover.

Upland Habitat—dense mesic grasslands, shrublands, or combinations of both, adjacent to riparian areas. Uplands may be part of the floodplain or extend beyond the floodplain up to 300 feet.

Non-habitat Areas—includes roads, buildings, parking lots, and other human-altered features not considered habitat for the Preble's mouse.

Potential habitat below Chatfield reservoir has been disqualified by USFWS by a block-clearance of the Denver Urban Drainage and Flood Control District (USFWS 2004). The clearance did not originally include South Platte Park and areas below the Chatfield Dam. USFWS has updated their Denver Urban Drainage and Flood Control District Block-Clearance to include the area of South Platte Park south to Colorado State Highway C-470 (USFWS 2007b). Given the heavy recreational use in the Chatfield Reservoir study area below Chatfield Reservoir, this portion of the Chatfield Reservoir study area should not be considered as potential habitat for the Preble's mouse.

4.3.3 Federal Candidate Species

4.3.3.1 Gunnison's Prairie Dog

On February 5, 2008, the U.S. Fish and Wildlife Service found that the Gunnison's prairie dog (*Cynomys gunnisoni*) is not threatened or endangered throughout all of its range but the portion of the current range of the species located in central and south-central Colorado and north-central New Mexico is warranted for listing under the Act (50 Federal Register Part 17). Consideration will be given to listing this species once USFWS' priorities allow making the Gunnison's prairie dog a candidate species. Listing of this species is currently prohibited due to higher priority species that need be listed first. The Gunnison's prairie dog has been given a listing priority number (LPN) of 2 because the threats facing the species are of a high magnitude and are imminent.

The Gunnison's prairie dog is dependent on burrows for protection from predators, for refuge for having and rearing young, and as a hibernacula (Burns et al. 1989). Thus, they need well-drained soils for making these burrows. They live in grasslands and semidesert and montane shrublands. Their diet consists of grasses and sedges (Fitzgerald et al. 1998). They inhabit flat to gently rolling areas.

The range of the Gunnison's prairie dog is considered to occur in two separate portions which are referred to as montane and prairie. Occupancy has been found to be higher in the prairie portions of the range as opposed to the montane portions in Colorado. This species has been deeply affected by both plague and poisoning. According to Fitzgerald et al. (1998) this species may occur in Douglas, El Paso, and Jefferson counties. However, according to a more recent report, "*The Draft Colorado Gunnison's and White-tailed Prairie Dog Conservation Plan*" (CDOW 2008c), the range nearest the Chatfield Reservoir study area, which is the Southeast population, does not enter into Douglas or Jefferson Counties. Thus, the Gunnison's prairie dog is not expected to occur in the Chatfield Reservoir study area.

5.0 Effects Analysis

5.1 Project Operations

To better understand the potential impacts of the Proposed Action on T&E species the following important aspects of the project are discussed in this section:

1. Actions to prepare the project area before inundation occurs—tree removal and relocation of road and recreation facilities;
2. Estimated pool levels during average years during the growing season, both seasonally and from year to year including range of variability; and
3. Estimated pool levels during flood years that may raise levels above 5,444 feet msl

Pool elevations were estimated from USACE's hydrologic modeling, based on historical flow and precipitation data for the Period of Record (POR) of 1942 to 2000 (see the FR/EIS and Appendix H for additional details). The modeling assumes that conditions of the past (i.e., POR) can predict conditions in the future. The modeling does not take into account climate change, which may result in altered hydrologic conditions such as more floods and more or longer periods of drought that cannot be accurately predicted at this time. In addition, the inflows during the entire POR tend to be greater on average than those expected during future conditions. This results in over estimation of

impacts and a greater probability of adequate mitigation for all types of inundation-related environmental impacts.

Adverse impacts under the Proposed Action include converting hundreds of acres of terrestrial habitats to aquatic or semi-aquatic habitats, and converting a substantial acreage of wetlands to deepwater habitats. These changes would likely benefit reservoir fisheries, but would negatively impact terrestrial wildlife species. These impacts may include direct loss of life (drowning) and reduction in the overall acreage of wildlife habitat within the Chatfield Reservoir study area. Habitat loss would include reduction in elements such as available forage, protective cover, breeding sites, and nesting sites.

The Proposed Action includes the removal of most trees between the elevations of 5,432 to 5,439 feet msl prior to inundation of this area. As described in the Tree Management Plan (Appendix Z in this FR/EIS), selected trees would be left in place to provide habitat for fisheries and wildlife. In addition, some of the cut trees could be moved to elevations above 5444 ft msl to provide downed woody debris for enhancement of Preble's mouse habitat. Based on the reservoir modeling results, trees above 5439 ft msl are less likely to be killed by inundation than trees at lower elevations. Because there is uncertainty of the impacts of trees above 5439 ft msl, an adaptive management approach would be used to monitor the condition of these trees after the pool level is increased, and trees would be removed as needed for safety reasons.

The relocation of roads and recreation facilities in the park would have some impacts on riparian, wetland, and upland habitats. Upland impacts would be primarily associated with borrow areas and temporary haul roads and these impacts would be temporary and would be mitigated by restoring native vegetation to these areas, as described in the Compensatory Mitigation Plan (CMP) (Appendix K of this FR/EIS). Cut and fill impacts to wetlands from the Recreation Modifications would be approximately 6.3 acres (as described in the 404(b)(1) Analysis, Appendix W of this FR/EIS). Riparian and wetland impacts would be mitigated as part of the CMP.

The average pool level on an annual basis would be subject to seasonal fluctuations of up to 21 feet, although annual fluctuations of 6 to 7 feet would be typical. To evaluate potential impacts to T&E species, it is useful to look at fluctuations during the growing season and also useful to look at fluctuations when hibernators are active or dormant and when migratory animals are present or absent. The vegetation growing season corresponds roughly to beginning at week 17 and ending at week 41 (i.e., April 25 to October 11) and corresponds to a growing season of approximately 170 days. During an average year, as modeled using POR data, pool levels would begin to increase prior to the onset of the growing season until reaching the peak during weeks 19 or 20, soon after the growing season starts. Since this increase in pool elevation would overlap with the hibernation of the Preble's mouse (approximately September 30 to May 1), this would have an impact to the Preble's mouse.

Then pool levels would recede modestly (2 to 3 feet) for a major portion of the growing season, leveling off toward the end of the growing season and for the remainder of the year (Figure 4). Within the growing season, the POR data predict that the pool level during an average year would approximate 5,440 feet msl with fluctuations equal to ± 2 feet (Figure 5). Pool levels during the majority of the growing season may also be influenced by reservoir management. During the recreation season (Memorial Day to Labor Day) pool level variations are currently restricted and

restrictions may continue under the Proposed Action. This would aid in maintaining pool levels during the majority of the growing season.

Outside of the growing season, pool levels would continue to decrease during average years to elevations approximating 5,436 feet msl in a typical year (Figure 4). The modeling of average pool levels reveals that the target pool elevation of 5,444 feet msl may not be attained in a typical year. Therefore, a portion of the habitat acres listed in Table 2 would typically not be inundated, or at least inundated for only short periods of time. If vegetation, including trees, were not removed within a specific zone, for example a zone of approximately 5,440 feet msl (the estimated average pool level during a typical growing season) to 5,444 feet msl (target pool elevation), then the vegetation within this zone would remain and possibly transform from terrestrial habitats to wetter environments instead of being completely eliminated. This could occur naturally through succession by decreasing or eliminating woody vegetation (trees and shrubs) and encouraging the growth of water-tolerant vegetation including wetland plants. As trees die and decay, they would provide habitat by creating downed woody debris which the Preble's mouse may use. These snags and surviving trees would also be close to the shoreline of the 5,444 msl target pool elevation, thereby lessening potential impacts to boater safety. ▲

An understanding of what may happen to pool levels during flood years and drought years is needed to further characterize potential impacts on T&E species. Figure 6 presents POR modeling showing pool elevations per year over the POR. Chatfield Reservoir's flood control function would result in periodic rises in water levels above the target pool elevation. Compared to current conditions, flooding occurs with the same frequency over the POR and of similar duration for each event. However, the pool elevations reached during the peak of an event is higher for the Proposed Action, and therefore floods a larger area. Adverse impacts on vegetation would be minimal because the flooding, especially at the highest elevations, is for a short duration (several days). Modeling of maximum levels using the POR water levels illustrate that fluctuations in maximum water elevations from year to year can be more than the average fluctuations and on extremely rare occasions can change more than 20 feet for extended durations. For example, the largest modeled flood event was for 1942 where the maximum pool elevation was greater than 5,465 feet msl, and flooding above 5,444 feet msl lasted for 40 days. This extreme flood event shows the variability of possible events. A flood of this magnitude would alter vegetation regardless of what pool levels are allowed. By reviewing Figure 6, flooding predicted over the POR at the new pool elevation of 5,444 feet msl would have occurred during 6 out of 59 years (10 percent). The duration of these flood events ranges widely from 30 to 40 days for the largest floods to 5 to 10 days for the more moderate floods. Currently, flooding along the South Platte River is dampened by the reservoirs upstream constructed in the 1970s. Although not quantified, the influence of the upstream reservoirs further lessens the probability of flooding along the South Platte River. Any diversions along Plum Creek likely dampen flooding on this drainage as well.

During drier years, pool levels can fall below the predicted average pool level of 5,440 feet msl and much lower than the target pool level of 5,444 feet msl. However, the frequency of these drier years occurs only as frequently as flood years (about 10 percent of the time; Figure 6). Therefore, the majority of the time (roughly 80 percent on average) the pool levels are at an average level, about 5,440 feet msl during the growing season (and therefore during the wildlife breeding season and the Preble's mouse active season). Pool levels maintained at this elevation would help to stabilize

vegetation above 5,444 feet msl and provide consistent habitat within a margin area of approximately ± 2 feet at the average pool level of 5,440 feet msl.

Under the Proposed Action, the Chatfield Reservoir level would fluctuate within the year more often and more widely than under current conditions. It is possible that the pool level could fluctuate over a distance of 21 feet under the worst conditions, likely an extended drought. The multipurpose pool level can recede to an elevation of 5,423 feet msl under the Proposed Action, which is the same level as under the current conditions. However, under the Proposed Action, the pool level can rise much more than under current conditions. Although the average peak fluctuation of 3 feet (Figure 7) during late spring or early summer is expected, over an entire year the pool level would have the potential to fluctuate 21 feet. Although the maximum pool elevation under this Proposed Action is predicted to be attained only once every 3–4 years, the minimum levels could reach 5,423 feet msl (Figure 6). According to POR modeling, reservoir levels have the potential of being at this elevation during some part of the year 1 out of every 3 years. Under current conditions, storage capacity is managed in an attempt not to exceed 9 feet of fluctuation annually.

Upstream impacts—The potential for secondary impacts from additional conservation storage capacity to flows upstream of the Chatfield Reservoir study area on the South Platte River and Plum Creek is dependent on whether utilization of storage capacity at Chatfield Reservoir would change the current management of water in these drainages, both by users of the reallocated storage at Chatfield Reservoir and potentially by other entities such as Denver Water. Available inflows to be stored in Chatfield by the water providers would be from both junior water rights and “free river” diversions, which would be exercised when there is available runoff for the taking (“free water”). The reallocation of storage at Chatfield simply enables water to be stored in Chatfield that now flows downstream through and beyond the Chatfield Reservoir study area. If a water provider drops out of the project and relinquishes their rights to the storage space, it is assumed that the water provider acquiring rights to that space would store and release water in the same manner as the original water provider. Under the current understanding of how water providers would access and store water at Chatfield, there are no expected direct or indirect impacts on upstream areas outside of the Chatfield Reservoir study area.

5.2 Potential Impacts to Federally-Listed Threatened, Endangered and Candidate Species

This section discusses the potential impacts to the federally-listed species that were identified in Section 4.3 as known to occur or with the potential to occur in the Chatfield Reservoir study area. The effects determinations for these species are presented in Section 6. As indicated in Section 4.3, potential impacts to the Platte River T&E species that occur in Nebraska are addressed under the PRRIP program (Attachment 1 of this BA).

5.2.1 Interior Least Tern

This species has the potential to occur in the Chatfield Reservoir study area during migration as it is attracted to gravelly or sandy shorelines. Under the Proposed Action there may be an increase in exposed shorelines during dry years and this may be a benefit to migrating interior least terns. The Proposed Action would have no adverse impact to the interior least tern within the Chatfield Reservoir study area. Potential impacts to this Platte River T&E species that occurs in Nebraska are addressed in the PRRIP BA.

5.2.2 Whooping Crane

This species has never been recorded at Chatfield Reservoir and has not been reported in Colorado since 2002. Their presence in this area would be considered part of an accidental migration pattern. Therefore, a change in the target pool elevation to 5,444 feet msl would have no adverse impact to the whooping crane within the Chatfield Reservoir study area. Potential impacts to this Platte River T&E species that occurs in Nebraska are addressed in the PRRIP BA.

5.2.3 Canada Lynx

The Canada lynx has been reintroduced to Colorado in recent years. However, no habitat for the lynx is found in the Chatfield Reservoir study area. Therefore, a change in the target pool elevation to 5,444 feet msl would have no adverse impact on the Canada lynx.

5.2.4 Mexican Spotted Owl

The Mexican spotted owl is found in mature coniferous forest typically in steep mountainous canyons such as those in the Pike-San Isabel National Forest and other forests in the southwest. No habitat for the Mexican spotted owl is found within the Chatfield Reservoir study area. Upstream portions of the South Platte River on National Forest land would not be affected by increased pool elevations at Chatfield. Therefore, there would be no adverse impact to the Mexican spotted owl. ▲

5.2.5 Piping Plover

This species has the potential to occur in the Chatfield Reservoir study area during migration as it is attracted to gravelly or sandy shorelines. Under the Proposed Action there may be an increase in exposed shorelines during dry years and this may be a benefit to migrating piping plovers. The Proposed Action would have no adverse impact to piping plovers within the Chatfield Reservoir study area. Potential impacts to this Platte River T&E species that occurs in Nebraska are addressed in the PRRIP BA.

5.2.6 Pawnee Montane Skipper

Pawnee montane skippers inhabit dry, open ponderosa pine woodlands with sparse understory at 6,000 to 7,500 feet msl. Blue grama grass (*Chondrosium gracile*) is the larval food plant. Prairie gayfeather (*Liatris punctata*) is the primary nectar plant. Both of these plant species occur in the Chatfield Reservoir study area. The skipper occurs only on the Pikes Peak Granite Formation in the South Platte River drainage system in Colorado involving portions of Jefferson, Douglas, Teller, and Park counties. The total known habitat within the range is estimated to be 37.9 square miles (98.2 square kilometers). Given the elevation restrictions of its habitat, the skipper does not appear likely to occur in the Chatfield Reservoir study area and therefore would not be adversely impacted by the Proposed Action.

Skipper habitat has been mapped on the slopes bordering the 4.5-mile reach of Sugar Creek in the Pike National Forest (ERT 1986) where the offsite mitigation for impacts to Preble's mouse critical habitat has been proposed (see Section 5.2.10). A component of the Sugar Creek Mitigation Project includes tree thinning by hand on about five acres of slopes that are adjacent to Sugar Creek. The tree thinning is proposed to decrease shading of the riparian area and increase the potential of riparian shrubs to increase their cover and distribution. The thinning of Ponderosa pine would temporarily disturb habitat for the skipper. However, over the long term, thinning the Ponderosa pine should increase skipper habitat in the thinned areas because the two plant species (blue grama

and prairie gayfeather) that the skipper uses tend to increase in openings within the Ponderosa pine forest. Monitoring of thinned Ponderosa pine sites indicates that skipper densities are positively correlated with prairie gayfeather flowering stem densities and that prairie gayfeather stem densities increase in the thinned Ponderosa pine forest sites (Drummond 2008). Monitoring of hand-thinned stands of Ponderosa pine on the Pike National Forest by the USFS indicates that the disturbed understory vegetation in the thinned areas recovers in one to two growing seasons depending on moisture. Over the long term, the selected thinning of the Ponderosa pine forest bordering the 4.5-mile reach of Sugar Creek would improve habitat for the skipper. The proposed mitigation activities are consistent with recovery criteria for the skipper because the activities would not fragment skipper habitat and over the long term would enhance skipper habitat in the Sugar Creek drainage.

5.2.7 Greenback Cutthroat Trout

The greenback cutthroat trout is found only in a few streams and lakes within the headwaters of the South Platte River and Arkansas River systems. None of the known populations occur within the Chatfield Reservoir study area or nearby (USFWS 1998c). In addition, all areas identified in the 1998 recovery plan for establishing stable populations are in headwater areas of the South Platte and Arkansas River drainages, far upstream from the Chatfield Reservoir study area (USFWS 1998c). Therefore, there would be no adverse impact on the greenback cutthroat trout.▲

5.2.8 Colorado Butterfly Plant

Rare plant surveys for the Colorado butterfly plant were conducted at Chatfield State Park in 2004 and 2005. No individuals of Colorado butterfly plant were found after intensive surveys during the proper survey window. This species has not been documented historically in the Chatfield Reservoir study area. Therefore, the raising of the pool elevation at Chatfield Reservoir would have no adverse impact on the Colorado butterfly plant.

5.2.9 Ute Ladies' Tresses Orchid

Rare plant surveys for the Ute ladies' tresses orchid were conducted at Chatfield State Park in 1998, 2004, and 2005. No Ute ladies'-tresses were found after intensive surveys during the correct time of year when other nearby ULTO populations were in bloom. No Ute ladies'-tresses orchids have been documented from the Chatfield Reservoir study area. Therefore, the raising of the pool elevation at Chatfield Reservoir would have no adverse impact on the Ute ladies' tresses orchid.

5.2.10 Preble's Meadow Jumping Mouse

The proposed increase of the target pool level to 5,444 feet msl would result in potential impacts to approximately 454 acres of Preble's mouse habitat. Table 4 presents the estimated acres of Preble's habitat inundated in the South Platte and Plum Creek drainages. Table 5 presents the estimated acres of critical habitat that would be inundated under the proposed increase in pool elevation. Acres are broken into high and low quality riparian habitat and upland areas. Portions of the potentially affected habitat along the South Platte River and Plum Creek are designated as critical habitat.

