6. DESCRIPTION OF SELECTED PLAN

6.1 Introduction

The Selected Plan is Alternative 3, the reallocation of 20,600 acre-feet of storage at the Chatfield Reservoir Project to municipal and industrial water supply. This chapter describes the plan features, which include water supply, recreation modifications, environmental mitigation and other modifications to the Chatfield Reservoir Project. The chapter also provides a summary of the first costs to implement the project, summarizes the Compensatory Mitigation Plan (CMP, Appendix K), and identifies other additional measures which the water providers (Chatfield Water Providers) and the Colorado Department of Natural Resources are developing beyond the federal reallocation project.

6.2 Features of Selected Plan

6.2.1 General

The Selected Plan reallocation would fully meet the purpose of and need for the project, which is to increase the availability of water, sustainable over the 50-year period of analysis, in the greater Denver Metro area so that a larger proportion of existing and future water needs can be met. The Selected Plan meets all federal NED goals, providing $8.42 million in annual NED benefits at total annual NED project costs of $7.92 million, for an NED benefit to cost ratio of 1.06. This alternative would provide storage to help meet part of the growing demand for water in the Denver Metro area by using existing federal infrastructure, and lessening the dependence on NTGW. The impacts of the Selected Plan can be fully compensated. The CMP for impacts to wetlands, to the federally listed threatened Preble's meadow jumping mouse habitat (including Designated Critical Habitat), and to bird habitat that also provides habitat for other wildlife, is presented in Appendix K. The Recreation Facilities Modification Plan for impacts to recreation facilities is provided in Appendix M. A summary of the major features of the CMP and recreation modification plan, which would be paid for by the non-federal sponsors of the Chatfield Reservoir storage reallocation project, is presented in this chapter.

In accordance with the cost-sharing provisions of the 1958 Water Supply Act and Section 103(c)(2) of WRDA 1986, the CDNR, through its agencies and non-federal project partners, will fund implementation and operation of the water supply reallocation project 100 percent at no cost to the federal government, and in accordance with Section 116 will perform design and construction of the recreation modifications and the environmental mitigation. In this report, the estimated costs to be paid by the water providers are presented as financial costs not NED costs.

6.2.2 Water Supply

The Selected Plan reallocates an additional 20,600 acre-feet to water supply storage. The storage would be reallocated from the flood control pool to the conservation pool. Under this alternative, the base elevation of the flood control pool would be raised 12 feet, from 5,432 to 5,444 feet msl, but the reallocation of storage for this project only involves the volume between 5,432 and 5,444 feet msl. This amount of storage would provide an average year yield of 8,539 acre-feet. The average year yield is based on regional experience that one acre-foot of available storage provides about 0.41 acre-foot of average year yield. Mitigation will be required to offset impacts to terrestrial-based

effects (wetland and riparian habitats, including Preble's mouse critical habitat). The CDNR is the non-federal signatory to the WSA. The water providers seeking storage space in Chatfield Reservoir are the Penley Reservoir User Group, the Lower South Platte Gravel Pit User Group, and Denver Botanic Gardens at Chatfield. The Penley Reservoir User Group includes Mount Carbon Metropolitan District, the eight SMWSA members that are participants in the study, Colorado Parks and Wildlife, Center of Colorado Water Conservancy District, and CWCB. The Lower South Platte Gravel Pit User Group is composed of Central Colorado WCD and Western Mutual Ditch Company.

6.2.3 Recreation

The Recreation Facilities Modification Plan is considered to be an integral component of the Selected Plan, as it is required to address the adverse impacts caused by operating the reservoir under the new system, which involves a significant change in how water levels fluctuate within the reservoir. The recreation modifications can be fully accomplished within the current boundaries of Chatfield State Park and are considered sufficient for maintaining recreational purposes of the Corps project.

To offset adverse impacts to the existing recreation facilities, the Selected Plan includes relocations and modifications of recreation facilities. In developing the Recreation Facilities Modification Plan for Chatfield State Park, operating conditions, including the relationship between water levels and existing facilities and how visitors use the park, were considered. Below is a list of impacted areas, modifications to occur, and estimated cost for modifications as shown in Appendix 1 of the Recreation Facilities Modification Plan (Appendix M). The cost price level is fiscal year (FY) 2010.

The Recreation Facilities Modification Plan would include the on-site actions listed below. Appendices M and N should be consulted for additional details about the recreation modifications.

- *North Boat Ramp:* Construction of new boat ramps, changes in ramp gradients, and facility relocation. Parking areas, concrete boat ramp, trails, day use shelter, picnic tables, trash receptacles, bollards, grills, regulatory signs, and water hydrants. Estimated cost: $636,228.

- *Massey Draw:* Relocation of facilities. Asphalt trails, picnic tables, benches, trash receptacles, grills, beach volleyball court, and horse shoe pit. Estimated cost: $357,851.

- *Eagle Cove:* Reconstruction of facilities and parking. Parking area, portable restroom, dumpsters, trash receptacles, regulatory signs, and fencing. Estimated cost: $222,432.

- *Deer Creek Day Use and Balloon Launch Area:* Reconstruction of facilities and parking and road relocation. Parking area, trails, picnic tables, trash receptacles, grills, and regulatory sign. Estimated cost: $779,343.

- *Swim Beach:* Reconstruction of beach, facility and parking and road relocation. Parking area, shower/restroom building, concession, first aid station, information kiosk, picnic tables, benches, water fountain, dumpsters, trash receptacles, bollards, grills, regulatory signs, fencing, beach volleyball court, horse shoe pits, sand, and utilities. Estimated cost: $5,109,500.

- *Jamison Area:* Reconstruction of facilities and parking and road relocation. Parking area, trails, restroom, picnic tables, benches, water fountain, dumpsters, trash receptacles, grills, regulatory signs, utilities, and electrical transformer. Estimated cost: $999,890.

- *Catfish Flats*: Relocation of facilities and parking. Parking areas, trails, restroom building, group picnic shelters, picnic tables, benches, water fountain, dumpsters, regulatory signs, utilities, and electrical transformer. Estimated cost: $902,609.

- *Fox Run:* Relocation of facilities and parking. Trails, group picnic area, picnic tables, benches, water fountain, dumpsters, trash receptacles, regulatory signs, beach volleyball court, and horse shoe pits. Estimated cost: $160,574.

- *Kingfisher Area:* Creation of new parking areas, facility relocation. Parking area, portable restrooms, dumpsters, trash receptacles, regulatory signs, fencing. Estimated cost: $154,280.

- *Gravel Ponds Area:* Creation of new parking areas, facility relocation. Construction of bridge over South Platte River (separate cost). Parking area, portable restrooms, picnic tables, dumpsters, trash receptacles, regulatory signs, and fencing. Estimated cost: $113,640.

- *Platte River Trailhead Area:* Construction of new trails. Estimated cost: $58,575.

- *Marina Point:* Facility relocation, breakwater construction, fishing pier replacement, new anchor construction, winch replacement, installation of floating platforms, relocation of entry road, parking, boat ramp, trails, and walkways. Parking area, trails, shower/restroom building, concession, day use area, information kiosk, riverside marina slips, group picnic area, picnic tables, benches, water fountain, dumpsters, trash receptacles, regulatory signs, beach volleyball court, horse shoe pits, sand, and utilities. Estimated cost: $6,023,353.

- *Roxborough Cove:* Facility relocation. Portable restroom, regulatory signs, picnic tables, trash receptacles, grills, and sand. Estimated cost: $213,949.

- *Plum Creek Picnic Area:* Relocation of parking area, entry road, and day use area, rerouting of trail, and relocating sanitary sewer line. Parking areas, trails, restroom building, picnic tables, benches, dumpsters, regulatory signs, fencing, and volleyball court. Estimated cost: $249,943.

- The Recreation Facilities Modification Plan includes a small amount of dredge and fill of wetlands. The potential impacts of these actions are evaluated in Appendix W and summarized below in Section 6.5.3.

