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Appendix X
FWCA Report

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
Colorado Field Office
P.O. Box 25486, DFC (MS 65412)
Denver, Colorado 80225-0486

IN REPLY REFER TO:
ES/CO: COE/Omaha/Chatfield
TAILS: 65412-2010-CPA-0111

Ms. Kayla Eckert Uptmor
U.S. Army Corps of Engineers, Omaha District
CENWO-PM-AE
106 South 15th Street
Omaha, Nebraska 68102-1618

Dear Ms. Uptmor:

This letter is submitted by the U.S. Fish and Wildlife Service (Service) to the U.S. Army Corps of Engineers (Corps) updating progress made to identify and address concerns and opportunities regarding fish and wildlife resources for the proposed Chatfield Reservoir Storage Reallocation project since the Service's February 2006 Planning Aid Report (PAR). The PAR identified significant and sensitive fish and wildlife resources, and suggested measures for mitigation of project-related impacts. The Service has prepared this letter under authority of the Fish and Wildlife Coordination Act (FWCA) (48 Stat. 401; 16 U.S.C. 661 et seq.), as amended. This letter amends the PAR and together they constitute our Draft FWCA Report for the Corps' Feasibility Study.

Since our PAL, we have reviewed preliminary portions of the Corps' Draft Environmental Impact Statement (DEIS) and participated in discussions with the Corps, the U.S. Forest Service, the Colorado Division of Wildlife, the Chatfield Water Providers, Tetra Tech, Otter Tail Environmental, ERO Resources Corporation (ERO), and other parties regarding the project.

As you know, the federally-threatened Preble's meadow jumping mouse (*Zapus hudsonius preblei*) (PMJM) is know to occur on and near riparian habitats at the project site and critical habitat for the PMJM is currently designated along the South Platte River from Chatfield Reservoir upstream to the upstream boundary of Corps property on the river. In addition, our October 8, 2009, proposal to revise critical habitat for the PMJM would, if finalized in its present form, extend PMJM critical habitat on site to the reach of Plum Creek from Chatfield Reservoir upstream to beyond the limits of Corps property. A variety of mitigation options are currently being pursued to avoid, reduce and offset impacts to the PMJM and its habitat, including both designated and proposed critical habitat.

As described in our PAR, the Service has consistently taken the position in its section 7 consultations that Federal agency actions resulting in existing or new water depletions to the Platte River system may affect the endangered whooping crane (*Grus americana*), endangered interior least tern (*Sterna antillarum*), threatened piping plover (*Charadrius melodus*), endangered pallid sturgeon (*Scaphirhynchus albus*), threatened western prairie fringed orchid (*Platanthera praeclara*), and designated critical habitat for the whooping crane in the central Platte River in Nebraska. Formal section 7 consultation on water-related projects associated with depletions to the central Platte River should include a complete project description including water-related project elements, origin of water associated with the proposed project, and the nature and estimated amount of water use under build-out conditions. If your office or the applicant would like to further discuss the proposed project in relation to Platte River system depletive issues in Colorado, please contact Sandy Vana-Miller in my office at (303) 236-4748.

This letter does not constitute interagency consultation within the meaning of section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531, et seq.). We anticipate that a Biological Assessment (BA) will be developed by the Corps and included with the Draft Chatfield Reservoir Storage Reallocation Feasibility Report and DEIS. The Service will provide a Biological Opinion regarding impacts of the preferred alternative in accordance with time frames established under the ESA.

The bald eagle (*Haliaeetus leucocephalus*), a species listed as threatened under the ESA at the time of our 2006 PAR, has since been removed from the Federal list of endangered and threatened species. However, it remains protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668) and the Migratory Bird Treaty Act (16 U.S.C. 703-712). While bald eagle populations in the Front Range of Colorado continue to increase, we are not aware of recent nesting or significant winter roosting activity in the vicinity of Chatfield Reservoir.

Since 2007, the Service has worked with ERO and other parties to assist in the development of a Comprehensive Mitigation Plan (CMP) that includes methodology and techniques appropriate for adequately quantifying impacts to the PMJM, migratory birds, wetlands, riparian woodlands, and other resources, and developing mitigation within and upstream of Corps property at Chatfield Reservoir. The CMP is based on an ecological function unit concept that quantifies resources that would be lost and provides a basis for the full mitigation of these losses. The plan continues to evolve, and while the Service has not fully evaluated specific details, we are supportive of the concepts underlying the CMP and are committed to working jointly with other parties to ensure its successful development and implementation.

As always, the Service is concerned that unavoidable impacts to fish and wildlife resources, including wetlands, be fully mitigated; that mitigation occurs in advance of impacts to the extent possible; and that the priority is to mitigate impacts on or near the project site. Wetland mitigation should be consistent with the Corps and U.S. Environmental Protection Agency's 2008 final rule regarding compensatory mitigation for losses of aquatic resources.

It is our understanding that the Chatfield Water Providers will be responsible for the successful implementation of the CMP, but that efforts will be led by the State with Corps oversight. The Service anticipates being involved throughout project and CMP implementation, and will participate in an appropriate advisory role to assure success of the CMP. Uncertainties remain as to the actual impacts of raised water storage levels. Frequency, duration, and timing of filling will influence impacts, as will periodic inundation associated with flood control. Monitoring of actual impacts over time and adaptive response to conditions that develop are important aspects of any mitigation plan.

Should your staff have any questions concerning this letter, please contact Peter Plage of my staff at [redacted].

Sincerely,

Susan C. Linner
Colorado Field Supervisor

pc: CDOW, Denver, CO
EPA, Denver, CO
Plage

PPlage:COE\Chatfield FWCAletter:070810

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
Colorado Field Office
P.O. Box 25486, DFC (MS 65412)
Denver, Colorado 80225-0486

IN REPLY REFER TO:
ES/CO: COE/Omaha/Chatfield
MS 65412 LK

Candace M. Gorton
U.S. Army Corps of Engineers, Omaha District
CENWO-PM-AE
106 South 15th Street
Omaha, Nebraska 68102-1618

Dear Ms. Gorton:

This Planning Aid Letter (PAL) is submitted by the U.S. Fish and Wildlife Service (Service) to the U.S. Army Corps of Engineers (Corps) for its use in a Feasibility Study of the proposed Chatfield Storage Reallocation Project. The report identifies significant and sensitive fish and wildlife resources, and suggests measures for mitigation of project-related impacts. Accordingly, this letter fulfills the fiscal year 2005 Scope of Work between the Service and the Corps. The Service has prepared this letter under authority of the Fish and Wildlife Coordination Act (FWCA) (48 Stat. 401; 16 U.S.C. 661 et seq.), as amended, but does not fulfill the reporting requirements of the Service under Section 2(b) of the FWCA.

In addition, this document does not constitute interagency consultation within the meaning of section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531, et seq.). Informal section 7 consultation with the Corps began on April 20, 2000, when Foster Wheeler Environmental Corporation, on behalf of the Corps, requested from the Service a list of federally-listed threatened and endangered species that may be present in the vicinity of the proposed project.

STUDY AREA

Chatfield Reservoir and the surrounding Chatfield State Park are located in Littleton, Colorado, within Jefferson, Douglas, and Arapahoe counties. The reservoir is located on the main stem of the South Platte River. Plum Creek and Deer Creek also flow into the reservoir. The authorized uses of Chatfield Reservoir are flood control, recreation, water supply storage, and fish and wildlife enhancement. The reservoir is administered by Corps, but the Colorado Department of Natural Resources, Division of Parks and Outdoor Recreation, has a park and recreation lease from the Corps for 5,381 land and water acres,

including the area covered by Chatfield Reservoir. Under the Corps' current operating plan, others hold the water rights up to the multipurpose pool level at 5,432 feet (above mean sea level). Once the pool rises above 5,432 feet, the Corps is responsible for the management of water in the flood control pool. The study area for the Chatfield Storage Reallocation Project includes Chatfield Reservoir, the surrounding state park, and, due to potential changes in downstream flows, the South Platte River corridor downstream from the reservoir to the Adams County/Weld County line. To a large extent this downstream river corridor is impacted by urbanization, especially through the City and County of Denver (Denver) reach, and by regulation of flows at Chatfield Reservoir and other upstream reservoirs. Flooding, flow regimes, and sediment loads have been greatly altered from their natural state.

Beyond the boundaries of the study area, water storage and potential flow manipulation have potential to cause impacts to the South Platte River and Platte River beyond the Adams County/Weld County line and upstream in the South Platte River and Plum Creek basins.

FISH AND WILDLIFE RESOURCES

Fish and wildlife resources in the project area include federally-listed threatened and endangered species, State-listed species, other species of concern, migratory birds, aquatic resources including fish, and the wetland and riparian habitats important for support of wildlife. The following summary of fish and wildlife resources makes significant use of information from Foster Wheeler Environmental Corporation's 2000 study, "Chatfield Storage Reallocation Feasibility Study, Draft Existing Conditions Report for Biological Resources" (Foster Wheeler 2000) and Tetra Tech's January 2006 draft of the "Chatfield Reservoir Storage Reallocation FR/EIS, Section 3, Affected Environment" (Tetra Tech 2006)

Federally-listed Threatened and Endangered Species

Preble's meadow jumping mouse

The federally-threatened Preble's meadow jumping mouse, *Zapus hudsonius preblei* (Preble's) a subspecies of the meadow jumping mouse, is a small rodent with an extremely long tail, large hind feet, and long hind legs. Preble's range is limited to eastern Colorado and southeastern Wyoming where it occupies riparian habitat that typically includes a dense combination of grasses, forbs, and shrubs. A taller shrub and tree canopy may also be present. Riparian shrub cover, tree cover, and the amount of open water nearby are good predictors of Preble's density. Preble's is a true hibernator, usually entering hibernation under ground in September or October and emerging the following May, after a potential hibernation period of seven or eight months.