The Upper South Platte River critical habitat unit extends from Chatfield Reservoir to Deckers, many miles upstream of Chatfield Reservoir, and contains approximately 3,265 acres on 43.8 miles of river and streams [Upper South Platte CHU (SP13) (FR68(120)37276-37332)]. The Upper South Platte CHU is divided into four subunits of critical habitat along the river and its tributaries. USACE property along the South Platte River above Chatfield Reservoir is designated as the

“Chatfield subunit” within the Upper South Platte CHU. The Chatfield subunit contains approximately 297.3 acres of critical habitat. The Proposed Action would inundate approximately 80.0 acres of Preble’s mouse critical habitat within the Chatfield subunit (Table 5); this is approximately 27 percent of the area of the subunit. ▲▲▲

▲▲▲ **Table 4. Acres of Preble’s Mouse Habitat Affected in Each Drainage Under the Proposed Action**

	South Platte River	Plum Creek	Total
	Proposed Action ▲	Proposed Action ▲	Proposed Action
High Value Riparian Habitat (1)	139.0	102.5	241.5
Low Value Riparian Habitat (1)	42.5	35.3	77.8
Upland (1)	95.2	39.3	134.5
Total Acres Affected	276.7	177.1	453.8
Acres of Occupied Range within the Study Area (2)	984.7	779.4	1,764.1 ▲
Percentage of Occupied Range within the Study Area Potentially Impacted	28.1%	22.7%	25.7%

Notes:

- (1) See Figure 3
- (2) See Figure 2

Table 5. Acres of Preble’s Mouse Critical Habitat Affected by the Proposed Action

Habitat Type	South Platte River	Plum Creek	Total ▲
High Value Riparian Habitat (1)	79.1	44.6	123.7
Low Value Riparian Habitat (1)	0.2	17.9	18.1
Upland (1)	0.7	12.7	13.4
Total Acres Affected	80.0	75.2	155.2
Acres in Critical Habitat Unit (2)	3,265	5,518	8,783 ▲
Percent of CHU Acres Affected	2.4%	1.4%	1.8%

Notes:

- (1) See Figure 3
- (2) Upper South Platte CHU for South Platte River and West Plum Creek CHU for Plum Creek.

The West Plum Creek CHU extends upstream from Chatfield Reservoir to include approximately 5,518 acres on 90 miles of streams in the Plum Creek Watershed (75 Fed. Reg. 78430). The Proposed Action would inundate approximately 75.2 acres of critical habitat along 2.8 stream miles of the Plum Creek arm of Chatfield Reservoir in the West Plum Creek CHU (Table 5).

The increased storage under the Proposed Action would affect the Preble’s mouse in two ways, directly as water rises and indirectly through the alteration of existing habitat. Initial and subsequent rise in water to the target pool level could, depending on the season and rate of rise, drown hibernating adults or young in maternal nests, or displace individuals as water rises. Preble’s mice swim well (Schorr 2001) and it seems unlikely that active adults or self-sufficient young would be drowned. It should be noted that under the current operating conditions of Chatfield Reservoir increases in the pool elevation associated with flooding can have similar direct impacts on Preble’s mice. In addition to direct mortality, inundation of Preble’s mouse habitat could cause secondary mortality from displacement, reduced population, and increased vulnerability based on a smaller population. Current population densities within the Chatfield Reservoir study area are unknown at

this time, so it is difficult to determine the number of individuals that may be affected by the Proposed Action. During trapping in 1998, nine Preble’s mice were captured along Plum Creek and four were captured along the South Platte River (it is uncertain whether recaptures were accounted for during this trapping effort).

Preble’s mouse habitat would be affected by direct inundation and by transformation as the new pool levels are established. The inundated acres shown in Tables 4 and 5 assume constant inundation at the target pool elevation, and therefore an estimate of maximum impacts. However, this is not how inundation is likely to occur. As discussed earlier in this section, it is more likely that during a typical year, the water level would be at 5,440 ±2 feet msl. Vegetation below this level would likely be completely lost but a ring of vegetation above this elevation may be transformed. This may result in a loss of woody vegetation or an increase in understory cover as more water becomes available closer to the surface. Additionally, at the new water level, a zone just below the area of habitat transformation may still support vegetation, but due to intermittent inundation, the vegetation would be composed of annual plants including good seed producers and weedy species. This also, depending on reservoir management, may positively or negatively impact the Preble’s mouse.

Upstream or downstream conditions related to this Proposed Action do not to affect the Preble’s mouse. Upstream conditions are thought to remain similar to baseline conditions as discussed previously in this section. Downstream conditions may change slightly, but no Preble’s mouse populations are known to exist downstream of Chatfield Reservoir to the Adams-Weld county line.

Offsite mitigation for impacts to Preble’s mouse critical habitat in the upper South Platte is proposed to occur along Sugar Creek in the Pike National Forest (i.e., Sugar Creek Mitigation Project; see Sections 5.2.6 and 7.0). The proposed mitigation activities along Sugar Creek would provide long-term sustainable gains in the quality and quantity of Preble’s mouse habitat for 4.5 miles of designated critical habitat for Preble’s mouse. Implementation of the Sugar Creek Mitigation Project would have some localized short-term adverse effects to Preble’s mouse and its habitat associated with construction of structures that would minimize sediment input to Sugar Creek and increase shrub riparian habitat. Table 6 lists the mitigation activities that are proposed to occur along Sugar Creek and potential impacts to Preble’s mouse habitat.

Table 6. Impacts of Mitigation Activities to Preble’s Mouse Habitat Along Sugar Creek.

Mitigation Activity	Estimated Adverse Impact to Preble’s Mouse Habitat (in acres)	
	Temporary	Permanent
Replace/install 55 culverts, culvert extensions, and stilling basins	7.35	0.38 ▲
Install five small mammal passage culverts	1.39	0.00 ▲
Construct six drop structures	3.03	0.21
Tree thinning over 2,800 linear feet (to increase riparian shrubs)	5.00	0.00 ▲
Grade and plant disturbed areas to increase riparian vegetation	▲ 3.50	0.00 ▲
Total	20.27	0.59

The majority of the estimated adverse impacts to Preble's mouse habitat associated with the Sugar Creek mitigation activities would be temporary, but all of the activities would result in improvements to the quantity and/or quality of Preble's designated critical habitat along Sugar Creek. Although short-term adverse effects to Preble's critical habitat would occur, overall there would be a net long-term benefit to the critical habitat. The rationale for this conclusion is as follows:

- Willow cuttings would be taken from live willows for the purpose of willow staking at riparian revegetation sites within the project area. Cutting activities would occur only during the Preble's mouse hibernation period for the Preble's mouse and would occur only by hand. No more than 50 percent of each donor live willow would be harvested and no more than 50 percent of willow plants at the harvest site would be used as donors. Harvest sites would be no larger than 0.5 acres.▲
- Revegetation work using conventional equipment to reshape sediment deposits or install drop structures to stabilize stream channels would adversely impact less than 1 acre of riparian vegetation over the life of the project, with less than 0.5 acres impacted at any given time.

In conclusion, a change in the target pool elevation to 5,444 feet msl would adversely impact the Preble's mouse habitat within the Chatfield Reservoir study area and adversely affect designated critical habitat along the South Platte River and Plum Creek.

5.2.11 Gunnison's Prairie Dog

The Gunnison's prairie dog is not expected to occur in the Chatfield Reservoir study area and thus would not be affected by the Proposed Action.

5.3 Cumulative Effects

Under the ESA, cumulative effects include the effects of State, tribal, local or private actions that are reasonably certain to occur in the action area in the future. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation under the ESA. If other water-related projects have actions that are permitted under Section 404 of the Clean Water Act these actions would be subject to compliance with Section 7 of the ESA. Adverse impacts on these species would be mitigated for and there would be no net adverse cumulative effects to federally-listed species. Projects involving water depletions would be required to mitigate those depletions, so there would be no net adverse cumulative effects on T&E species in the central and lower Platte River Valley. Refer to Section 4.19 of the FR/EIS for an evaluation of cumulative impacts from other Federal projects in the area, as well as past or present non-Federal actions.

This section focuses on Preble's mouse because it is the only federally-listed species that is potentially affected by the Proposed Action, based on the preceding analysis in Section 5. Six State, local, and private projects were identified during development of the FR/EIS (Section 4.19) as potential contributors to cumulative effects. These are summarized in Table 7 and discussed below.

Table 7. Past, Present, and Foreseeable Future Projects Considered As Part of the Cumulative Impacts Analysis

Project	County	Timeframe	Reference
CDOT Projects: 2030 Metro Vision	Adams, Arapahoe, Boulder, Broomfield, Denver, Douglas, Jefferson	Present/ Reasonably foreseeable future	CDOT http://www.drcog.org/index.cfm?page=RegionalTransportationPlan
CDOT Projects: C470 Corridor Plan	Jefferson	Present/ Reasonably foreseeable future	CDOT http://co.jefferson.co.us/planning/planning_T59_R12.htm
CDOT Projects: South Jefferson County Community Plan	Jefferson	Present/ Reasonably foreseeable future	CDOT - http://co.jefferson.co.us/planning/planning_T59_R24.htm
Gravel Pits	Multiple	Present/ Reasonably foreseeable future	Multiple Water Providers
Residential Development Projects	Douglas, Jefferson	Present/ Reasonably foreseeable future	Multiple Developers - http://www.douglas.co.us/community/planning/Zoning.html and http://www.jeffco.us/planning/
Plum Creek Reservoir	Douglas	Reasonably foreseeable future	Town of Castle Rock, Castle Pines Metropolitan District, and Castle Pines North Metropolitan District

CDOT Projects: 2030 Metro Vision. The 2030 Metro Vision Regional Transportation Plan (2030 MVRTP) addresses the challenges and guides the development of a multimodal transportation through 2030. It is an element of the overall Metro Vision 2030 Plan adopted by the Denver Regional Council of Governments (DRCOG). To meet current and future challenges, the 2030 MVRTP includes plans to enhance the relationship between transportation and land use development, provide for maintenance of the existing system, incorporate transportation management actions to increase the existing system’s efficiency, include travel demand management efforts to slow the growth of single-occupant vehicle trips, identify transit and roadway improvements to increase the system’s people-carrying and freight movement capacity, add bicycle and pedestrian facilities, prioritize improvements considering limited resources, integrate plan components to result in a connected and complete system, encourage coordination between neighboring communities and between agencies, and support the Metro Vision urban center, extent of development, environmental quality, and freestanding community elements.

CDOT Projects: C-470 Corridor Plan. A 1999 Jefferson Economic Council (JEC) study revealed that only 4,000 acres of developable commercial and industrial land remained within Jefferson County. The Jefferson County Planning Commission directed JEC and the Planning and Zoning Department to write Land Development Policies to remedy this shortage. Approved policies were incorporated into the county’s Policy and Procedures Manual in 2002 by the Board of County Commissioners. In 2001, the Planning Commission and the Board of County Commissioners directed staff to develop a plan for the C-470 corridor to identify and designate locations for employment-generating land uses. Three prime locations for employment-generating land uses along the C-470 corridor were identified: Bowles, Belleview, and Ken-Caryl. The C-470 Corridor Plan is intended to encourage the development of job opportunities along the C-470 corridor to improve the county’s jobs-to-population imbalance. This plan provides land use recommendations for office development and smaller-scale retail that would support office development. This plan includes the C-470 area adjacent to Chatfield Reservoir.

CDOT Projects: South Jefferson County Community Plan. The South Jefferson County Community Plan is a set of policy recommendations developed for the southeastern portion of Jefferson County. Its purpose is to serve as a guide for land use and service decisions now and in the future. Included in the plan are guidelines for land use activities, including activity centers, arterial intersections, open spaces, trails, parks, utilities and services, and redevelopment to encourage the reuse of existing facilities. In addition, subareas are identified within the plan as areas west of the Hogback and in the rural plains, and guidelines are laid out specific to these areas to maintain their unique character. This plan includes the area around Chatfield Reservoir.

Gravel Pits. Approximately 41 gravel pits located north of Denver have been built or are planned to be converted into reservoirs by various Water Providers in the Denver Metro area. About half of these gravel pits have been built or are under construction, and the remaining half are planned to be built in the future. The gravel pits are or would be located along the South Platte River from Denver to the Adams-Weld County line (i.e., Brighton) and possibly even farther downstream. Based on the available information, the largest gravel pit (Lupton Lake) would hold approximately 11,000 acre-feet of water, and the smallest gravel pit (Tanabe) would hold approximately 700 acre-feet of water. These gravel pits would have pipeline facilities; however, information about these pipelines was not available at the time of the study. Additional details on these reservoirs are located in Section 4.18 of the FR/EIS.

Residential Development Projects in Jefferson and Douglas Counties. Residential development is occurring around Chatfield, mostly to the south of the reservoir. This development is removing wildlife habitat by building housing communities in the area. Currently, the open spaces of undeveloped land to the south of the park are ad-hoc wildlife habitats.

The U.S. Census Bureau (2006) data indicate that there are a total of 226,195 housing units in Jefferson County and a total of 95,511 housing units in Douglas County. In 2005, a total of 3,671 housing units were built in Jefferson County, and another 6,902 housing units were built in Douglas County. These data are not site specific, so the locations where the houses were built within each of the counties could not be determined. However, there are some undeveloped properties located near Chatfield that could be developed in the future, as discussed below.

Jefferson County. The Jefferson County zoning map identifies a few pockets of open space around Chatfield State Park. The portion of Jefferson County south of C-470 and east of Wadsworth is zoned Agriculture-One Zone District (A-1). The A-1 district is “intended to provide for limited farming, ranching and agriculturally related uses while protecting the surrounding land from any harmful effects. A revision in March 1972 increased the minimum land area for this district to 5 acres. Contained in this section are the allowed land uses, building and lot standards (including minimum setbacks) and other general requirements specified for this zone district” (Zoning Resolution). The Lockheed Martin property is zoned Industrial-One Zone District (I-1). The I-1 district is “intended to provide areas for medium industrial development. Contained in this section are the allowed land uses, building and lot standards (including minimum setbacks) and other general requirements specified for this zone district” (Zoning Resolution). South and west of the Lockheed Martin property, it is zoned Agriculture-Two Zone District (A-2) but there are several small pockets of residential development scattered throughout that area (it appears those subdivision pockets were rezoned). The A-2 district is intended to provide for general farming, ranching, intensive agricultural

uses and agriculturally related uses while protecting the surrounding land from any harmful effects. A revision in March 1972 increased the minimum land area for this district to 10 acres. Contained in this section are the allowed land uses, building and lot standards (including minimum setbacks) and other general requirements specified for this zone district” (Zoning Resolution). The Chatfield Green (owned by the City of Littleton) is the subdivision just north of Lockheed Martin on the west side of Wadsworth. It is surrounded by open space. The city of Littleton has numerous subdivisions on the north side of C-470.

Douglas County. Everything south of Chatfield State Park is currently zoned, planned, or zoned A-1. North of Titan Road and south of Chatfield State Park, there are several subdivisions. Also, east of Santa Fe Drive, there are multiple subdivisions and industrial areas. There are some planned (urban and non-urban) developments in these areas too. Industrial developments are abundant along Santa Fe Drive. South of Titan Road and west of Santa Fe Drive, development against the mountain range is planned. The east side of Santa Fe Drive is being developed heavily at this time, down to Castle Rock and I-25.

Plum Creek Reservoir. The Town of Castle Rock, Castle Pines Metropolitan District, and Castle Pines North Metropolitan District are considering constructing the “Plum Creek Reservoir” in Douglas County. The proposed location is about 3 miles southeast of Sedalia, CO and is shown in Figure 2-5 of the FR/EIS. The reservoir would have a capacity of 1,200 to 1,700 acre-feet. Studies are being conducted regarding the size and economic feasibility of the reservoir. Castle Pines Metropolitan District and Castle Pines North Metropolitan District jointly have applied for Water Court Decrees allowing storage in Plum Creek Reservoir of existing and applied-for conditional East Plum Creek water rights. The Districts also seek rights of exchange from Chatfield Reservoir to Plum Creek Reservoir and would store recaptured reusable water rights in the Plum Creek Reservoir if the Chatfield Reallocation project were approved. However, the reservoir will be constructed regardless of whether the Chatfield reallocation is approved. Currently, there is not a firm construction schedule, but the parties expect that construction likely will occur within the next five to ten years.

The land development and highway projects described above could include direct and indirect adverse impacts on native vegetation communities and wildlife habitat in locations in the area around Chatfield Reservoir and downstream along the South Platte River to approximately the Adams-Weld County line (i.e., gravel pits). Land development projects must address potential impacts on T&E species and must mitigate for adverse impacts. Activities covered under an incidental take permit would be subject to compliance with Section 10 of the ESA. Furthermore, project activities permitted under Section 404 of the Clean Water Act (impacts on wetlands) also must avoid, minimize, or mitigate wetland impacts and must address federally-listed species under Section 7 of the ESA. Therefore, cumulative impacts on T&E species from land development and the Proposed Action would not adversely affect federally-listed species as impacts would be minimized or mitigated.

No cumulative effects to Preble’s mouse would be expected from land development or other projects downstream of Chatfield Reservoir to approximately the Adams-Weld County line (i.e., Brighton) because this area is not thought to contain Preble’s mouse and is excluded through a

block clearance agreement with USFWS (USFWS 2010b). The area covered by the block clearance in the Denver Metro Area is shown in Figure 8.

6.0 Effects Determination

The effects determinations are presented below for each of the federally-listed species evaluated in Section 5.2, and are summarized in Table 8.

6.1 Interior Least Tern

This species has the potential to occur in the Chatfield Reservoir study area during migration as it is attracted to gravelly or sandy shorelines. Increased exposure of shorelines that may potentially occur under this Proposed Action may be a benefit to migrating interior least terns. Therefore, we have determined that the Proposed Action “may affect, but is not likely to adversely affect” the interior least tern within the Chatfield Reservoir study area. We request your concurrence with our finding.

6.2 Whooping Crane

This species has not been seen in Colorado since 2002 (CDOW 2009b) and has never been reported in the Chatfield Reservoir study area. Therefore, we have determined that there would be “no effect” to the whooping crane or its habitat within the Chatfield Reservoir study area from the Proposed Action.

6.3 Canada Lynx

No habitat for the lynx is found in the Chatfield Reservoir study area. Therefore, we have determined that there would be “no effect” to the Canada lynx or its habitat from the Proposed Action.

6.4 Mexican Spotted Owl

No habitat for the Mexican spotted owl is found within the Chatfield Reservoir study area. Upstream portions of the South Platte River on National Forest land (where habitat is found) would not be affected by increased pool elevations at Chatfield. Therefore, we have determined that there would be “no effect” to the Mexican spotted owl or its habitat from the Proposed Action.

Table 8. Summary of Determination of Effect on Federally-Listed Species

Species	Status	Determination of Effect
Mammals		
Canada Lynx	T	No effect
Gunnison's Prairie Dog	C	No effect
Preble's Meadow Jumping Mouse	T	May affect, and is likely to adversely affect May affect, and is likely to adversely affect critical habitat
Birds		
Interior Least Tern	E	May affect, but is not likely to adversely affect
Mexican Spotted Owl	T	No effect
Piping Plover	T	May affect, but is not likely to adversely affect
Whooping Crane	E	No effect
Fish		
Greenback Cutthroat Trout	T	No effect

Table 8. Summary of Determination of Effect on Federally-Listed Species

Insects		
Pawnee Montane Skipper	T	No effect
Plants		
Colorado Butterfly Plant	T	No effect
Ute Ladies'-Tresses Orchid	T	No effect

6.5 Piping Plover

This species has the potential to occur in the Chatfield Reservoir study area during migration as it is attracted to gravelly or sandy shorelines. Increased exposure of shorelines that may potentially occur under this Proposed Action may be a benefit to migrating piping plovers. Therefore, we have determined that the Proposed Action “may affect, but is not likely to adversely affect” the piping plover or its **habitat within the Chatfield Reservoir study area**. We request your concurrence with our finding. ▲

6.6 Pawnee Montane Skipper

Given the elevation restrictions of its habitat, the Pawnee montane skipper does not occur in the Chatfield Reservoir study area. Over the long term, the mitigation activities along Sugar Creek (for Preble’s mouse) would improve habitat for the skipper (see Section 5.2.6). The proposed mitigation activities are consistent with recovery criteria for the skipper as they would not fragment skipper habitat and over the long term would enhance skipper habitat in the Sugar Creek drainage.

