

# CHATFIELD STORAGE REALLOCATION PROJECT

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## TECHNICAL ADVISORY COMMITTEE (TAC) TAC RECOMMENDATION DOCUMENT - No. 9

**SUBJECT:** Crediting Conservation Easement Bird EFUs outside of the RCZ/CHU  
Rev 09

**Date:** March 29, 2017

### Purpose:

Recognition that all areas protected by conservation easements (CEs), including the Douglas County Riparian Conservation Zone (RCZ), the Plum Creek/West Plum Creek Critical Habitat Unit (CHU), and upland habitat outside of the RCZ/CHU provide bird ecological function units (BEFUs). This document serves as the basis for the TAC recommendation on this subject.

### Background:

Impacts to bird habitat located within upland, riparian and wetland vegetation communities resulting from the Chatfield Storage Reallocation Project (CSR or the Project) have been identified in the EM1 ecological function unit (EFU) baseline assessment (ERO, 2016). Section 4.1 of the Ecological Functions Approach (EFA) (ERO 2013), describes the geographic target habitat boundary suitable for off-site mitigation as a combination of the RCZ and the 2002 proposed Preble's meadow jumping mouse (PMJM) CHU in the Plum Creek/West Plum Creek watershed. This combined RCZ/CHU boundary was selected for crediting off-site **combined EFUs** (CEFUs) because it defined the most geographically limited habitat of the three target habitat resources (PMJM, bird and wetland) as being PMJM habitat. The USFWS has agreed that the RCZ can be considered a rough approximation of PMJM habitat; however, there are areas of PMJM habitat outside of the RCZ that are mapped as CHU and areas within the RCZ that are not considered technically to be CHU. By definition, the RCZ is comprised primarily of riparian and wetland vegetation communities located along stream channels with about 25 feet of the adjacent upland included for foraging. Therefore, the combined RCZ/CHU boundary, while extending the boundary for crediting off-site mitigation, limits the target resource boundary to an area that covers mostly riparian and wetland vegetation communities that are considered PMJM habitat.

CMP, Page 26, Section 6.0, entitled, Proposed Mitigation Activities (FR/EIS 2013) states:

*On-site mitigation activities will enhance bird habitat and create wetlands and off-site compensatory mitigation actions will permanently protect and enhance bird and wetland habitat through long-term management of riparian areas and associated wetlands and adjacent uplands that provide substantial habitat for a variety of birds.*

The CMP, on Pg. 63, Section 6.2.1.1 Permanent Protection of Target Habitat, goes on to say:

*(Off-site) Target habitat typically includes well developed riparian habitat and some amount of adjacent upland areas.*

Further, the CMP, in Appendix C, Section 4.3.2, Buffer Zones, (FR/EIS 2013) identifies the habitat benefit associated with the inclusion of buffer zones in habitat preservation and impact mitigation:

*...wide, forested riparian areas provided breeding habitat for more bird species and that the addition of grassland-shrub buffer strips along narrow riparian habitat increased breeding bird species richness.*

The EFA described in the CMP outlines the methodology used to assess target resources preserved by EM5 off-site CEs. This methodology is only applied to target resource habitats located within the RCZ/CHU boundary. In addition, the methodology recognizes that habitat benefit can be derived from a contiguous zone that buffer the RCZ/CHU habitat from potentially developable adjacent land. The RCZ/CHU can include a thin strip, about 25 feet wide, of upland buffer; however, it is generally recognized that this is a minimum buffer width and greater habitat benefit can be derived from a much wider buffer zone. This additional benefit is captured in the EFA by a weighting factor that is applied to the EFUs within the RCZ/CHU..

A typical EM5 off-site CE is composed of two elements:

1. **The RCZ/CHU;** currently target resource EFU lift is obtainable only from this element of the CE. The RCZ/CHU is comprised almost entirely of riparian plant communities and aquatic habitats with the thin 25-foot strip of upland habitat described in the previous paragraph.
2. **The remainder of the CE, that is outside of the RCZ/CHU boundary.** This remainder can include the buffer, that abuts the RCZ/CHU boundary and any additional habitat outside of the buffer, but still within the area preserved by CE.

Target resource habitats within the area of the CE that lies outside of the RCZ/CHU are not accounted for in the EFU calculations, and only a maximum of 300 feet of this area can be used to derive the buffer zone weighting factor benefit. This weighting factor is not applied to EFUs within the CE area beyond the RCZ/CHU, but only to those within the RCZ/CHU. However, when preserved, target resource habitat outside of the RCZ/CHU could provide considerable, currently unaccounted for, EFUs. The CMP identifies the importance of buffer zones in protecting target habitats (see CMP, Appendix C Section 4.3.2, Buffer Zones [FR/EIS 2013]). However, the CMP does not recognize the EFUs associated with vegetation communities, largely upland, that will also be preserved and protected outside of the RCZ/CHU as a part of the EM5 off-site mitigation.

One of the goals of the Project mitigation is to avoid *out-of-kind mitigation*; for instance, *mitigating... lost cottonwood woodlands, with a greater area of uplands* (see CMP, Pg. 131; Section 8.2.6, Summary [FR/EIS 2013]). However; this goal conflicts with the target habitat geography described in CMP Section 6.2.1.1 (FR/EIS 2013). As explained in the CMP and the EFA, the extent of upland vegetation communities that can be credited is contained within the RCZ/CHU, along with riparian and wetland vegetation communities and is only a narrow (average 25-foot wide) strip, intended

for PMJM foraging. Areas outside of the RCZ/CHU that will be preserved as a part of the EM5 CEs, can account for a large proportion of the CE. This element of the CE often includes existing high quality upland vegetation communities that support bird habitat. These buffer zones will be preserved upon acquisition of the CE, but the bird EFUs (BEFUs) associated with the upland vegetation communities located in this non-RCZ/CHU element of the CE cannot currently be accounted for as mitigation in the off-site BEFU calculations as defined in the CMP and EFA. While the RCZ/CHU is comprised primarily of riparian and wetland plant communities, the buffer zone primarily consists of upland plant communities.

The FR/EIS does not distinguish BEFU impacts by vegetation community. However, the EM1 EFU baseline assessment has identified bird habitat impacts in three general vegetation communities: wetlands, riparian and upland. Most of the EM2 on-site environmental mitigation/protection will be focused on the enhancement and protection of high functioning wetland and riparian vegetation communities with very little upland mitigation. Per the accepted EFA methodology, minimal on-site BEFU lift can be obtained through enhancement of upland vegetation communities. This contrasts with the large estimate of 370 BEFU Project impacts. BEFUs associated with upland vegetation communities located in the CE outside of the RCZ/CHU could be utilized to mitigate these BEFU impacts.

Table 1 Provides an estimate of BEFU debits (impacts) and credits (mitigation). Assuming buffer zone BEFUs are included in the mitigation of BEFU Project impacts, EM5 off-site mitigation could result in an additional 12 BEFUs beyond the required 111. This estimate assumes CEs will be established, preserving and protecting RCZ/CHU and adjacent buffer zones for the top 8 priority properties as identified by Great Ecology as a part of the CSRP EM5 project. To date, CE option agreements have been executed on 2 of the 8.