Limited trapping efforts in 1998 captured Preble's in the project area. Along the South Platte River upstream of Chatfield Reservoir, 4 Preble's were captured in 1,115 trap nights (a trap night equals one trap set for one night). Along Plum Creek upstream of Chatfield Reservoir, 9 mice were captured in 887 trap nights. No Preble's were captured on Deer Creek (574 trap nights) or the South Platte River below the dam (402 trap nights) (Burns and McDonnell, Inc. 1998). A follow-up trapping survey along Deer Creek in 2001 found no Preble's. The

Preble's has been documented at multiple sites upstream of the project area in the South Platte River and Plum Creek drainages. While no comprehensive studies of number or distribution of Preble's in these drainages have been attempted, it is assumed that Preble's range widely over appropriate habitats in the project area upstream from Chatfield Reservoir. Based on a number of past trapping efforts, it appears unlikely that Preble's are currently present along the Platte River downstream from the dam at Chatfield Reservoir to the Adams County-Weld County line. The Service has formally designated a "block clearance" zone around Denver, including the South Platte River corridor from West Bowles Avenue (Littleton) to the Weld County line. A block clearance zone is one in which the Service has determined that the species in question is no longer likely to exist.

The Service designated critical habitat for Preble's on June 23, 2003 (68 FR 37275). Critical habitat Unit SP13 encompasses approximately 3,265 acres on 43.8 miles of streams within the South Platte River watershed. It includes four subunits. The Chatfield subunit includes a section of the South Platte River upstream of Chatfield Reservoir within Chatfield State Park, specifically from Chatfield Reservoir upstream south and west, to the boundary of Corps property, excluding 22 acres owned by Denver. Critical habitat extends 460 feet outward from normal high water on both sides of the river. There are sites within this area where habitat is not supportive of Preble's (lakes, roads, etc.) where critical habitat designation could be excluded. However, habitat for Preble's may extend beyond designated critical habitat boundaries. Tetra Tech (2006) estimated 552 acres of Preble's habitat at Chatfield State Park, including 295 acres of designated critical habitat.

The Denver Museum of Nature and Science conducted a study regarding the genetic makeup of Preble's and its relationship to other subspecies of jumping mice. The findings of this study supported petitions that the Service received to delist Preble's, which maintained that Preble's was listed in error Preble's is not a valid subspecies. On February 2, 2004, the Service proposed to delist Preble's on that basis. A final decision has been delayed on the basis of conflicting results from a more recent study by the U.S. Geological Survey supporting subspecies designation for Preble's. Until such time as a final decision to delist Preble's takes place, it remains fully protected under the ESA. If the Service delists Preble's it would likely remain listed by the State. Regardless of listing status it represents a rare species whose presence is a good indicator of quality riparian habitat.

Federally-listed Platte River Program Species Downstream of the Project Area

Habitat loss and degradation of the Platte River ecosystem in Nebraska have contributed to concerns for the continued existence of the federally-listed whooping crane, *Grus americana*, piping plover, *Charadrius melodus*, interior least tern *Sterna antillarum*, and pallid sturgeon *Scaphirhynchus albus*.

Maps of the Fort Kearney to Grand Island, Nebraska area produced in 1847 indicate extensive areas of wetlands, "sloughs," and "bayous" in the Platte River valley. However, in the past century, both springtime discharges and wet meadow acreage have decreased substantially. As a consequence of a reduction in base flow and magnitude of spring discharges during the past 80 years, woody vegetation has increased dramatically along the

Platte River. Presently, much of the former river channel is dominated by woodlands and surrounded by croplands.

The severity and extent of habitat degradation and destruction existing within the Platte River valley ecosystem has resulted principally from development of Platte River basin water resources. Thus, while the Platte River in Nebraska is beyond the designated project area, any depletions resulting from the Chatfield Reservoir reallocation may affect these species and their habitat.

Bald Eagle in the Project Area

The federally-threatened bald eagle (*Haliaeetus leucocephalus*) winters in Colorado in significant numbers and is an increasingly common breeder in the State. The Colorado Division of Wildlife (CDOW) has conducted aerial midwinter counts of bald eagles since 1981. From the low count of 418 eagles in 1981, the number of wintering eagles increased steadily through the 1980's to the early 1990's. Since 1992, the number of wintering eagles has varied substantially but has not shown any apparent trend, averaging 887 eagles, ranging from a high count of 1235 in 1994 to a low count of 595 in 2001. Winter habitat includes roost trees along rivers and other large open bodies of ice-free waters that allow access to fish and forested night roosts in sheltered areas. The bald eagle is a regular winter visitor to Chatfield Reservoir and is often seen perched on trees along the shoreline or standing on the ice. Principal eagle food resources available in the project area include fish, waterfowl, and prairie dogs.

The Colorado breeding bald eagle population has increased substantially over the last 30 years, and the increase appears to be continuing. In 1974 there was one known nesting pair within the State. There are currently 87 described bald eagle nest sites in Colorado, 79 of which are considered active. Roughly 75% of known active sites are occupied in any given year so around 60 sites are currently occupied in Colorado. Roughly one-third of the breeding sites are found east of the Continental Divide within the South Platte River watershed. Typical nesting sites include trees on reservoir edges, cottonwoods along rivers, and conifers near lakes or streams.

A bald eagle nest was present in 2004 at South Platte Park, north of Chatfield Sate Park. Successful breeding did not occur. In 2005 great-horned owls occupied the nest. In 2005, bald eagles built a nest along the Highline Canal just south of Chatfield State Park. The nesting attempt was abandoned. It is highly likely that bald eagles will continue to attempt nesting in the vicinity of Chatfield Reservoir, though specific sites are difficult to predict.

In 1999 the Service proposed a rule to remove the bald eagle from the list of threatened and endangered species (64 FR 47755). Should the Bald Eagle be removed from the list it will remain protected under the provisions of the Bald and Golden Eagle Protection Act (16 U.S.C. 668) and the Migratory Bird Treaty Act (16 U.S.C. 703-712).

Other Federally-listed Threatened and Endangered Species

Other federally-listed threatened or endangered species are unlikely to regularly reside within the project area. However, highly migratory species such as the piping plover and interior least tern can occur at Chatfield Reservoir in migration.

Chatfield is within the potential range of two listed plants. The federally-threatened Ute-ladies' tresses orchid (*Spiranthes diluvialis*) occurs in portions of the South Platte River drainage. This orchid is found in seasonally moist soils and wet meadows near springs, lakes, or perennial streams and their associated floodplains below 6,500 feet. 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. The federally-threatened Colorado butterfly plant (*Gaura neomexicana coloradensis*) is endemic to southeastern Wyoming, western Nebraska, and northeastern Colorado, including Boulder, Douglas, Larimer, and Weld counties in Colorado. This short-lived, perennial herb grows in moist soils in meadows of floodplain areas. Surveys for the Ute-ladies tresses orchid within appropriate habitats in the project area were conducted in 1998, 2004, and 2005. Surveys for Colorado butterfly plant within appropriate habitats were conducted in 2004 and 2005. Presence of neither species has been confirmed (Burns and McDonnell 1998, Tetra Tech 2006). The Service issued a positive 90-Day finding on a petition to delist the Ute Ladies'-Tresses Orchid and initiated a 5-year review of species status in 2004 (69 FR 60605). A 12-month finding on the petition is anticipated shortly.

The greenback cutthroat trout (*Oncorhynchus clarki stomias*) is both a federally- and state-listed threatened species. This species inhabits clear, cold streams and lakes. It requires clean gravel substrates for its spring spawning. Historically, the range of the greenback cutthroat trout likely included large portions of the South Platte River within the project area. The current distribution is limited to streams and lakes in the headwaters of the drainage. The greenback cutthroat trout does not occur within the project area.

Among other federally-listed species, the endangered Black-footed ferret (*Mustela nigripes*) is currently not known to exist in eastern Colorado. The threatened Canada lynx (*Lynx Canadensis*) is largely limited to high-elevation boreal forest. The threatened Mexican spotted owl (*Strix occidentalis lucid*) and Pawnee mountain skipper (*Hesperia leonardus Montana*) are known within the South Platte basin only from higher-elevation mountainous sites.

Colorado Species of Conservation Concern

Tetra Tech (2006) summarized the following species of concern identified on the Colorado Listing of Endangered, Threatened and Wildlife Species of Special Concern and those tracked by the Colorado Natural Heritage Program (CNHP), that are potentially present in the project area.

The black-tailed prairie dog, (*Cynomys ludovicianus*), is a Colorado species of special concern. A small prairie dog town is reported present within the project area, southeast of the model airplane flying field at Chatfield State Park.