Therefore, we have determined that there would be “no effect” to the Pawnee montane skipper or its habitat from the Proposed Action.

6.7 Greenback Cutthroat Trout

No greenback cutthroat trout are found within the Chatfield Reservoir study area. Furthermore, all of the areas identified in the recovery plan for establishing stable populations are in headwater areas of the South Platte and Arkansas River drainages, far upstream from the Chatfield Reservoir study area. Therefore, we have determined that there would be “no effect” to the greenback cutthroat trout or its habitat from the Proposed Action.

6.8 Colorado Butterfly Plant

Intensive surveys for the Colorado butterfly plant by Tetra Tech personnel in 2004 and 2005 did not result in a documented occurrence of this plant. Concurrence on these studies was provided by USFWS (USFWS 2004b). There are no documented historical occurrences of Colorado butterfly plants from the Chatfield Reservoir study area. Therefore, we have determined that there would be “no effect” to the Colorado butterfly plant or its habitat from the Proposed Action.

6.9 Ute Ladies'-Tresses Orchid

Rare plant surveys for the Ute ladies'-tresses orchid were conducted at Chatfield State Park in 1998 (Burns and McDonnell) and 2004, and 2005 (Tetra Tech) and no populations or individuals were documented. USFWS has concurred with these findings. There are no documented historical occurrences of this plant in the Chatfield Reservoir study area. Therefore, we have determined that there would be “no effect” to the Ute ladies'-tresses orchid or its habitat from the Proposed Action.

6.10 Preble's Meadow Jumping Mouse

The proposed increase of the target pool level to 5,444 feet msl would result in the potential inundation of approximately 454 acres of Preble's mouse habitat, including 80 acres of designated critical habitat in the Upper South Platte CHU and approximately 75.2 acres of critical habitat along Plum Creek in the West Plum Creek CHU. Short-term adverse effects to Preble's critical habitat would occur from the mitigation activities at Sugar Creek, but overall there would be a net long-term benefit to the critical habitat (see Section 5.2.10). Therefore, we have determined that the Proposed Action "may affect, and is likely to adversely affect" the Preble's meadow jumping mouse and "adversely affect" its designated critical habitat. We are thus requesting initiation of formal consultation with USFWS regarding our determinations.

6.11 Gunnison's Prairie Dog

It is believed that the Gunnison's prairie dog has been extirpated from Douglas and Jefferson counties. Therefore, we have determined that there would be "no effect" to the Gunnison's prairie dog or its habitat from the Proposed Action. ▲

7.0 Conservation Measures

Under the Proposed Action, impacts to federally protected species by contractors during construction activities at federal projects would be avoided or minimized by specific contract provisions for avoidance and minimization of these impacts. Under the Tree Management Plan (Appendix Z of this FR/EIS), the majority of trees below 5,439 ft msl would be removed prior to inundation. The Plan would be carried out to minimize potential impacts to migratory birds and Preble's mouse. In addition, some of the removed trees would be scattered in Preble's mouse habitat within Chatfield State Park, above 5,444 ft msl, to enhance the habitat for the Preble's mouse. Woody debris has been found to be a component of Preble's mouse high use areas (Trainor et al. 2007). The use of removed trees for this purpose would be reviewed by resource managers at Chatfield to ensure that it is consistent with boater and dam safety.

The U.S. Army Corps of Engineers (Corps) has developed a Compensatory Mitigation Plan (CMP) to address environmental impacts associated with the proposed reallocation of storage at Chatfield Reservoir. This section provides a summary of the main provisions of the CMP pertaining to Preble's mouse (for full details see the CMP, Appendix K of this FR/EIS). The CMP has been developed at a feasibility level and considers the ecological resources that would be adversely affected and presents a plan for compensatory mitigation for the functions and values of resources to be impacted. The FR/EIS identified Preble's mouse habitat, bird habitat, and wetlands as resources of particular concern and warranting specific mitigation strategies for the estimated adverse impacts to those resources. These resources are referred to as the "target environmental resources" in the CMP. The CMP is designed to fully mitigate the adverse impacts to the target environmental resources associated with Alternative 3, should Alternative 3 be approved as proposed in the draft FR/EIS. Implementation of the CMP is intended to offset adverse impacts to Preble's mouse and maintain the functional conservation role of the affected critical habitat units.

The CMP concludes that:

- There are adequate opportunities within the Chatfield Reservoir watershed to mitigate for adverse impacts to the target environmental resources;

- The proposed compensatory mitigation measures would be successfully implemented, and there are mechanisms within the CMP for correcting a mitigation measure if it is not successful; and
- The estimated costs for implementing, managing, and monitoring the proposed mitigation are within the range of feasibility for the Chatfield Water Providers.

The CMP has been developed with substantial input from stakeholders including the U.S. Fish and Wildlife Service (Service), Colorado Division of Wildlife (CDOW), Colorado State Parks, Denver Chapter of the Audubon Society, Sierra Club, South Suburban Parks and Recreation District, and the Chatfield Basin Conservation Network. Representatives from these organizations participated with the Corps and project consultants in a series of five mitigation workgroup meetings between July and December 2008.

The CMP is based on the following conservative assumptions: ▲

- Under the proposed action (Alternative 3) all of the existing target environmental resources would be lost below 5,444 feet msl;
- Under the proposed action (Alternative 3) none of the target environmental resources would reestablish below 5,444 feet msl;
- Only 15 percent of the private land in the off-site target mitigation area would be available for habitat protection or enhancement.

The CMP is ecologically based. The “currency” of the CMP is ecological functional units (EFUs). This ecological functions approach (EFA) was taken because of the substantial geographic overlap in the target environmental resources. The EFUs capture the ecological functions provided by the individual target environmental resources as well as their overlap. To ensure a diversity and balance of mitigation activities, minimum levels of mitigation activities were established for Preble’s mouse, birds, and wetlands that would contribute to meeting the overall goal to replace lost ecological functions and values of Preble’s mouse habitat, bird habitat, and wetlands associated with adverse impacts of reallocation. The terrestrial habitat at Chatfield Reservoir provides shared ecological functions for the target environmental resources. Several existing models that evaluate habitat functions were assessed including Habitat Equivalency Analysis (HEA), Habitat Evaluation Procedures (HEP), and Habitat Suitability Indices (HSI). No existing model is capable of accurately representing the site-specific characteristics of Preble’s mouse and bird resources for the project, therefore, a site-specific approach was developed. The Corps’ National Ecosystem Planning Center of Expertise (ECO-PCX) requested that the modeling associated with Preble’s habitat be evaluated by an independent Preble’s expert. Battelle, a 501(c)(3) nonprofit science and technology organization, was engaged by the Corps to administer the review of the Preble’s modeling. Battelle contracted with Dr. Mark Bakeman of Ensign Technical Services, Inc. to conduct the review. A report was prepared by the Corps to document the model review (USACE 2009) and is included in the CMP as Appendix I. The model has been reviewed and certified by the Corps as part of its Planning Models Improvement Program: Model Certification (USACE 2005b).

To provide an ecologically meaningful assessment of impacts to the overlapping habitats of the target environmental resources, an ecological functioning index (EFI) was developed for each habitat type. The EFI is a unitless measure that rates habitat components for the target environmental resources on a scale of zero to one. The EFIs for the target environmental resource habitat components were multiplied by acres of impacts to determine the number of impacted EFUs for each target environmental resource. For example, if a habitat type has an EFI of 0.5 for Preble's mouse and 12 acres of the habitat is lost, 6 Preble's mouse EFUs would be lost. The total number of EFUs impacted is the sum of EFUs provided in the impact area for each target environmental resource.

The CMP establishes quantifiable objectives and maximizes, to the degree practicable, the amount of mitigation that would occur on Corps lands in the vicinity of Chatfield Reservoir (on-site). The CMP provides requirements for monitoring, reporting, and for adaptive management. The CMP specifies:

- The location of the mitigation activities;
- The activities that would occur; ▲
- When the activities would occur;
- The approximate scope of the activities;
- The estimated range of EFUs to be gained; and
- The criteria for determining success of the mitigation activity.

To ensure that the CMP is successfully implemented, it establishes milestones for implementing mitigation activities and meeting the success criteria defined in the CMP. The mitigation milestones are linked to use of the reallocated storage by the Chatfield Water Providers, thus assuring that the mitigation would be accomplished as a prerequisite to proportionate use of the storage reallocation.

The CMP provides a process to proceed from the feasibility level to the detailed level needed to implement the mitigation activity. The CMP would benefit from refinements and would mature over time. The process for refinement of the CMP and adaptive management measures are specified.

The Proposed Action would inundate approximately 454 acres of Preble's habitat, comprised of approximately 298.6 acres (210 EFUs) of non-critical habitat and approximately 80.0 acres of critical habitat in the Upper South Platte CHU and approximately 75.2 acres of critical habitat on Plum Creek in the West Plum Creek CHU. This maximum impact estimate is conservative because the estimate assumes that all of the target environmental resources below 5,444 ft msl would be lost.

7.1 On-Site Mitigation

The CMP maximizes the amount of mitigation that would occur on-site. Conservation measures for approximately 20 percent of the impacts to the non-critical habitat EFUs would occur on-site, this would require 111 acres of land and would yield an estimated 43 EFUs. Within the West Plum Creek CHU there are four proposed on-site compensatory mitigation areas that overlap with designated critical habitat (these are mitigation areas PC-1, PC-2, PC-4, and PC-9 as described in the CMP). These four areas comprise approximately 5.8 acres. The on-site mitigation activities are discussed in Section 6.1 of the CMP. The CMP provides a process and schedule for moving toward

increased specificity. The EIS and CMP provide sufficient detail to enable reviewers to determine the mitigation which is proposed and provide comments on the proposed mitigation. Mitigation plans have been refined since the draft FR/EIS and draft CMP and will continue to be refined as the EIS process proceeds and as mitigation proceeds from planning to implementation. On behalf of the Corps, ERO Resources, Muller Engineering, Ark Environmental, the water providers, and others have undertaken the following mitigation plan development and refinements subsequent to the draft CMP:

1. The installation of 80 groundwater monitoring wells in potential on-site mitigation areas.
2. Monitoring the elevations of groundwater in the wells since May 2011.
3. Obtained topographic survey for the potential mitigation areas.
4. Soil sampling of the potential mitigation areas and evaluated the soils for permeability and other characteristics.
5. Evaluated potential sources of supportive hydrology in potential mitigation areas using the groundwater monitoring data, topographic survey, and soil test results, 6. Refined the locations and limits of potential mitigation areas (several areas were eliminated from consideration due to lack of suitable hydrology).
7. Developed preliminary grading plans for the remaining potential mitigation areas.
8. Currently working with CDPW to develop an access agreement to perform pump tests on several ponds along Plum Creek and the South Platte River to evaluate their suitability as sources of surface water for mitigation areas.
9. Delineated wetlands in potential mitigation areas along Plum Creek and will do the same along the South Platte River. The delineations will be used to further refine mitigation area grading plans.
10. Evaluating what types of vegetation communities may persist below 5,444 feet msl under various hydrologic scenarios to better understand potential impacts versus the currently assumed worst case of no vegetation below 5,444 feet msl.
11. Working on the habitat field evaluation to finalize the ecological functions model to eventually determine the number of existing EFUs and EFU impacts based on existing site conditions.

These activities will revise the design of the on-site mitigation presented in the draft FR/EIS and draft CMP. It is anticipated that the revised design for on-site mitigation will rely more on surface water hydrology than ground water hydrology as was anticipated in the draft CMP. Additionally, on-site mitigation may include activities to restore habitat, hydrology and channel stability to Plum Creek which has severely down cut through much of Chatfield State Park. The development of on-site mitigation will continue to be coordinated with the Service. Conservation measures for the remaining 167 EFUs of impacts to non-critical habitat would be mitigated off-site. The majority of

the off-site conservation measures would occur on private lands in the Plum Creek watershed within designated critical habitat through the permanent protection, enhancement, and management of riparian habitats and adjoining uplands to benefit the target environmental resources.

7.2 Off-site Mitigation

The remaining mitigation for impacts to designated critical habitat for Preble's will occur off-site within the Upper South Platte critical habitat unit (CHU) that occurs within the Pike National Forest and the West Plum Creek CHU upstream of Chatfield Reservoir. The mitigation activities in the Upper South Platte CHU are based on a review of designated critical habitat of Preble's within the Pike National Forest as discussed below and have been coordinated with the U.S. Forest Service (USFS) and the Service (ERO, pers. comm. 2009b).

7.2.1 Upper South Platte CHU

Opportunities for on-site critical habitat conservation measures are limited, so most of the conservation measures for loss of Preble's mouse critical habitat on the South Platte River arm would occur off-site on the Pike National Forest. However, within the Upper South Platte CHU there are five proposed on-site compensatory mitigation areas that overlap with designated critical habitat (these are mitigation areas SPR-2, SPR-3, SPR-4, SPR-5, and SPR-7 as described in the CMP). These five areas comprise approximately 17.1 acres. Because most of the conservation measures for impacts to critical habitat would occur in the montane environment of the Pike National Forest, and not the plains environment in the vicinity of Chatfield Reservoir in which the ecological functions approach and EFUs were developed, impacts and conservation measures for critical habitat in the Upper South Platte CHU is expressed in acres or stream miles and not in EFUs.

Off-site conservation measures for impacts to Preble's mouse critical habitat in the Upper South Platte CHU are proposed to involve implementation of the Sugar Creek Sediment Mitigation Project (see Section 6.3.2 of the Compensatory Mitigation Plan [Appendix K of this FR/EIS]) and other habitat enhancement measures in the Pike National Forest. Sugar Creek is a tributary of the South Platte River within the Pike National Forest about 18 miles west of Castle Rock, Colorado. The proposed compensatory mitigation for impacts to designated critical habitat for Preble's mouse associated with the Chatfield Reservoir Storage Reallocation Project includes actions to substantially reduce and minimize the pervasive sediment impacts to the riparian and aquatic habitats within about a 4.5-mile reach of Sugar Creek that is designated critical habitat for Preble's mouse (68 Fed. Reg. 37301, June 23, 2003). The main source of the sediment in Sugar Creek and its riparian areas and wetlands is from Highway 67 and the highly erodible decomposed granite that composes the cut slopes along the road. Past fires higher in the watershed contribute some sediment, but it is a minor contribution relative to the adjoining road, slope and soils. The mitigation project would benefit this reach of Preble's mouse critical habitat by returning Sugar Creek to a functioning aquatic and riparian ecosystem. In addition to Preble's mouse, this reach of Sugar Creek is known to provide habitat for the federally listed Pawnee montane skipper. The potential effects of the Sugar Creek Sediment Mitigation Project on the skipper and Preble's mouse are addressed in Sections 5.2.6 and 5.2.10, respectively, of this BA. Suitable habitat is not present in the Sugar Creek Sediment Mitigation Project area for any other federally listed species, including the Mexican spotted owl, and thus these species would not be affected by the Sugar Creek project, as indicated in the Forest Service's BA for the pilot project (USFS 2012).

Although there are more than 3,000 acres of critical habitat within the PNF, feasible opportunities for mitigation on PNF lands is very limited due to high quality existing habitat, steep topography, and poor access (for additional details see the review of PNF critical habitat in Appendix H of the CMP). Additionally, for the PNF drainages most of the areas of actual Preble's mouse habitat (riparian areas and areas of adjoining upland shrubs) comprise a minor portion of the designated critical habitat, because most of the designated critical habitat is Ponderosa pine-Douglas-fir forest. Much of the forest within the designated critical habitat occurs on dry slopes of decomposed granite. Therefore, there are limited opportunities for forest management activities to improve Preble's mouse habitat.

It appears that Sugar Creek provides the most feasible opportunities for mitigation for impacts to designated critical habitat for Preble's mouse. The proposed mitigation within the critical habitat reach of Sugar Creek would be in addition to any management activities by the U.S. Forest Service. The U.S. Forest Service does not have the funding at this time, or the foreseeable future, to implement the Sugar Creek Sediment Mitigation Project. The Pike National Forest is currently addressing a variety of issues associated with catastrophic wildfires from the past decade. While the Sugar Creek Sediment Mitigation Project would benefit national forest lands, water resources and habitat along Sugar Creek, addressing the larger scale issues associated with the catastrophic wildfires is a higher priority for the Pike National Forest and it is directing its limited resources toward these issues.

7.2.2 Plum Creek CHU

Off-site mitigation for Preble's focuses on the long-term protection, enhancement, and management of Preble's habitat in the Plum Creek watershed upstream of Chatfield State Park. The lands targeted for off-site mitigation are identified in the CMP (Appendix K of the Draft feasibility report and Environmental Impact Statement (FR/EIS)). Subsequent to release of the Draft FR/EIS and Draft Biological Assessment (BA), the Corps and Service held discussions regarding crediting of off-site mitigation measures. In addition to providing additional detail to the CMP regarding mitigation, monitoring, adaptive management, and reporting, sections of the CMP were also revised as to how weighting factors are applied to EFU calculations for the long-term protection, enhancement, and management of Preble's habitat. While the EFUs are calculated solely on the basis of target habitat within a particular area, weighting factors form the basis of benefit that comes from the ecological effects of the landscape context in which the off-site mitigation habitats are situated. The three weighting factors of proximity, buffers and connectivity directly increase the value of EFUs and are incorporated into the off-site target habitat EFU calculations. As described below, these weighting factors will be applied to the baseline EFUs for protecting a property and to EFUs for enhancing a protected property. When applied to both baseline protection and enhancement of a protected property the products of the revised weightings are summed to arrive at the total weighted mitigation EFUs. Crediting for protection, habitat enhancement and weightings can be adjusted on a site-specific basis by the Technical Advisory Committee based on site-specific information and circumstances.

7.3 Permanent Protection of Target Habitat

The off-site mitigation for impacts to Preble's habitat focuses on the West Plum Creek and Plum Creek watersheds upstream of Chatfield State Park (Figure 18 of CMP). The permanent protection of private property not already protected in the watershed and managed to benefit Preble's will

receive a credit of 0.15 times the existing EFUs at the time of protection (baseline EFUs). Mitigation areas will be permanently protected by conservation easements or other protective instruments put in place on property purchased from willing property owners or through conservation easement agreements with willing property owners. To ensure that mitigation credits are associated with suitable Preble's habitat, only portions of private parcels identified as target habitat would contribute to accrual of mitigation credits. Target habitat typically includes well-developed riparian habitat and some amount of adjacent upland areas including the Riparian Conservation Zone (RCZ) mapped as part of the Douglas County Habitat Conservation Plan (DCHCP) (Douglas County et al. 2006) and designated critical habitat for Preble's (75 Fed. Reg. 78430 (December 15, 2010)). The CMP specifies the documentation required to demonstrate that a property has been permanently protected (Section 7 of CMP) and the contents of management plans required for each protected property (Section 7.1.3 of CMP).