**Table 1. Bird EFU Accounting Summary**

	BEFUs
Total Impacts	(370)
Fluctuation Zone Residual	189
Required Mitigation	(181)
EM2 On-site Mitigation	70
Required EM5 Offsite Mitigation	(111)
EM5 Cottonwood Recruitment and Preservation	23
Required EM5 CE Preservation	(88)
Estimated EM5 CE Preservation	100
Remainder CE Preservation	12

Note: Red figures in parentheses represent BEFU debits, black figures represent BEFU credits.

Of the 370 total BEFU impacts estimated by EM1, 128 are associated with upland vegetation communities (see EM1 reference document, ERO 2017), while the remaining 242 are associated with riparian and wetland vegetation communities. These different plant community impacts are not distinguished in Table 1 and are provided herein for informational purposes only; BEFU impacts and mitigation will not be distinguished by vegetation community. 189 residual bird EFUs are predicted to remain within the fluctuation zone upon storage of CSRP water. Subtracting these

189 residual BEFUs from the 370 impacted, means the Project will be required to mitigate 181 BEFUs. EM2 estimates that 70 BEFUs will result from on-site vegetation community enhancement and/or protection, leaving 111 BEFUs to be mitigated off-site by EM5 preservation through CEs and cottonwood recruitment and preservation, which is currently projected to provide 23 mitigation BEFUs as described in Table 23 of the EM1 EFU baseline report (ERO, 2016), leaving a remainder of 88 BEFUs that will need to be mitigated off-site within EM5 CEs.

Figure 1 provides a graphic representation of a hypothetical EM5 CE. As previously described in this memorandum, included in this CE are the RCZ/CHU area that include mostly wetlands, riparian and a small amount of upland plant communities and an area outside of the RCZ/CHU that consists mostly of upland plant communities. This area outside of the RCZ/CHU can be further divided into two subareas; the first is the buffer zone of up to 300 feet in width that is contiguous to the RCZ/CHU boundary that provides weighting credit for EFUs preserved within the RCZ/CHU. Other than this weighting factor that is applied only to the EFUs within the RCZ/CHU, no EFU lift is obtained for preservation of habitat in the CE area outside of the RCZ/CHU. As can be seen in Figure 1, the actual EFUs preserved within this area, but not accounted for in the EFA, can be significant. Land outside of the RCZ/CHU preserved under CEs will consist primarily of upland grass and shrub lands that provide quality bird habitat (see Figure 1). Due to the limitation of mitigation BEFUs to the RCZ/CHU, EM5 will be unable to credit BEFUs within the preserved upland vegetation communities located in the CE buffer zones and other preserved habitat outside of the RCZ/CHU (see Figure 1). Therefore, these BEFUs represent an unrealized mitigation credit. EM5 has estimated that up to 44 BEFUs outside of the RCZ/CHU are associated with CEs identified for the EM5 top 8 priority properties. In contrast, EM5 has estimated 56 BEFUs can be obtained within the RCZ/CHU for a combined BEFU off-site total of 100 BEFUs consisting of upland, riparian and wetland vegetation communities (see EM5 reference document, Great Ecology 2017). If the 44 buffer zone BEFUs can be applied to mitigation and EM5 is successful in obtaining CEs on all 8 properties, then the projected BEFU credits could exceed the off-site mitigation requirement by 12 BEFUs.

One of the potential EM5 conservation easement under negotiation includes very high quality bird habitat as documented by ERO Resources (ERO Resources 2017b). The memorandum concludes:

*The Chatfield Storage Reallocation Project Feasibility Report/Environmental Impact Statement (FR/EIS) does not distinguish bird Ecological Function Unit (EFUs) impacts by vegetation type; and the overall intent of the Comprehensive Mitigation Plan (CMP) is to replace impacted target resource EFUs with EFUs of equal or higher functioning ecological value, regardless of vegetation type. There is substantial overlap of bird species found at both Chatfield SP and the Conservation Easement (66 of 70 known species or 94% overlap). Both properties have highly functioning ecological value, provide a large percentage of bird species identified as species of conservation concern by Partners in Flight, and satisfy both the written requirements and intent of the CMP.*

The proposed approach to crediting BEFUs in high quality bird habitat outside of the RCZ/CHU is consistent with the FR/EIS (2013) Appendix GG, Adaptive Management Plan, that anticipated additional habitat enhancement could be performed to increase EFU lift and achieve mitigation goals. Specifically, the AMP lists a series of contingencies that can be used to achieve additional EFUs (See page 9). Amongst these contingencies are the following:

*Broaden the geographic scope of the target off-site mitigation area identified in the CMP (CMP, Figure 25) to increase the potential for protection of private lands or enhancement of public lands;*

*Other measures agreed upon by the PCT and the Chatfield Water Providers that are appropriate to address mitigation issues.*

In this case, the geographic scope of off-site bird habitat enhancement could be broadened to include BEFUs derived from preservation of the upland plant communities associated with each CE, but located outside of the RCZ/CHU.

## Recommendations

In recognition that all areas protected by CEs provide BEFUs, the following recommendations are made to broaden the geographic scope of the target off-site mitigation areas identified in the CMP to increase the potential for protection of private lands or enhancement of public lands in accordance with Appendix GG, Adaptive Management Plan, of the FR/EIS (2013). The TAC agrees with, and accepts the following:

### Whereas:

1. CSRP bird habitat impacts include upland vegetation communities as well as riparian and wetland vegetation communities.
2. Of the estimated 370 BEFUs, 128 occur within uplands with low functional value (smooth brome and non-native or noxious forbs).
3. EM5 CE land adjacent to, but not included in, the RCZ/CHU, contain existing upland vegetation communities that currently provide bird habitat with generally high functional value (native or mixed native/non-native grasslands, shrublands and woodlands).

### Therefore resolve:

1. That bird habitat impacts be mitigated, both on- and off-site, through mitigation of bird habitat of equal or greater functional value that includes a combination of wetland, upland and riparian vegetation communities.
2. That since BEFU impacts occur in upland vegetation communities, BEFU mitigation should also include BEFUs within upland vegetation communities, approximating, but not exceeding upland BEFU impacts

### Whereas:

1. The RCZ/CHU target resource mitigation boundary defined in the FR/EIS (2013) and used in the EFA calculations does not currently recognize the benefit derived from the preservation of existing upland vegetation communities located in non-RCZ/CHU land included in the CE.
2. The off-site RCZ/CHU target resource boundary described in the FR/EIS (2013) omits BEFUs in CE land located outside of the RCZ/CHU boundary.
3. Additional BEFU lift could be obtained through the enhancement of upland vegetation communities in the CE located outside of the RCZ/CHU,

### Therefore resolve:

1. That off-site BEFU mitigation credits not be limited to the riparian and wetland vegetation communities found within the RCZ/CHU.
2. That all BEFUs preserved within EM5 CE land located adjacent to, but outside of, the RCZ/CHU be included in the combined BEFU mitigation of CSRP combined BEFU impacts. In this case, combined BEFUs refers to a combination of BEFUs associated with upland, riparian and wetland vegetation communities.