Among birds, the ferruginous hawk, *Buteo regalis,* a Colorado species of special concern, occupies grasslands and shrub communities where it nests in isolated trees, on rock outcrops and structures such as windmills and power poles, or on the ground. Ferruginous hawks tend to be most numerous where black-tailed prairie dog towns are plentiful. This hawk occasionally occurs in the project area in migration and as a winter resident. The white pelican, *Pelecanus erythrorhynchos,* a Colorado species of special concern, is a common migrant and summer resident in eastern Colorado. Through the warm months of the year, Chatfield Reservoir supports a population of non-breeding pelicans. Other migratory birds of State concern potentially present in the project area, but which more rarely occur, include the State-threatened burrowing owl (*Athene cunicularia*), and species of special concern including sandhill crane (*Grus canadensis*), peregrine falcon (*Falco peregrinus*), snowy plover (*Charadirus alexandrinus*), and mountain plover (*Charadrius montanus*).

The northern leopard frog, *Rana pipiens*, is a Colorado species of special concern that can be found in wet areas including marshes, streams, and the shorelines of lakes. The distribution of the northern leopard frog includes portions of Jefferson, Douglas, and Arapahoe counties, and it is known to exist in the project area.

Distribution of the Iowa darter *Etheostoma exile,* a Colorado species of special concern in Colorado, is limited to a few streams, including Plum Creek and the South Platte River. Characteristic habitat includes cool, clear water over a sand or organic matter substrate. This species is known within the project area in the South Platte River downstream from Chatfield Reservoir. The northern redbelly dace, *Phoxinus eos*, a State endangered species, and the common shiner, *Notropis cornutus,* a State threatened species, were both historically more widespread in the South Platte River drainage but current distribution appears limited to the upper reaches of Plum Creek. The characteristic habitat of the dace is slow-flowing streams with abundant vegetation. The shiner is found in small, less-turbid streams along the foothills. The stream areas from which these species are currently known are well upstream from Chatfield Reservoir and these species are not expected to occur within the project area.

The Moss' elfin butterfly *Callophrys mossii schryveri*, a species tracked by CNHP, occupies the foothills and lower montane canyons between 6,000 and 8,000 feet from Larimer County south to Pueblo County. The CNHP database identifies the Moss' elfin as being found along the South Platte River just south of Chatfield Reservoir. The species is highly dependent on its host plant, stonecrop (*Sedum lanceolatum*). Marginal habitat for this plant species occurs within the project area, so the butterfly may be present.

Species known to exist in the project area or that seem likely to be present include two plants tracked by CNHP, American currant (*Ribes americanum*) and forktip three-awn (*Aristida basiramea*). While not confirmed present within the project area, the American currant potentially occurs at Chatfield State Park since suitable habitat exists and a known population is located nearby. CNHP indicates that forktip three-awn has been identified in Jefferson

County in the vicinity of Chatfield Reservoir and the South Platte River; therefore, it too has potential to occur within the project area.

Migratory Birds

The project area supports a host of resident and migratory bird species including waterfowl, shorebirds, wading birds, raptors, and neotropical songbirds. For Chatfield State Park, data on bird presence includes Christmas Bird Counts, field trip reports, waterfowl censuses, and breeding bird point counts. Well over 200 species regularly occur within the project area. Chatfield State Park and South Platte Park (a 650-acre municipal park just downstream of Chatfield Reservoir), have been designated Important Bird Areas by the National Audubon Society. The program recognizes sites of unique importance to one or more species of birds.

Chatfield Reservoir attracts a range of water birds throughout the year, with maximum use in spring and fall migration. A colonial bird rookery at Chatfield Reservoir that supported nesting great blue herons (*Ardea herodias*) and double-crested cormorants (*Phalarocorax auritus*) has been abandoned for the last two years.

Wetlands and riparian forests at Chatfield State Park associated with the South Platte River and Plum Creek floodplains provide ideal breeding habitat for many bird species including neotropical migrants such as western wood peewee (*Contopus sordidulus*), warbling vireo (*Vireo gilvus*), house wren (*Troglodytes aedon*), yellow-breasted chat (*Icteria virens*), and yellow warbler (*Dendroica petechia*). These areas also support breeding of species relatively uncommon in the State including the American redstart (*Setophaga ruticilla*) and least flycatcher (*Empidonax minimus*).

In addition to federally-listed as threatened or endangered bird species discussed above, the Service has identified bird species of conservation concern and in greatest need of conservation action, by region. Among those listed in Service Region 6, the Mountain-Prairie Region, that have been confirmed to occur within the project area (Tetra Tech 2006) are:

Northern harrier *Circus cyaneus*
Swainson's hawk *Buteo swainsoni*
Ferruginous hawk *Buteo regalis*
Golden eagle *Aquila chrysaetos*
Peregrine falcon *Falco peregrinus*
Prairie falcon *Falco mexicanus*
Solitary sandpiper *Tringa solitaria*
Upland sandpiper *Bartramia longicauda*
Long-billed curlew *Numenius americanus*
Marbled godwit *Limosa fedoa*
Wilson's phalarope *Phalaropus tricolor*
Short-eared owl *Asio flammeus*
Lewis' woodpecker *Melanerpes lewis*
Red-headed woodpecker *Melanerpes erythrocephalus*

Loggerhead shrike *Lanius ludovicianus*
Virginia's warbler *Vermivora virginiae*
Cassin's sparrow *Aimophila cassinii*
Brewer's sparrow *Spizella breweri*
Grasshopper sparrow *Ammodramus savannarum*

All of the species above are migratory and could seasonally be found in the project area. However, only Swainson's hawk is likely to breed regularly in the project area.

Downstream of the Chatfield Dam, with the exception of South Platte Park, the riparian corridor is largely impinged upon by development through Denver. While land bird diversity is reduced, the river and nearby aggregate pits provide wintering habitat for a variety of migratory waterfowl. In winter a variety of geese and ducks use the South Platte, where water stays open when nearby lakes are frozen. Johnson et al. (1993) found highest numbers of northern shoveler (*Anas clypeata*), gadwall (*Anas strepera*), and mallard (*Anas platychychos*) using the South Platte River, and that dabbling ducks and diving ducks preferred different river habitats. Beyond Denver, to the Adams County/Weld County line, the flood plain is less urbanized and provides habitat for a wider range of bird species.

Mammals, Reptiles, and Amphibians

Common mammals at Chatfield State Park include mule deer (*Odocoileus hemionus*) and white-tailed deer (*Odocoileus virginianus*). Elk (*Cervus elaphus*) also occur in the park, as well as occasional black bear (*Ursus americanus*) and mountain lions (*Felis concolor*). Coyotes (*Canis latrans*), raccoons (*Procyon lotor*), and various small mammals are also present. Reptiles and amphibians include painted turtle (*Chrysemys picta*), bullsnake (*Pituophis canenifer*), and bullfrog (*Rana catesbeiana*). Tetra Tech (2006) listed a total of 49 mammals,12 reptiles and 6 amphibians as occurring in the project area.

Aquatic Resources, Fish/Fisheries

Aquatic resources in the project area include: Chatfield Reservoir; the South Platte River, both upstream and downstream of the reservoir; the major tributaries, Plum Creek and Deer Creek in Chatfield State Park; and ponds occurring upstream of the reservoir and west of the South Platte River.

Chatfield Reservoir, located between the cold-water region of the Rocky Mountains and the warm-water region of the Great Plains, currently covers about 1,479 acres of open water. The reservoir has a maximum depth of 45 to 50 feet and on average is 24 feet deep. The range in reservoir water levels between years has been substantial in the past; for example, 22 feet of variation between high and low water levels occurred from 1981 to 1983. A maximum 9-foot annual range in water levels is the current management goal. During the 20 years from 1976 to 1996, this goal was met approximately 80 percent of the time. Monthly, the average range in water levels is less than 3 feet.

Chatfield Reservoir is suitable to cold-water species as well as cool- and warm-water species. The reservoir has a state designation of Class I for recreation and coldwater aquatic life. The Class I coldwater aquatic life designation defines acceptable water quality conditions, flow conditions, and bed material for coldwater aquatic species. Waters with this designation are capable of sustaining a wide variety of coldwater biota, including sensitive species, and have a goal of no substantial impairment of the abundance and diversity of species. While the reservoir has been generally considered to have good water quality, it is slightly eutrophic because of elevated phosphorus levels.

A short segment of the South Platte River just below the reservoir, in Littleton, is also a cold-water habitat. The South Platte River stretching from below Littleton to the Weld County line is considered a warm-water stream. This reach has been significantly altered through the Denver metropolitan area by control of flows, channelization, and reduction in channel and floodplain width. Gravel mining operations and flood-control measures, have resulted in a lack of stream sinuosity. Streamside vegetation though the metropolitan area consists of mostly non-native plants. Except during periods of high rainfall or snowmelt, low flows occur for most the year in the 18-mile river reach of the lower South Platte River that stretches from Chatfield Reservoir to Cherry Creek. These low flows are partially the result of water diversions upstream. During times when no water is released from the Chatfield Reservoir or when upstream diversions remove all water, portions of this reach can be dry or be only minimally maintained from groundwater inputs or dam leakage. Downstream of the confluence with Cherry Creek flows are generally more persistent.

Plum Creek and Deer Creek both have variable flows. Plum Creek in the project area is braided, with few pools offering quality fish habitat. It is often dry in the summer and fall seasons. Deer Creek is a small creek that is mostly dry in the summer season.