- In addition to the items specified above, the Recreation Facilities Modification Plan will replant trees as part of relocating facilities; however the ability of those trees to immediately provide shade and aesthetic value will be limited. The Tree Management Plan (Appendix Z) attempts to minimize the amount of large trees removed by minimizing the number of trees that are removed above elevation 5,439 feet msl due to their higher likelihood of survival. In addition, the CMP (discussed in environmental considerations below) also identifies onsite mitigation to be priority for mitigating ecological resources. In completing onsite mitigation,

replacement of lost riparian areas and wetlands will occur, not only helping to replace ecological values, but also will eventually provide some replacement value for shade and aesthetics.

6.2.4 Environmental Mitigation

To off-set the adverse impacts to environmental resources, the Selected Plan includes the CMP which consists of on-site and off-site mitigation measures.

On-site mitigation would occur within Chatfield Reservoir project lands. Twenty-nine potential on-site mitigation sites are being evaluated for their mitigation potential. The mitigation sites occur within four general areas of the Chatfield Reservoir project lands: Lower Marcy Gulch, Deer Creek, West Plum Creek, and South Platte River. The on-site mitigation site locations are shown in Appendix K (CMP Figures 7 through 15). Two potential mitigation sites totaling 17.4 acres are located in Lower Marcy Gulch, four potential mitigation sites totaling 13.6 acres are located in the Deer Creek area, 10 potential mitigation sites totaling 54.1 acres are located in the West Plum Creek arm of Chatfield Reservoir, and 13 potential mitigation sites totaling 80.2 acres are located in the South Platte River arm of Chatfield Reservoir. All of the on-site mitigation sites are designed to provide gains in EFUs for the target environmental resources (Preble's, wetlands, and birds). Similar to how the target environmental resources overlap within the Chatfield Reservoir project lands, the on-site mitigation areas will provide overlapping and combined resources for the target environmental resources. Detailed information for each potential mitigation site, including the existing conditions and proposed habitat gains can be found in Appendix K.

Off-site mitigation would occur outside the boundaries of Chatfield Lake project and would include:

- Permanent protection of habitat associated with the target environmental resources (Preble's, wetlands, and birds) for an estimated 888 acres (of the 5,917 acres identified) by conservation easements put in place on property purchased in fee from willing sellers or through conservation easement agreements with willing property owners. This habitat protection will be acquired from willing sellers only and the non-federal sponsor (CDNR) will not subject any owner to condemnation;

- Off-site habitat conversion and enhancement activities associated with protection of the estimated 888 acres of protected habitat described above; and

- Protection of up to 22.5 acres of off-site existing mature cottonwood habitat and designation of up to 10 acres for cottonwood regeneration associated with protection of the estimated 888 acres of protected habitat described above.

As part of the on-site and off-site mitigation actions discussed above, mitigation for impacts to Preble's designated critical habitat would include:

- On-site mitigation of approximately 17 acres in the Upper South Platte CHU and 6 acres in the West Plum Creek CHU as described in Section 6.3.1 of Appendix K; and

- Off-site mitigation in the form of sediment control and riparian habitat extension along 4.5 stream miles of Sugar Creek in the Upper South Platte CHU on U.S. Forest Service land,

and up to 65 Preble's EFUs in the West Plum Creek CHU through permanent protection, management, and enhancement on private lands, included in the estimated 888 acres of off-site mitigation discussed above.

6.2.5 Other Modifications to the Chatfield Reservoir Project

The raising of the lake and the changes to Chatfield operating procedures will require modification to some Corps project facilities and operational documents, including: dam safety instrumentation, Master Plan supplement, review and real estate activities, update capacity tables, water release and calculations, and update project operation manual. Additional Corps operation and maintenance activities will also be required to accommodate the water providers' use of the reservoir storage for water supply.

The State Engineer determines the releases needed to satisfy water rights in the conservation zone (5,385–5,432 feet msl) and the joint-use pool (5,432–5,444 feet msl). If the pool elevation is forecast to rise above the top of the joint use zone (5,444 feet msl), the Corps will have the option to take control of the reservoir releases. When the pool is in the flood control zone (5,444–5,500 feet msl), the Corps determines the releases needed to safely evacuate flood storage and reduce flood risk downstream. In the event of an emergency the Corps will determine the necessary releases to ensure safety of the dam. See Appendix B, Water Control Plan, for further details. Allowing water providers downstream of Chatfield Reservoir to use existing infrastructure to divert their portion of the stored water into their water systems, the number of water providers with storage rights within the reservoir would increase from one (Denver Water) to 12.

6.3 CDNR/Water Providers Additional Measures Beyond the Federal Project

The following measures were developed by the water providers, Colorado State Parks, and Colorado Division of Wildlife (CDOW)[1] to provide additional assurances of a like recreational experience, to compensate Colorado Parks and Wildlife for lost revenue or increased costs, and to provide ecological benefits above and beyond where the CMP has planned to replace lost ecological functions. These actions are beyond the Selected Plan. These additional measures are described for information only. They are not part of the federal reallocation project and are not included in project costs or evaluations of the FR/EIS. Recreation plans that are being developed include: re-contouring the south shore, portions of the west shoreline, and potentially other select sites to minimize the appearance of a "bathtub ring;" maximizing buffer areas, reforesting areas for aesthetics and shade; and reimbursing Colorado Parks and Wildlife and the marina operator on an annual basis for documented lost revenue. Environmental discussions include: funding up to 0.7 miles of the mainstem of the South Platte River above Chatfield Reservoir and up to 0.5 miles of the mainstem of the South Platte River downstream of Chatfield Reservoir for stream habitat improvements, work closely with CDOW on reservoir operations to address potential impacts to walleye and the brood rearing facility below Chatfield Reservoir, and use monitoring and adaptive management to address potential water quality issues.

Table 6-1, Appendix N and Appendix CC provide more information on these additional measures. The measures are conceptual and intended to provide the public with information for review and

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

comment during the NEPA Process, and provide decision makers a basis upon which to base their decisions.

Table 6-1
Summary of Additional Measures that are Being Developed Between the Colorado Department of Natural Resources and the Water Providers. These Measures are Separate and Independent from the Selected Plan

Recreation:
Water providers fund re-contouring along the south shoreline, portions of the west shoreline and potentially other select sites in order to minimize the appearance of a "bathtub ring"
Water providers work with Colorado Parks and Wildlife and landowners adjacent to Chatfield State Park to maximize buffer areas (via easements) to add usable upland acres
Water providers work with the state to provide for the reforestation of certain areas where Colorado Parks and Wildlife feels it would help preserve park aesthetics and provide shade
Water providers will reimburse Colorado Parks and Wildlife and the operators of the marina on an annual basis for documented lost revenues
Water providers will hire a temporary Colorado Parks and Wildlife engineering employee to act as a resident engineer during design and construction of recreational facilities.
Water providers will fund a Chatfield State Park marketing plan.
Environmental:
Water providers fund stream habitat improvements on up to 0.7 miles of the mainstem of the South Platte River above Chatfield Reservoir
Water providers fund stream habitat improvement on up to 0.5 miles of the mainstem of the South Platte River downstream of Chatfield Reservoir
Water providers and Corps will work closely with CDOW on Operations of Reservoir to address potential impacts to walleye and brood rearing facility downstream of the dam
Water providers use monitoring and adaptive management to address potential water quality issues. It is thought that mitigation would improve water quality, thus monitoring of mitigation sites would provide insight to improved water quality contribution. Adaptive management and Operations of Reservoir would also address water quality concerns.
Water providers and Colorado Parks and Wildlife will develop a plan to address the current significant erosion on Plum Creek.
Water providers and Colorado Parks and Wildlife will work to develop a portion of the reallocated storage for environmental purposes to be controlled by Colorado Parks and Wildlife.

6.4 Cost of Selected Plan

Table 6-2 shows the current estimate of the financial costs to implement the Chatfield Lake Water Supply Reallocation Project at FY 2013 price levels.