**Whereas:**

1. The FR/EIS (2013) recommendation to avoid out-of-kind mitigation encourages that impacts to vegetation communities that include target resource habitat be mitigated by similar vegetation communities.
2. Riparian areas in eastern Colorado are often the most limited in geographic extent, yet generally provide habitat for the most diverse bird community.
3. Conceptual environmental mitigation designs in the FR/EIS (2013) presumed that most impacts from inundation would occur in wetland and riparian vegetation communities, and most on-site mitigation would occur in uplands, leaving a shortfall in overall riparian EFUs
4. EM5 CE preservation of bird habitat will be weighted, by definition of the RCZ/CHU, towards riparian and wetlands vegetation communities rather than upland vegetation communities.

**Therefore resolve:**

1. That combined BEFU upland, riparian and wetland vegetation community CSRP impacts should be mitigated, in like kind to the extent practicable, by combined BEFU upland, riparian and wetland vegetation community enhancement and preservation/protection.
2. Off-site mitigation of BEFUs strive to maximize riparian BEFUs
3. BEFU mitigation should also include BEFUs within upland vegetation communities, approximating, but not exceeding upland BEFU impacts

**Whereas:**

- a) The intent of the CMP was to focus off-site mitigation on riparian and wetland vegetation communities within the RCZ/CHU and the contiguous upland communities.

**Therefore resolve:**

1. All upland areas that are included in BEFU mitigation calculations be located contiguous (i.e., abutting) to the RCZ/CHU.
2. No EM5 conservations easements be established that include only upland plant communities.

## Referenced Documents

ERO 2013. Section 4.1, Geographic Boundaries of Ecologically Suitable Target Habitat, Appendix C, Ecological Functions Approach of the Compensatory Mitigation Plan (CMP), Appendix K of the FR/EIS. July, 2013.

ERO 2016. Final Baseline Ecological Function Units and Field Evaluation Report, Chatfield Storage Reallocation Project. By: ERO Resources, Denver, CO. For: Chatfield Reservoir Mitigation Company, Littleton, CO. November 14, 2016. **NOT ATTACHED**

ERO 2017. CSRP Upland Bird Habitat Impacts. January 13, 2017.

ERO 2017b. Memorandum Regarding *Ecological Value of Conservation Easement No. 1 for Birds*. From: Ron Beane, ERO Resources. To: Barbara Biggs, CDM Smith, February 13, 2017.

FR/EIS 2013. Chatfield Reservoir Storage Reallocation Project, Final Integrated Feasibility Report and Environmental Impact Statement. US Army Corps of Engineers, Omaha District. July, 2013. **NOT ATTACHED**

FR/EIS 2013. Compensatory Mitigation Plan (CMP), Section 4.3.2, Buffer Zones. July, 2013.

FR/EIS 2013. CMP, Section 6.0 Proposed Mitigation Activities. Pg. 26. July, 2013.

FR/EIS 2013. CMP, Section 6.2.1.1 Permanent Protection of Target Habitat. Pg. 63. July, 2013.

FR/EIS 2013. CMP, Section 8.2.6, (Cost) Summary. Pg. 131. July, 2013.

Great Ecology 2017. Preservation of Upland Bird Habitat in EM5 Off-site Conservation Easement Buffer Areas. January 17, 2017.

## Requested Action

The TAC is requested to include in the mitigation of BEFU impacts the currently unaccounted for BEFUs associated with the preservation of upland vegetation communities located in EM5 CE land located contiguous to but outside of the RCZ/CHU.

## Request Rationale

The inclusion of BEFUs associated with upland vegetation communities located in EM5 CE land located contiguous to but outside of the RCZ/CHU in mitigation calculations is consistent with the goals, objectives and intent of the CMP in the FR/EIS in the following ways:

- All BEFUs associated with all EM5 off-site wetland, upland and riparian vegetation communities preserved by CEs should be utilized to offset BEFUs associated with upland, wetland and riparian vegetation communities impacted by the CSRPs.
- Upland vegetation communities located in lands preserved by EM5 CEs that are located contiguous to but outside of the RCZ/CHU boundary, are of higher quality than the uplands vegetation communities impacted on-site.
- Credit EM5 CE lands located contiguous to but outside of the RCZ/CHU BEFUs in the calculation of off-site mitigation of upland, riparian and wetland vegetation communities associated with CSRPs impacts, in conformance with the FR/EIS like-kind mitigation objective.

## TAC Recommendation

The TAC recommends inclusion of BEFUs associated with upland vegetation communities located in EM5 CE lands located contiguous to but outside of the RCZ/CHU in the calculation of offsite BEFUs intended to mitigate Project BEFU impacts associated with upland, riparian and wetland vegetation communities.

## TAC Voting

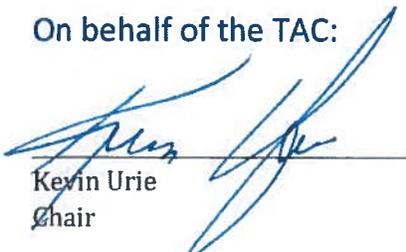
The TAC members in attendance voted on this Recommendation, in accordance with the TAC Charter Section C. The vote tally was 11 votes to "agree"; 0 votes to "accept"; and 0 votes to "reject" the Recommendation. The recommendation is based on the total votes for "agree" and "accept". TAC adopted voting procedures also require that any Member voting to "reject" a recommendation to propose alternative(s) for consideration to move the issue forward.

## TAC Rationale

The inclusion of BEFUs associated with upland vegetation communities located in EM5 CE's land located contiguous to but outside of the RCZ/CHU in mitigation calculations is consistent with the goals, objectives and intent of the CMP in the FR/EIS in the following ways:

- All BEFUs associated with all EM5 off-site wetland, upland and riparian vegetation communities preserved by CE's should be utilized to offset BEFUs associated with upland, wetland and riparian vegetation communities impacted by the CSRP.
- Upland vegetation communities located in lands preserved by EM5 CE's that are located contiguous to but outside of the RCZ/CHU boundary, are of higher quality than the uplands vegetation communities impacted on-site.
- Credit EM5 CE lands located contiguous to but outside of the RCZ/CHU BEFUs in the calculation of off-site mitigation of upland, riparian and wetland vegetation communities associated with CSRP impacts, in conformance with the FR/EIS like-kind mitigation objective.