The South Platte River upstream of the reservoir is a cold-water stream that has retained good riparian habitats and other characteristics suitable for trout species. The dam at Strontia Springs Reservoir, 6 miles upstream of the Chatfield Reservoir, partially controls flows in this reach. Releases at the Stronia Springs dam maintain both minimum winter and summer flows.

Fish Communities/Fisheries

Approximately 38 species of fish are present or were formerly present in the project area. Due to human development in the project area, many native fish have declined or are no longer present. Chatfield Reservoir supports a variety of introduced gamefish. Appendix A, adapted from Tetra Tech (2006), shows fish species potentially present in the project area and upstream.

Sport fishing is a popular recreational activity in the project area, especially at Chatfield Reservoir. Game fish in the Chatfield Reservoir and the South Platte River upstream or the reservoir include walleye, rainbow trout, brook trout, cutthroat trout, yellow perch, tiger muskie, smallmouth bass, crappie, sunfishes, and channel catfish. Important forage fish that support game fish in Chatfield Reservoir include gizzard shad and spottail shiner. CDOW

fisheries management efforts are directed towards enhancing both walleye and smallmouth bass fisheries at Chatfield State Park. CDOW collects walleye eggs from Chatfield Reservoir for walleye stocking occurring statewide. Walleye in the reservoir spawn in the spring in gravel areas along the eastern shoreline of the South Platte River where it meets the reservoir and also in the riprap at the reservoir dam. The smallmouth bass in the reservoir and in ponds upstream in Chatfield State Park spawn in water 1 to 3 feet deep in the rocky regions along the dam face and shoreline areas with cobble substrates.

The habitat of the lower South Platte River reach from Chatfield Dam to the Denver/Adams County line changes from cold-water to warm-water conditions. Relatively cool water temperatures occur in the upstream portion of the reach due to releases of cold water from the reservoir and from the presence of a riparian greenbelt in some areas. While this upstream portion of the reach has a more diverse and abundant fish and invertebrate community, it suffers from lack of structural diversity, including deeper pools, and in places is impacted by siltation. Downstream from Chatfield Reservoir to Bear Creek (the first approximately 7 miles below the dam) subcatchable (4 – 5 inch) brown trout have been stocked by CDOW and have grown to maturity where conditions are favorable (Paul Winkle, CDOW, pers. comm., 2005).

In the warmer conditions occurring downstream through Denver, low flows result in little useable habitat for warm-water game fish. Those species occasionally present including carp, black bullhead, largemouth bass, channel catfish, yellow perch, and green sunfish (Instream Issues Task Force 1996, Corps 2000). Below the Cherry Creek confluence and extending to the Weld County line, flows are generally greater and warm-water conditions result in a fish community dominated by sunfish, suckers, and minnows.

The South Platte River above the reservoir and extending upstream of the project area supports cold-water habitats that contain cold-water game fish such as rainbow, brown and some cutthroat trout. Also occurring are white sucker, longnose sucker, and longnose dace. The other reservoir tributaries, Plum Creek and Deer Creek, described above, are limited in flows and in quality of game fish habitats.

Water Quality

All surface waters of Colorado are also subject to U.S. Environmental Protection Agency (EPA) approved basic standards for surface waters. Water quality in the project area is regulated by Section 304 (a)(1) of the Clean Water Act of 1972 that requires water quality criteria for pollutants and organoleptic effects set by the EPA be met. Water quality within the project area is also subject to State water quality standards. The water quality management agency for the Chatfield Reservoir watershed is the Chatfield Watershed Authority, which manages point source (wastewater treatment) and prohibited nonpoint sources of pollution.

In 1980 the total maximum daily loads for phosphorous standards used to monitor water quality were established for Chatfield Reservoir. These standards are updated every 3 years. In 1984, a study of the water quality in Chatfield Reservoir indicated potential problems.

More recent data has also indicated somewhat eutrophic conditions, thought to be a result of elevated phosphorous levels. Most the phosphorous entering the reservoir originates in the Plum Creek basin. Runoff entering Chatfield Reservoir from ever-increasing urbanized areas results in both phosphorous and nitrogen loading.

Wetlands/Riparian Woodlands/Uplands

Tetra Tech (2006) described six vegetation community types within the project area including shortgrass steppe, shrubland, riparian, wetlands, weedy/disturbed, and landscape plantings. Of these, wetlands and riparian communities provide the greatest support for fish and wildlife. The majority of natural wetlands and riparian communities at Chatfield State Park occur adjacent to Plum Creek, and the South Platte River both above and below the reservoir. Others occur along the southwestern shoreline of the reservoir, in limited areas along Deer Creek. These two communities overlap, with wetlands representing a subset of wider riparian corridors that are largely dominated by trees and shrubs. Trees species include plains cottonwood (*Populus deltoides*), peachleaf willow (*Salix amygdloides*), boxelder (*Acer negundo*), green ash (*Fraxinus pennsylvanica*), and narrowleaf cottonwood (*Populus angustifolia*). The shrub layer includes coyote willow (*Salix exigua*), snowberry (*Symphocarpos occidentalis*), redtwig dogwood (*Cornus stolonifera*), and golden currant (*Ribes aureum*). In places the understory is dominated by varied herbaceous vegetation including weed species. Wetland and riparian communities are also present along the South Platte River downstream of Chatfield Reservoir. Through the urbanized Denver metropolitan reach, riparian vegetation consists of mostly non-native species, with Siberian elm (*Ulmus pumila*) and Russian olive (*Elaeagnus angustifolia)* often dominant. At South Platte Park and downstream of Denver more substantial and somewhat more natural wetland and riparian communities exist.

Based on the classification of wetlands developed by Cowardin et al. (1979), project area wetlands including riverine, palustrine, and lacustrine sytems. Riverine systems in the project area are predominantly slow-flowing waters associated with the South Platte River and Plum Creek. Palustrine systems consist of forested wetlands dominated by trees, scrub/shrub wetlands dominated by shrubs, and emergent wetlands dominated by non-woody species. Palustrine wetlands are found in association with the floodplains of Plum Creek, Deer Creek, and the South Platte River upstream of Chatfield Reservoir, and to a more limited extent along the South Platte River downstream of the reservoir. In addition to naturally-occurring wetlands, approximately 20 acres of palustrine wetlands have been created in Chatfield State Park upstream of the reservoir and west of the South Platte River through a partnership of the Corps and various groups. Lacustrine systems include wetlands and deepwater habitats lacking trees, shrubs, and persistent emergents that are larger than 20 acres in size. Chatfield Reservoir is categorized as a lacustrine system, as are the ponds upstream within Chatfield State Park.

Wetland and riparian communities within the project area are important for wildlife including migratory birds. Approximately 75% of the wildlife species known or likely to occur in

Colorado are dependent on riparian areas during all or a portion of their life cycle. This is especially significant since riparian areas make less than 3 percent of the land mass in Colorado.

The four other vegetative community types identified by Tetra Tech (shortgrass steppe, shrubland, weedy/disturbed, and landscape plantings) are of significantly less value in supporting fish and wildlife resources. Of these, the shortgrass steppe community comprises the largest acreage within the project area, occurring throughout the rolling hills and flat plateaus surrounding Chatfield Reservoir. Species typical within this community type include blue grama (*Bouteloua gracilis*), buffalograss (*Buchloe dactyloides*), and western wheatgrass (*Agropyron smithii.* Shrubland communities occupy limited portions of the project area and include a mountain mahogany (*Cercocarpos montanus*) community west of Chatfield Reservoir, and a mixed deciduous shrubland community in swales, and north- and west-facing hillsides south of the reservoir. Weedy and disturbed areas exist along the roadways, campgrounds, marina, and shorelines within the project area. Landscape plantings, both native and non-native, have been added to the campgrounds and surrounding recreation areas at Chatfield State Park, and along trails and in parks along the South Platte River below Chatfield Reservoir.

ALTERNATIVES UNDER CONSIDERATION

The Corps operates the Chatfield Reservoir to provide flood protection for the greater metropolitan area. The Corps is conducting a feasibility study to reassign a portion of the storage space in the reservoir to joint flood control/conservation purposes, including storage for municipal and industrial water supply, agriculture, and recreation and fishery habitat protection and enhancement. The reallocated storage space within Chatfield Reservoir would be used by those with existing water rights. The Colorado Water Conservation Board requested that the Corps consider reallocating additional storage capacity to accommodate additional conservation use by its consortium of users in the greater Denver metropolitan area.

Under proposed alternatives, operational changes would raise the current multipurpose pool level of 5,432 feet by 12 feet (to 5,444 feet) providing storage of an additional 20,600 acre-feet of water or raise it 7 feet (to 5,439 feet) providing storage of an additional 7,700 acre-feet of water. A third alternative, the "no action" alternative, would leave the operational pool at its current level, resulting in no increased water storage capacity. An antecedent flood study, currently undergoing review, will assess whether such operational changes are consistent with flood protection functions of Chatfield Reservoir.