Table 6-2
User Costs for the Selected Plan (Million Dollars, FY 2013 Price Levels)

	Annual Costs	Capital Costs
Construction and Implementation Costs		
Cost of Storage	$720,000*	$16,040,0004
First Costs		
Specific water provider's Infrastructure **	$3,000	75,000
Environmental Mitigation	$2,610,000	58,550,000
Recreation Modifications	$2,110,000	$47,300,000
Other Modifications to Chatfield Reservoir Project	$30,000	$710,000
Total Construction & Implementation	$5,470,000	$122,700,000
OMRR&R Costs		
Water Supply Proportion of Corps Joint-use O&M	$170,000	$3,800,000
Additional Corps Specific Water Supply O&M	$50,000	$1,060,000
Specific water provider's Infrastructure**	$1,420,000	$31,900,000

Table 6-2
User Costs for the Selected Plan (Million Dollars, FY 2013 Price Levels)

	Annual Costs	Capital Costs
Environmental Mitigation	$860,000	$19,250,000
Recreation Modifications	$0.00	$0.0
Total OMRR&R	$2,500,000	$56,040,000
Total User Costs	$7,970,000	$178,700,000
* Costs are annualized over 50 years, although Cost of Storage will be repaid within 30 years ** Costs required to develop, access, treat, and deliver the water provider's water		

Cost Account Adjustments. There are no hydropower capabilities at Chatfield Reservoir. Therefore, there would be no revenues to the U.S. Treasury foregone and no cost account adjustments are needed.

6.5 Environmental Considerations

The major impacts to environmental resources from Alternative 3, the Selected Plan, are detailed in Chapter 4, and will be fully compensated through the CMP. In addition, as part of the FR/EIS and in compliance with Section 7(b) of the Endangered Species Act (ESA), a Biological Assessment (BA) was 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). 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 Critical Habitat Unit (CHU) and 75 acres of critical habitat along Plum Creek in the West Plum Creek CHU. The BA concluded that the Proposed Action is likely to adversely affect the Preble's mouse and adversely affect its designated critical habitat. The impacts to environmental resources, including T&E species, are summarized in Table 2-9 and the BA is located in Appendix V of the FR/EIS.

The CMP describes that proposed mitigation activities would include on-site mitigation, off-site mitigation, and mitigation for impacts to Preble's designated critical habitat, each of which would include monitoring and adaptive management. Appendix K should be consulted for specific details about the mitigation activities.

6.5.1 Summary of Compensatory Mitigation Plan

The CMP (Appendix K) was developed to provide full mitigation for the impacts under Alternative 3 to the target environmental resources. Preble's meadow jumping mouse habitat, bird habitat, and wetlands were identified in the FR/EIS as "target environmental resources" of particular concern and warranting specific mitigation strategies for the estimated adverse impacts to these resources. The CMP is designed to offset the adverse impacts to these target environmental resources associated with Alternative 3. The CMP, as presented in this report, is considered an integral part of the Selected Plan, and as such, its implementation must be carried out concurrently as part of the overall project.

The CMP concludes the following: 1) there are adequate opportunities within the Chatfield Reservoir watershed to mitigate for adverse impacts to the target environmental resources; 2) the proposed compensatory mitigation measures have a high likelihood of being successfully

implemented; and 3) the estimated costs for implementing, managing, and monitoring the proposed mitigation are within the range of feasibility for the water providers. The CMP is ecologically-based and the "currency" of the CMP is ecological functional units (EFUs). The EFUs capture the ecological functions provided by the individual target environmental resources as well as accounts for the substantial geographic overlap of the target environmental resources. The CMP establishes quantifiable objectives and maximizes the amount of mitigation that would occur on Corps lands in the vicinity of Chatfield Reservoir. The CMP provides requirements for monitoring, reporting, and adaptive management.

The CMP is estimated to take six years to implement and another five years of management and habitat improvement to realize the target EFU gains. Each individual mitigation activity will be monitored at least annually for a minimum of five years or until success criteria are met. Table 6-3 summarizes the key components of the CMP and where these components are discussed in detail in the CMP (Appendix K).

Table 6-3
Summary of Key Components of the Compensatory Mitigation Plan

Key CMP Components	Description	Location in CMP (Appendix K of the FR/EIS)
Funding	No federal funds. The Chatfield Water Providers are responsible for the full cost of implementing the CMP.	Sections 7.3 and 8.2.6
Estimated Present Value Costs	$77.8 Million ($58.5 million initial implementation costs plus $19.3 million present value of $0.86 million annual OMRR&R FY 2013 price level)	Section 8.2.6
Objectives	1. Provide the total compensatory mitigation needed. 2. Mitigate impacts to designated critical habitat. 3. Provide a diversity and balance of resources for compensatory mitigation.	Section 5.0
Target Environmental Resources	1. Wetlands. 2. Preble's meadow jumping mouse habitat (includes designated critical habitat). 3. Bird habitat.	Sections 1.0 and 6.0
Approach	1. Prioritize mitigation. 2. Consider the context of mitigation activities. 3. Account for the overlap of habitat for the target environmental resources. 4. Replace lost ecological functions.	Sections 3.0 and 4.0 Table 1
Compliance with Mitigation Policies and Guidance	The CMP complies with: • Department of the Army Planning Guidance Notebook – ER 1105-2-100 (April 22, 2000) six-step planning process and Appendix C Environmental Evaluation and Compliance; • Water Resources Development Act of 2007 (WRDA 07) – Mitigation for Fish and Wildlife and Wetlands Losses (August 31, 2009) (P.L. 110-114), Section 2036, Mitigation for Fish and Wildlife and Wetlands Losses; • Memorandum addressing Implementation Guidance for Section 2036(a) of the Water Resources Development Act of 2007; • The Corps and EPA rule for the compensatory mitigation for losses of aquatic resources for activities authorized by Section 404 of the CWA (73 Fed. Reg. 19594 (April 10, 2008); and • U.S. Fish and Wildlife Service policy under Endangered Species Act addressing mitigation of impacts to designated critical habitat.	Section 2.0 as well as the entirety of Appendix B address how the CMP complies with these various polices and guidance.

Table 6-3
Summary of Key Components of the Compensatory Mitigation Plan

Key CMP Components	Description	Location in CMP (Appendix K of the FR/EIS)
Locations	All mitigation will occur within the Chatfield Reservoir basin watershed. Mitigation occurs on-site within Chatfield State Park to the maximum practicable. Off-site mitigation for impacts to Preble's designated critical habitat on the South Platte River arm of Chatfield Reservoir will occur along Sugar Creek, a tributary to the South Platte River within the Upper South Platte CHU about 12 miles from Chatfield Reservoir. Off-site mitigation for impacts to Preble's designated critical habitat on the Plum Creek arm of Chatfield Reservoir will occur along Plum Creek and its tributaries upstream of Chatfield State Park, within the West Plum Creek CHU. The remainder of the off-site mitigation for noncritical habitat will occur in the Plum Creek watershed.	Sections 6.1.1, 6.2.1, 6.3.1, and 6.3.2 Figures 7 through 22, 25 and 28
Enforceability	The Corps, the Colorado Department of Natural Resources (CDNR), and the water providers (Chatfield Water Providers) will each have complementary responsibilities for ensuring the accomplishment of the reallocation, the Compensatory Mitigation Plan and the Recreation Facilities Modification Plan (the Plans), as described in this report. The Department of the Army and the CDNR will enter into a Water Storage-Agreement (WSA) 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 WSA, and for undertaking the CDNR's obligations to the Government under the WSA 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 WSA, unless the WSA is suitably modified by mutual consent of the Corps and the CDNR. The Corps continues to have discussions with the State and the Chatfield Water Providers to further refine the legal relationship between the entities.	Section 7.3 Appendix E sets forth the Challenge Cost Share Agreement which follows the required USFS format and has been agreed to by all parties to the agreement.
Protection of Mitigation Lands	The on-site mitigation will be protected and managed as part of Chatfield State Park. The off-site mitigation along Sugar Creek will occur within the Pike National Forest and will be protected and managed as part of the Pike National Forest. The remainder of the off-site mitigation is proposed to occur on private lands or lands acquired in fee from willing sellers, and in both instances will be protected by a conservation easement. The conservation easement will protect lands which could be transferred to qualified land management agencies (e.g., Douglas County Land Trust or Douglas County Open Space). Off-site mitigation will not receive credit until the land has been protected in perpetuity. The Corps continues to have discussions with the state and the water providers to further refine the legal relationship between the entities.	Section 7.4 and Appendix E (sets forth the Challenge Cost Share Agreement which specifies the mitigation activities and their maintenance on Pike National Forest lands.)
Monitoring	All mitigation activities will be monitored to determine that they have been fully and properly implemented. Each individual mitigation activity will be monitored at least annually for a minimum of 5 years or until success criteria are met. Monitoring has been designed to: 1. Determine if the estimated maximum impacts to the target environmental resources stated in the CMP that form the basis of the mitigation objectives need to be revised. 2. Document that compensatory mitigation activities are properly and fully implemented. 3. Ensure the defined compensatory mitigation objectives are met. 4. Provide information needed for adaptive management.	Section 7.4
Oversight	The Corps, CDNR, and the water providers will each have complementary responsibilities for ensuring the accomplishment of the reallocation, the Compensatory Mitigation Plan and the Recreation Facilities Modification Plan (the Plans), as described in this report. The purpose of the oversight plan established in the CMP is to determine whether the CMP: • Is being implemented according to the approved management plans; • Is trending positively in meeting the success criteria defined in the approved management plans; • Needs adjustments; and	Section 7.3 and 7.6, and Figure 32