7.4 Habitat Enhancement

Mitigation credit will accrue from increases in the baseline EFUs of protected properties resulting from habitat enhancement activities. Site-specific opportunities for habitat enhancement will be identified as part of the development of property specific management plans. The CMP presents how the net gains in EFUs will be calculated and the success criteria for habitat enhancements (Section 6.2.1.3 of CMP).

7.5 Buffers

Vegetation in buffer areas improves the quality of water as it moves across a buffer by trapping and removing various pollutants from both overland and shallow subsurface flow through the buffer. Wildlife habitat can be improved when a buffer provides distance and a separation between human disturbance and riparian habitat. An extensive literature review and analysis conducted by the Environmental Law Institute (ELI 2003) found that a 300-foot buffer was the most consistent and scientifically supported buffer width reported in the literature. Based on this information, an incremental buffer up to 300 feet from the edge of target habitat is an area that provides added value to the EFUs contained within that habitat. Buffers are areas adjoining Preble's habitat that are permanently protected and managed similar to the permanent protection of target habitat. This added value is accounted for by applying a weighting factor to the baseline and enhancement EFUs. The values of increasing buffers widths are as follow:

- Minimum buffer width of 100 feet = EFUs multiplied by 1.3;
- Average buffer width 200+ feet with no portion of the buffer < 100 feet = EFUs multiplied by 1.5; and
- Average buffer width 300+ feet with no portion of the buffer < 150 feet = EFUs multiplied by 1.6.

Targeted properties will have riparian habitats and the potential occurs for one side of the property to be buffered while the other side of the property is not. The goal is to have the protected property fully buffered. Reduced credit will be received for partially buffered properties. For partially buffered areas, the EFUs bordering the buffered area will receive 25 percent of the buffer credit applied to the EFUs between the buffer and the stream. If a portion of the protected property had

a buffer prior to protection and the remainder of the property is buffered as part of protection, then crediting will be received for the appropriate buffer width applied to the EFUs between the buffer and the creek.

7.6 Connectivity

Off-site mitigation targets riparian areas that tend to be linear in shape and, therefore, are more susceptible to being fragmented than other types of habitat. Habitat fragmentation has a negative impact on wildlife, including Preble's populations, either through the creation of two or more small, isolated populations or the reduction of viability in larger populations. Conservation biologists researching species viability and the design and configuration of conservation reserves have found that connectivity between reserves increases dispersal, allows genetic interchange, provides avenues for nearby meta-populations to recolonize reserves, and improves overall population viability (Beier and Noss 1998; Beier and Loe 1992; Sondgerath and Schroder 2002). Based on these conservation principles, the weighting value of increasing connectivity in the West Plum and Plum Creek watershed upstream of Chatfield Reservoir will receive a weighting of 1.25 times the baseline EFUs and enhancement EFUs of the protected property. Crediting for increasing the connectivity will be received when the protected property adds to the connection of an existing protected property. The crediting for connectivity can occur at the time of protection or could occur in the future as the protection of other adjoining properties builds a series of connected properties.

7.7 Proximity

The type and structure of bird habitat impacted by the Chatfield Reservoir reallocation is limited by both space and structure to areas in close proximity to Chatfield Reservoir. Much of the bird habitat impacted by reallocation consists of a multistory, multistructure habitat of mature cottonwood, diverse shrub community, and a herbaceous understory. Because mitigating Preble's and wetland habitats in close proximity to impacts is not as ecologically beneficial as for bird habitat, a weighting factor for proximity will only be applied to bird habitat EFUs at off-site mitigation sites. The weighting factor for bird habitat is a three-tiered weighting based on the proximity of the three zones below to Chatfield State Park:

- Zone 1 - Chatfield State Park boundary to upstream to Sedalia, has multistoried cottonwoods and this zone generally provides the functions needed to sustain a cottonwood forest. Crediting is 1.25 X baseline bird habitat EFUs.
- Zone 2 - Sedalia to US 86 (Wolfensberger Road). Crediting is 1.0 X baseline bird habitat EFUs.
- Zone 3 - All areas farther away from Chatfield State Park than Zone 2. Crediting is 0.75 X baseline bird habitat EFUs.

Responsibility: The Corps, the Colorado Department of Natural Resources (CDNR), and the water users (Chatfield Water Providers) will each have complementary responsibilities for ensuring the accomplishment of the reallocation, and of the Comprehensive Management Plan and the Recreation Modification Plan (the Plans)..

The Department of the Army and the CDNR will enter into a Water Storage-Project Partnership Agreement (WS-PPA) after execution of the Record of Decision, setting out their respective obligations for reallocating the designated water supply storage, and for accomplishing the two Plans. The CDNR will then execute sub-agreements, identical in their terms and conditions, with each of the Chatfield Water Providers. The sub-agreements will set out the responsibilities of the Chatfield Water Providers to the CDNR for funding the reallocation of the water supply storage under the WS-PPA, and for undertaking the CDNR's obligations to the Government under the WS-PPA for implementing the Plans. The sub-agreements, however, will not affect the ultimate duty of the CDNR and the Government to fulfill their reciprocal obligations under the WS-PPA, unless the WS-PPA is suitably modified by mutual consent of the Corps and the CDNR.

After execution of the WS-PPA, the Chatfield Water Providers will place the funds then judged necessary to satisfy all of the non-Federal obligations under the WS-PPA into an escrow account. The Chatfield Water Providers will also create a new non-profit corporation called the Chatfield Reservoir Mitigation Company as a vehicle for facilitating the coordinated management of the process for implementing the Plans.

In accordance with the terms of the WS-PPA, general oversight of the design, construction and implementation of the Chatfield Reallocation Project will reside in the Project Coordination Team, which will consist of representation from the Corps and the CDNR. The Project Coordination Team will work closely, and consult frequently, with the Chatfield Water Providers. The Project Coordination Team, in turn, may make recommendations to the Omaha District Commander. The Corps has the final authority on acceptance or rejection of the Team's recommendations.

Monitoring and Adaptive Management. Monitoring will be used to track the progress of habitat enhancement activities toward success criteria and to track impact and mitigation EFUs and compliance with mitigation commitments over the life of the project. The goals of monitoring are to 1) document that habitat enhancement activities meet success criteria, 2) document that compensatory mitigation activities are properly and fully implemented, 3) track EFU impacts (debits) and mitigation (credits) over time to document that EFU losses are offset by mitigation, 4) ensure the defined compensatory mitigation objectives are met, and 5) provide information needed for adaptive management. Mitigation will require two types of monitoring: 1) short- to mid-term monitoring which focuses on mitigation implementation, meeting specified success criteria, tracking EFUs and providing information for adaptive management, 2) long-term monitoring to ensure that once mitigation has been fully implemented and success criteria are met that mitigation areas continue to function to benefit the target environmental resources.

7.8 Short- to Mid-term Monitoring

Monitoring of site-specific habitat enhancement activities will document progress toward the specific success criteria established for on-site and off-site habitat enhancement areas. This monitoring will occur annually at each site for at least 5 years after completion of the enhancement activities. Habitat enhancement in these mitigation areas will be considered successful when the criteria have been met for at least 3 consecutive years without intervening remedial activities. If success criteria at a particular site are met prior to year 5 of monitoring, the Chatfield Water Providers may request concurrence from the Corps that annual monitoring end since the success

criteria have been met and the site is self-sustaining. The following monitoring actions would be common to all mitigation activities:

- Documentation that the mitigation activity has been fully implemented (e.g., as-built report, recordation of a conservation easement for protected properties, or report on habitat enhancement activities);
- Documentation of progress in meeting the success criteria;
- Recommended corrective actions;
- Management or corrective actions taken since last monitoring; and
- Number of EFUs gained to date.

The Chatfield Water Providers would provide annual monitoring reports to the Project Coordination Team and Technical Advisory Committee. The Technical Advisory Committee would be comprised of representatives from the following entities: U.S. Army Corps of Engineers, Environmental Protection Agency, Colorado Water Conservation Board and/or CDNR, U.S. Fish and Wildlife Service, Colorado Parks and Wildlife, Audubon Society of Greater Denver and/or other environmental organizations, Chatfield Water Providers, Douglas County Land Trust or other land conservation organization, Denver Water, and other “in-stream” interests. Short-term monitoring would be concluded when all of the core mitigation objectives are met. A separate report will be submitted to the Service addressing mitigation for impacts to Preble’s and its habitat and compliance with the terms and conditions specified in the Biological Opinion.

Progress toward full implementation of compensatory mitigation will be monitored annually until all mitigation activities have been fully implemented and habitat enhancement success criteria have been met. This is a system-wide level of monitoring focusing on tracking the progress of on-site and off-site critical and non-critical habitat enhancement activities toward success criteria, status of permanent protection of off-site target habitat, and acres of cottonwood regeneration. Once all initial mitigation activities have been completed and success criteria have been met, the short-term monitoring would transition to the mid-term monitoring of any remedial activities undertaken as part of adaptive management responses to any identified mitigation deficiencies. This monitoring will be used in the adaptive management process (Section 7.5 of CMP) to determine if adjustments to the CMP are needed to meet the core CMP objectives. Any changes in the CMP, including new mitigation activities, would be monitored annually until the core objectives are met.

7.9 Long-term Monitoring

Long-term monitoring of protected properties will occur over the life of the project to ensure the properties are managed as specified in the required management plans. The frequency of the long-term monitoring will be specified in the management plan for each property. Long-term monitoring will determine if corrective actions need to occur to maintain the benefits to the target environmental resources for which the property was protected and managed..

An Adaptive Management Plan (Appendix GG of the FR/EIS) has been developed for the Project and adaptive management would be used to address anticipated and unanticipated issues and events

that affect compensatory mitigation activities. Monitoring would determine the degree to which issues and events adversely affect or limit proposed compensatory mitigation activities. All adaptive management measures would be coordinated with the Project Coordination Team and Technical Advisory Committee. The CMP and Adaptive Management Plan present situations which could require adjustments to mitigation and the corrective actions which could be taken to meet the objectives of the CMP (Section 7.5 of CMP and Appendix GG of the FR/EIS).

Schedule. If the reallocation is approved, the Chatfield Water Providers would begin implementing the CMP as soon as practicable following the approval. By implementing the CMP soon after approval, some amount of compensatory mitigation would be in place (e.g., on-site mitigation) prior to the impacts occurring. Mitigation milestones have been established in the CMP that correspond to the phased use of the reallocated storage in Chatfield Reservoir. By year 3 following project approval there would be 100 percent implementation of mitigation for impacts to Preble's critical habitat proposed to occur on-site and in the Upper South Platte CHU.

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Consultation with Cooperating Agencies:

- November 10, 2003: USFWS, USACE, and Tetra Tech meeting
- March 17, 2004: USFWS, Colorado State Parks, CWCB, Colorado Division of Wildlife (CDOW), USACE, and Tetra Tech meeting
- February 10, 2005: USFWS, USACE, Tetra Tech, and Ottertail Environmental meeting
- May 10, 2006: USFWS, USACE, and Tetra Tech meeting to discuss delineation of Preble's Meadow Jumping Mouse Habitat at the Chatfield Lake Project Area, and additional biological issues.
- May 14, 2007: USFWS, Tetra Tech, and OtterTail Environmental meeting to discuss requirements for South Platte Water Related Activities Program (SPWRAP).
- July 30, 2007: USFWS, Tetra Tech, and OtterTail Environmental meeting to discuss Mitigation for Preble's Meadow Jumping Mouse.
- September 12, 2007: USFWS, USACE, and Tetra Tech conference call to discuss Section 7, BA, and BO preparation and coordination
- November 2, 2007: USFWS, USFS, and Ottertail Environmental meeting and field trip to Preble's mouse critical habitat and potential mitigation sites on Upper South Platte.
- November 20, 2007: Chatfield Reservoir Reallocation FR/EIS Approaches to Mitigation and Conservation Measures at USFWS Colorado Field Office
- February 5, 2009: Chatfield Update Meeting
- March 6, 2009: USFWS, USACE, Tetra Tech, and Ottertail Environmental conference call to discuss ESA coordination
- September 30, 2009: USFWS, USFS, USACE, ERO, and Tetra Tech meeting to discuss Preble's Mouse mitigation sites on USFS property on Upper South Platte
- April 10, 2012: USFWS, USACE, ERO, and Tetra Tech meeting to discuss project status and plan for mitigation
- June 14, 2012: USFWS, USACE, and Tetra Tech meeting to discuss USFWS's comments on Draft PRRIP BA.

- October 2, 2012: USFWS, USACE, ERO, and Tetra Tech meeting to discuss USFWS's comments on Draft FR/EIS, including BA and Compensatory Mitigation Plan
- October 19, 2012: USFWS, USACE, ERO, and Tetra Tech conference call to discuss USFWS's comments on revised Draft PRRIP BA.
- February 7, 2013: USFWS, USACE, ERO, and Tetra Tech meeting to discuss project history and status, revisions to the BA and CMP per USFWS's comments, and schedule for submittal and review by USFWS.
- Additional cooperating agency and stakeholder coordination meetings are listed in Appendix A of the Compensatory Mitigation Plan.▲

Experts Consulted:

- Ellen Mayo, United States Fish and Wildlife Service, Grand Junction Office
- Erin Robertson, Senior Staff Biologist, Center for Native Ecosystems
- Nicole Rosmarino, Ph.D., Wildlife Program Director, Wildlife Guardians

FIGURES

Figure 1. Project Area

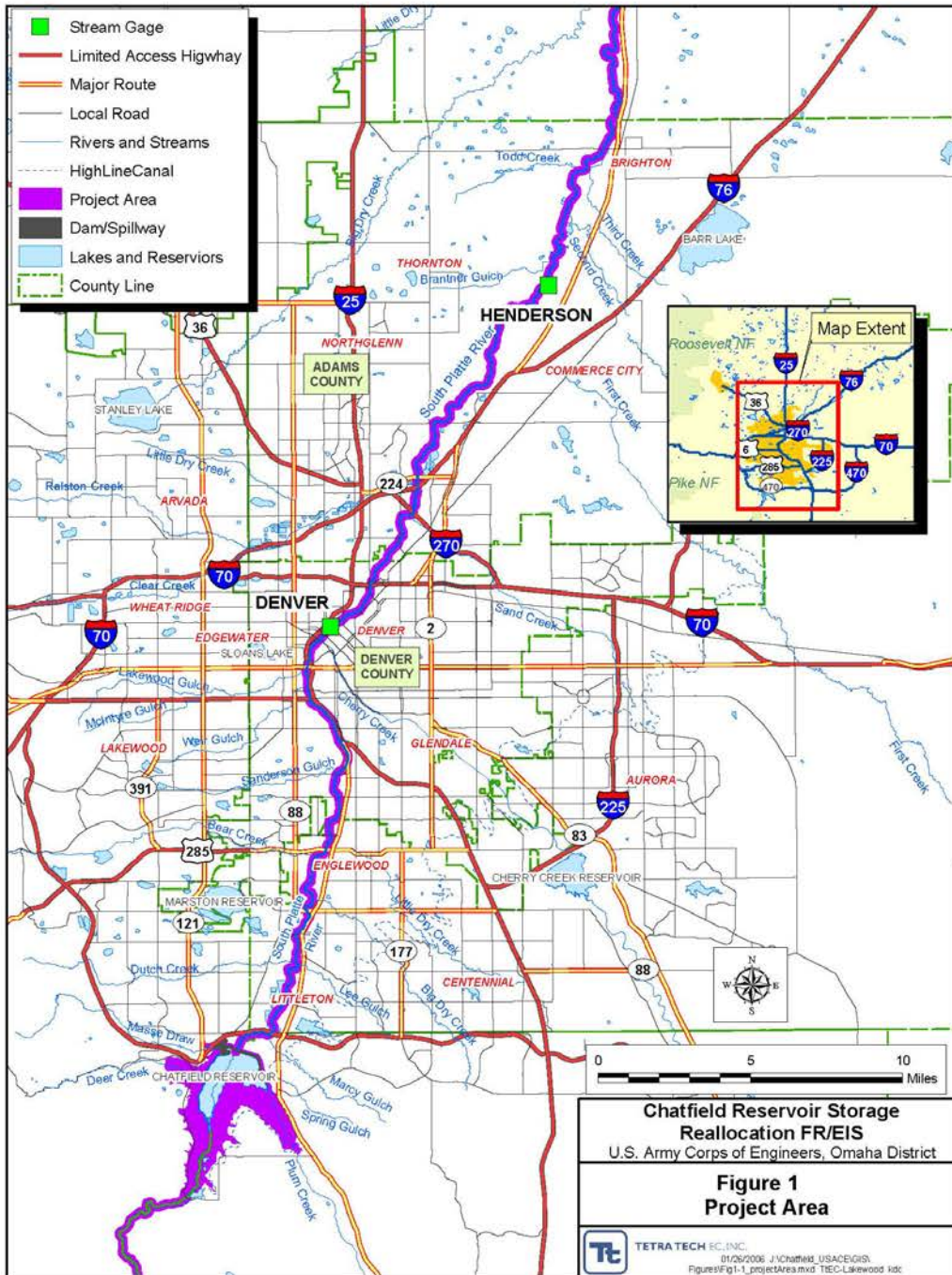


Figure 2. Preble's Mouse Occupied Range and Critical Habitat within the Chatfield Project