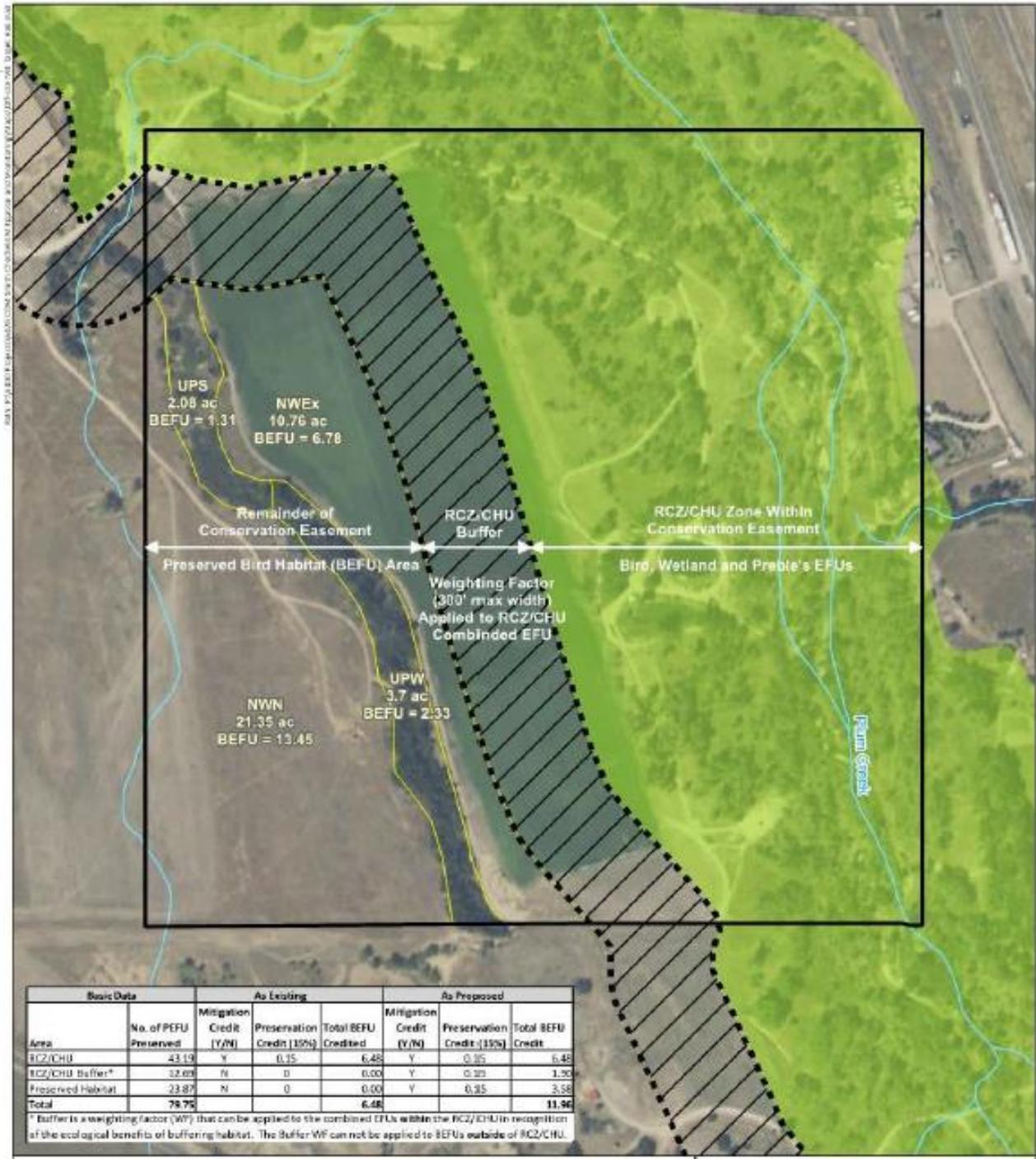
On behalf of the TAC:



Kevin Urie  
Chair



Kris Wahlers  
Vice-Chair



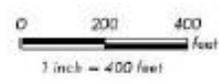
Basic Data	As Existing				As Proposed			
	No. of PEFU Preserved	Mitigation Credit (Y/N)	Preservation Credit (15%)	Total BEFU Credited	Mitigation Credit (Y/N)	Preservation Credit (15%)	Total BEFU Credit	
RCZ/CHU	43.19	Y	0.35	6.48	Y	0.35	6.48	
RCZ/CHU Buffer*	32.09	N	0	0.00	Y	0.30	1.30	
Preserved Habitat	23.87	N	0	0.00	Y	0.35	3.58	
<b>Total</b>	<b>79.75</b>			<b>6.48</b>			<b>11.36</b>	

\* Buffer is a weighting factor (WF) that can be applied to the combined EFUs within the RCZ/CHU in recognition of the ecological benefits of buffering habitat. The Buffer WF can not be applied to BEFUs outside of RCZ/CHU.

### Chatfield Reallocation Study

- Vegetation
- Parcel Under Conservation Easement
- Riparian Conservation Zone
- RCZ/CHU Upland Buffer (Max. 300 FT) for Calculating Weighting Factor

Stream (NHD)



**Figure 1**  
Example Off-Site Mitigation Target Habitat

File: Off-site Mit Target Habitat (WI)  
March 10, 2017



Sources: USGS NHD, 2015; National Hydrography Dataset (NHD)

## Reference Document Attachments

ERO 2013. Section 4.1, Geographic Boundaries of Ecologically Suitable Target Habitat, Appendix C, Ecological Functions Approach of the Compensatory Mitigation Plan (CMP), Appendix K of the FR/EIS. July, 2013.

Because of the differences from on-site mitigation, the following standards were established to define and select ecologically suitable habitat for off-site mitigation and to appropriately calculate EFU mitigation credits for off-site mitigation areas:

- Geographic boundaries of ecologically suitable habitat that can be targeted for mitigation;
- Baseline value of EFUs contained within ecologically suitable habitat in a mitigation parcel; and
- Weighting factor values.

#### **4.1 Geographic Boundaries of Ecologically Suitable Target Habitat**

To effectively identify potential mitigation properties, criteria for defining or setting boundaries on ecologically suitable mitigation habitat must be established. In other words, what defines the target habitat containing the EFUs that can be credited toward mitigation? Because Preble's has substantial geographic overlap with the other target environmental resources and suitable Preble's habitat is the most geographically limited of the target environmental resources, **Preble's habitat was used to define the target habitat.** However, there is no absolute standard for defining the spatial extent of Preble's habitat. For trapping survey purposes, the Service recommends that surveys be conducted in suitable habitat within 300 feet of Federal Emergency Management Agency (FEMA)-designated 100-year floodplains associated with rivers, creeks, and their tributaries (Service 2004). In 2002, the Service proposed critical habitat within the Upper South Platte River Drainage, including West Plum Creek (67 Fed. Reg. 47163 (July 17, 2002)). The width of proposed critical habitat was based on the size of the stream or stream order. For streams of orders 1 and 2 (the smallest streams), the Service delineated critical habitat as 110 meters (360 feet) outward from the stream edge; for streams of orders 3 and 4, the Service delineated critical habitat as 120 meters (400 feet) outward from the stream edge; and for stream orders 5 and above (the largest streams and rivers), the Service delineated critical habitat as 140 meters (460 feet) outward from the stream edge. Douglas County (County) created a Riparian Conservation Zone (RCZ) as part of the Douglas County Habitat Conservation Plan (DCHCP). The RCZ includes riparian areas and adjacent upland habitats on nonfederal lands with a high likelihood of supporting Preble's within the three major watersheds in the County (Plum Creek, Cherry Creek, and South Platte River upstream of Chatfield Reservoir). The RCZ was developed to include habitat attributes needed for all aspects of Preble's life cycle (e.g., water, cover, nesting, breeding, foraging, movement, and hibernation), including:

- The active channel;
- Alluvial floor;
- Upland side slopes adjacent to the channel or alluvial floor; and
- A component of the upland vegetation adjacent to the upland side slopes (generally 25 feet to 100 feet wide depending on potential habitat quality).