Table 6-3
Summary of Key Components of the Compensatory Mitigation Plan

Key CMP Components	Description	Location in CMP (Appendix K of the FR/EIS)
	• Has been fully implemented and successfully meets the success criteria defined in the approved management plans. The Corps continues to have discussions with the state and the water providers to further refine the legal relationship between the entities.	
Reporting	It is envisioned the Chatfield Water Providers will provide annual monitoring reports to the Technical Advisory Committee for review and comment. The reporting will include: • Documentation that the mitigation activity has been fully implemented (e.g., as-built report, recordation of a conservation agreement 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 Corps continues to have discussions with the state and the water providers to further refine the legal relationship between the entities.	Section 7.4.1
Adaptive Management	Adaptive management will be used to address anticipated and unanticipated issues and events that affect compensatory mitigation activities. Monitoring will determine the degree to which issues and events adversely affect or limit proposed compensatory mitigation activities, as well as document benefits greater than estimated for the CMP. The CMP and AMP identify strategies to be used to adaptively manage issues and events that could adversely affect or limit proposed compensatory mitigation.	Section 7.5 of CMP and Appendix GG of FR/EIS
Estimated Schedule	Mitigation implemented in years following the FR/EIS: • On-site mitigation and critical habitat mitigation – year 3; • Off-site mitigation – year 7; and • Management of mitigation sites and continued monitoring – years 8-13+.	Section 7.2 and Table 12

The WRDA mitigation policy establishes a priority for consideration of the use of approved wetland mitigation bank credits to offset impacts to wetlands. The use of approved wetland mitigation bank credits is not a component of the proposed CMP because many of the wetlands that would be adversely affected by the reallocation are also Preble's habitat. There are currently no approved wetland mitigation banks that also include Preble's habitat.

Preble's habitat overlaps substantially with wetlands and riparian habitat types; however, there are no approved Preble's habitat mitigation banks in Colorado, and there are no wetland mitigation banks in Colorado that occur within known Preble's habitat. Therefore, use of an approved wetlands mitigation bank to provide separate compensatory mitigation for impacts to wetlands at Chatfield Reservoir would not compensate for impacts to Preble's habitat (which are similar in total area as impacts to wetlands). As such, it would not be practicable to singularly pursue wetland mitigation banks that do not compensate for other lost resources (especially Preble's habitat.).

Because the target environmental resources have substantial geographic overlap, habitat variables in a particular location can provide overlapping ecological functions for each of the target environmental resources. The CMP uses an ecological functions approach (EFA) to quantify impacts for the overlapping ecological functions of the target environmental resources and to quantify benefits gained from mitigation activities proposed in the CMP. To provide an ecologically meaningful assessment of the overlapping habitats of the target environmental resources, an ecological function index (EFI) was developed for each target resource habitat type. The EFIs for the habitat types were generated using an ecological function model. The model was evaluated by

independent experts as part of the Corps' formal model review process. The overall approach to developing the model was to convene an Ecological Functions Technical Committee of locally recognized experts with expertise in the three target environmental resources. The number of EFUs for a particular resource in a particular area is the product of the EFI of the habitat type and the acreage of the area. For instance, if a particular area of Preble's habitat has an EFI of 0.63 and the area is 12 acres, the area provides 7.56 EFUs (0.63 x 12) for Preble's. If four of those 12 acres are inundated, 2.5 EFUs (4 x 0.63) would no longer be available. The CMP dedicates substantial discussion to why EFUs are used as the currency for impacts and mitigation (Sections 3.3 and 4.0 and Appendix C).

About 789 acres and 1,180 EFUs of the target environmental resources are estimated to be impacted by Alternative 3, the Selected Plan. The CMP maximizes the amount of mitigation that would occur on-site; up to 338 acres and 203 EFUs of mitigation are proposed to occur on-site above the maximum pool elevation of 5,444 feet msl. An estimated 384 EFUs would be mitigated on-site and in place with the restoration of the borrow areas and utility relocations, and up to 85 EFUs of combined wetland and riparian habitat would be created on-site that would benefit Preble's and birds, including up to 23 acres of Preble's critical habitat. Proposed on-site compensatory mitigation has been maximized to the degree practicable for the following reasons:

- On-site mitigation provides the least amount of risk regarding the ability to acquire lands and ensure mitigation is fully implemented.

- U.S. Fish and Wildlife Service (Service) policy establishes that mitigation for impacts to designated critical habitat must occur within the same CHU. There are two separate CHUs within Chatfield State Park (USFWS, 2004d).

- Ecological resources are an important part of the overall makeup and feel of Chatfield State Park. Maximizing on-site mitigation to compensate for adverse impacts to these ecological resources helps restore the overall integrity of Chatfield State Park by providing comparable resources to the extent practicable following reallocation.

- Agencies that manage resources within Chatfield State Park have been involved in development of the principles that guide the CMP. Colorado Parks and Wildlife manages the park for recreation, fisheries, and wildlife and the Service oversees compliance with the ESA and has designated the South Platte River and Plum Creek arms of Chatfield Reservoir as critical habitat for Preble's.

- Local environmental groups that use Chatfield State Park (e.g., Audubon Society) were invited by the Corps to participate as special technical advisors for the FR/EIS process because of their expertise and knowledge of ecological resources in Chatfield State Park. These organizations and the agencies above have provided valuable input for developing and prioritizing mitigation strategies.

- On-site compensatory mitigation is considered a priority by the Corps and EPA when it is practicable (EPA and Department of the Army, 1990).

- No federal funds will be used to implement the proposed compensatory mitigation. The cost of on-site compensatory mitigation is estimated to be more expensive than the cost of off-site compensatory mitigation; however, compensatory mitigation will be entirely funded by the Chatfield Water Providers.

The mitigation for the remaining EFUs (up to 711) would occur off-site. The CMP focuses mitigation efforts first in on-site areas. However, it is recognized that mitigation requirements would exceed what is available within on-site areas. The majority of the off-site mitigation would occur on private lands in the Plum Creek watershed upstream of Chatfield Reservoir through the permanent protection, enhancement, and management of riparian habitats and adjoining uplands to benefit the target environmental resources. The CMP identifies the portions of these watersheds with potential to provide off-site mitigation. The final number and extent of off-site mitigation areas would be determined by how many EFU credits are generated from each mitigation area. Unlike on-site mitigation areas, most off-site areas would require legal real estate instruments to ensure perpetual protection and management of the mitigation areas to benefit the target environmental resources.

U.S. Fish and Wildlife Service policy requires that impacts to designated critical habitat be mitigated within the same CHU. The Plum Creek arm of Chatfield Reservoir occurs in the West Plum Creek CHU and the South Platte River arm occurs in the separate Upper South Platte CHU. With the exception of the South Platte River arm of Chatfield Reservoir, the Upper South Platte CHU occurs on the Pike National Forest. Off-site mitigation for impacts to Preble's critical habitat in the Plum Creek arm of Chatfield Reservoir would involve the permanent protection and, where needed, enhancement of Preble's habitat within the West Plum Creek CHU that includes lands designated for a large Preble's recovery population.