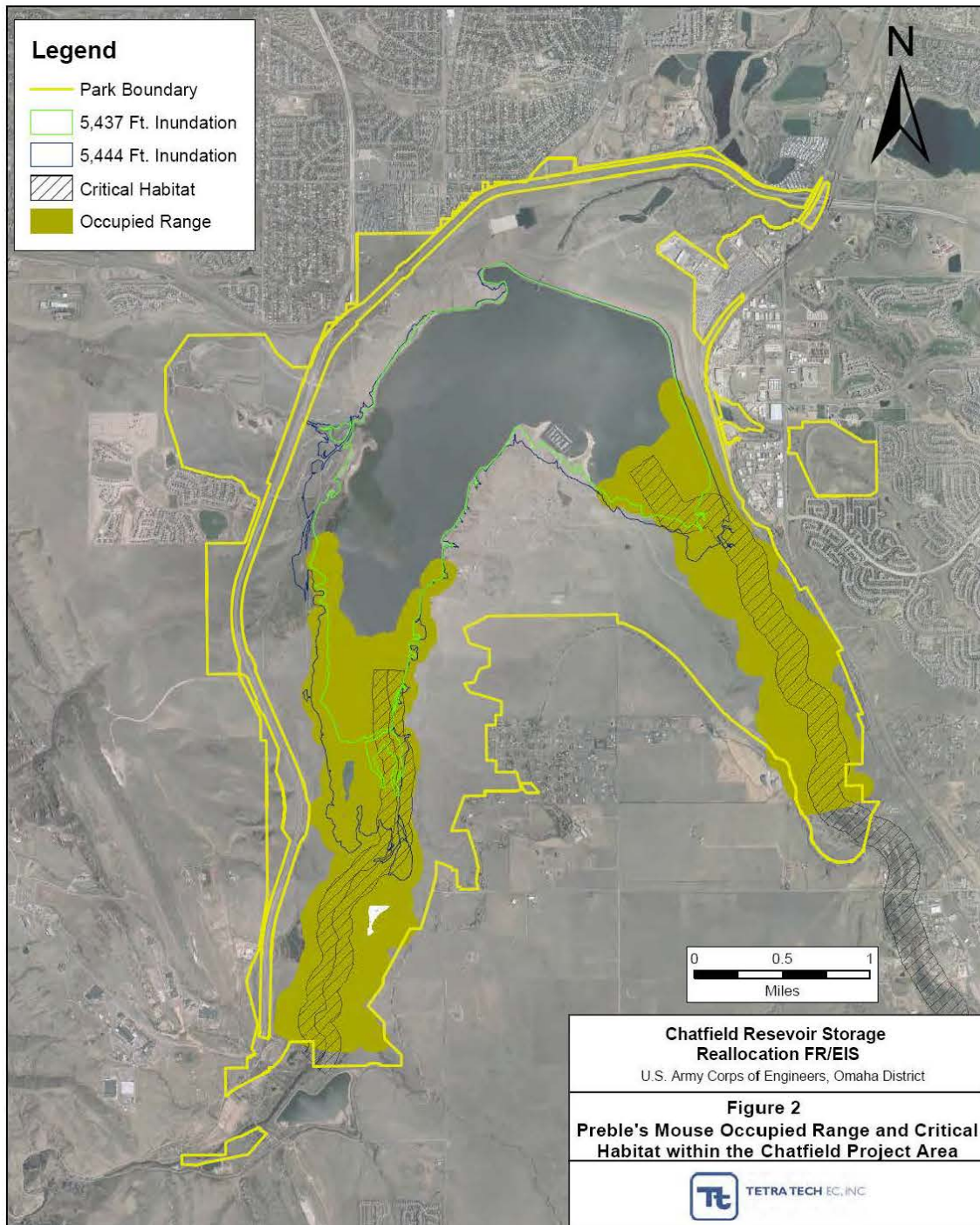


Figure 3. Preble's Mouse Habitat within the Reallocation Study Area

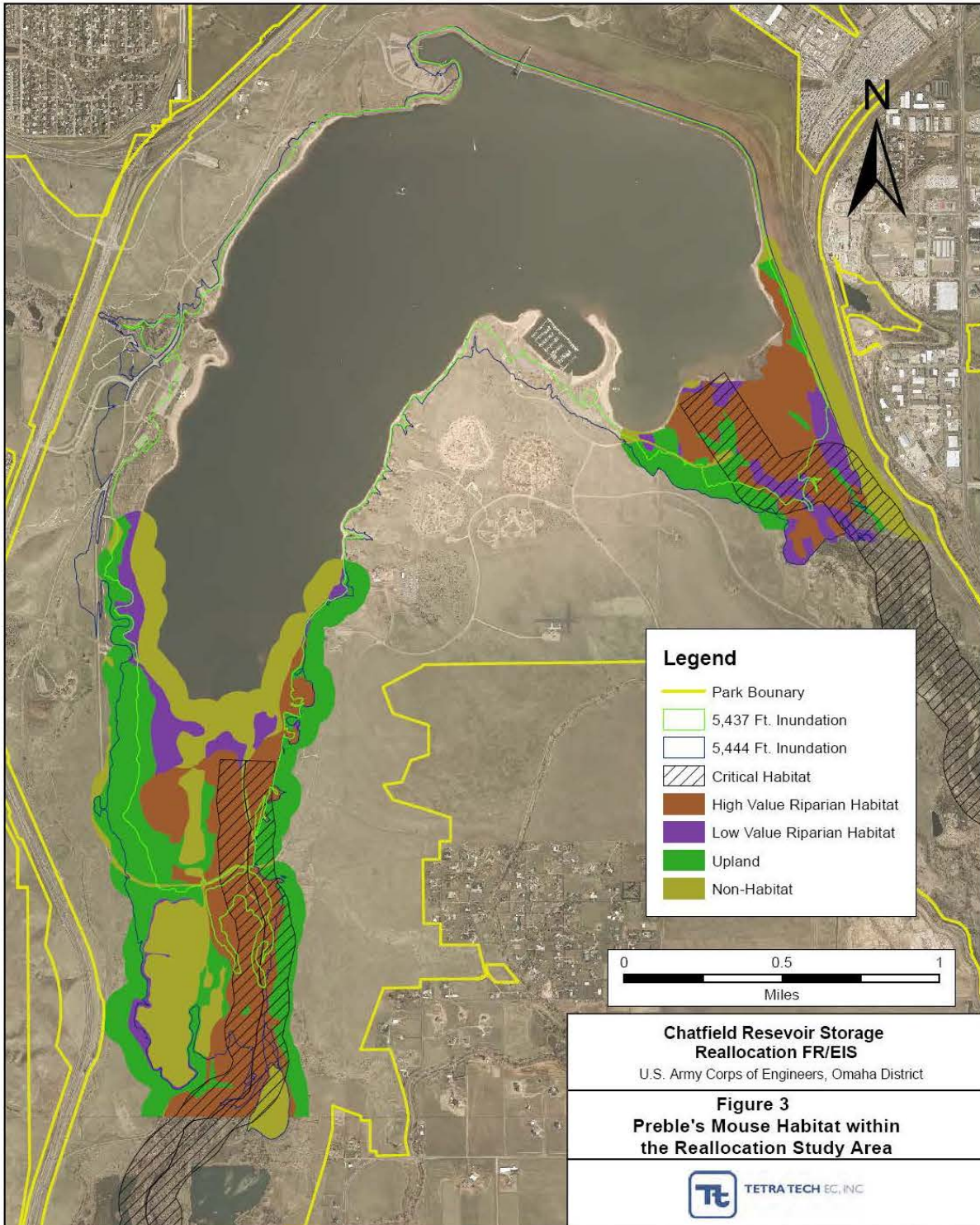


Figure 4. Weekly Mean Pool Elevations for the Entire Year for All Alternatives

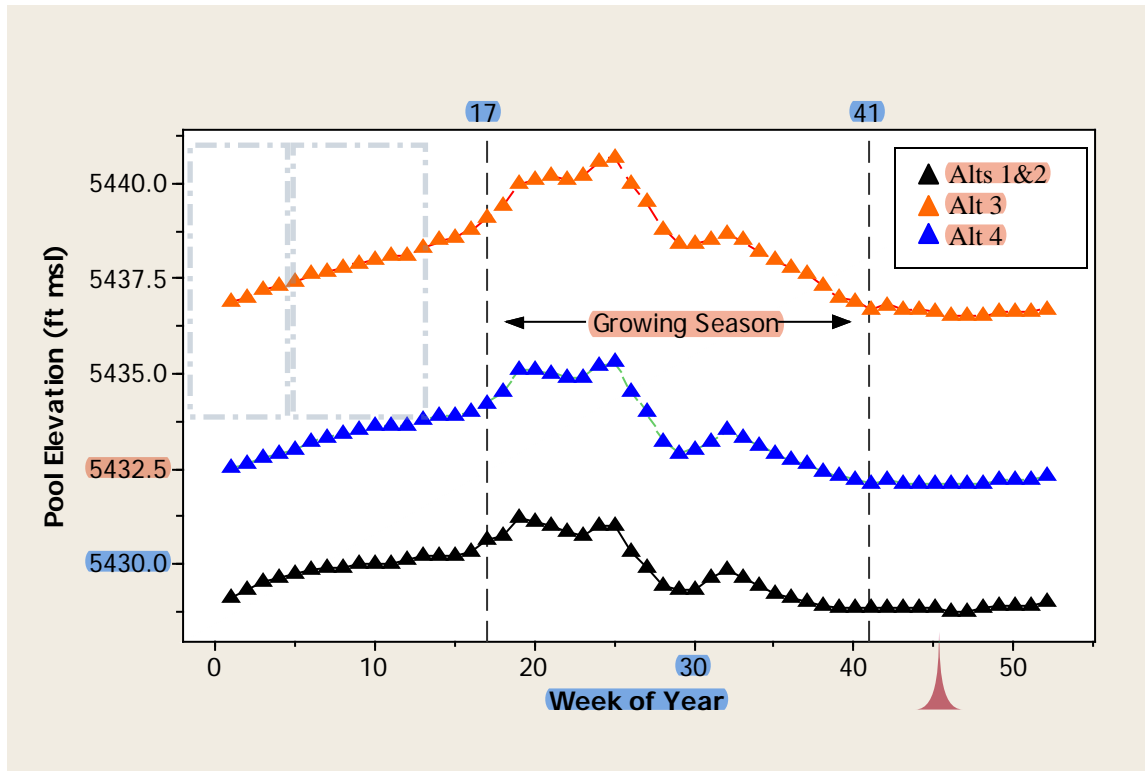


Figure 5. Pool Fluctuation During Growing Season Under Alternative 3

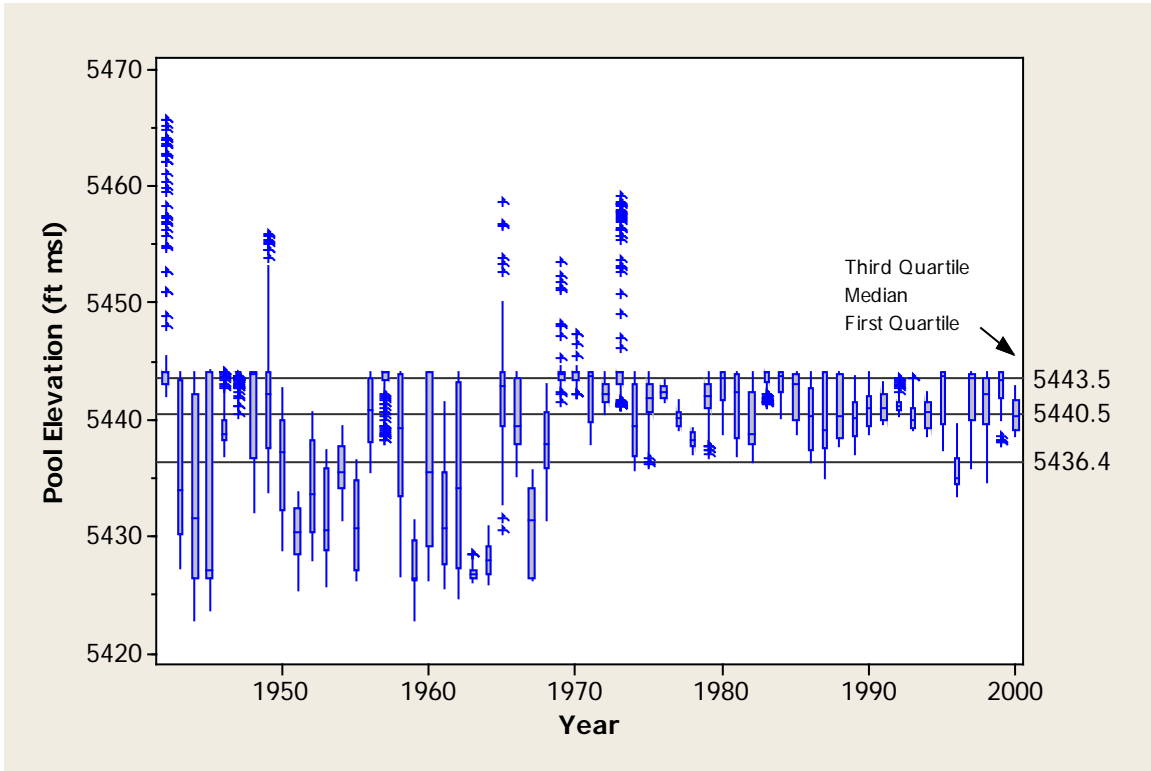


Figure 6. Pool Elevations Over the POR by Alternative

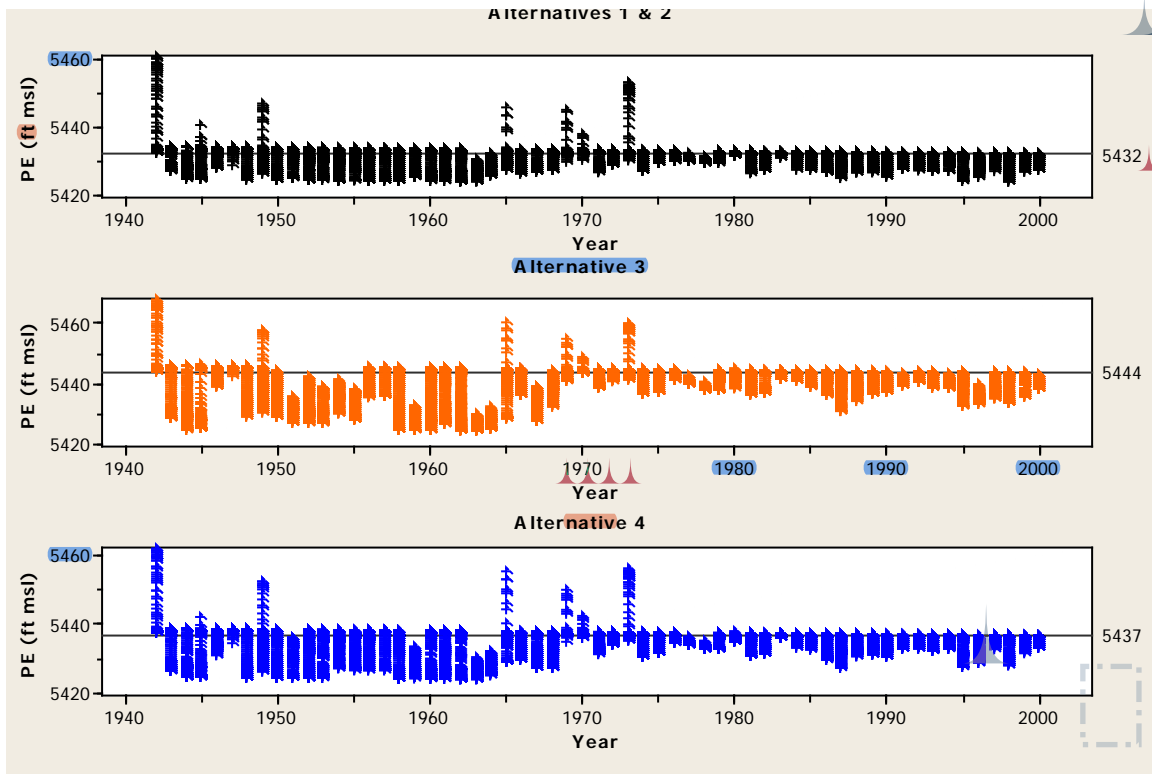


Figure 7. Average Monthly Pool Fluctuations in Chatfield Reservoir

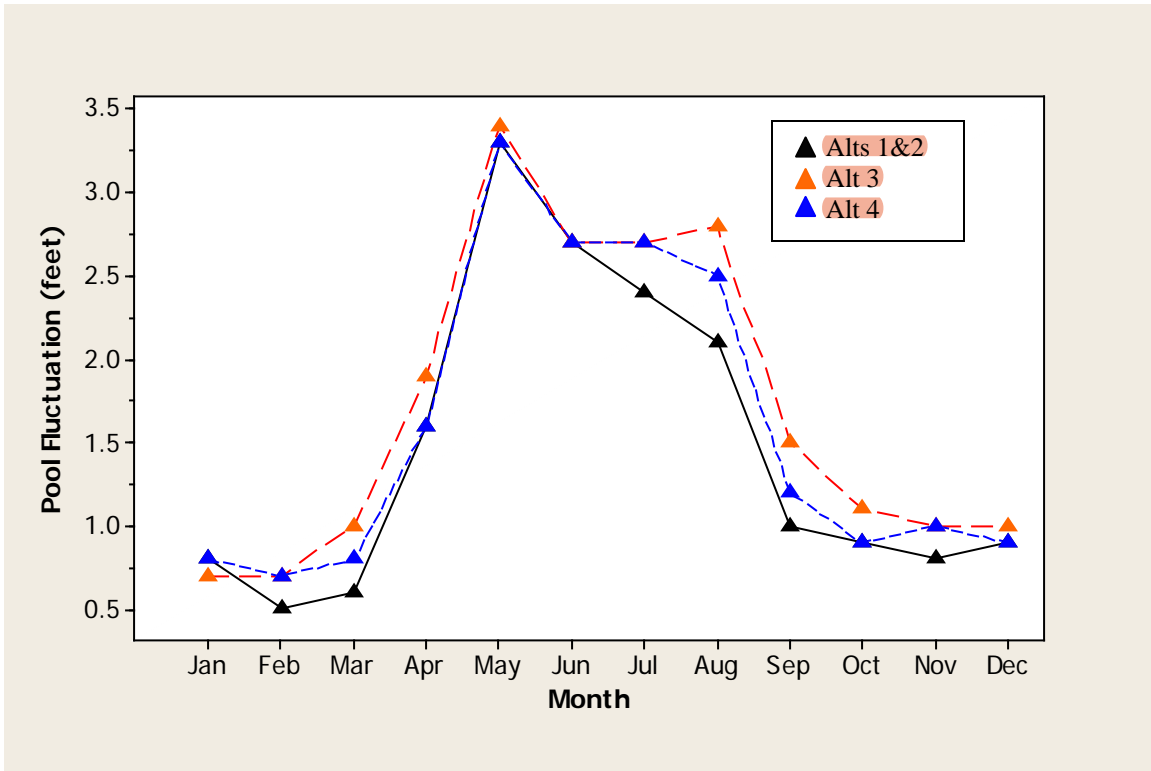
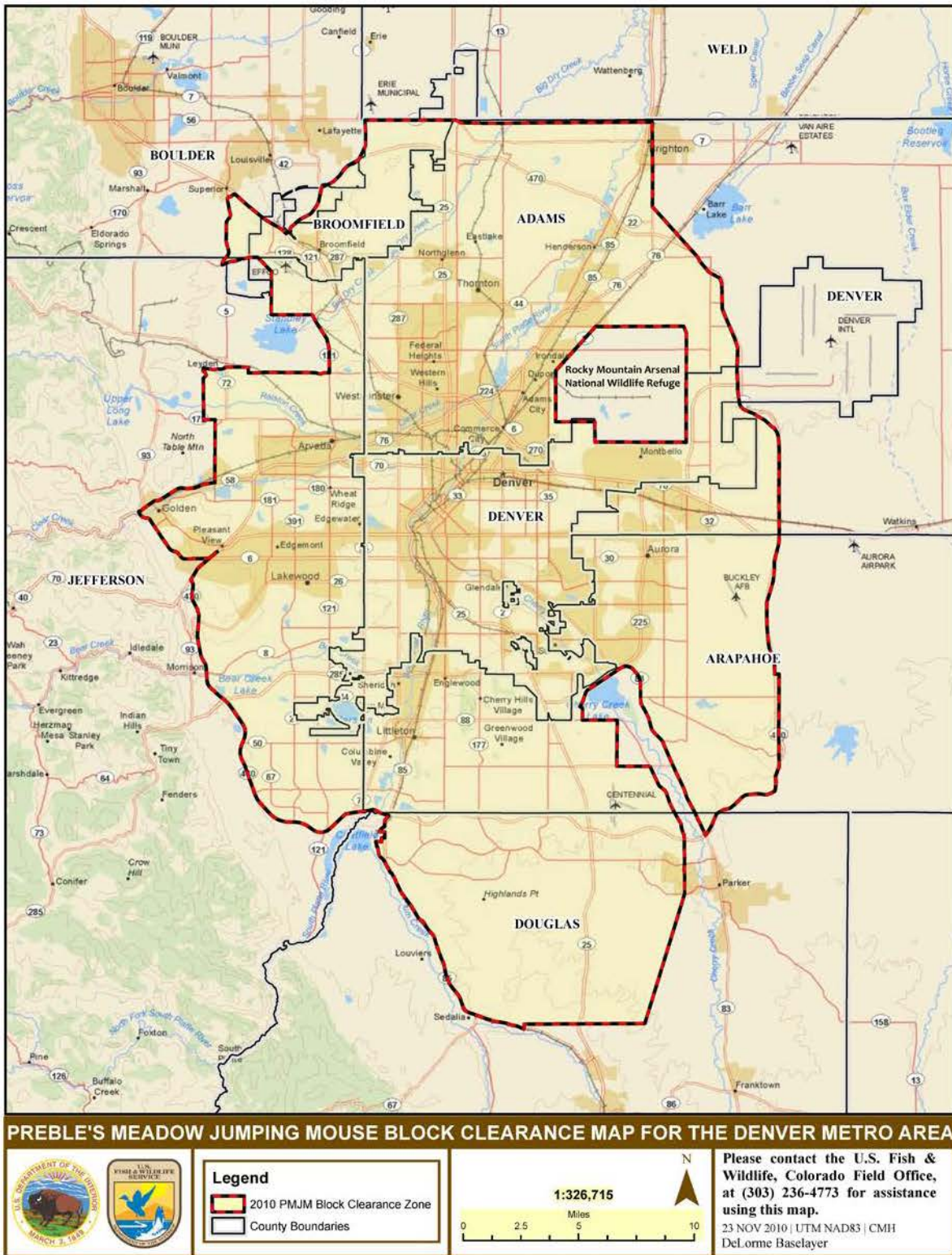


Figure 8. Preble's Meadow Jumping Mouse Block Clearance Map for the Metro Denver Area.