An earlier alternative to raise the conservation pool by 2 feet (to 5,434 feet), with increased water storage of 2,900 acre-feet, has been dropped. An option that would raise the level somewhere between 7 feet and 12 feet has been discussed, but is not a currently identified alternative. Scoping comments included a suggestion that dredging of the reservoir bottom should be considered as an alternative way of increasing water storage, but this is not an identified alternative. Other alternatives that have been suggested included water conservation, water reuse, or water storage in alternative off-channel reservoirs.

Operational scenarios for the two action alternatives (that raise the multipurpose pool level) are being developed. Timing and rates of reservoir filling and drawdown are being modeled based on information being developed by proposed water users and the Colorado Water Conservation Board.

IMPACTS

General

Impacts from proposed alternatives include those at Chatfield State Park, downstream of Chatfield Reservoir within the project area, and downstream and potentially upstream of the project area within the South Platte River and Plum Creek drainages.

Impacts of the two action alternatives are generally, but not specifically known, since operations models of storage utilization by water users (using projected inflow and outflow data based on their existing, sometimes junior, water rights) are still being developed. Results of operational models will inform assessment of environmental impacts. Impacts of the 5,439-foot and 5,444-foot alternatives vary mostly by degree. In the following discussion, impacts of the larger rise will be highlighted.

The capture, release, and use of water under an increased multipurpose pool level has the potential to affect not only water levels at Chatfield Reservoir but also flows downstream in the South Platte River and, less directly, flows upstream in the South Platte River and in Plum Creek outside of the project area. Current fluctuations in water level at Chatfield Reservoir based on Denver Water use of its existing storage capacity are managed in an attempt not to exceed approximately 9 vertical feet annually, with variations even further constrained in the recreation season, Memorial Day to Labor Day. Under the 5,444 foot alternative (a rise of 12 feet), regular annually fluctuations could increase to as much as 21 vertical feet (10/21/05 Chatfield Reservoir Reallocation Study Group meeting). The potential impacts of this alternative would be greatly dependent on the frequency, duration, and seasonality of storage above the current multipurpose pool level, as well as the rate of filling and withdrawal. While it is estimated that existing water rights would allow filling to the 5,444-foot level an average of only once every 3 to 4 years, it can generally be assumed that all vegetation currently present below 5,444 feet would be killed with repeated water level rises. Wave action and soil saturation could further impact vegetation above this level. While the difference in total area of inundation between the current pool level and 5,444-foot alternative has not been calculated, by an early estimate, potential Preble's habitat alone could suffer approximately 200 acres of inundation in the South Platte River and Plum Creek (Tom Ryan, Ottertail, pers. comm., 2005).

An additional complexity results from periodic rises in water level related to Chatfield Reservoir's flood control function. Such events occur infrequently, but would raise water levels above a potential base as high as 5,444 feet, rather than the current base of 5,432 feet. The potential for increased frequency of inundation for various levels above 5,444 feet also is yet undetermined for various flood scenarios.

Specifics of utilization of additional storage capacity will determine effect on flows below Chatfield Reservoir. Capture of up to 20,600 acre-feet appears to have the potential to decrease existing flows and alter timing of flows downstream. However, water stored and later released to downstream users has potential to temporarily augment flows.

Since roads and recreational facilities would be displaced as a result of the action alternatives, additional impacts to vegetative communities and wildlife habitats may result from development of relocated facilities.

The potential for secondary impacts from additional storage capacity to flows upstream of the project 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 new capacity at Chatfield Reservoir and potentially by other entities such as Denver Water. The Service has little information on which to predict any such impacts, but potential for impact from flow changes upstream of the project area, from all alternatives including the no action alternative, should be examined.

Under the no action alternative water users would continue to pursue a number of different alternatives within the drainage including alternate storage in existing or new reservoirs, storage in lined aggregate mining pits, water reuse, increased drilling and use of wells, trades, and conservation measures to lessen demand. It is beyond the scope of this report to assess how these options may play out. Suffice to say, future water demands will dictate alterations in current flow patterns in the South Platte River through the project area both with or without increased storage capacity in Chatfield Reservoir.

The currently proposed Denver Water pump installation project at Chatfield Reservoir, while unrelated to the reallocation project, could significantly alter the baseline conditions both at Chatfield Reservoir and downstream by lowering reservoir levels in times of drought. Due to potential for even greater variation in pool level at the reservoir, cumulative effects of the two projects combined could be significantly greater than either project alone.

Given the complexities above, details of project impacts from the 5,444-foot or 5,439-foot alternatives, and of the no action alternative, are somewhat speculative. The following provides potential effects of the identified alternatives on fish and wildlife resources.

Federally-listed Threatened and Endangered Species

Preble's Meadow Jumping Mouse

The proposed increase the multipurpose pool level to 5,444 feet would result in potential inundation of perhaps 200 acres of Preble's habitat. Much of the area potentially inundated is diverse, multistory riparian forest habitat. A significant portion of the area inundated would include designated critical habitat for the Preble's located along the South Platte River upstream of Chatfield Reservoir.

The increased storage alternatives would affect Preble's present in the area in two ways, directly as water rises, and indirectly through alteration of existing habitat. Initial and subsequent rise in water to the multipurpose pool level could, depending on season and rate of rise, drown hibernating adult Preble's or young Preble's in maternal nests, or displace mice as water rises. Preble's swim well and it is unlikely that active adults or self-sufficient young would drown. However, it is uncertain whether displaced animals would successfully establish new home ranges in adjacent habitat presumably occupied by other Preble's and other rodent species. It should be noted that current increases in water level associated with flood events can have similar direct impact to Preble's.

Since storage to the increased multipurpose pool level appears unlikely to be achieved annually, exposed shoreline areas below the multipurpose pool level could develop vegetation acceptable for Preble's use during intervening years. If so, subsequent rises in water level could cause similar impacts as the initial rise. A likely scenario is that exposed shoreline areas would prove barren or weedy and inhospitable to the Preble's. In such a case, these areas would be permanently lost as Preble's habitat but subsequent rises in water level would have little additional direct impact to Preble's.

Since little is know of the numbers or distribution of Preble's in the area, the specific quantity of habitat to be impacted, and of that which would remain, potential overall impacts of an increased pool level to the survival of Preble's populations currently present along the South Platte River and Plum Creek are currently unknown. Logically, the 5,439 foot alternative would appear to have significantly less impact than the 5,444 foot alternative; however, area of habitat inundated has not been determined for either alternative.

Any alteration in flow patterns upstream on the South Platte River and Plum Creek resulting from increased storage could positively or negatively affect Preble's habitat in these drainages. Since Preble's is not currently known to be present downstream of Chatfield Reservoir to the Adams County/Weld County line, changes in downstream flow are not likely to affect the Preble's.

Under the no action alternative, conditions in the project area for Preble's are likely to remain generally unchanged into the future, dependent on nature and extent of future water manipulation in the basin. Storage alternatives pursued by water users may affect flows upstream of and through the project area. Gradual maturation of cottonwoods and other trees within Preble's habitat may increase shading and reduce ground level cover favored by Preble's. Factors that set back vegetative succession (fire, flood, disease) could effect habitat both positively or negatively for Preble's.

Federally-listed Platte River Program Species

For more than two decades, the Service has consistently taken the position that Federal agency actions resulting in water depletions to the Platte River system may jeopardize the continued existence of one or more federally-listed threatened or endangered species (whooping crane, piping plover, interior least tern, and pallid sturgeon) and adversely modify designated critical habitat. Historic and new depletions to Platte River flows associated with

implementation of the action alternatives will need to be described and estimated (see the Mitigative Measures/Opportunities section below).

Bald Eagle

Under increased multipurpose pool levels, the greatest potential for impacts to the bald eagle would result from greater variation in water levels and any resultant impacts on eagle prey, principally fish and wintering waterfowl. At this point it is not clear whether prey populations and use of the project area would be affected either positively or negatively, or whether fish or waterfowl could become more available to eagles directly or through other forms of mortality.

Death of mature trees in inundated areas could, in the short term, provide more available snags along shorelines, but ultimately would decrease shoreline perches as trees decay. Some potential nesting trees may be lost but, based on trends of increased nesting in the Front Range corridor, chances of future bald eagles breeding in the area would likely increase over all alternatives.

Other Federally-listed Threatened and Endangered Species

Since other federally-listed species are not known to regularly use the project area, it is unlikely that alternatives being considered would affect additional species. The least tern is listed as "known to occur" at Chatfield Reservoir (Tetra Tech 2006) and the piping plover has been reported there. Any change in use of the reservoir by these species would likely be based on future regional population trends of these birds, though the greater extent of exposed shoreline periodically created in conjunction with increased multipurpose pool levels could be attractive to piping plovers.

Under all alternatives it is unlikely that federally-listed plant species not currently present would colonize the project area. Periodic future surveys in appropriate habitat for the Ute-ladies' tresses orchid and Colorado butterfly plant may be worthwhile.

Colorado Species of Conservation Concern

Of species believed present in the project area, water-dependent species such as the northern leopard frog and white pelican appear most likely to be affected by any increase in the multipurpose pool level. Frog habitat within areas affected by pool level increases would be at least temporarily lost. Greater variation in water levels may permanently affect wetland or shoreline habitat used by the frogs. Much as with eagles, white pelicans may be impacted if prey abundance (in this case fish populations) and availability are affected. More exposed shoreline habitat at a variety of water levels may increase loafing and roosting sites for pelicans.