Off-site conservation measures for impacts to Preble's critical habitat in the South Platte River arm of Chatfield Reservoir are proposed to involve implementation of the Sugar Creek Sediment Mitigation Project and other habitat enhancement measures in the Pike National Forest, located about 12 miles west of Chatfield Reservoir within the watershed that feeds Chatfield Reservoir. The Upper South Platte CHU within the Pike National Forest is distributed over eight drainage segments and includes more than 3,000 acres. The entire CHU was reviewed to determine sites with the potential for enhancing, restoring, or creating habitat for Preble's. The drainage segments designated as critical habitat with sites that could potentially provide suitable conservation measures were reviewed to determine what types of mitigation could be implemented and where conservation measures could be feasibly implemented. Although the designated critical habitat within the Pike National Forest is extensive, opportunities for habitat enhancement, restoration, and creation are limited in most drainages by existing high-quality habitat, steep topography, constructability issues, and poor access. The most feasible opportunities for habitat restoration and enhancement within the designated critical habitat occur on Sugar Creek (Table 6-3 and Appendix H of the CMP). The Service has reviewed the selection of the Sugar Creek site and concurs that it is the site with the greatest potential for habitat improvement and conservation measures in the Upper South Platte CHU.

6.5.2 Implementation of Compensatory Mitigation Plan

If the reallocation is approved, the Chatfield Water Providers would begin implementing the CMP as soon as practicable following the approval. The Chatfield Water Providers will establish an

environmental escrow fund that will be at least equal to the estimated cost of fully implementing and completing the CMP including a reasonable contingency. The establishment of the escrow fund prior to any storage in the reallocated space will allow the Chatfield Water Providers to fully use the reallocated storage subject to the following conditions:

1. Storage between elevations of 5,444 feet msl and 5,442 feet msl cannot exceed 30 days within any calendar year until the CMP is fully implemented; and

2. If the Chatfield Water Providers are unable to meet the mitigation schedules shown in Table 6-4 and Table 6-5, the ability to use storage will be defined by the mitigation milestones and reallocated storage available in Table 6-4 and Table 6-5 until mitigation implementation and EFUs gained meet the defined mitigation milestones.

This approach ensures that the Chatfield Water Providers continually make progress toward meeting goals and objectives of the CMP or they will not fully benefit from use of the storage reallocation. The compensatory mitigation activities have two major components: 1) implementation, and 2) meeting the success criteria for gained EFUs. The mitigation schedule and use of reallocated storage milestones (Table 6-4 and Table 6-5) are linked to these two major components. Because the environmental mitigation is substantial and would take years to implement, the CMP would be implemented incrementally according to its respective priorities. On-site mitigation also needs to coincide with the recreation facilities modification, which would also disturb Chatfield State Park, so that the total disturbance and duration of disturbance to Chatfield State Park is minimized. The CMP is multifaceted and involves a substantial amount of land transactions. It is anticipated that it would take six years to fully implement the CMP. The milestones in Table 6-4 are listed in order of priority and are additive when determining if the percent of water stored in the reallocated space is available to the Chatfield Water Providers. For example, all of the on-site compensatory mitigation needs to be implemented before credit toward the use of reallocated storage is given for the implementation of Preble's critical habitat mitigation. The schedule in Table 6-5 assumes it would take an average of about five years of management and habitat improvement to realize the target gains in EFUs.

Table 6-4
Compensatory Mitigation Implementation Schedule and Reallocated Storage Milestones

Year Following Approval	Milestone	Estimated EFUs Gained Per Milestone	Estimated Running Total of EFUs Gained Per Milestone	Estimated % of EFUs Gained of Total EFUs Needed	% of Reallocated Storage Available	Approximate Maximum Pool Elevation (ft)[4]
3	Complete implementation of all on-site compensatory mitigation, including on-site mitigation in critical habitat[1]	85	85	9	10	5,433.0
3	Complete implementation of all off-site mitigation of impacts to Preble's critical habitat on the South Platte River arm	--[2]	--[2]	--[2]	20	5,435.0

Table 6-4
Compensatory Mitigation Implementation Schedule and Reallocated Storage Milestones

Year Following Approval	Milestone	Estimated EFUs Gained Per Milestone	Estimated Running Total of EFUs Gained Per Milestone	Estimated % of EFUs Gained of Total EFUs Needed	% of Reallocated Storage Available	Approximate Maximum Pool Elevation (ft)[4]
3	Complete implementation of off-site mitigation to gain 100% of needed Preble's EFUs in the West Plum Creek CHU including implementation of 25% of off-site mitigation	178	263	26	25	5,435.5
4	Complete implementation of 50% of off-site mitigation	178	441	44	45	5,437.5
5	Complete implementation of 70% of off-site mitigation	142	583	59	60	5,440.0
6	Complete implementation of 90% of off-site mitigation[3]	142	725	73	80	5,442.0

[1] Includes restoration and revegetation of borrow areas and temporary impacts associated with the relocation of recreation facilities.

[2] Preble's critical habitat impacts and mitigation in the Upper South Platte CHU are calculated in terms of acres and stream miles. For purposes of the CMP schedule, completion of the implementation of all mitigation of Preble's Upper South Platte CHU will allow use of another 10 percent of the reallocated storage.

[3] The last increment (10 percent) of off-site mitigation will be based on the results of meeting the success criteria defined in the approved management plans in accordance with the CMP.

[4] Storage between 5,444 and 5,432 feet msl cannot exceed 30 days within any calendar year until the CMP is fully implemented.

Table 6-5
EFUs Gained and Reallocated Storage Milestones

Year Following Approval	% of Total EFUs Gained	Additional % of Reallocated Storage Available[1]
7	80	0[2]
8	85	5
9	90	10
10	95	15
11	100	20

[1] Additive to the percent of reallocated storage available to the Chatfield Water Providers once the CMP has been 80 percent implemented.

[2] No credit is given for providing up to 80 percent of the EFUs because it is estimated that 80 percent of the EFUs will be provided with implementation of the mitigation activities.

The limitation on storage above 5,442 feet in elevation until the CMP is fully implemented is intended to delay losses of woody riparian vegetation until the CMP is fully implemented. The limitation in storage above 5,442 feet in elevation assumes an estimated new OHWM of 5,442 feet and that water would be infrequently stored above 5,442 feet with reallocation. The elevations between 5,444 feet and 5,442 feet contain a substantial amount of vegetation that could be lost to inundation. Information presented in Chapter 4 demonstrates that most of the riparian vegetation associated with a new OHWM would likely tolerate up to 30 days of inundation. Table 6-6 presents an estimated schedule for environmental mitigation relative to key events in the reallocation review and approval process (e.g., release of the Final FR/EIS). More detailed information on the mitigation tracks and mitigation schedule is presented in Section 7.2 of the CMP (Appendix K).

Table 6-6
Estimated Schedule for Environmental Mitigation

Year	Activities
0	Final FR/EIS released to public. ASA(CW)'s Section 808 determinations, FR/EIS approval. Corps/CDNR Water Storage Agreement and CDNR/water providers Reallocated Storage Contract sub-agreements executed.
1	Recreation facilities design and environmental mitigation design in progress.
2	Recreation facilities modification begins, on-site environmental mitigation begins, and off-site Preble's critical habitat mitigation begins.
3	Recreation facility modification, on-site environmental mitigation, and off-site critical habitat mitigation continue. Environmental mitigation monitoring begins.
4	Recreation facility modification, on-site environmental mitigation, off-site critical habitat mitigation, and implementation of 25 percent of off-site noncritical habitat mitigation completed. Environmental mitigation monitoring continues.
5	Complete implementation of 50 percent of off-site noncritical habitat mitigation. Environmental mitigation monitoring continues.
6	Complete implementation of 70 percent of off-site noncritical habitat mitigation. Environmental mitigation monitoring continues.
7	Complete implementation of 90 percent of off-site noncritical habitat mitigation. Environmental mitigation monitoring continues.
9–13+	Management of environmental mitigation sites continues to meet success criteria. Environmental mitigation monitoring continues.

The CMP provides an estimated 740.15 average annual equivalents of EFUs. The CMP fully mitigates the estimated loss of 796 EFUs because the estimated loss of EFUs would occur over several years and in the first few years of implementing the CMP, mitigation gains would exceed impacts. Three scenarios estimating the timing of impacts (EFUs lost) were developed to determine if the CMP would fully mitigate the estimated impacts when considering the losses and gains of EFUs over 50 years (Table 6-7). All three scenarios assume that in the first three years of mitigation implementation, seven EFUs per year would be lost associated with the relocation of the recreation facilities, but during these first three years, mitigation implementation would result in a gain of about 100 EFUs per year. After year 3, the EFUs lost per year varies with each scenario. This variation would be affected by availability of water to store, length of storage, operations, adaptive management, and tolerance of vegetation to inundation. The three scenarios demonstrate that the estimated average annual equivalent of EFUs lost is less than the estimated average annual gain of 740.15EFUs provided by the CMP.