Attachment 1: PRRIP BA

Platte River Recovery Implementation Program
Biological Assessment & Request for Formal Section 7 Consultation

February 14 2013

From: US Army Corps of Engineers
Omaha District
Attn: CENWO-PM-AP
106 South 15th Street
Omaha, NE 68102-1618

To: U.S. Fish & Wildlife Service
Ecological Services
Colorado Field Office
P.O. Box 25486, DFC (MS 65412)
Denver, Colorado 80225-0486
Attn: Sandy Vana-Miller

This letter contains the Biological Assessment addressing potential impacts from operation of the Chatfield Reservoir Storage Reallocation Project (Project) on federally-listed species in Nebraska. Potential impacts from construction and operation of the Project on on-site species and designated critical habitat in Colorado are addressed in a separate Biological Assessment. With this submission, we are requesting initiation of Formal Consultation under Section 7(a) of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et. Seq.)(ESA), concerning the whooping crane (*Grus americana*), interior least tern (*Sternula antillarum*), northern Great Plains population of the piping plover (*Charadrius melodus*), and pallid sturgeon (*Scaphirhynchus albus*) (collectively referred to as the “target species”), and designated critical habitat of the whooping crane. We further request initiation of Formal Consultation for the western prairie fringed orchid (*Platanthera praeclara*). We have determined that the Project is not likely to adversely affect the American burying beetle (*Nicrophorus americanus*) and will have no effect on the Eskimo curlew (*Numenius borealis*).

Project Background

Project: The Chatfield Reservoir, which stores and distributes water to the Front Range of Colorado, is under consideration for reallocating water storage space and distribution. A combined Feasibility Report (FR) and Environmental Impact Statement (EIS) were prepared to evaluate the potential for reallocation of reservoir storage space from flood control use to conservation purposes, including storage for up to 20,600 acre-feet (AF) for municipal and industrial (M&I) water supply and agriculture. The Proposed Action (Alternative 3 in the FR/EIS) would allow for a maximum reallocation of 20,600 acre-feet of storage, representing a maximum increase in the elevation of the permanent pool of 12 feet, from the current 5,432 feet above mean sea level (msl) to 5,444 feet msl. The purpose of and need for the Proposed Action is to increase availability of water, sustainable over the 50-year period of analysis, in the greater Denver, Colorado Metropolitan Area so that a larger proportion of existing and future

(increasing) water needs can be met. The reallocated storage space in Chatfield Reservoir would be filled using existing South Platte River water rights or new water rights, including wastewater return flows and other decreed water rights, belonging to a consortium of water providers. The primary objective of the reallocation is to help enable water providers to supply water to local users, mainly for municipal and industrial (M&I), and agricultural needs, in response to rapidly increasing demand. Chatfield Reservoir is well placed to help meet this objective, because the reservoir provides a relatively immediate opportunity to increase water supply storage without the development of significant amounts of new infrastructure. It lies at the confluence of the South Platte River (efficient capture of runoff) and Plum Creek, and it provides an opportunity to gain additional use of an existing federal resource.

Chatfield Dam and Reservoir are owned by the U.S. Army Corps of Engineers (Corps). The reservoir is managed by the Corps, in conjunction with Cherry Creek and Bear Creek reservoirs (i.e., Tri-Lakes), to protect the Denver Metro area from catastrophic floods. Construction of Chatfield Dam began in 1967 and dam closure was made in August 1973. Chatfield Dam is a rolled earthfill dam with a height of 147 feet and a length of 13,136 feet; the top elevation is 5,527 feet msl. The width at the top of the dam is 30 feet. The dam includes an ungated concrete spillway 500 feet wide located in the left abutment, and a gated concrete outlet works located in the right abutment. The original authorized purposes of the Chatfield Dam and Lake Project were flood control and silt control. These purposes were later expanded to include recreation, and fish and wildlife. Water supply was added later as a project purpose. In July 1974, the Corps leased 5,378 acres of land and water to the State of Colorado for the use and benefit of the Colorado Department of Natural Resources (CDNR) and Division of Parks and Outdoor Recreation, for what is now known as Chatfield State Park. In December 1981, a portion of the Corps' land on the downstream side of Chatfield Dam was subleased to the Colorado Division of Wildlife for development of fish production and a rearing area, including the Chatfield State Fish Unit (also known as the Chatfield Fish Planting Base). The Chatfield State Fish Unit receives its water supply from Chatfield Reservoir via a water supply pipe (54 inches in diameter) that also feeds City Ditch and Nevada Ditch. Another water supply pipe (48 inches in diameter) extends downstream of Chatfield Dam to feed the Last Chance Ditch.

Applicant and Federal Action Associated with the Project: The U.S. Army Corps of Engineers (Corps) action is to determine the feasibility and economic justification for reassigning a portion of the flood storage space in Chatfield Reservoir for municipal and industrial supply, agriculture, and recreation and fishery habitat protection and enhancement, and if the reallocation is determined to be feasible and economically justified to reassign a portion of the storage space. Congress authorized the Corps to conduct a reallocation study for Chatfield Reservoir for joint flood control-conservation purposes, including storage for municipal and industrial supply, agriculture, and recreation and fishery habitat protection and enhancement. The authorization for the reallocation study under Section 808 of the Water Resources Development Act authorizes the Secretary of the Army, upon request of and in coordination with the Colorado Department of Natural Resources (CDNR) and upon the Chief of Engineer's finding of feasibility and economic justification, to reassign a portion of the storage space in the Chatfield Lake project to joint control-conservation purposes.

An antecedent flood study was completed and approved by the Corps to allow for the conversion of flood control storage space to water supply storage space. The study demonstrated that the reallocation could take place using technical, administrative, and operational techniques without requiring physical changes to the dam or spillway, and without adversely impacting the flood control function of Chatfield Reservoir. Chatfield Reservoir currently has a multipurpose-conservation pool at an elevation of 5,432 ft mean sea level (msl). The FR/EIS determined that 20,600 AF would be the greatest volume of storage that could be reallocated from flood control to multipurpose use without major incremental costs or jeopardizing the flood control function of Chatfield Reservoir. The Proposed Action (20,600 AF Reallocation) would reallocate storage from the flood control pool to the multipurpose-conservation pool. The additional storage would be used for M&I, conjunctive, and augmentation uses. Under this alternative, the top elevation of the multipurpose-conservation pool would be raised from 5,432 to 5,444 ft msl. The average annual yield (or average year yield) is estimated at 8,539 AF. The average annual yield was calculated from the estimated annual yields over the 59-year period (1942-2000) that was evaluated for the FR/EIS.

The CDNR, through the Colorado Water Conservation Board (CWCB) entered into a Feasibility Cost Share Agreement (FCSA) with the Corps to complete a FR/EIS for the reallocation effort. The CWCB also signed individual agreements (Letters of Commitment) with 16 Front Range water providers to formalize requirements related to study costs and allocation of potential space in the reservoir. In 2011, Perry Park withdrew from the project and its 100 acre-feet of storage was acquired by CWCB (approved November 15, 2011). In 2012, the City of Brighton withdrew from the project and its 1,425 acre-feet of storage was acquired by Centennial WSD (1,181 acre-feet), Castle Pines Metro (125 acre-feet), and Castle Pines North (119 acre-feet) (approved April 23, 2012). The City of Aurora and Roxborough WSD are in the process of withdrawing from the Project. Aurora's share of the reallocated storage of 3,561 acre-feet (downstream) and Roxborough's share of 564 acre-feet (upstream) are designated as unassigned, as shown in Table 1, and will be reassigned to one or more of the water providers or others at a future date. The 12 entities currently in the study and the amount of storage requested by each entity are shown in Table 1. The 12 entities are: Central Colorado Water Conservancy District (WCD), Colorado Parks and Wildlife, Denver Botanic Gardens, Western Mutual Ditch Company, Castle Pines Metropolitan District (MD), Castle Pines North MD, Town of Castle Rock, Centennial WSD, Center of Colorado WCD, Colorado Water Conservation Board, Mount Carbon MD, and South Metro Water Supply Authority (SMWSA). The SMWSA is an entity that provides coordination of regional planning efforts to develop renewable water supplies for its members. The SMWSA is requesting storage space in Chatfield Reservoir that would be used by eight of its members. These eight local-government water providers are: Arapahoe County Water and Wastewater Authority, Castle Pines MD, Castle Pines North MD, Town of Castle Rock, Centennial WSD, Cottonwood WSD, Stonegate Village MD, and Denver Southeast Suburban WSD (which does business as Pinery Water and Wastewater District). Note that four of these SMWSA members are also seeking storage space under their own name; these are Castle Pines MD, Castle Pines North MD, Town of Castle Rock, and Centennial WSD.

Project Location: Chatfield Reservoir is located at the confluence of the South Platte River and Plum Creek within the South Platte Basin. The reservoir is located southwest of Denver in Douglas, Jefferson, and Arapahoe counties. The drainage area for the South Platte River Basin

upstream of the reservoir encompasses 3,018 square miles and originates at the headwaters of the North Fork of the South Platte and the South Fork of the South Platte in Park County, Colorado. The United States Forest Service (USFS) manages most of the lands along the mainstem of the South Platte River upstream of the reservoir. Plum Creek, the second largest of the reservoir's tributaries, flows through a mixture of rangelands and suburban areas. The Chatfield Reservoir and surrounding state park is located near Littleton, Colorado, and south of State Highway 470 (i.e., C-470).

Existing Uses: Chatfield Reservoir currently consists of four storage areas referred to as pools (i.e., inactive/sediment storage, multipurpose-conservation, flood control, and maximum surcharge/spillway design flood pools) that are used for different purposes. Figure 1 shows the locations of these pools in a cross-section of the reservoir. Table 2 presents a comparison of the capacity, surface area, and elevations of each of these pools under existing conditions and under the proposed action. Chatfield Reservoir supports a variety of uses including: flood storage, passive and active recreation, habitat for fish and wildlife, and water supply storage.

Currently, Denver Water is the only water provider with storage water rights in Chatfield Reservoir. By contract in 1979, Denver Water is allowed to store approximately 27,000 acre-feet in Chatfield Reservoir with the conditions that storage space between 5,423 and 5,432 feet msl can be regulated solely by Denver Water. Denver Water will use its efforts "as nearly as practicable" to maintain a minimum storage level goal of 20,000 acre-feet from May 1 to August 31 each year, and only during "severe and protracted drought" conditions, as determined by the State of Colorado and endorsed by the Omaha District Engineer (USACE), will the pool be allowed to fall below 5,423 feet msl. Reallocation of the flood control pool involves storage above the elevation of Denver Water's storage (Figure 1). Denver Water's storage in Chatfield Reservoir predates the reallocation study, is not part of the federal action for the proposed reallocation, and would be unaffected by the Corps' decision regarding reallocation (i.e., Denver Water would continue its use of Chatfield Reservoir with or without reallocation).

Environmental Mitigation: The Corps has developed a Compensatory Mitigation Plan (CMP) to address environmental impacts associated with the proposed reallocation of storage at Chatfield Reservoir (for full details see the CMP, Appendix K of this FR/EIS). The CMP has been developed at a feasibility level and considers the ecological resources that would be adversely affected and presents a plan for compensatory mitigation for the functions and values of resources to be impacted. The FR/EIS identified Preble's mouse habitat, bird habitat, and wetlands as resources of particular concern and warranting specific mitigation strategies for the estimated adverse impacts to those resources. These resources are referred to as the "target environmental resources" in the CMP. The CMP is designed to fully mitigate the adverse impacts to the target environmental resources associated with Alternative 3, should Alternative 3 be approved as proposed in the draft FR/EIS. Implementation of the CMP is intended to offset adverse impacts to Preble's mouse and maintain the functional conservation role of the affected critical habitat units. Impacts to Preble's and proposed mitigation are addressed in a separate Biological Assessment.

Mitigation implementation, monitoring, and adaptive management would be overseen by the Project Coordination Team comprised of representatives from the Corps and CDNR. The

Chatfield Water Providers would provide annual monitoring reports to the Project Coordination Team and the Technical Advisory Committee. The Technical Advisory Committee would be comprised of representatives from the following entities: U.S. Army Corps of Engineers, Colorado Water Conservation Board and/or CDNR, U.S. Fish and Wildlife Service, U.S. Environmental Protection Agency, Colorado Parks and Wildlife, Audubon Society of Greater Denver and/or other environmental organizations, Chatfield Water Providers, Douglas County Land Trust or other land conservation organization, Denver Water, and other “in-stream” interests. Monitoring would be concluded when all of the core mitigation objectives are met, and the Corps would determine when all mitigation objectives have been successfully met. Adaptive management would be used to address anticipated and unanticipated issues and events that affect compensatory mitigation activities. Monitoring would determine the degree to which issues and events adversely affect or limit proposed compensatory mitigation activities. All adaptive management measures would be coordinated with the Project Coordination Team and Technical Advisory Committee.

Reservoir Operations and Water Use: The Reallocation would require a change in the operations of the reservoir and would require the construction of additional infrastructure and relocation of some of the existing roads and facilities. Currently, Denver Water is the only entity that has storage rights in Chatfield Reservoir. Under the reallocation, an additional 12 entities would have storage rights within the reservoir (see Table 1). The reservoir will continue to be managed based on the elevation of the water level at a given time. The State Engineer would continue to manage the discharge within the multipurpose-conservation pool based on Colorado water law and the demand for water supply while the Corps manages the flood control pool discharges in order to release the maximum amount of water possible while keeping below a target flow of 5,000 cubic feet per second (cfs) in the South Platte River at the Denver Gage. Once the pool elevation falls back to the multipurpose-conservation pool, the State Engineers Office resumes responsibility for managing the discharge.

Operation of the reallocated storage in Chatfield Reservoir will result in some amount of continuing historic and/or new depletions to the South Platte River associated with the average annual use of 8,539 AF of water for M&I, agricultural, and recreation use. Historic uses are associated with evaporation. Under current conditions (pool elevation 5,432 ft msl) evaporative loss is approximately 2,215 acre-feet per year. Under the proposed action (pool elevation 5,444 ft msl) evaporative loss would increase to approximately 2,907 acre-feet per year (an increase of approximately 692 acre-feet per year, which is less than 1 cfs). Table 3 summarizes water provider and water use information for the project, including the source and quantity of water, use of the water, and location of use. Municipal and industrial use will be the main use of the water, this will include 7 of the 12 water providers. The other water providers will use it for agriculture and/or recreation. Most of the water will be used in Douglas, Adams, Arapahoe, Denver, Weld, and Morgan Counties. Small amounts will be used in Jefferson (40 AF storage) and Park (131 AF storage) Counties. The service areas for the water providers are shown in Figure 2.

Reliance on the Platte River Recovery Implementation Program

The Platte River Recovery Implementation Program (PRRIP), established in 2006, is implementing actions designed to assist in the conservation and recovery of the target species and their associated habitats along the central and lower Platte River in Nebraska through a basin-wide cooperative approach agreed to by the States of Colorado, Nebraska, and Wyoming and the U.S. Department of the Interior [Program, I.A.1.]. The Program addresses the adverse impacts of existing and certain new water related activities on the Platte target species and associated habitats, as well as provides ESA compliance¹ for effects to the target species and whooping crane critical habitat from such activities including avoidance of any prohibited take of such species. [Program, I.A.2. & footnote 2]. The State of Colorado is in compliance with its obligations under the Program.

For Federal actions and projects participating in the Program, the Platte River Recovery Implementation Program Final Environmental Impact Statement (FEIS) and the June 16, 2006 Programmatic Biological Opinion (PBO) serve as the description of the environmental baseline and environmental consequences for the effects of the Federal actions on the listed target species, whooping crane critical habitat, and other listed species in the central and lower Platte River. These documents are hereby incorporated into this Biological Assessment by this reference.

Table II-1 of the PBO (pp. 21-23) contains a list of species and critical habitat in the action area, their status, and the Service's determination of the effects of the Federal action analyzed in the PBO. The Service determined in the PBO that the continued operation of existing and certain new water-related activities may adversely affect but would not likely jeopardize the continued existence of the endangered whooping crane, interior least tern, pallid sturgeon, or the threatened northern Great Plains population of the piping plover. Further, the Service found that the continued operation of existing and certain new water-related activities may adversely affect but would not likely jeopardize the threatened bald eagle and western prairie fringed orchid associated with the central and lower reaches of the Platte River in Nebraska, and was not likely to destroy or adversely modify designated critical habitat for the whooping crane. The bald eagle was subsequently removed from the federal endangered species list on August 8, 2007.

The Service also determined that the PBO Federal Action would have no effect on the endangered Eskimo curlew. There has not been a confirmed sighting since 1926 and this species is believed to be extirpated in Nebraska. Lastly, the Service determined that the PBO Federal Action, including the continued operation of existing and certain new water-related activities, was not likely to adversely affect the endangered American burying beetle.