A side-by-side comparison of the proposed critical habitat and the RCZ revealed that the RCZ generally captures a larger area of potential Preble's habitat on larger order streams, whereas the proposed critical habitat captures more potential Preble's habitat on smaller streams (Figure C-5). To maximize the opportunity to conserve and enhance riparian corridors, an inclusive approach was used by overlaying the RCZ and proposed critical habitat and using whichever boundary was wider as the outer boundary of target habitat.

#### **4.2 Baseline Credits for Preservation**

While local, state, and federal regulations provide governmental entities the ability to restrict uses on private land, no regulation or combination of regulations prohibits all land use activities with the potential to negatively affect EFUs on target habitat. For example, local floodplain regulations are often considered among the most restrictive land use regulations; however, under such regulations, land uses such as the following are allowed:

1. Water-related recreational facilities;
2. Agricultural uses such as general farming, pasture, truck farming, sod farming, grazing, and crop harvesting;
3. Recreational uses not requiring structures or fences, including parks, golf courses, driving ranges, picnic grounds, wildlife and natural reserves, game farms, target ranges, trap and skeet ranges, hunting, fishing, and hiking areas;
4. Lawns, gardens, parking areas, and other similar uses accessory to the residential use of the land; and
5. All-terrain vehicle use.





Consultants in Natural Resources and the Environment

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# Final Chatfield Storage Reallocation CSRP Upland Bird Habitat Impacts

Prepared for—

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January 13, 2017

## Background

ERO Resources Corporation (ERO), as the environmental mitigation 1 contractor (EM1), is providing independent ecological review of environmental mitigation for the Chatfield Storage Reallocation Project (CSRP) per the requirements of the Comprehensive Mitigation Plan (CMP). ERO completed a detailed field assessment of Ecological Functional Units (EFUs) within the proposed fluctuation zones, recreation facilities, borrow areas, and proposed on-site mitigation areas. The assessment provided a standardized baseline of existing conditions to be used for impact calculation and mitigation design.

## Upland BEFU Impacts

Impacts to bird habitat resulting from CSRP have been identified in the 2016 EM1 EFU baseline assessment report. The FR/EIS does not distinguish bird EFU impacts by vegetation type; however, the EM1 EFU baseline assessment has identified bird habitat impacts in three general vegetation communities - wetlands, riparian, and uplands. Field surveys in 2016 identified a total of 657 EFUs in the fluctuation zone and an additional 35 EFUs that would be permanently impacted by relocation of recreation facilities and environmental mitigation (Table 1). This total of 692 EFUs consist of 370 bird EFUs (BEFUs), 158 non-critical habitat Preble's mouse EFUs (PEFUs), 102 critical habitat PEFUs, and 62 wetland EFUs (WEFUs) (Table 1).

A total of 128 of the 370 BEFUs impacted by the CSRP occur in uplands (Table 2). The majority of the impacted uplands are poor quality and very low functioning non-woody exotic (smooth brome) and non-woody noxious (weeds) types (Table 2). Of the 128 upland BEFUs impacted by the CSRP, an estimated 121.8 are in these low quality habitats (Table 2, red numbers).

## On-site BEFU Mitigation

The overall intent of the CMP is to replace impacted target resource EFUs with EFUs of equal or higher functioning ecological value, regardless of vegetation type. A secondary goal of this overall intent is to avoid out-of-kind mitigation. Thus, one of the objectives of mitigation, both on-site and off-site, is to mitigate the low quality upland BEFUs with up to 128 equal or higher functioning upland BEFUs.

On-site mitigation has evolved to focus on protection and enhancement on the high functioning habitats along Plum Creek and the South Platte River. Therefore, most of the on-site mitigation/protection proposed by the EM2 consultant (Muller) will concentrate on wetland and riparian vegetation communities with very little on-site mitigation involving uplands. In addition, on-site bird habitat enhancements derive minimal EFU lift. As previously mentioned 370 total BEFUs (all vegetation communities) will be impacted by CSRP. Accounting for the estimated 189 residual BEFUs, the CSRP will be required to mitigate 181 BEFUs (Table 1). EM2 estimates mitigating/protecting 70 bird EFUs, leaving 111 BEFUs to be mitigated off-site. Assuming 23 BEFUs can be obtained through off-site cottonwood preservation and recruitment commitments described in the CMP, an additional 88 BEFUs will need to be mitigated off-site.

### Calculations:

370 BEFUs impacted – 189 residual BEFUs = total mitigation requirement of 181 BEFUs

181 BEFUs – 70 BEFUs mitigated/protected on-site – 23 BEFUs mitigated off-site = 88 BEFUs remain to be mitigated off-site

**Table 1. EFU Impacts and Mitigation by Target Resource.**

Impacts by Resource	BEFU	PEFU Non CHU	PEFU CHU <sup>1</sup>	WEFU	Total EFU
Impacted EFU (Fluctuation Zone)	342	152	102	61	657
Impacted EFU (Recreation Facility Above El. 5444)	28	6	0	1	35
<b>Total Impacted EFU</b>	<b>370</b>	158	102	62	692
Residual EFU	189	55	19	0	264
<b>Required Mitigation</b>	<b>181</b>	<b>103</b>	<b>82</b>	<b>62</b>	<b>428</b>
On-site Mitigation by Resource					
EFU Lift above the future w/o Protection	33	140	44	87	304
On-site Mitigation within Fluctuation Zone (EFU enhancement of borrow)	37	24	0	5	66
<b>Total On-Site Mitigation</b>	<b>70</b>	<b>164</b>	<b>44</b>	<b>92</b>	<b>370</b>
Off-site Mitigation Requirement by Resource					
Mature Cottonwood Preservation <sup>2</sup> .	16	0	11	0	27
Cottonwood Recruitment <sup>2</sup> .	7.5	0	7.5	0	15
<b>Total Additional Off-site Compensatory Mitigation<sup>3</sup>.</b>	<b>88<sup>4</sup></b>	<b>-61</b>	<b>19<sup>4</sup></b>	<b>-30</b>	<b>107<sup>4</sup></b>

<sup>1</sup> Impacts with the critical habitat unit (CHU) for Plum Creek - Impacts to upper S. Platte CHU are mitigated on Sugar Creek

<sup>2</sup> Estimates based on known cottonwood community scores observed on-site

<sup>3</sup> Positive numbers indicate where off-site resource EFUs are needed and negative numbers indicate where on-site mitigation exceeds mitigation requirement.