The black-tailed prairie dog and the ferruginous hawk, both species dependent on open upland habitats, are unlikely to be directly affected by increases to the multipurpose pool level and marginal inundation of their preferred habitat. But since roads and recreational

facilities may be relocated with increased pool levels, there appears potential that upland habitat on which these species depend could be secondarily impacted.

The Iowa darter likely inhabits the South Platte River in the area of Chatfield Reservoir. Changes in flows, water temperature, or water quality could significantly impact the darter.

The northern redbelly dace and the common shiner are present in the upper reaches of Plum Creek (as is the Iowa darter). Since these reaches are well upstream, only secondary impacts associated with flow alterations outside of the project area would be of concern.

Migratory Birds

Potential impacts to migratory birds stemming from the action alternatives are mostly limited to Chatfield State Park and can largely be divided between those affecting water birds and those affecting terrestrial species. Changes to their fish and invertebrate prey base seem most likely to affect water bird use. It is unclear if or how an increase in water levels or increased range of water levels would affect these prey items. Gulls, terns, waterfowl, pelicans, cormorants and other species are supported by loafing and roosting areas that are largely removed from human activity. Currently the spit near the marina serves this function at a normal range of water levels. Given potential increases in water levels associated with the action alternatives this area may be inundated or reconfigured along with changes to the marina.

Ground nesting along shorelines by Canada geese (*Branta canadensis*), mallards, other waterfowl, and shorebirds including spotted sandpiper (*Actitis macularia*) currently occurs at the reservoir. Increases in water levels during the nesting season could inundate nests. Changes to vegetation, especially the creation of a wide sterile beach area surrounding the reservoir, could remove protective cover important to some nesters.

The frequency, extent, and seasonality of exposed shoreline substrate supporting macroinvertebrates will in part dictate whether shorebirds (sandpipers, plovers, etc.) will be positively or negatively affected by action alternatives. As is currently the case, low-gradient shorelines composed of fine sediments, such as the Plum Creek "delta," are most likely to support shorebird feeding. Any changes in the abundance and availability of shoreline invertebrates, especially during spring and fall migration, may positively of negatively affect reservoir use by shorebirds.

A concern has arisen regarding potential for increased bird use to result in water quality issues, especially increased bacterial counts in the beach area. While resident Canada geese would likely contribute most to the problem, large concentrations of other species in limited areas such as loafing and roosting sites may be an issue.

Among terrestrial species, including neotropical migrants, the loss of palustrine wetlands and riparian communities through repeated inundation would cause the greatest impacts. A significant area of mature woodlands would be impacted under the action alternatives, especially near the mouths of the South Platte River and Plum Creek. Inundated trees, if left

standing, may provide temporary habitat for woodpeckers and other cavity nesters. Overall, terrestrial birds, especially inner forest breeders, would be adversely impacted by action alternatives.

Significant impacts to migratory birds downstream from Chatfield Reservoir would appear unlikely. Should flow regimes downstream be affected, limited beneficial or adverse impact to water birds may result, primarily through any changes on food availability.

Mammals, reptiles, and amphibians would likely lose habitat through inundation at Chatfield State Park. Those dependent on palustrine wetland and riparian forest would be most greatly impacted.

Aquatic Resources, Fish/Fisheries

The seasonality, frequency, rate, and degree of water level change could be either beneficial or detrimental to fish and the recreational fishery at Chatfield Reservoir. Shallow shoreline habitats are important to aquatic species. Action alternatives could alter the structure, substrate, vegetation, and overall habitat of shoreline areas. The timing of changes in water levels, and resulting availability of appropriate shallow water habitats, would affect aquatic species depending on their habitat requirements. For example, spawning season inundated trees and other "stucture" near shorelines may enhance nesting success of bass and sunfish. Increases or decreases to water levels could cause inundation or drying of appropriate spawning habitat in given years. Changes in water temperature and clarity brought on by changes in water levels can further affect spawning. Of particular concern is maintenance of appropriate conditions for walleye spawning near the dam in March and April and spawning of gizzard shad, an important forage fish, in shallows mostly in April and May (Paul Winkle, CDOW, pers. comm., 2005). Overall, stability of water levels would be better for fish spawning than changing levels. A quick drop in levels during spawning would prove most problematic.

Increased storage capacity and operational changes at Chatfield Reservoir could affect downstream flows, flooding patterns, channel features, water quality, and, in turn, fish populations and recreational opportunities (see Mitigative Measures/Opportunities below).

Water Quality

Tetra Tech is developing a scope of work for detailed studies to address whether and how proposed alternatives will affect water quality at Chatfield Reservoir. Principle concerns are impacts of increased lake volume on nutrients and algae (including issues of heightened levels of phosphorus and low dissolved oxygen), metals mobility under anoxic bottom conditions, and heightened bacteria levels related to possible increases in bird use of shallows and beach areas. Significant change in water quality within Chatfield Reservoir may have important implications for fish and recreational fisheries that the reservoir currently supports.

Independent of the Chatfield Reallocation study, Roxborough Park Metro District will construct a wastewater pipeline that, as early as 2007, will remove a treatment plant and

800,000 gallons a day of wastewater currently entering the South Platte River above Chatfield Reservoir. Significant reduction in phosphorus input will result.

Wetlands/Riparian Woodlands

Inundation to an increased multipurpose pool level would, over time kill existing vegetation below that level. Cottonwoods and willows are very tolerant of inundation and can likely survive inundation through portions of two or more growing seasons (Teskey and Hinckley 1978). While short-term inundation during the growing season could actually enhance growth of trees, repeated long-term inundation would harm and eventually kill these trees. Other plant species vary in their response to inundation, but on average can withstand only 1 to 3 months of growing season inundation before succumbing. In addition, soil saturation and wave action would impact vegetation above the multipurpose pool level. Species less tolerant of saturated soil would be most affected, with additional impacts most widespread on low gradient shoreline.

Increase to the multipurpose pool level would result in periodic increases in open water (lacustrine) habitat at the expense of riverine and palustrine systems. Increased variation in water levels would discourage wetland development in shallows of the reservoir.

Between periods of filling to the mulitipurpose pool level, a wide, barren "beach" area would potentially form with wind and wave action hampering establishment of vegetation. Weed species are most likely to become established. Where soil moisture is appropriate, cottonwoods will likely germinate. However, subsequent inundation would periodically kill any vegetation that becomes established below the multipurpose pool level. New cottonwoods may become established and persist at and just above the multipurpose pool level if sufficient soil moisture is maintained in years of low water levels, especially during their early development.

MITIGATIVE MEASURES/OPPORTUNITIES

At Chatfield State Park the most obvious and direct impacts would stem from action alternatives that would reallocate water storage to define a multipurpose pool level of 5,444 or 5,439 feet. Land clearing, grading, and relocation of existing roads and facilities should be planned to minimize impacts to fish and wildlife resources and their habitat.

Significant impact to valuable wildlife habitat, including areas supporting Preble's, seems inevitable under the action alternatives. Assuming that the Preble's remains listed under the ESA, further consultation with the Service regarding the effect of the project on Preble's and its critical habitat would be required. The consultation process would address means to limit impacts to Preble's and could result in project modification, for example through terms and conditions imposed through a biological opinion.

Much of the expansion of the multipurpose pool area, and presumably the relocation of most road and existing facilities would occur in the shortgrass steppe community that surrounds much of the reservoir. This community is widespread at Chatfield State Park and is of a

relatively low value to wildlife. Avoidance of impacts to this community and wildlife it supports could be achieved through planning relocation to minimize extent of disturbance and especially the degree of further fragmentation.

To help avoid impacts to wetlands and the riparian communities, the current road crossing location of the South Platte River (Kingfisher Bridge) should be maintained if feasible. If not, the crossing should be relocated to a site that minimizes new impacts to these communities. Any areas from which roads and facilities are moved that will not be inundated at the new multipurpose pool level are candidates for revegetation.

Below any new multipurpose pool level all existing vegetation would be ultimately killed, either through clearing or the eventual effects of inundation. Maintaining dying or dead trees would prove beneficial as potential roosting, feeding, and nesting sites for migratory birds and, in times of high water, could enhance productivity of shallows for breeding fish (including bass and sunfish), and serve as a nursery area for various fish species. However, clearing of vegetation prior to initial filling would likely be favored due to concerns that remaining organic material may impact water quality and that trees may interfere with recreational boating. Feasibility of leaving areas of standing trees or other stable structure below the new multipurpose pool level should be investigated.

As much as possible, any clearing of vegetation prior to initial filling to the new multipurpose pool level should be timed to avoid impacts to Preble's and other wildlife. Clearing of Preble's habitat during hibernation (September – May) could kill hibernating mice. Clearing during Preble's breeding (June – mid August) could disturb maternal nests. Clearing also should be timed to avoid impacts to nesting birds consistent with provisions of the Migratory Bird Treaty Act (16 U.S.C. 703-712 et seq.), which prohibits the taking, killing, possession, transportation and importation of migratory birds, their eggs, parts, and nests, except when specifically authorized by the Department of the Interior. The primary migratory bird nesting season extends from April 1 to July 15. While any extensive clearing will cause direct impact to wildlife, late summer may be the best time to clear vegetation in areas thought to support Preble's. To the extent that wildlife habitat, including nesting bird habitat, is present during initial and subsequent episodes of filling to the new multipurpose pool level, similar considerations may apply.