Table 6-7
Estimated EFUs Lost by Reservoir Elevation, Chatfield Reallocation

	Scenario 1			Scenario 2			Scenario 3		
Year Following Approval	Approximate Reservoir Elevation (feet msl)	EFUs Lost in Yr.	Cumulative EFUs Lost	Approximate Reservoir Elevation	EFUs Lost in Yr.	Cumulative EFUs Lost	Approximate Reservoir Elevation	EFUs Lost in Yr.	Cumulative EFUs Lost
1	5432.00	7.00	7.00	5432.0	7.00	7.00	5432.0	7.00	7.00
2	5432.00	7.00	14.00	5432.0	7.00	14.00	5432.0	7.00	14.00
3	5432.00	7.00	21.00	5432.0	7.00	21.00	5432.0	7.00	21.00
4	5433.00	301.67	322.67	5433.0	301.67	322.67	5433.0	301.67	322.67
5	5435.00	100.30	422.97	5435.5	123.96	446.63	5435.5	123.96	446.63
6	5435.50	23.66	446.63	5437.5	96.80	543.43	5437.5	96.80	543.43
7	5437.50	96.80	543.43	5440.0	102.82	646.25	5440.0	102.82	646.25
8	5440.00	102.82	646.25	5440.0	0.00	646.25	5440.0	0.00	646.25

Table 6-7
Estimated EFUs Lost by Reservoir Elevation, Chatfield Reallocation

Year Following Approval	Scenario 1			Scenario 2			Scenario 3		
	Approximate Reservoir Elevation (feet msl)	EFUs Lost in Yr.	Cumulative EFUs Lost	Approximate Reservoir Elevation	EFUs Lost in Yr.	Cumulative EFUs Lost	Approximate Reservoir Elevation	EFUs Lost in Yr.	Cumulative EFUs Lost
9	5440.00	0.00	646.25	5442.0	75.34	721.59	5442.0	75.34	721.59
10	5442.00	75.34	721.59	5442.0	0.00	721.59	5442.0	0.00	721.59
11	5443.00	44.77	766.36	5443.0	89.53	811.12	5443.0	44.77	766.36
Yrs 12–50	5444.00	44.76	31,633.68	5444.0	0.00	31,633.68	5444.0	44.76	31,633.68
Total			36,191.83			36,535.21			36,490.45
Average Annual Equivalent EFUs:			723.84			730.70			729.81

The CMP is based on conservative assumptions including that all of the target environmental resources will be lost below 5,444 feet in elevation and none of the target environmental resources will reestablish below 5,444 feet in elevation. Impacts associated with inundation may be less than have been conservatively estimated. Adaptive management, informed by impact and mitigation monitoring, would be used as needed to adjust mitigation in response to impacts, issues, and events that affect compensatory mitigation (Appendix GG). The CMP and Adaptive Management Plan present a process and defined actions for mitigation monitoring, adaptive management, and oversight of mitigation implementation monitoring.

6.5.3 Summary of Potential Impacts of Proposed Dredge and Fill Materials

The Section 404(b)(1) Guidelines (40 Code of Federal Regulations [CFR] 230) are the substantive criteria used in evaluating discharges of dredged or fill materials in waters of the United States. The 404(b)(1) Analysis (Appendix W) is an integral aspect of the FR/EIS and evaluates the effects of the proposed dredge and discharge activities proposed to occur incidental to the Selected Plan (Alternative 3) and consistency with Section 404(b)(1) Guidelines under Section 404 of the Clean Water Act. As proposed, the modification of recreation facilities and certain environmental mitigation activities would involve the discharge of dredge and fill material into waters of the United States, including wetlands. These discharge activities would involve an estimated temporary impact to about 5.5 acres of wetlands and a loss of about 6.9 acres of wetlands.

The purpose of the analysis is to demonstrate that the proposed discharge of dredge and fill material associated with the implementation of the proposed Recreation Facilities Modification Plan (Appendix M) and CMP (Appendix K) comply with the Section 404(b)(1) Guidelines. Evaluation criteria included potential impacts on physical and chemical characteristics of the aquatic ecosystem (physical substrate, suspended particulates/turbidity, water quality, water fluctuations and circulation), potential impacts on biological characteristics of the aquatic ecosystem (threatened and endangered species, fish, crustaceans, mollusks, and other aquatic organisms), potential impacts on special aquatic sites (wetlands, mudflats and vegetated shallows) and potential effects on human use characteristics (municipal and private water supplies, recreational and commercial fisheries, water-related recreation, aesthetics). The analysis also evaluates alternatives to the proposed discharges.

The CMP (Appendix K) identified and addressed the unavoidable environmental impacts associated with the reallocation of storage under the Selected Plan and impacts to wetlands and habitat for

Preble's and birds associated with the dredge and fill activities incidental to the Selected Plan. The CMP identified a limited number of on-site areas where habitat conversion would occur to change upland grasslands to wetlands. This type of conversion is generally accomplished by manipulating ground surface elevations, and surface water and groundwater, to provide hydrology adequate to support mesic riparian and wetland habitat. In most cases, the habitat conversion activities would require heavy equipment and earthwork, including the installation of sheet pile cutoff structures to raise the ground water table closer to the surface, the creation of new secondary channels, ditches, or backwaters to bring surface water to mitigation areas, and the modification of surface topography to lower the ground surface closer to ground water or to better retain surface water. These activities entail localized in-place excavation and grading and would not impact long-term water quality or the aquatic ecosystem. In many locations, the proposed activities would provide a beneficial effect on sediment erosion control and riparian habitat preservation.

Off-site mitigation includes conversion of upland grassland to scrub-shrub wetland primarily on private lands upstream of the Chatfield State Park in the Plum Creek and West Plum Creek Watersheds. Off-site habitat conversion would generally be similar to that described for the on-site habitat conversion, with on-site mitigation activities, with no impacts to long-term water quality or the aquatic ecosystem, and the ancillary benefit of improved sediment erosion control.

Modifications to the recreational facilities comprise the vast majority of actions involving dredge and fill activities. The Recreation Facilities Modification Plan identified ten areas where fill material would be required for site preparation, such as slope adjustment and general grading. The plan considered cut and fill requirements that allowed for minimal impact to the reservoir under the proposed operational high water elevation of 5,444 ft above msl.

Modifications to three of the recreational facilities would require dredging below the current ordinary high water mark of 5,432 feet msl. The North Boat Ramp and Riverside Marina would require limited dredging to shape channels for boat ramps and local boat access. This dredging would be scheduled to occur during low reservoir periods such that there would be no impact to benthos, turbidity, and general water quality during construction. Impacts to the Swim Beach area are the most substantial of all facilities located along the shoreline. The Swim Beach would be relocated to the southwest of the current facility. In order to construct the beach, the existing facility would be demolished and excavated. Sand would be saved and also imported to create the new beach.

Fill material for the modification of recreation facilities would be derived from five borrow sources within the park boundary. Based on analysis in the Recreation Facilities Modification Plan, approximately 65,000 cubic yards of fill material would be needed to make the improvements to the ten recreation areas. The five borrow areas have varying topographic conditions including flat ground, drainage channel, depression, local knob, and rolling hill. The ground is covered with native grasses, weeds and some trees. All borrow locations are located above the current mean reservoir elevation so there would be no impacts to water quality caused by excavation.

Use of the proposed fill sites would have a limited effect on federally-listed threatened or endangered species or their critical habitats, as well as other wildlife and aquatic life in and around the reservoir. Approximately 2.54 acres of Preble's habitat and 2.54 acres of bird habitat would be impacted by land disturbance associated with relocation of the Plum Creek Day Use Area. There

would be a temporary impact to recreational fishing access during the relocation of the North Boat Ramp and the Riverside Marina. Similarly, there would be a temporary and limited impact to water-related recreation during the relocation of the various recreational facilities. The preliminary construction implementation concept and schedule, associated with the Recreation Facilities Modification Plan, indicated that the optimum construction concept would comprise a three-year construction season, with maintenance of operations of the North Boat Ramp, Swim Beach and Riverside Marina during each high-use season (May 1 to September 30) and with closure for relocation occurring during one off season. The remaining lower use facilities would be sequenced for relocation during high-use and low-use seasons.