<sup>4</sup> Red number indicate off-site mitigation requirement

**Table 2. BEFU Permanent Upland Impacts by Vegetation Type.**

Vegetation Type	Upland BEFU		
	Fluctuation Zone	Recreational Facilities	Total BEFU
Non-woody Exotic (NWEx)	87.4	22.8	110.2
Non-woody Noxious (NWNox)	11.0	0.6	11.6
Upland Shrub (UPS)	0.1	0.6	0.7
Upland Wooded (UPW)	2.2	0	2.2
Upland Sparsely Vegetated (USV)	3.3	0	3.3
<b>Total</b>	<b>104.0</b>	<b>24.0</b>	<b>128.0</b>

## **Conclusions**

Based on the analysis summarized in this reference document and ERO's independent review of EM5's estimate of off-site upland BEFU preservation in conservation easements, ERO concludes the following:

### ***Buffer Zone Weighting Factor and Upland BEFUs***

1. Buffer zone weighting factors apply only to combined EFUs preserved within the RCZ and do not apply to additional conservation easement upland buffer zones located adjacent to, but outside of the RCZ.
2. BEFUs located in on-site upland buffer zones that are adjacent to, but outside of the RCZ, are not accounted for in any off-site EFU preservation calculations.
3. BEFUs located in off-site upland buffer zones that are adjacent to, but outside of the RCZ and preserved as a part of an EM5 conservation easement should be included in the preservation BEFUs that will be used to offset impact BEFUs. This approach is in conformance with the CMP like-kind mitigation goal.

### ***On-site BEFUs***

1. Total BEFU mitigation requirement = 181.
2. After on-site mitigation and off-site cottonwood recruitment and preservation, an additional 88 BEFUs need to be mitigated off site.
3. 128 upland BEFUs will be impacted by CSRP – these are poor quality, low functioning BEFUs.
4. Up to 128 BEFUs could be mitigated with upland BEFUs, both on- and off-site.

### ***Off-site BEFUs***

1. Because very little on-site mitigation involves uplands, all 88 BEFUs needed from off-site preservation could come from buffer zone uplands and still be consistent with the spirit and intent of the CMP.
2. ERO has reviewed EM5's approach and calculations for estimating off-site upland BEFUs and agrees with their findings.

ERO 2017b. Memorandum Regarding Ecological Value of Conservation Easement No. 1 for Birds. From: Ron Beane, ERO Resources. To: Barbara Biggs, CDM Smith. February 13, 2017.

February 13, 2017

**To:** Barbara Biggs; CDM Smith  
**From:** Ron Beane; ERO Resources Corp.  
**Re:** Ecological Value of Conservation Easement No. 1 for Birds

**Purpose:**

The purpose of this memo is to provide an evaluation of the ecological value of the Conservation Easement No. 1 (Conservation Easement) for birds.

**Background**

Both Chatfield State Park (Chatfield SP) and the Conservation Easement are located at the interface of the Shortgrass Prairie and the Southern Rocky Mountains Bird Conservation Regions (BCRs) (USFWS 2008). Being located at this interface, both properties provide habitat for similar bird communities. Characteristic birds in these BCRs include hairy woodpecker (*Picoides villosus*), western tanager (*Piranga ludoviciana*), and pygmy nuthatch (*Sitta pygmaea*); species that have been identified on both properties. Furthermore, of the 70-bird species known to occur on the Conservation Easement (Great Ecology 2017), 66 have also been recorded at Chatfield SP (CDOW 2009). More indicative of the ecological value of both Chatfield SP and the Conservation Easement is the number of Birds of Conservation Concern (BCC) that occur on the respective properties (Table 1). The U.S. Fish and Wildlife Service is the lead agency for a multi-agency effort for migratory bird protection called Partners in Flight. Partners in Flight have identified 17 BCC species within the Shortgrass Prairie BCR and 27 BCC species within the Southern Rockies BCR (USFWS 2008). Ten of these BCC species are known to occur at both Chatfield SP and the Conservation Easement property (Table 1.)

Table 1. Comparison of BCC Species found at Chatfield State Park and Conservation Easement No. 1<sup>1</sup>.

Birds of Conservation Concern	Chatfield SP	Conservation Easement
Number BCC species shared by both properties	10	10
Number of Shortgrass Prairie BCC species	14	10
Number Southern Rockies BCC species	17	11

<sup>1</sup>. Based on extensive surveys at Chatfield SP and much less intensive survey effort at the Conservation Easement

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 Emmett, ID 83617  
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Conclusion:

The Chatfield Storage Reallocation Project Feasibility Report/Environmental Impact Statement (FR/EIS) does not distinguish bird Ecological Function Unit (EFUs) impacts by vegetation type; and the overall intent of the Comprehensive Mitigation Plan (CMP) is to replace impacted target resource EFUs with EFUs of equal or higher functioning ecological value, regardless of vegetation type. There is substantial overlap of bird species found at both Chatfield SP and the Conservation Easement (66 of 70 known species or 94% overlap). Both properties have highly functioning ecological value, provide a large percentage of bird species identified as species of conservation concern by Partners in Flight, and satisfy both the written requirements and intent of the CMP.

References:

Colorado Division of Wildlife (CDOW). 2009. Birds of Chatfield State Park and Waterton, Colorado. Compiled by H. Kingery, F. Justice and J. Justice. Updated by J. Kellner, 2009. Available online at: <http://www.denveraudubon.org/wp-content/uploads/2012/05/Chatfield-Bird-List.pdf>.

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U.S. Fish and Wildlife Service (USFWS). 2008. Birds of Conservation Concern 2008. United States Department of Interior, Fish and Wildlife Service, Division of Migratory Bird Management, Arlington, Virginia. 85 pp. Available online at <https://www.fws.gov/migratorybirds/pdf/management/BCC2008.pdf>

Sincerely,



Ronald Beane  
Senior Wildlife Biologist  
Project Manager EM1



### 4.3.2 Buffers

A riparian buffer is a linear band of permanent vegetation adjacent to a riparian area intended to maintain or improve ecological functions such as water quality and wildlife habitat.

Vegetation in buffer areas improves the quality of water as it moves across a buffer by trapping and removing various pollutants (e.g., contaminants from herbicides and pesticides; nutrients from fertilizers; and sediment from upland soils) from both overland and shallow subsurface flow through the buffer. Wildlife habitat can be improved when a buffer provides distance and a separation between human disturbance and riparian habitat. A study by Peak and Thompson (2006) found that wide, forested riparian areas provided breeding habitat for more bird species and that the addition of grassland-shrub buffer strips along narrow riparian habitat increased breeding bird species richness.

Minimum buffer widths recommended in the scientific literature to meet specific environmental objectives vary from only a few feet to more than 300 feet. Water quality functions can generally be protected with a 100-foot buffer to trap sediments and reduce nitrate concentrations Wenger (1999). Aquatic habitat can be protected with forest riparian buffers between 35 and 100 feet and terrestrial riparian wildlife communities require minimum buffers of 300 feet from the stream edge and extend beyond 660 feet (NRCS 2003; Wenger 1999). An extensive literature review and analysis conducted by the Environmental Law Institute (ELI 2003) found that a 300-foot buffer was the most consistent and scientifically supported buffer width reported in the literature. Based on this information, an incremental buffer up to 300 feet from the edge of target habitat is an area that provides added value to the EFUs contained within that habitat. This added value is accounted for by applying a weighting factor to the baseline EFUs.