The above-described Project operations qualify as a new water related activity because such operations constitute a new surface water or hydrologically connected groundwater activity

¹ "ESA compliance" means: (1) serving as the reasonable and prudent alternative to offset the effects of water-related activities that the U.S. Fish & Wildlife Service found were likely to cause jeopardy to one or more of the target species or to adversely modify critical habitat before the Program was in place; (2) providing offsetting measures to avoid the likelihood of jeopardy to one or more of the target species or adverse modification of critical habitat in the Platte River basin for new or existing water-related activities evaluated under the ESA after the Program was in place; and (3) avoiding any prohibited take of target species in the Platte River basin.

which may affect the quantity or timing of water reaching the associated habitats of the target species implemented after July 1, 1997 [Program, I.A. footnote 3]. The Project conforms to the following criteria in Section H of Colorado's Plan for Future Depletions [Program, Attachment 5, Section 9]:

1. The Project is operated on behalf of Colorado water providers.
2. The Project does not involve construction of a major on-stream reservoir located on the mainstem of the South Platte River anywhere downstream of Denver, Colorado.
3. The Project is not a hydropower diversion/return project diverting water including sediments from the mainstem of the South Platte River anywhere downstream of Denver and returning clear water to the South Platte River.
4. The Project does not cause the average annual water supply to serve Colorado's population increase from Wastewater Exchange/Reuse and Native South Platte Flows to exceed 98,110 acre feet during the February-July period.

Accordingly, the impacts of this activity to the target species, whooping crane critical habitat, and other listed species in the central and lower Platte River addressed in the PBO are covered and offset by operation of Colorado's Future Depletions Plan as part of the PRRIP.

The Applicant intends to rely on the provisions of the Program to provide ESA compliance for potential impacts to the target species and whooping crane critical habitat. The U.S. Army Corps of Engineers intends to require, as a condition of any approval, that the Applicant fulfill the responsibilities required of Program participants in Colorado, which includes participation in the South Platte Water Related Activities Program, Inc. (SPWRAP). Note that Colorado Government agencies (i.e., Colorado Division of Parks and Wildlife, and Colorado Water Conservation Board) are members of SPWRAP but do not contribute toward membership assessments in view of the State's direct monetary contribution to the Program. However, all of the other water providers who are planning to remain involved in the study are current SPWRAP members; copies of their 2012 Certificates of Membership in SPWRAP are included in Attachment A. The U.S. Army Corps of Engineers also intends to retain discretionary Federal authority for the Project, consistent with applicable regulations and Program provisions, in case reinitiation of Section 7 consultation is required.

This letter addresses consultation on the referenced Platte River target species and whooping crane critical habitat. Potential impacts from construction and operation of the Project to any other federally-listed threatened or endangered species and designated critical habitats will be addressed within the applicable biological opinion prepared by the Service, in accordance with the ESA.

[Signature]

(From The U.S. Army Corps of Engineers)

Table 1. Colorado Water Providers Requesting Storage Space in Chatfield Reservoir

Entity Requesting Storage	Nature of Entity	Purpose of Use of Storage	Maximum Storage Reallocation (acre-feet)	Percent of Costs and Storage Reallocation
Downstream Providers				
Unassigned ¹	TBD	Unassigned	3,561	17.3
Central Colorado Water Conservancy District (WCD)	Agricultural	Agricultural	2,849	13.8
Colorado Parks and Wildlife ^{6,7}	Governmental: State Agency	Recreation	1,000	4.9
Denver Botanic Gardens at Chatfield	Governmental: City and County of Denver	Recreation and Agriculture	40	0.2
Western Mutual Ditch Company	Agricultural	Agricultural	1,425	6.9
Upstream Providers				
Unassigned	TBD	Unassigned	564	2.7
Castle Pines Metropolitan District (MD) ³	Local government serving Denver suburban area	Municipal and Industrial	785.6	3.8
Castle Pines North Metropolitan District (MD) ³	Local government serving Denver suburban area	Municipal and Industrial	941.5	4.6
Town of Castle Rock ³	Municipality	Municipal and Industrial	1,013.16	4.9
Centennial Water and Sanitation District (WSD) ³	Local government serving Denver suburban area	Municipal and Industrial	6434.9	31.2
Center of Colorado Water Conservancy District (WCD)	Governmental: Park County	Municipal and Industrial	131.3	0.6
Colorado Water Conservation Board	Governmental: State Agency	Recreation	100	0.49
Mount Carbon Metropolitan District (MD)	Local government serving Denver suburban area	Municipal and Industrial	400	1.9
South Metro Water Supply Authority (SMWSA) ³ Includes storage for the following entities:	Local governments providing water supplies to Denver suburbs	Municipal and Industrial	1354.3	6.6
Arapahoe County Water and Wastewater Authority			121.6	0.59
Castle Pines North MD			64.3	0.31
Castle Pines MD			1.1	0.005
Centennial WSD			487.2	2.37
Cottonwood WSD			64.3	0.31
Pinery WSD ⁴			64.3	0.31
Stonegate Village MD			64.3	0.31
Town of Castle Rock			487.2	2.37
Total			20,600	100%

¹The City of Aurora and Roxborough WSD are in the process of withdrawing from the Project. Their combined share of the reallocated storage of 4,125.3 acre-feet is designated as "unassigned" and will be reassigned to one or more of the water providers or others at a future date.

²Municipal and Industrial uses may include domestic, mechanical, manufacturing, and industrial uses; power generation; fire protection; sewage treatment; street sprinkling; irrigation of parks, lawns, gardens, and grounds; and augmentation and replacement, recharge, use as a substitute water supply, and exchange for water supplies also dedicated to these types of uses.

³Note that these entities are requesting their own storage space in Chatfield Reservoir, and are also seeking storage space as members of the South Metro Water Supply Authority. Their portion of SMWSA's storage space would be allotted as described below in note 4.

Entity Requesting Storage	Nature of Entity	Purpose of Use of Storage	Maximum Storage Reallocation (acre-feet)	Percent of Costs and Storage Reallocation
---------------------------	------------------	---------------------------	--	---

⁴The South Metro Water Supply Authority is an entity that provides coordination of regional planning efforts to develop renewable water supplies for its members. The SMWSA is requesting storage space in Chatfield Reservoir that would be used by eight of its members, these are: Arapahoe County Water and Wastewater Authority, Castle Pines Metropolitan District, Castle Pines North Metropolitan District, Town of Castle Rock, Centennial WSD, Cottonwood WSD, Stonegate Village Metropolitan District, and Denver Southeast Suburban Water and Sanitation District doing business as Pinery Water and Wastewater District. SMWSA's storage space would be allocated among these eight members as shown in the table. Note that some of these SMWSA members are also seeking storage space as their own entity (i.e., not under SMWSA); these are shown in the table and include Castle Pines MD, Castle Pines North MD, Centennial WSD, and Town of Castle Rock. The total storage space for each of these entities is shown in Table 3.

⁵The Pinery WSD is also known as Denver Southeast Suburban Water and Sanitation District.

⁶The Colorado Water Conservation Board (CWCB) is temporarily holding the shares of Colorado Parks and Wildlife (CPW).

⁷On July 1, 2011, Colorado State Parks and the Colorado Division of Wildlife merged to form Colorado Parks and Wildlife.

MD = Metropolitan District

WSD = Water and Sanitation District

Table 2. Comparison of Characteristics of Each Pool Under Current Conditions and the Proposed Action

Pool	Elevation (feet msl)		Capacity (acre-feet)		Surface Area (acres)	
	Current Conditions (No Action)	20,600 Acre-Foot Reallocation	Current Conditions (No Action)	20,600 Acre-Foot Reallocation	Current Conditions (No Action)	20,600 Acre-Foot Reallocation
Maximum Surcharge/Spillway Design Flood	5,500–5,521.6	5,500–5,521.6	116,469	116,469	5,991	5,991
Flood Control Pool	5,432–5,500	5,444–5,500	206,779	186,179	4,779	4,779
Multipurpose-Conservation Pool	5,385–5,432	5,385–5,444	27,405	48,005	1,429	2,009
Inactive/Sediment Storage Pool	5,377–5,385	5,377–5,385	23	23	N/A	N/A

Table 3. Chatfield Reservoir Storage Reallocation Project: Water Provider Information

Water Provider	Reallocated Space, AF	Average Annual Yield (or Average year Yield), AF¹	Type of Water Right Planned to be used in Chatfield Reservoir (water right case decree number in parentheses)	Nature of Water Use	Quantification of Use (Taps or Acres)	Location of Use County
Downstream Provider						
Unassigned Storage ¹	3,561	1,476	TBD	TBD	TBD	TBD
Central Colorado Water Conservancy District (WCD)	2,849	1,181	SW (83CW184)	Ag	100,000 acres	Adams, Weld, Morgan
Colorado Parks and Wildlife	1,000	414.5	SW (09CW265)	Rec	5,381 acres	Denver, Adams
Denver Botanic Gardens	40	16.6	SW (05CW332)	Ag	59 acres	Jefferson
Western Mutual Ditch Company	1,425	590.7	SW (83CW184)	Ag	7,900 acres	Weld
Upstream Provider						
Unassigned Storage	564	233.9	TBD	TBD	TBD	TBD
Castle Pines Metropolitan District (MD) ²	786.7	326.1	SW (04CW308) & NTGW ⁴	M & I	534 taps	Douglas
Castle Pines North MD ²	1,005.8	416.9	SW (04CW308) & NTGW ⁴	M & I	683 taps	Douglas
Town of Castle Rock ²	1,500.3	621.9	SW (89CW169) & NTGW ⁴	M & I	1,020 taps	Douglas
Centennial Water and Sanitation District (WSD) ²	6,922.1	2,869.3	SW (83CW184, 84CW411, & 85CW314)	M & I	4,707 taps	Douglas
Center of Colorado Water Conservation District	131.3	54.4	SW (05CW111)	M & I	90 taps	Park
Colorado Water Conservation Board	100.0	41.5	TBD	TBD	TBD	TBD
Mount Carbon MD	400.0	165.8	SW (85CW463)	M & I	272 taps	Douglas
Remaining Members of South Metro Water Supply Authority ³ :						
Arapahoe County Water and Wastewater Authority	121.6	50.4	SW (04CW309)	M & I	83 taps	Douglas
Cottonwood WSD	64.3	26.7	SW (04CW309)	M & I	44 taps	Douglas
Pinery WSD ⁵	64.3	26.7	SW (04CW309)	M & I	44 taps	Douglas
Stonegate Village MD	64.3	26.7	SW (04CW309)	M & I	44 taps	Douglas
Subtotal – Remaining SMWSA	314.5	106.92	SW (04CW309)	M & I	215 taps	Douglas
Total =	20,600	8,539			113,340 acres 7,521 taps	

SW = surface water

NTGW = nontributary groundwater

M&I= municipal and industrial

Ag = agricultural

Rec = recreation

MD = metropolitan district

TBD = to be determined

SMWSA = South Metro Water Supply Authority

WSD = Water and Sanitation District

¹The City of Aurora and Roxborough WSD are in the process of withdrawing from the Project. Their combined share of the reallocated storage of 4,125.3 acre-feet are designated as “unassigned” and will be reassigned to one or more of the water providers or others at a future date. ²This entity is also a member of SMWSA, and the information presented in this table includes the storage requested by this entity, including the amount of storage requested under its own name as well as the amount of storage requested under SMWSA (as reported in Table 1).

³The “Remaining Members of South Metro Water Supply Authority” include those SMWSA members who are participating in the Project that are not previously listed in the table, these include: Arapahoe County Water and Wastewater Authority, and Pinery WSD, and Stonegate Metropolitan District. See Table 1 for further information on SMWSA members.

⁴The NTGW water will be used by Castle Rock, Castle Pines North, and Castle Pines Metro District (all entities on Plum Creek) for their M&I use. The water will then be treated at a single wastewater treatment plant operated by the Plum Creek Wastewater Authority, located on Plum Creek above Chatfield Reservoir. Some of the reusable effluent is routed back to these entities by pump and pipeline for non-potable irrigation (e.g., golf courses). Portions of the reusable effluent which exceed irrigation demands are discharged to Plum Creek to flow down channel to Chatfield Reservoir. This is a water source legally able to be used and reused to extinction so the entities are motivated to either directly recapture this effluent by pumping and piping it back to their service areas (which Castle Pines North will do by wheeling the effluent through Centennial’s system) or by using the release of the water from Chatfield Reservoir to complete an exchange of water rights allowing upstream diversions of the same amount and timing as that of the water released to the extent no intervening water rights are injured. These exchanges are done either with a decree or with the prior permission of the State Engineer’s Office. For the purposes of this consultation these uses are considered to have occurred prior to July 1, 1997.

⁵The Pinery WSD is also known as Denver Southeast Suburban Water and Sanitation District.

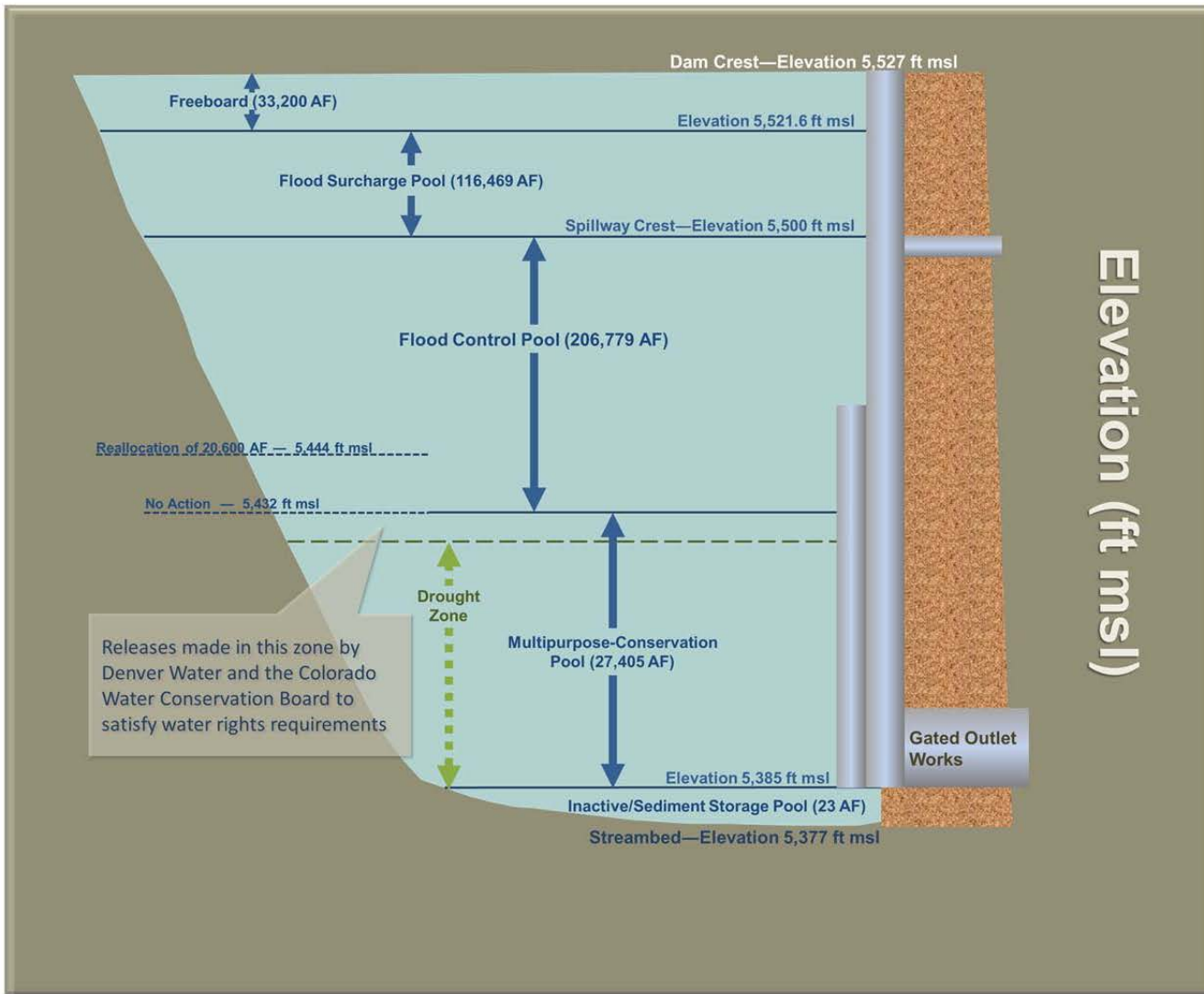
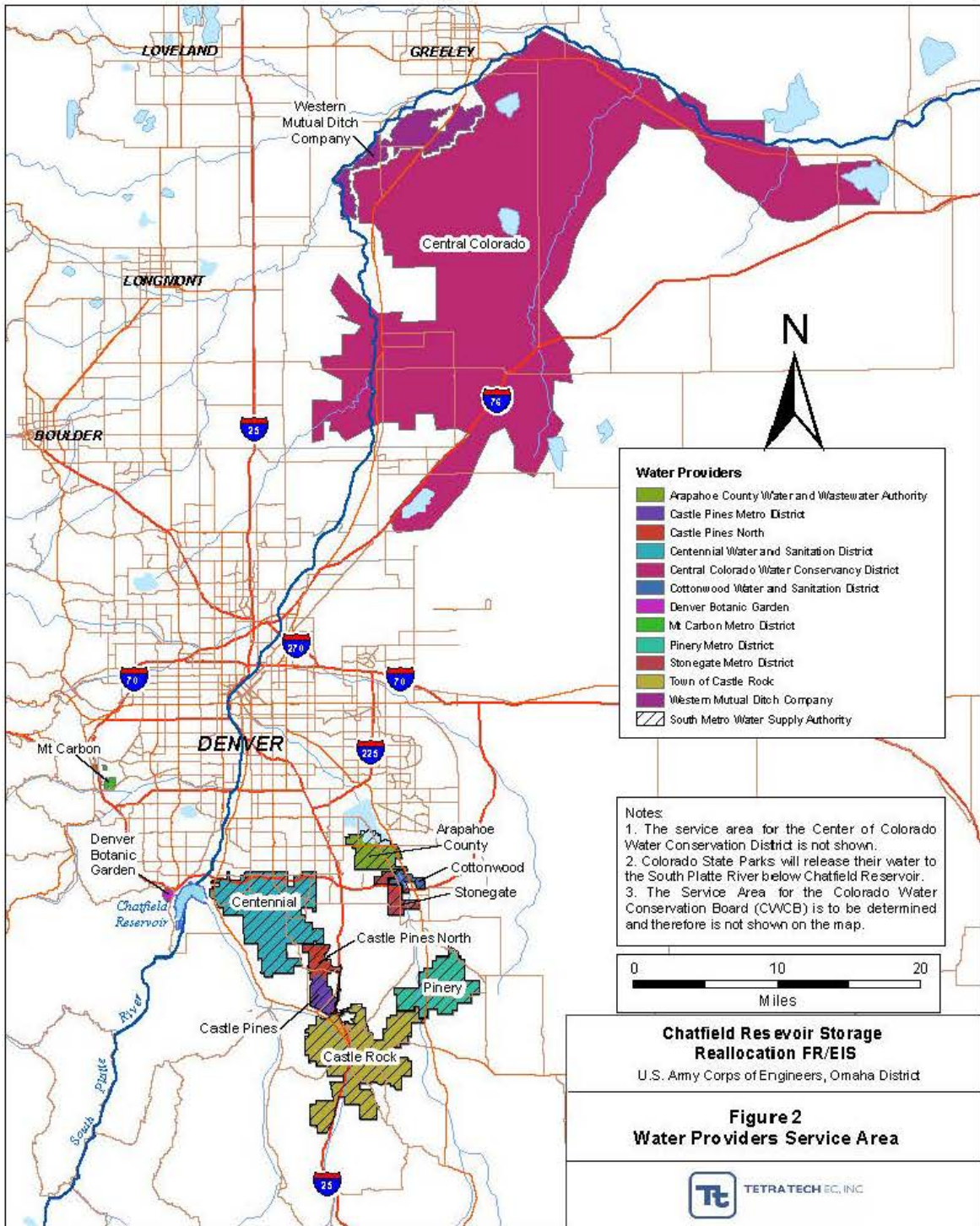


Figure 1. Pool Types and Elevations at Chatfield Reservoir



Attachment A

Certificates of Membership in SPWRAP

YEAR: 2012

37,831.0 UNITS

CERTIFICATE OF MEMBERSHIP

South Platte Water Related Activities Program, Inc.