The in-kind replacement of recreation facilities would result in similar levels of continued recreation at Chatfield State Park and Chatfield Reservoir. The water-based recreation can have effects on the aquatic ecosystem of Chatfield Reservoir through the introduction of oil and gas from gas motor-powered boats, increased shoreline erosion and turbidity associated with power boats and prop wash, and the potential introduction of nonnative aquatic invasive species (e.g., zebra mussels and Eurasian milfoil). The in-kind replacement of recreation facilities would not increase these secondary effects, but would continue the potential for these effects to occur.

The secondary effects of environmental mitigation are primarily beneficial and consistent with the purpose of environmental mitigation (i.e., creating wetlands and Preble's and bird habitat). The on-site creation of wetlands and riparian habitat involve the conversion of xeric upland grasslands to these mesic and hydric habitats. The conversion of the upland grasslands would result in fewer upland grasslands, which are common at Chatfield State Park and would provide less habitat for the wildlife that use these upland grasslands.

Cumulative impacts of the proposed dredge and fill activities on the aquatic ecosystem are expected to be small. These proposed activities associated with the Recreation Facilities Modification Plan, in total, would have little effect on the aquatic ecosystem due to limited dredge and fill footprints of the respective sites relative to the overall area and volume of the reservoir. Off-site mitigation includes conversion of upland grassland to scrub-shrub wetland primarily on private lands upstream of the Chatfield State Park in the Plum Creek and West Plum Creek Watersheds. As with the on-site mitigation activities, there would be no impacts to long-term water quality or the aquatic ecosystem, and the benefit of improved sediment erosion control.

Dredge and fill activities associated with the selected plan would not violate any applicable state water quality standards or any Toxic Effluent Standard or Prohibition Under Section 307 of the Clean Water Act, and they would not degrade waters of the United States.

7. IMPLEMENTATION

7.1 Plan Implementation

Section 808 of WRDA 1986, as amended, authorizes the Secretary of the Army to reallocate storage at Chatfield Reservoir, upon the request of and in coordination with CDNR, and if the Chief of Engineers finds the reallocation feasible and economically justified. If these conditions are met, the Secretary can approve reallocation without obtaining additional authority from Congress. Section 116 of Division C, of the Omnibus Appropriations Act of 2009 (P.L. 111-8) authorizes CDNR to perform facility modifications and mitigation for the project, provided that the Secretary of the Army collaborates with CDNR and local interests to determine storage cost repayments that reflect the limited reliability of the reallocated storage space.

In accordance with Section 808, the CDNR has requested this reallocation project; and per Section 116, CDNR proposes to accomplish through its agencies and non-federal project partners, the water providers, all the modification and mitigation work for the project. Said work will involve every phase of design, construction, project management, and coordination for the project, including but not limited to: 1) on-site and off-site environmental mitigation; 2) modification/re-construction of all impacted recreation facilities; 3) utility relocations; 4) earthwork and shoreline contouring; 5) road, bridge and parking lot construction; 6) demolition, clearing, and grubbing; and 7) vegetation management. The Omaha District Corps of Engineers may decide to perform work related to modification or instrumentation of the dam or other Chatfield Project safety features, as well as modifications to project operating documents and processes. The district would also retain responsibility for oversight of the CDNR work and inherent Government responsibilities, including agency approvals and decisions.

In accordance with the 1958 Water Supply Act and Section 103(c)(2) of WRDA 1986 (P.L. 99-662), the cost to implement and operate the Water Supply Reallocation Project at Chatfield Reservoir is a 100 percent non-federal responsibility. Project costs include the cost of storage, specific water supply costs, recreation modifications, environmental mitigation, and minor modifications to the Corps project and operations. In this report these costs have been identified as financial costs. Although price levels increased over time, the FY 2012 overall annual and capital costs for Alternative 3 were lower than those calculated in FY 2011 (see Tables 5-16 and 5-11) due to lower estimated first costs for environmental mitigation features. Table 6-2 shows the current estimate of these costs at FY 2013 price levels.

The water providers could repay the cost of storage ($16,046,300 at FY 2013 price levels) up-front or repay the cost with interest over a 30-year period, beginning with the date of signing the new WSA by the Assistant Secretary of the Army (Civil Works). The signing date would be determined in the future. Applying the FY 2013 water supply interest rate of 2.875 percent over a period of 30 years, the current estimated annual cost is approximately $805,500 at FY 2013 price levels assuming no cash is paid up front by any of the water providers. The cost of storage was derived using the Use of Facilities cost allocation procedure (Appendix E of ER 1105-2-100). This procedure picks the greatest among benefits foregone, revenue foregone, updated cost of storage, or replacement costs for the cost of storage. The procedure updates the cost of the original construction of the Chatfield Reservoir Project to the current year price level to identify the updated joint-use project

construction costs and prorates that cost by the ratio of the reallocated storage to the total usable storage to determine the cost of the 20,600 acre-foot reallocation. The final cost of storage reallocation would be updated again prior to signing the new agreement from the mid-point of construction to the beginning of the month in which the new water supply agreement is signed. In addition, the water providers will be responsible for the costs for instrumentation including piezometers, revising the operation manual, revising the master plan, review of real estate requests, and revising the area-capacity tables. These costs are estimated at $709,200 ($31,600 annually). The Corps continues to have discussions with the state and the water providers to further refine the legal relationship between the entities.

The OMRR&R annual costs of the Federal Government associated with the reallocated storage (for both joint-use and specific water supply O&M) is also a non-federal responsibility. This would be paid annually at the beginning of each year. At the end of the year, final adjustments would be made for the year. The Use of Facilities cost allocation procedure would be applied to the joint-use OMRR&R cost to determine the proportionate of joint-use O&M related to the water supply reallocation. The costs for additional Corps OMRR&R costs ($170,500 per year) related to operation of the Chatfield Lake project for specific water supply actions are also a non-federal responsibility. This second type of OMRR&R ($47,200 per year) would cover the costs of additional operation and instrumentation-based monitoring activities. The sum of these two OMRR&R costs is currently estimated to be $217,700 per year over 50 years at FY 2013 price levels.

The specific water provider's infrastructure construction and OMRR&R cost estimates were provided by the water providers and are associated with features needed by the water providers to access their water at Chatfield Reservoir. All water providers' infrastructure costs except for Denver Botanic Garden (DBG) would be zero. They would require no new infrastructure. DBG costs would be about $75,600. The water providers would finance and pay these costs. The interest rate would vary by user; therefore, the actual annual amount is not known. The total amount is currently estimated to be $52.3 million or $2.3 million per year at FY 2013 price levels and the FY 2013 federal interest rate of 3.75 percent over 50 years.

The costs of environmental mitigation and recreation modifications would be paid by the water providers. These estimated costs are shown in Table 6-2. The actual costs for each water provider would vary due to the different interest rates and level of participation in the Chatfield Reservoir storage reallocation project. The OMRR&R costs associated with mitigation are the responsibility of the water providers. The OMRR&R cost include monitoring mitigation sites for five years following development and management over the 50 year period of analysis. The total environment mitigation and recreation modification costs are $77.8 million (including present value of $19.3 million for OMRR&R) and $47.3 million, respectively.

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), as described in this Report.

The Department of the Army and the CDNR will enter into a WSA, 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 WSA, and for undertaking the CDNR's obligations to the Government under the WSA 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 WSA, unless the WSA is suitably modified by mutual consent of the Corps and the CDNR. The CDNR has positioned itself through legislative action to financially account for all known orphan shares at the time of the requested funding authorization. CDNR plans to hold the orphan shares in reserve until such time that interested water entities proceed with established protocols for acquiring these shares. The Corps continues to have discussions with the state and the water providers to further refine the legal relationship between the entities.