Operational plans for the reservoir should consider fish and wildlife values when addressing the range and rate of fluctuations in the water level. Providing some stability to water levels by minimizing rates of filling and draining would be most beneficial during spring and summer fish spawning. Seasonal manipulation of water levels could also prove beneficial to enhancing food resources along reservoir shorelines for shorebirds.

Opportunities may exist to enhance loafing and roosting sites for water birds including pelicans, gulls, terns, and shorebirds. Ideally, unvegetated spits or islands isolated from human disturbance, would be available at various water levels. Sites managed for birds should take potential for increased bacterial levels into account. Potential bird concentration areas should be actively discouraged in the vicinity of the swimming beach.

A significant challenge may exist in providing compensatory mitigation for unavoidable impacts to existing habitats, especially wetland and riparian communities that support Preble's and other wildlife. Consistent with Service mitigation policy (46 FR 7644), the Service considers most wetlands potentially impacted at Chatfield State Park to be of high value for wildlife and scarce in the region. The Service's goal is no net loss of in-kind habitat values. Under Service Region 6 wetland mitigation policy, compensatory mitigation through restoration or creation concurrent with impacts in forested and scrub-shrub wetlands should occur at a recommended ratio of no less than 2 to 1, and in emergent wetlands at a ratio of not less than 1.5 to 1, due to the time required to replace functions lost, inability to fully replicate functions performed by existing wetlands, and uncertainty that mitigation will function as planned. Similar ratios may be appropriate for compensatory mitigation for other important habitats that are lost, including additional Preble's habitat and high-quality migratory bird habitat such as the riparian communities. Efforts to minimize and offset adverse impacts to migratory birds should be employed consistent with the Executive Order 13186 (Responsibilities of Federal Agencies to Protect Migratory Birds).

The most desirable compensatory mitigation for any impacts at Chatfield State Park would be in kind (compensating for those habitats and values impacted) and at or near the site of impact. Temporary impacts can usually be mitigated on site. Opportunities to mitigate permanent impacts should generally occur as close as possible to the site of impact. Ideal would be in-kind mitigation that addresses wetland loss, Preble's habitat loss, and migratory bird habitat loss located at Chatfield State Park and adjacent to sites of impact. The cost of mitigation should not be underestimated. For example, CWCB minutes of May 31, 2001, estimated $15,000 to $30,000 an acre for mitigation of Preble's habitat lost. While we do not know the basis for the estimate, the cost of Preble's, wetland, or riparian mitigation could easily exceed these per-acre figures.

Suggestions of potential wetland and riparian enhancement at Chatfield State Park include expansion of these habitats in areas adjacent to where they are currently present. Appropriate hydrology and soils would be required to support wetland and riparian vegetation. Such sites may be currently limited in extent. The possibility of grading to an appropriate level relative to the water table could be explored. Water flow from the South Platte River and Plum Creek, and perhaps Deer Creek might be incorporated into mitigation design if these flows could be spread through diversions or slowed through check dams.

With reservoir levels often predicted to be well below the multipurpose pool level, flows from the South Platte River and Plum Creek will likely form a narrow channel where they flow across exposed reservoir bottom. The adjacent reservoir bottom, depending on gradient, may be well drained at low pool levels. Near the mouths of the South Platte River and Plum Creek, construction of low, long check dams on the reservoir bottom to a height at or just below the multipurpose pool level could enhance hydrology and support wetland development on the upstream side, while capturing sediment coming downstream. Ideally, when water levels rise to the multipurpose pool level, such areas would be subject to little additional inundation and not lose wetland vegetation that had developed. Location and design would need to avoid detrimental inundation of quality habitat above the multipurpose

pool level. The feasibility of such efforts, the extent of area that could be enhanced, and potential loss of reservoir capacity would need to be assessed.

Outside of Chatfield State Park, mitigation of wetlands and riparian habitats may be feasible along the South Platte River at South Platte Park or downstream through the Denver urban corridor, along Deer Creek on property of the Denver Botanical Gardens, or upstream at various locations on the South Platte River or Plum Creek. With the possible exception of upstream sites, mitigation at these sites would do little to address the loss to the contiguous wooded habitat corridor at Chatfield State Park or to mitigate for Preble's habitat loss.

One suggestion in scoping comments was planting of a 50-foot wide wooded habitat corridor between the South Platte River and Plum Creek along the Highline Canal, south of Chatfield State Park. While a travel corridor may have merit, existing hydrology would seem to limit its feasibility and value as wetland or riparian habitat mitigation.

A working group has been created to look at possible environmental enhancement of the South Platte River downstream within the project area (Chatfield Dam to the Weld County line) through strategic releases of water to downstream users of reallocated storage. Releases downstream at times of lowest flows could increase wetted surface, water depth, and velocity, influence water temperature, and enhance water quality.

Increased water or increased water velocities could benefit some fish species by increasing total habitat available, creating appropriate spawning habitat, and maintaining appropriate temperatures and water quality. In the reach immediate to Chatfield Reservoir targeted releases could also be used to flush away silt buildup and maintain gravel substrate that could enhance the trout fishery. Manipulation of downstream flows may provide benefits to aquatic and terrestrial species in the river corridor through some increase in riverine, backwater, wetland, and floodplain habitats.

The enhancement of downstream flows would be of greatest benefit to aquatic and terrestrial species if provided in conjunction with activities such as the: 1) creation of instream structure including boulders and large woody debris; 2) increased habitat complexity, pool-riffle-run structure, reduced stream channelization, and creation of point bars; 3) elimination of existing barriers to fish movement; 4) enhancement of low-flow channels; 5) restoration or enhancement of wetlands and riparian vegetation, especially overhanging/overhead vegetation; and 6) control of noxious weeds and non-native vegetation and replacement with beneficial native vegetation.

The timing, amount, and frequency of flow augmentation must be considered. Current thinking is that enhancement of summer and winter flows would prove most beneficial. A current modeling estimate is that at the 5,444 foot alternative, water conveyed to downstream users could increase percentage of times when summer (July – September) target flows of 150 c.f.s. are achieved at the Englewood gauge from 60 to 67 percent, while increasing the percentage of the times when winter (December – March) target flows of 30 c.f.s. leaving Chatfield Reservoir are achieved from 13 to 41 percent.

Downstream users hold junior water rights that would not allow them to intercept and store water annually. In addition, the downstream users' ability to accept water at most beneficial times is not fully known. Since holders of senior water rights in the area may divert water, it is not clear that enhanced flows from Chatfield Reservoir releases would benefit this entire reach. Efforts to determine how downstream releases could be managed to be most beneficial and, nature and extent of possible benefits are ongoing.

To aid the Service in addressing concerns for federally-listed Platte River species, historic and new depletions to Platte River flows associated with implementation of the Chatfield Reallocation Project will need to be described and estimated. Efforts are underway to establish a basin-wide, cooperative recovery program for the four Platte River "target species" (whooping crane, piping plover, interior least tern, and pallid sturgeon). Such a program would provide existing and most or all new water-related projects in the Platte River basin above Chapman, Nebraska with "coverage" under the Act for their adverse effects on these species or their habitat. In July 1997, a Cooperative Agreement was signed by the Secretary of the U.S. Department of the Interior (DOI) and the governors of the states of Colorado, Nebraska and Wyoming committing to a process for developing a Platte River Recovery Implementation Program (Program). Since that time, the ten parties on the Cooperative Agreement Governance Committee have held scores of meetings in efforts to fashion a satisfactory Program.

The Service is optimistic that an agreement will be reached between the Secretary of the Interior and the governors of Colorado, Nebraska, and Wyoming on a satisfactory Program prior to the initiation of any Chatfield Reservoir reallocation. As of today, however, no such agreement has been reached and there is no guarantee that such a Program will become a reality. (The original deadline for agreement on a Program was December of 2000, and that deadline has been repeatedly extended. The current extended deadline is June 2006).

<u>If a Platte River Recovery Implementation Program is not in place</u> by the time a Chatfield Reservoir reallocation is implemented, the adverse effects of historic depletions (pre-1997) associated with the reallocated storage as well as the adverse effects of any new depletions (i.e., reductions in native flows in or return flows to the South Platte River relative to pre-1997 conditions) will need to be addressed in consultation with the Service. In this case, the Program would not be available as an option for addressing either historic or new depletions associated with the project, and project proponents will need to identify other satisfactory measures to offset the historic and new impacts of depletions associated with their project. The Service's current interim requirements for new depletions to the South Platte basin in Colorado, for example, include the option of replacing those depletions acre-foot for acre-foot in the basin until a Program is in place to address those impacts.

<u>If a Platte River Recovery Implementation Program is agreed to and in effect</u> prior to implementation of any Chatfield Reservoir reallocation, it is anticipated that project proponents will have the option of being "covered" by the Program in terms of potential adverse impacts to the four target species. Historic depletions associated with the proposed operations would be covered by the Program with respect to these species. It is likely that new depletions also would be covered under Colorado's Plan for Future Depletions, provided

that the State of Colorado and the U.S. Fish and Wildlife Service agree that it is appropriately addressed under that Plan. (As of today, we have no reason to believe the Chatfield Reallocation wouldn't or shouldn't be covered).