Assuming that as buffer width increases, the gain in ecological benefits to habitat incrementally diminishes, the buffer area to which a weighting factor would be applied consists of three 100-foot-wide bands that approximately parallel target habitat. Because 100 feet was reported most often as the buffer width required to meet water quality objectives, a buffer that averages 100 feet in width, that at no point is less than 50 feet wide, is established as the minimum buffer threshold to receive any weighting credit. The 50-foot limit was established because this is the minimum reported in the literature to provide water quality benefits. In

recognition of the decreased ecological benefits, a weighting factor of decreasing value would be applied to each subsequent 100 feet (on average) of buffer included within a protected mitigation parcel. For example, the EFU value within a mitigation area that included the target habitat and an adjacent 100-foot buffer (on average) would be increased by 30 percent. Increasing the buffer width to 200 feet (on average) would increase the EFU value by an additional 20 percent, for a 50 percent total increase in value. Increasing the average buffer width to 300 feet or more would increase the EFU value by an additional 10 percent, for a maximum increase in EFUs of 60 percent. The values of increasing buffers widths are as follow (Figure C-7):

- Average buffer width less than 100 feet = no increase in value (no multiplier);
- Average buffer width between 100 and 200 feet = EFU multiplied by 1.3;
- Average buffer width between 200 and 300 feet = EFU multiplied by 1.5; and
- Average buffer width greater than 300 feet = EFU multiplied by 1.6.

Situations may exist where target habitat may be able to be buffered only on a single side, or buffers may be of unequal widths on the opposite sides of target habitat. To address these situations, target habitat will be split at the stream channel centerline, and the average width of the buffer will be calculated and credited separately to the EFUs for the protected property on each side of the stream.

### **4.3.3 Connectivity**

Riparian areas tend to be linear in shape and, therefore, are more susceptible to being fragmented than other types of habitat. Habitat fragmentation has a negative impact on wildlife, including Preble's populations, either through the creation of two or more small, isolated populations or the reduction of viability in larger populations. Providing connectivity by permanently protecting corridors is one of the most effective tools for increasing the viability of threatened populations.



Because of this substantial functional and geographic overlap, compensatory mitigation actions for Preble's will benefit birds and wetlands and provide the majority of the compensatory mitigation needed for impacts to the target environmental resources. This approach will provide mitigation cost efficiencies by accounting for the functional and geographic overlap of impacts to the target environmental resources and focusing mitigation first on mitigation for Preble's habitat. On-site mitigation activities will enhance bird habitat and create wetlands and off-site compensatory mitigation actions will permanently protect and enhance bird and wetland habitat through long-term management of riparian areas and associated wetlands and adjacent uplands that provide substantial habitat for a variety of birds. Additionally, because Preble's habitat has a diversity of components (wooded riparian, riparian wetlands, and adjoining uplands), Preble's habitat supports a broad diversity of wildlife other than birds, including large and small mammals, reptiles, amphibians, and insects. Therefore, other wildlife will benefit from mitigating impacts to Preble's habitat.

Although birds will also benefit from Preble's mitigation activities, there are certain activities specifically intended to compensate for impacts of up to 42.5 acres of mature cottonwood bird habitat that will be adversely affected. Because mature cottonwood habitat has been specifically identified as an important habitat type in Chatfield State Park, mitigation for this resource will include not only compensating for lost EFUs, but also compensating for lost acres. Proposed activities include designating up to 13 acres of on-site mitigation for recruitment of new cottonwood growth (Section 6.1.1.3), protecting up to 22.5 acres of existing mature cottonwood habitat in off-site compensatory mitigation areas, and designating up to 10 acres of off-site mitigation areas for recruitment of new cottonwood growth (Section 6.1.1.4). Areas designated for new recruitment will contribute to the long-term persistence of multi-aged patches of cottonwoods, including future stands of mature cottonwoods.

In addition to compensatory mitigation activities, restoration activities will be undertaken to restore areas that are disturbed during relocation of the recreation facilities, but are not part of the permanent footprint of the facilities. These areas include the borrow areas, haul roads, and the majority of areas filled to elevate the relocated facilities.

The remainder of this section describes various proven techniques that will be used to restore, enhance, create, and conserve habitat for compensatory mitigation. Some activities, such



## 6.2.1 Proposed Activities

### 6.2.1.1 Permanent Protection of Target Habitat

The off-site mitigation for impacts to Preble's noncritical habitat focuses on the West Plum Creek and Plum Creek watersheds upstream of Chatfield State Park (Figure 26). Similar large-scale conservation efforts have been successful in Douglas County (Douglas County et al. 2006). Mitigation areas will be permanently protected by conservation easements put in place on property purchased from willing property owners or through conservation easement agreements with willing property owners. To ensure that mitigation credits are associated with suitable Preble's habitat, only portions of private parcels identified as target habitat would contribute to accrual of mitigation credits (Appendix C, Section 4.1). Target habitat typically includes well-developed riparian habitat and some amount of adjacent upland areas. Douglas County has mapped Preble's habitat as part of the Douglas County Habitat Conservation Plan (DCHCP) (Douglas County et al. 2006). The mapped areas are the Riparian Conservation Zone (RCZ) in the DCHCP. Additionally, in 2009 the Service proposed to designate certain reaches of Plum Creek and its tributaries as critical habitat for Preble's. Off-site target habitat was mapped by overlaying the RCZ and proposed critical habitat and using whichever boundary was wider as the outer boundary of target habitat (Figure 27). The combination of the 2009 proposed critical habitat designation for Preble's and the RCZ mapping provide the maximum target habitat width for off-site mitigation within the target habitat area (Figure 27). Generally, the RCZ is wider than the 2009 proposed critical habitat designation on larger streams (e.g., Plum Creek) and narrower on tributaries to West Plum Creek (e.g., Jarre Creek or Garber Creek). The combination of the RCZ and the 2009 proposed critical habitat designation will facilitate the potential for increased protection of riparian habitats and their adjoining uplands in the off-site mitigation target habitat area.



and provide compensatory resources similar to those lost. This approach shapes the relative mix of mitigation components and prevents out-of-kind or imbalanced mitigation that could be driven by costs. For example, mature cottonwood woodlands are a valued resource at Chatfield State Park. The CMP calls for creating up to 13 acres of designated cottonwood recruitment areas on-site. This approach prevents out-of-kind mitigation (e.g., mitigating the lost cottonwood woodlands, with a greater area of uplands) or having all compensatory mitigation for cottonwood woodlands occur off-site.

The CMP is consistent with the guiding principles and objectives established for compensatory mitigation for impacts to the target environmental resources. These principles and objectives have been reviewed by environmental stakeholders and are intended to ensure a diversity and balance of mitigation that compensates for impacts to the target environmental resources. In addition, the water providers are willing to spend additional dollars required to implement the CMP alternative. Thus, while the water providers and stakeholders understand that the CMP is not the least cost mitigation alternative evaluated, it is the plan that should be implemented based on consideration of other overriding factors.

The Chatfield Water Providers will be responsible for CMP cost of \$77.8 million including the off-site CHU and capitalized management and monitoring costs of \$19.3 million. This represents the present value of the costs presented in Table 3, Table 13, and Table 16 using an interest rate of 3.75 percent and a time period of 50 years.