After execution of the WSA and the subagreements, the Chatfield water providers will place the funds then judged necessary to satisfy all of the non-federal obligations under the WSA 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 WSA, senior management oversight of the implementation of the Compensatory Mitigation Plan and the Recreation Modification Plan will reside in the Project Coordination Team, consisting of senior management representation from the Corps, the CDNR, and the water providers. The Project Coordination Team shall consult on the progress of the non-Federal work being undertaken pursuant to the Plans, with a view towards anticipating and offering solutions to potential problems to its scheduled completion, and may make recommendations to the Omaha District Commander. The Corps has the final authority on acceptance or rejection of the Team's recommendations.

Schedule/Phasing Sequencing

The public was provided an opportunity to review and comment on this FR/EIS and the revised Chatfield Water Control Plan that would be used to operate Chatfield Reservoir if the Selected Plan is implemented. The revised Water Control Plan is provided as Appendix B.

If the reallocation is approved by the ASA(CW), the Chatfield water providers will begin implementing the actions to fulfill mitigation obligations as soon as practicable, the Corps and CDNR sign the WSA, and the water providers and CDNR sign the subagreements. The Compensatory Mitigation Plan (CMP) presents a phased project implementation process which establishes milestones for implementing mitigation activities and meeting success criteria as a precondition for the water providers' use of proportionate amounts of reallocated storage. Section 6.5.2 presents the mitigation milestones and associated proportions of reallocated storage available for use.

It is anticipated that the implementation of mitigation measures relating to recreational facilities modifications will take approximately three years to complete. The actions to construct facilities or structures related to environmental mitigation are estimated to take up to six years. Some of the actions involve establishment of vegetation which requires time for monitoring and adaptive management in order to help ensure success of the actions. The recreational modification and

environmental mitigation implementation activities will be conducted simultaneously to the extent possible. The monitoring of environmental mitigation actions will continue until all mitigation obligations are completely fulfilled. Each individual mitigation activity will be monitored at least annually for a minimum of five years or until success criteria are met. The Corps will determine when all project obligations have been successfully met.

7.2 Items of Non-Federal Cooperation

Federal implementation of the Selected Plan will be subject to the non-federal sponsor, the CDNR, agreeing in a WSA to comply with applicable federal laws and policies, including but not limited to:

a. For reallocation of water storage:

   1. Provide 100 percent of the reallocated cost of storage as calculated in accordance with the Water Supply Act of 1958, as amended (43 U.S.C. 390b), and implementing regulations, including the policy exception granted by the Assistant Secretary of the Army (Civil Works) on January 22, 2009;

   2. Provide the applicable pro-rata percentage of the Chatfield Lake project operations and maintenance joint costs; the applicable pro-rata percentage of the Chatfield Lake project repair, rehabilitation, and replacement joint costs; 100 percent of the annual additional Chatfield Lake project operations and maintenance expenses related to the non-federal sponsor's specific water supply use; and 100 percent of the annual operations and maintenance expenses of the specific water supply facilities operated by the non-federal sponsor;

   3. Hold and save the Government, including its officers, agents and employees harmless from liability of any nature or kind for or on account of any claim for damages which may be filed or asserted as a result of the storage in the Chatfield Lake project, or withdrawal or release of water from the Chatfield Lake project, made or ordered by the non-federal sponsor or as a result of the construction, operation, or maintenance of the water supply facilities and appurtenances thereto owned and operated by the non-federal sponsor except for damages due to the fault or negligence of the Government or its contractors.

b. For recreation modifications and the environmental mitigation features:

   1. Provide 100 percent of the cost of the recreation modifications and the environmental mitigation features, either by cash contributions or by in-kind work pursuant to Section 116 of the Omnibus Appropriations Act of 2009 (P.L. 111-8);

   2. Operate, maintain, repair, rehabilitate, and replace the features, at no cost to the Government, in a manner compatible with this Report, and in accordance with applicable Federal and State laws and regulations and any specific directions prescribed by the Government;

   3. Hold and save the Government free from all damages arising from the construction, operation, maintenance, repair, rehabilitation, and replacement of the recreation modifications and the environmental mitigation features, except for damages due to the fault or negligence of the Government or its contractors;

c. Provide any lands, easements, and rights-of-way not currently owned or possessed by the Government necessary for the construction, operation, and maintenance of the recreation modifications and the environmental mitigation features;

d. Keep and maintain books, records, documents, and other evidence pertaining to costs and expenses incurred pursuant to the project, for a minimum of 3 years after completion of the accounting for which such books, records, documents, and other evidence is required, to the extent and in such detail as will properly reflect total cost of construction of the project, and in accordance with the standards for financial management systems set forth in the Uniform Administrative Requirements for Grants and Cooperative Agreements to State and local governments at 32 CFR, Section 33.20;

e. Comply with all applicable federal and state laws and regulations, including, but not limited to: Section 601 of the Civil Rights Act of 1964, P.L. 88-352 (42 U.S.C. 2000d), and Department of Defense Directive 5500.11 issued pursuant thereto; Army Regulation 600-7, entitled "Nondiscrimination on the Basis of Handicap in Programs and Activities Assisted or Conducted by the Department of the Army;" and all applicable federal labor standards requirements including, but not limited to, 40 U.S.C. 3141-3148 and 40 U.S.C. 3701-3708 [revising, codifying and enacting without substantive change the provisions of the Davis-Bacon Act (formerly 40 U.S.C. 276a et seq.), the Contract Work Hours and Safety Standards Act (formerly 40 U.S.C. 327 et seq.), and the Copeland Anti-Kickback Act (formerly 40 U.S.C. 276c)];

f. Shall not use funds from other federal programs to meet any of the non-federal obligations unless the federal agency providing the federal portion of such funds verifies in writing that such funds are authorized to be used to carry out the Selected Plan;

g. In the case of c. above, perform, or ensure performance of, any investigations for hazardous substances as are determined necessary to identify the existence and extent of any hazardous substances regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 U.S.C. 9601–9675, that may exist in, on, or under lands, easements, or rights-of-way that the Federal Government determines to be required for the recreation modifications and the environmental mitigation features. However, for lands, easements, or rights-of-way that the Government determines to be subject to the navigation servitude, only the Government shall perform such investigations unless the Federal Government provides the Sponsor with prior specific written direction, in which case the Sponsor shall perform such investigations in accordance with such written direction;

h. In the case of c. above, assume, as between the Federal Government and the non-federal sponsor, complete financial responsibility for all necessary cleanup and response costs of any hazardous substances regulated under CERCLA that are located in, on, or under lands, easements, or rights-of-way that the Federal Government determines to be required for the recreation modifications and the environmental mitigation features;

i. In the case of c. above, comply with the applicable provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, P.L. 91-646, as amended, (42 U.S.C. 4601-4655), and the Uniform Regulations contained in 49 CFR 24, in acquiring lands, easements, and rights-of-way necessary for construction, operation, and maintenance of the recreation modifications and the environmental mitigation features, including those necessary for relocations,

the borrowing of material, or the disposal of dredged or excavated material; and inform all affected persons of applicable benefits, policies, and procedures in connection with said act;

j. To the maximum extent practicable, perform its obligations in a manner that will not cause liability to arise under CERCLA;

k. Prevent obstructions or encroachments (including prescribing and enforcing regulations to prevent such obstructions and encroachments) such as any new developments on lands, easements, or rights-of-way required for the recreation modifications and the environmental mitigation features, or the addition of facilities which might hinder the operation and maintenance of the Chatfield Lake project, or interfere with Chatfield Lake project's proper function; and

l. Shall have an archeologist on-site during construction activities to ensure compliance with historic preservation laws.

7.3 Implementation of CDNR/Water Providers Additional Measures

The water providers propose to fund and undertake additional measures beyond the federal reallocation project for recreation modifications and environmental mitigation activities (See Section 6.3 and Table 6-1). These additional measures were developed by the water providers, Colorado State Parks, and Colorado Division of Wildlife[1] to provide additional assurances of a like recreational experience, to compensate Colorado Parks and Wildlife for lost revenue or increased costs, and to provide ecological benefits above and beyond where the CMP has planned to replace lost ecological functions. These additional measures are separate from the federal reallocation project, but will be implemented by the water providers concurrently with the federal project, with sequencing and phasing as applicable to the nature of the measure.

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