In order to be covered under Colorado's Plan for Future Depletions, our current understanding is that project applicants will be asked to:

(1) Complete and submit a streamlined "template" biological assessment (BA) describing the project and the associated estimated depletions; and

(2) Sign a Platte recovery agreement indicating, among other things, that the water user will fulfill the responsibilities required of Program participants in Colorado, including membership in the South Platte Water Related Activities Program, Inc. (SPWRAP). (This agreement would be similar to the agreement currently required for project applicants seeking coverage under the Colorado River Recovery Program).

Both the template and the agreement are in the process of being finalized and should be available to prospective Project proponents soon. Project proponents should contact the State of Colorado (Mr. Ted Kowalski, (303) 866-3978) for additional information regarding the status of Colorado's participation in the Program and procedures for being covered under the Colorado Plan if and when a Program is adopted (including any fees or other obligations that may be required of SPWRAP members).

Before verifying that the Chatfield Reallocation Project can be covered under Colorado's Plan for Future Depletions, the Service will need to review the description of depletions to South Platte River flows below Chatfield Reservoir as described in the BA. At a minimum that description should include:

- The water rights and sources of water supply associated with the project;
- Estimated average annual depletions to South Platte River flows associated with the project, including those appropriately characterized as "continuing historic depletions" versus "new depletions."

In the absence of a Program providing ESA coverage, or should project proponents not be able to (or choose not to) be covered by the Program, additional information on the quantity, nature, and timing of depletions and water sources may be required in order to assess project impacts.

Questions about data, models, or analytical approaches appropriate for the Section 7 ESA consultation with regard to Platte River species should be directed to Don Anderson, Service Platte River hydrologist, [redacted].

RECOMMENDATIONS

Continue informal consultation with the Service regarding project effects to federally-listed species under section 7 of the ESA, with emphasis on the Preble's meadow jumping mouse and listed species along the Platte River in Nebraska.

Generate cost estimates and develop specific mitigation measures to avoid, minimize, and compensate for impacts to the Preble's Meadow Jumping Mouse and its critical habitat, in conjunction with mitigation plans for wetland, riparian, and other habitats impacted. Coordinate mitigation planning with the Service, CDOW, and other entities, as appropriate.

Monitor seasonal use and any breeding of bald eagles in the project area. In coordination with the Service and DCOW, limit human disturbances in and near nesting, or significant roosting or feeding areas.

To avoid take of migratory birds, time the construction, clearing, and initial filling of viable nesting habitat to occur outside the nesting season.

Consistent with Executive Order 13186 (Responsibilities of Federal Agencies to Protect Migratory Birds) explore measures to enhance migratory bird habitat at Chatfield State Park.

Minimize the range and rate of fluctuations in Chatfield Reservoir levels as practicable, especially during spring fish spawning.

Coordinate closely with CDOW on matters regarding fish and fisheries in the project area.

Develop a weed control program for Chatfield State Park, concentrating on shoreline areas and other areas subject to disturbance.

Pursue operational plans to minimize adverse impacts and maximize benefits to the South Platte River downstream of Chatfield Reservoir. Continue to explore potential for augmentation of downstream flows in conjunction with other habitat enhancement efforts.

Ensure that modeling of potential impacts adequately addresses all flood and drought scenarios both at Chatfield Reservoir and downstream.

Address potential for cumulative effects of the currently proposed Denver Water pumping project at Chatfield Reservoir when considering impacts of project alternatives.

For all alternatives, including the no action alternative, examine potential effects to future water storage and management upstream in the South Platte River and Plum Creek basins.

Develop a work agreement and scope of work for future Service participation in the Chatfield Reallocation Project under Fish and Wildlife Coordination Act.

SUMMARY

This report evaluates the impacts of the proposed alternatives for the Chatfield Reallocation Project on the fish and wildlife resources. Project-related benefits and adverse impacts to fish and wildlife species and their habitats are evaluated, and mitigation and enhancement measures are recommended.

The action alternatives could incorporate at least one feature that would provide net benefits to fish and wildlife resources, the use of targeted releases to downstream users of water from the increased storage capacity at Chatfield Reservoir to beneficially modify flow regimes in the South Platte River within the project area.

Potentially significant negative impacts associated with the action alternatives include: a) impacts to the Preble's meadow jumping mouse and its habitat at Chatfield State Park though inundation; b) impacts to federally-listed species in Nebraska resulting from depletions to the Platte River; c) impact to wildlife habitats, including those that support migratory birds, from loss of wetlands, riparian habitat, and upland habitat at Chatfield State Park through inundation; d) potential impacts to existing fish populations and the sport fishery at Chatfield Reservoir from increased magnitude and rate of water level changes; and, e.) possible adverse changes to aquatic habitats within the project area downstream in the South Platte River resulting from increased storage and modified flows.

In order to offset negative impacts on the fish and wildlife resource resulting from the action alternatives, measures designed to mitigate these adverse impacts are recommended. The Service appreciates the opportunity to provide this input and anticipates working closely with the Corps and the sponsor in future investigations of this proposed project.

Service personnel will coordinate with Gary Drendel of Tetra Tech and Elizabeth Peake of the Corps regarding the methodology and techniques considered appropriate for adequately quantifying resources and assessing impacts within and beyond the project area during preparation of the Draft Feasibility Report/Draft EIS.

Should your staff have any questions concerning this Planning Aid Letter, please contact Peter Plage of my staff at [redacted].

Sincerely,

Susan C. Linner
Colorado Field Supervisor

pc: Plage

PPlage:COE\Chatfield PAL:021506

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APPENDIX A

Fish Species Present in the Project Area

Fish Species Present In the Project Area

Family	Common Name	Species	Location						Type
			Chatfield OR S.Platte @Chatfield	Tributaries (of Chatfield)	Dowstream (of Chatfield)	Formerly present	South Platte (Bear Creek to Adams line)	Lower S. Platte (Adams to Weld Line)	
Herrings									
	Gizzard shad	*Dorosoma cepedianum*	X					X	Native
Carps/ Minnows									
	Central stoneroller	*Campostoma anomalum*		X					Native
	Common shiner	*Notropis cornutus*	X					X	Native
	Bigmouth shiner	*Notropis dorsalis*	X					X	Native
	Sand shiner	*Notropis stramineus*		X			X	X	Native
	Northern redbelly dace	*Phoxinus eos*		X					Native
	Fathead minnow	*Pimephales promelas*	X	X			X	X	Native
	Longnose dace	*Rhinichthys cataractae*	X	X			X	X	Native
	Creek chub	*Semotilus atromaculatus*	X	X			X	X	Native
Suckers									
	Longnose sucker	*Catostomus catostomus*	X				X	X	Native
	White sucker	*Catostomus commersoni*	X	X			X	X	Native
Trout									
	Greenback cutthroat trout	*Oncorhynchus clarki stomias*				X			Native sport
Killifishes									
	Plains topminnow	*Fundulus sciadicus*		X			X	X	Native
	Plains killifish	*Fundulus zebrinus*					X	X	Native
Sticklebacks									
	Brook stickleback	*Culaea inconstans*		X			X	X	Native
Sunfishes									
	Green sunfish	*Lepomis cyanellus*	X				X	X	Native sport
	Orange spotted sunfish	*Lepomis humilis*					X	X	Native sport
Bullhead, catfishes									
	Black bullhead	*Ameiurus melas*			X		X	X	Native sport
	Brown bullhead	*Ameiurus nebulosus*			X				Native sport
	Channel catfish	*Ictalurus punctatus*	X				X	X	Native sport
Perches									
	Iowa darter	*Etheostoma exile*		X			X	X	Native
	Johnny darter	*Etheostoma nigrum*		X			X	X	Native

Fish Species Present In the Project Area

Family	Common Name	Species	Location						Type
			Chatfield OR S. Platte @ Chatfield	Tributaries (of Chatfield)	Dowstream (of Chatfield)	Formerly present	South Platte (Bear Creek to Adams line)	Lower S. Platte (Adams to Weld Line)	
Carps/ Minnows									
	Common carp	*Cyprinus carpio*	X				X	X	Non-native sport
	Spottail shiner	*Notropis hudsonius*	X						Non-native
Trout									
	Rainbow trout	*Oncorhynchus mykiss*	X	X			X		Non-native sport
	Cutthroat trout	*Oncorhynchus clarki*	X						Non-native sport
	Brown trout	*Salmo trutta*	X	X			X	X	Non-native sport
Pikes									
	Tiger muskellunge	*Esox lucius X masquinongy*	*X*						Non-native sport
Sunfishes									
	Pumpkinseed	*Lepomis gibbosus*					X		Non-native sport
	Bluegill	*Lepomis macrochirus*	X				X	X	Non-native sport
	Smallmouth bass	*Micropterus dolomieu*	X				X	X	Non-native sport
	Largemouth bass	*Micropterus salmoides*	X				X	X	Non-native sport
	White crappie	*Pomoxis annularis*					X	X	Non-native sport
	Black crappie	*Pomoxis nigromaculatus*	X				X	X	Non-native sport
	Yellow perch	*Perca flavescens*	X				X	X	Non-native sport
	Walleye	*Stizostedion vitreum*	X				X	X	Non-native sport
Goldfish									
	Goldfish	*Carassius auratus*					X	X	Non-native
Mosquitofish									
	Western mosquitofish	*Gambusia affinis*					X	X	Non-native