## 9.0 REFERENCES

- CH2M Hill. 2009. Sugar Creek Sediment Mitigation Project, Site Assessment, Conceptual Solutions, and Preferred Alternatives. April 30.
- Douglas County and the Towns of Castle Rock and Parker, ERO Resources Corporation, Brooke Fox, and Trout, Raley, Montaño, Witwer and Freeman, P.C. 2006. Habitat Conservation Plan and Assessment for Douglas County and the Towns of Castle Rock and Parker.
- EDAW. 2009. Chatfield Reservoir Recreation Facilities Reallocation Plan. November.
- Environmental Protection Agency (EPA) and Department of the Army. 1990. Memorandum of Agreement Between the Environmental Protection Agency and the Department of the Army Concerning the Determination of Mitigation Under the Clean Water Act Section 404(b)(1) Guidelines. February.
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- ERO Resources Corporation (ERO). 2009. Meeting with Peter Plage (Service) and Denny Bohon (USFS) on critical habitat mitigation on the Pike National Forest. September 30.

Great Ecology 2017. Preservation of Upland Bird Habitat in EM5 Off-site Conservation Easement Buffer Areas. January 17, 2017.



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**CHATFIELD STORAGE REALLOCATION PROJECT**

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**PRESERVATION OF UPLAND BIRD HABITAT IN EM5 OFF-SITE  
CONSERVATION EASEMENT BUFFER AREAS**

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Submitted to:

**Chatfield Reservoir Mitigation Company**

Date:

**January 18, 2017**

Prepared by



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## EM5 OFFSITE MITIGATION – BIRD EFUS

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### BACKGROUND

Great Ecology is supporting EM5 offsite mitigation for the Chatfield Storage Reallocation Project (CSRP). To identify offsite mitigation properties, Great Ecology performed a remote assessment of potential mitigation properties which contained a portion of the Douglas County Riparian Conservation Zone (RCZ). Properties within this zone are likely to contain target resources required for offsite mitigation including critical habitat for Preble's Meadow Jumping Mouse (*Zapus hudsonius preblei*; Preble's), bird habitat, wetlands and cottonwood trees (*Populus* spp.). Our remote assessment included mapping vegetation areas and generating an estimate of potential Ecological Functional Units (EFUs) that would be gained through preservation of the property. We used the results of this remote assessment to generate a list of priority properties to which we performed outreach for possible inclusion in the conservation easement program. Great Ecology was able to access four properties and perform field validation of vegetation mapping and habitat quality assessments. Currently, Great Ecology is engaging with two property owners to complete a conservation easement to be a part of the EM5 mitigation process.

### METHODS

As part of remote and field assessment of EFUs, Great Ecology generated estimates of EFUs for bird habitat (BEFUs). Calculating BEFUs requires mapping vegetation areas as polygons based on standardized vegetation types. Bird habitat is directly correlated to these polygons (ERO 2015). Vegetation polygons were mapped in the RCZ area of the property, as well as in upland buffers, an area extending from the RCZ border outward 300 feet. This buffer area is consistent with the buffer area described in the Draft Chatfield Reallocation Ecological Step-by-Step (ERO 2015).

Each vegetation polygon type is associated with an Ecological Functional Index (EFI) value that is used to calculate EFUs. For preservation credit, a baseline credit of 15 percent is applied, as well as weighting factors for connectivity, proximity, and buffers (ERO 2015). We did not apply the buffer weighting factor to the vegetation polygons in the upland buffer areas.

### PROPERTIES EVALUATED

We performed preliminary BEFU evaluations on over 80 properties. Table 1 lists ten offsite mitigation properties that we have either evaluated on the ground or we believe will engage us in the future. Two of these properties, the WP007 and J002, are currently undergoing a conservation easement process as preservation sites through EM5 offsite mitigation. We visited these two sites to verify the target resources within the RCZ area of the property, as well as conduct a general assessment of site conditions, including the buffer areas. During our site survey, we mapped RCZ vegetation communities, and observed conditions in the buffer zone, but did not map these areas. Therefore, we used our knowledge of vegetation communities in the RCZ, along with aerial imagery, to map the buffer areas of the site.

The EM5 team performed field evaluations and verified EFUs within the RCZ area on two other properties listed on Table 1, G001 and I007. We are currently communicating with the owners of these properties regarding inclusion in the offsite mitigation program, but they have not yet agreed to undergo the conservation easement process. The target resources in the RCZ areas of these properties have been field verified, but the upland buffers are based on adjacent areas and remote assessments.

Similar to the two properties undergoing conservation easements, we used information from our field evaluations to estimate type and scoring values for the upland buffers.

The remaining six properties in Table 1 were among those from the priority list that underwent remote assessment of vegetation polygons and BEFU calculations. We engaged with the owners of these properties and received at least some response or indication of interest in preservation of their property. We have not visited these six properties nor verified target resources in the RCZ or upland buffer areas. However, the BEFU estimates for properties that were field-validated remained roughly consistent with our remote BEFU assessment of those properties, suggesting that remote mapping can produce relatively accurate estimates. We also erred conservatively with EFI scoring values for vegetation polygons in remote assessments to not contribute to overestimating potential BEFUs.

The results of calculations for total BEFUs in the RCZ and upland buffers of these ten properties are in TABLE 1:

			BEFUs	
		<i>Offsite Requirement</i>	<b>88</b>	
			<b>RCZ</b>	<b>Upland Buffer</b>
<b>Offsite Properties</b>	<b>Easement Pending</b>	<b>WP007</b>	3.4	1.6
		<b>J002</b>	2.1	3.2
	<b>Field Verified</b>	<b>G001</b>	4.7	7.3
		<b>I007</b>	6.5	9.2
	<b>Potential Easements; Remote Assessment Only</b>	<b>P002</b>	7.6	3.0
		<b>WP002</b>	14.6	6.5
		<b>WP009</b>	3.8	0.5
		<b>P010</b>	3.0	1.0
		<b>P007</b>	5.0	1.6
		<b>GD001</b>	5.2	10.6
<b>Grand Total</b>			<b>55.9</b>	<b>44.4</b>
			<b>100.3</b>	

## CONCLUSIONS

The results of the BEFU calculations indicate that including buffer areas on the ten potential properties evaluated could result in 100.3 BEFUs for both the RCZ and upland buffer areas. The RCZ represents a larger number of BEFUs, but upland buffers still represent a significant portion of the total. Combining these two areas makes ecological sense because birds that are using the RCZ are also likely using the upland areas for feeding and or nesting habitat. There is a large range between BEFUs in buffer areas relative to RCZ by property, which is due to the extent of buffer relative to RCZ area of the property and quality of habitat. In general, the results indicate that habitat is available for birds in the riparian as well as upland areas. The upland buffer areas are being preserved in the conservation easement, therefore the habitat within the buffers should also count toward mitigation credit.

## REFERENCES

ERO. 2015. Draft Chatfield Reallocation Ecological Function Step-by-Step Process. Prepared for Chatfield Reallocation Mitigation Company.