CLASS M

This certifies that **Arapahoe County Water & Wastewater Authority** (“Member”) has become a Class M member of the South Platte Water Related Activities Program, Inc. (SPWRAP), a non-profit corporation incorporated under the laws of the State of Colorado. This Certificate indicates that Member has paid all assessments owed on its membership through the current year identified above. This membership is not transferable except as may be provided in the Articles or Bylaws of SPWRAP. Additional terms, conditions and limitations pertaining to this membership are printed on the back hereof.

In Witness Whereof, SPWRAP has caused this Certificate to be signed by its duly authorized officers, and sealed with the seal of the corporation this 4th day of June, 2012.

Craig Dewey
Secretary

[seal]

Lisa B. Darling
President

YEAR: 2012

12,864.0 UNITS

CERTIFICATE OF MEMBERSHIP

South Platte Water Related Activities Program, Inc.

CLASS M

Castle Pines Metropolitan District

This certifies that _____ ("Member")
has become a Class M member of the South Platte Water Related Activities Program, Inc. (SPWRAP), a non-profit corporation incorporated under the laws of the State of Colorado. This Certificate indicates that Member has paid all assessments owed on its membership through the current year identified above. This membership is not transferable except as may be provided in the Articles or Bylaws of SPWRAP. Additional terms, conditions and limitations pertaining to this membership are printed on the back hereof.

In Witness Whereof, SPWRAP has caused this Certificate to be signed by its duly authorized officers, and sealed with the seal of the corporation this 15th day of May, 2012.

Craig Dewey
Secretary

[seal]

Lisa B. Darling
President

YEAR: 2012

22,862.40 UNITS

CERTIFICATE OF MEMBERSHIP

South Platte Water Related Activities Program, Inc.

CLASS M

Castle Pines North Metro District

This certifies that _____ (“Member”) has become a Class M member of the South Platte Water Related Activities Program, Inc. (SPWRAP), a non-profit corporation incorporated under the laws of the State of Colorado. This Certificate indicates that Member has paid all assessments owed on its membership through the current year identified above. This membership is not transferable except as may be provided in the Articles or Bylaws of SPWRAP. Additional terms, conditions and limitations pertaining to this membership are printed on the back hereof.

In Witness Whereof, SPWRAP has caused this Certificate to be signed by its duly authorized officers, and sealed with the seal of the corporation this 4th day of June, 2012.

Craig Dewey
Secretary

Lisa B Darling
President

[seal]

YEAR: 2012

78,120.0 UNITS

CERTIFICATE OF MEMBERSHIP

South Platte Water Related Activities Program, Inc.

CLASS M

Town of Castle Rock

This certifies that _____ (“Member”) has become a Class M member of the South Platte Water Related Activities Program, Inc. (SPWRAP), a non-profit corporation incorporated under the laws of the State of Colorado. This Certificate indicates that Member has paid all assessments owed on its membership through the current year identified above. This membership is not transferable except as may be provided in the Articles or Bylaws of SPWRAP. Additional terms, conditions and limitations pertaining to this membership are printed on the back hereof.

In Witness Whereof, SPWRAP has caused this Certificate to be signed by its duly authorized officers, and sealed with the seal of the corporation this 30th day of February, 2012.

Craig Dewey
Secretary

[seal]

Lisa B. Darling
President

YEAR: 2012

69,228.0 UNITS

CERTIFICATE OF MEMBERSHIP

South Platte Water Related Activities Program, Inc.

CLASS M

Centennial Water & Sanitation District

This certifies that _____ ("Member")
has become a Class M member of the South Platte Water Related Activities Program, Inc. (SPWRAP), a non-profit corporation incorporated under the laws of the State of Colorado. This Certificate indicates that Member has paid all assessments owed on its membership through the current year identified above. This membership is not transferable except as may be provided in the Articles or Bylaws of SPWRAP. Additional terms, conditions and limitations pertaining to this membership are printed on the back hereof.

In Witness Whereof, SPWRAP has caused this Certificate to be signed by its duly authorized officers, and sealed with the seal of the corporation this 15th day of May, 2012.

Craig Dewey
Secretary

[seal]

Lisa B. Darling
President

YEAR: 2011 - 2019

1,027.5 UNITS/YEAR

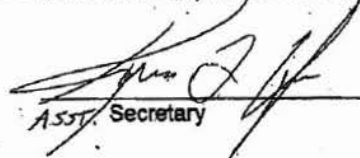
CERTIFICATE OF MEMBERSHIP

South Platte Water Related Activities Program, Inc.

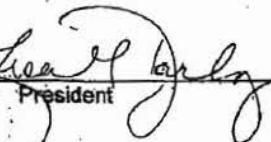
CLASS X-3

This certifies that **Center of Colorado Water Conservancy District** ("Member") has become a Class X-3 member of the South Platte Water Related Activities Program, Inc. (SPWRAP), a non-profit corporation incorporated under the laws of the State of Colorado. This Certificate indicates that Member has paid all assessments owed on its membership through the current year identified above. This membership is not transferable except as may be provided in the Articles or Bylaws of SPWRAP. Additional terms, conditions and limitations pertaining to this membership are printed on the back hereof.

In Witness Whereof, SPWRAP has caused this Certificate to be signed by its duly authorized officers, and sealed with the seal of the corporation this 9 day of November, 2010.


ASST. Secretary




President

MAR-22-2011 09:55A FROM: D J DRUCKER & ASSOC. 303-839-0302

TO: 3037910437

P. 2

YEAR: 2012

3,433.0 UNITS

CERTIFICATE OF MEMBERSHIP

South Platte Water Related Activities Program, Inc.

CLASS W

This certifies that **Central Colorado Water Conservancy District** ("Member") has become a Class W member of the South Platte Water Related Activities Program, Inc. (SPWRAP), a non-profit corporation incorporated under the laws of the State of Colorado. This Certificate indicates that Member has paid all assessments owed on its membership through the current year identified above. This membership is not transferable except as may be provided in the Articles or Bylaws of SPWRAP. Additional terms, conditions and limitations pertaining to this membership are printed on the back hereof.

In Witness Whereof, SPWRAP has caused this Certificate to be signed by its duly authorized officers, and sealed with the seal of the corporation this 10th day of February, 2012.

Cree Dewey
Secretary

[seal]

Lisa B. Darling
President

YEAR: 2012

9,819.12 UNITS

CERTIFICATE OF MEMBERSHIP

South Platte Water Related Activities Program, Inc.

CLASS M

Cottonwood Water & Sanitation District

This certifies that _____ (“Member”) has become a Class M member of the South Platte Water Related Activities Program, Inc. (SPWRAP), a non-profit corporation incorporated under the laws of the State of Colorado. This Certificate indicates that Member has paid all assessments owed on its membership through the current year identified above. This membership is not transferable except as may be provided in the Articles or Bylaws of SPWRAP. Additional terms, conditions and limitations pertaining to this membership are printed on the back hereof.

In Witness Whereof, SPWRAP has caused this Certificate to be signed by its duly authorized officers, and sealed with the seal of the corporation this 28th day of February, 2012.

Craig Dewey
Secretary

[seal]

Lisa B. Darling
President

YEAR: 2007 - 2019

11.0 UNITS

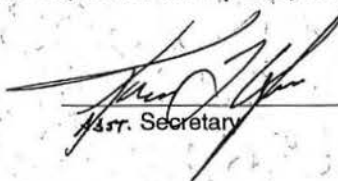
CERTIFICATE OF MEMBERSHIP

South Platte Water Related Activities Program, Inc.

CLASS M

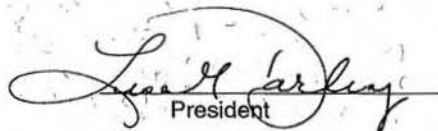
This certifies that Mt. Carbon Metro District ("Member") has become a Class M member of the South Platte Water Related Activities Program, Inc. (SPWRAP), a non-profit corporation incorporated under the laws of the State of Colorado. This Certificate indicates that Member has paid all assessments owed on its membership through the first increment of the Program as shown above. This membership is not transferable except as may be provided in the Articles or Bylaws of SPWRAP. Additional terms, conditions and limitations pertaining to this membership are printed on the back hereof.

In Witness Whereof, SPWRAP has caused this Certificate to be signed by its duly authorized officers, and sealed with the seal of the corporation this 9th day of September, 2009.



Secretary

[seal]



President

Membership in SPWRAP entitles the Member to those rights and privileges specified in the Articles of Incorporation and Bylaws of SPWRAP, as may be amended from time to time, provided said Member is current in payment of annual fees and assessments levied by SPWRAP.

This Member may rely on implementation of the Platte River Recovery Implementation Program ("PRRIP") for Endangered Species Act ("ESA") compliance for its water-related activities affecting flow volume and timing in the central and lower reaches of the Platte River in Nebraska to the extent described in the PRRIP and June 16, 2006 Programmatic Biological Opinion. The following conditions apply to Member's reliance on the PRRIP for ESA compliance purposes: (1) PRRIP coverage for ESA compliance is dependent upon continued implementation of the PRRIP and fulfillment of Colorado's responsibilities under the PRRIP; (2) PRRIP coverage extends to Member's interests in facilities, water rights, and other water-related activities associated with the: i] irrigated acreage for Class A and W members; ii] municipal and domestic water supply system for Class M members; iii] diversions for self-supplied industrial water needs for Class I members; and, iv] depletions for Class X-2 members, upon which Member's Units are based; (3) Member must be current in payment of applicable fees and assessments levied by SPWRAP with respect to Member's Units; (4) PRRIP coverage does not obviate the need to follow procedural requirements of the ESA, including those related to Section 7 consultation, that may be or become applicable to Member or its activities; and (5) PRRIP coverage does not extend to site-specific project impacts that may affect federally listed species or designated critical habitat outside the scope of the PRRIP and Programmatic Biological Opinion.

Any member who is not a natural person must provide to SPWRAP the name of the person authorized to cast votes for that member. Any changes of such authorization must be made in writing and received by SPWRAP not less than 30 days prior to an annual meeting at which such votes are to be cast.

RATIONALE - Membership Units/Assessments

1. The traditional "trigger" for Platte Section 7 compliance, and thus the key driver for membership in SPWRAP, is construction, maintenance and/or operation of structures and facilities diverting out of the South Platte River and its tributaries. A membership covers all facilities of the member entity including diversion, conveyance, storage and other associated structures. Each entity utilizing those should have its own membership and certificate in SPWRAP.
2. Payment (Units) will be based on the following as more fully described in Article VI.B. of the Articles of Incorporation:
 - Class A: The acreage that is thereby irrigated through that member entity.
 - Class I: The member's diversions, in acre feet.
 - Class M: The member's single family equivalent taps, calculated as one SFE per half acre foot of potable water treated by or delivered to the water supply entity.
 - Class W: The irrigated acreage within the member's boundaries.
 - Class X-2: The "small depletion" determination made by the USFWS.
 - Class X-3: An entity that operates a plan for augmentation to replace the depletions caused primarily by rural domestic wells.
3. Where multiple structures / water rights of different member entities serve the same acreage, flexibility exists to allocate that acreage among the participating entities for purposes of determining assessments.

YEAR: 2007 – 2019
"FIRST INCREMENT"

1.0 UNIT

CERTIFICATE OF MEMBERSHIP

South Platte Water Related Activities Program, Inc.

CLASS A

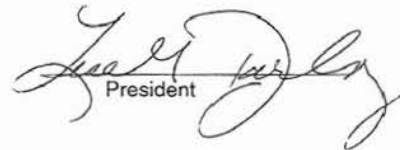
Denver Botanical Gardens at Chatfield

This certifies that _____, "Member")
has become a Class A member of the South Platte Water Related Activities Program, Inc. (SPWRAP), a non-profit corporation incorporated under the laws of the State of Colorado. This Certificate indicates that Member has paid all assessments owed on its membership through the "First Increment" of the Program as identified above. This membership is not transferable except as may be provided in the Articles or Bylaws of SPWRAP. Additional terms, conditions and limitations pertaining to this membership are printed on the back hereof.

In Witness Whereof, SPWRAP has caused this Certificate to be signed by its duly authorized officers, and sealed with the seal of the corporation this 22 day of July, 2010.


Secretary

[seal]


President

YEAR: 2012

32,754.0 UNITS

CERTIFICATE OF MEMBERSHIP

South Platte Water Related Activities Program, Inc.

CLASS M

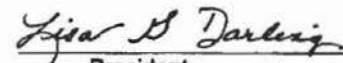
Denver Southeast Suburban Water & Sanitation District

This certifies that _____ ("Member")
has become a Class M member of the South Platte Water Related Activities Program, Inc. (SPWRAP), a non-profit corporation incorporated under the laws of the State of Colorado. This Certificate indicates that Member has paid all assessments owed on its membership through the current year identified above. This membership is not transferable except as may be provided in the Articles or Bylaws of SPWRAP. Additional terms, conditions and limitations pertaining to this membership are printed on the back hereof.

In Witness Whereof, SPWRAP has caused this Certificate to be signed by its duly authorized officers, and sealed with the seal of the corporation this 28th day of February, 2012.


Secretary

[seal]


President

YEAR: 2012

20,452.32 UNITS

CERTIFICATE OF MEMBERSHIP

South Platte Water Related Activities Program, Inc.

CLASS M

Stonegate Village Metropolitan District

This certifies that _____ (“Member”) has become a Class M member of the South Platte Water Related Activities Program, Inc. (SPWRAP), a non-profit corporation incorporated under the laws of the State of Colorado. This Certificate indicates that Member has paid all assessments owed on its membership through the current year identified above. This membership is not transferable except as may be provided in the Articles or Bylaws of SPWRAP. Additional terms, conditions and limitations pertaining to this membership are printed on the back hereof.

In Witness Whereof, SPWRAP has caused this Certificate to be signed by its duly authorized officers, and sealed with the seal of the corporation this 28th day of February, 2012.

Craig Dewey
Secretary

[seal]

Lisa B Darling
President

Membership in SPWRAP entitles the Member to those rights and privileges specified in the Articles of Incorporation and Bylaws of SPWRAP, as may be amended from time to time, provided said Member is current in payment of annual fees and assessments levied by SPWRAP.

This Member may rely on implementation of the Platte River Recovery Implementation Program ("PRRIP") for Endangered Species Act ("ESA") compliance for its water-related activities affecting flow volume and timing in the central and lower reaches of the Platte River in Nebraska to the extent described in the PRRIP and June 16, 2006 Programmatic Biological Opinion. The following conditions apply to Member's reliance on the PRRIP for ESA compliance purposes: (1) PRRIP coverage for ESA compliance is dependent upon continued implementation of the PRRIP and fulfillment of Colorado's responsibilities under the PRRIP; (2) PRRIP coverage extends to Member's interests in facilities, water rights, and other water-related activities associated with the: i] irrigated acreage for Class A and W members; ii] municipal and domestic water supply system for Class M members; iii] diversions for self-supplied industrial water needs for Class I members; and, iv] depletions for Class X-2 members, upon which Member's Units are based; (3) Member must be current in payment of applicable fees and assessments levied by SPWRAP with respect to Member's Units; (4) PRRIP coverage does not obviate the need to follow procedural requirements of the ESA, including those related to Section 7 consultation, that may be or become applicable to Member or its activities; and (5) PRRIP coverage does not extend to site-specific project impacts that may affect federally listed species or designated critical habitat outside the scope of the PRRIP and Programmatic Biological Opinion.

Any member who is not a natural person must provide to SPWRAP the name of the person authorized to cast votes for that member. Any changes of such authorization must be made in writing and received by SPWRAP not less than 30 days prior to an annual meeting at which such votes are to be cast.

RATIONALE - Membership Units/Assessments

1. The traditional "trigger" for Platte Section 7 compliance, and thus the key driver for membership in SPWRAP, is construction, maintenance and/or operation of structures and facilities diverting out of the South Platte River and its tributaries. A membership covers all facilities of the member entity including diversion, conveyance, storage and other associated structures. Each entity utilizing those should have its own membership and certificate in SPWRAP.
2. Payment (Units) will be based on the following as more fully described in Article VI.B. of the Articles of Incorporation:
 - Class A: The acreage that is thereby irrigated through that member entity.
 - Class I: The member's diversions, in acre feet.
 - Class M: The member's single family equivalent taps, calculated as one SFE per half acre foot of potable water treated by or delivered to the water supply entity.
 - Class W: The irrigated acreage within the member's boundaries.
 - Class X-2: The "small depletion" determination made by the USFWS.
 - Class X-3: An entity that operates a plan for augmentation to replace the depletions caused primarily by rural domestic wells.
3. Where multiple structures / water rights of different member entities serve the same acreage, flexibility exists to allocate that acreage among the participating entities for purposes of determining assessments.

YEAR: 2012

790.0 UNITS

CERTIFICATE OF MEMBERSHIP

South Platte Water Related Activities Program, Inc.

CLASS A

Western Mutual Ditch Company

This certifies that _____ (“Member”) has become a Class A member of the South Platte Water Related Activities Program, Inc. (SPWRAP), a non-profit corporation incorporated under the laws of the State of Colorado. This Certificate indicates that Member has paid all assessments owed on its membership through the current year identified above. This membership is not transferable except as may be provided in the Articles or Bylaws of SPWRAP. Additional terms, conditions and limitations pertaining to this membership are printed on the back hereof.

In Witness Whereof, SPWRAP has caused this Certificate to be signed by its duly authorized officers, and sealed with the seal of the corporation this 4th day of June, 2012.

Cree Dewey
Secretary

[seal]

Lisa B Darling
President