

Enclosure 4

US Forest Service Comments on FERC Study Request Determinations

Moffat Collection System Project

Denver Water Draft License Amendment Application

Gross Hydroelectric Project, P-2035

March 2010

Enclosed are the specific comments of the US Forest Service in regard to FERC's response to Forest Service requested studies for the proposed Moffat Collection System Project (Project).

Study 1: Cultural Resource Inventory – This study request is for a complete pedestrian inventory of the area of potential effect for this project

The Forest Service requested this study for compliance with the National Historic Preservation Act, as amended (NHPA), Archaeological Resources Protection Act (ARPA) and Native American Graves Protection and Repatriation Act (NAGPRA).

FERC Response: A draft of the Programmatic Agreement (PA), included in the Corps' DEIS, stipulates measures to be taken to protect significant cultural resources, including avoidance, protection measures, and data recovery.

Forest Service Response:

As the land managing agency, the Forest Service will be involved in the development of mitigation for adverse effects to any historic property located on National Forest System land. It is premature to say the mitigations in the draft PA are the only mitigation as the PA and subsequent consultation on mitigation has not yet been finalized.

Study 2: Provide Physical Description of Project Operation Facilities

The Forest Service requested this study in an attempt to better understand the operations and existing infrastructure of the Moffat Collection System. This included: physical descriptions (height of structures, diversion capacity, the presence of fish passage mitigation, etc), locations of all diversion structures (including tunnels, intakes, canals, pipelines, etc), and a flow diagram of all potential routes of water through the Moffat Collection System.

FERC Response: "In the Corps' DEIS and its appendices, we found detailed information describing the Moffat Collection System's facilities, operations, and the streams it utilizes. We believe the information in the EIS should satisfy the Forest Service's needs"

Forest Service Response:

- The Forest Service disagrees with FERC’s conclusion that sufficient information exists in the DEIS to satisfy the Forest Service’s needs.
- The FS requested the above information in order to conduct independent analyses regarding the project footprint and future maintenance of the facilities and necessary project infrastructure.
- The FS will also use the requested information to assess potential effects to aquatic resources by integrating stream specific hydrology with site-specific diversion capacity.
- A map in the DEIS does display the location of diversions, but physical descriptions and flow diagrams were not provided. Listed above is what we specifically asked for in that study, and those items were not adequately described in the Corps’ DEIS; therefore, FS needs were not satisfied.

Study 3: Provide site-specific flow-habitat relationships for streams containing cutthroat trout through the conduct of PHABSIM studies

The Forest Service requested PHABSIM studies in order to quantify the flow-habitat relationships over a range of discharges to assess the effects of project operations on resident trout habitat in the affected stream reaches. The objective of this study is to develop site specific flow-habitat relationships for each affected stream segment for resident trout. The Forest Service was primarily interested in reviewing flow-habitat relationships on the 11 streams that contain resident cutthroat trout where they occupy NFS lands.

FERC Response: We found that the Corps’ DEIS references and makes use of IFIM data and/or fish population data from studies of almost all tributary streams identified by the Forest Service... The information and analysis in the Corps’ DEIS should satisfy most or all of the Forest Service’s needs.

Forest Service Response:

- The Corps’ DEIS included only one out of the 11 streams that the FS requested PHABSIM analyses. Contrary to FERC’s conclusion, the DEIS clearly states that their document *does not* cover all of the diverted systems: on page 3-213 in the DEIS, the Corps’ says, “Habitat simulations are not available for most tributaries.” On page 4-309 in the DEIS, the Corps’ states “In the Fraser River and Williams Fork basins, there are tributaries with Denver Water diversions that were included in the Project Area. IFIM data were not available for most of these tributaries but R2 Cross data was available for a few. However, no hydrologic data were available for most of these tributaries.”
 - For clarification, IFIM is a process and not a model. PHABSIM is the model that is used to assess the relationship between flow and aquatic habitat which in this case is fish habitat.
 - A Habitat Time Series analysis is an essential part of any PHABSIM analysis. This type of analysis integrates site specific hydrology with the flow-habitat relationship for targeted species and life stages. The DEIS clearly notes that there

Enclosure 4. US Forest Service Comments on FERC Study Request Determinations; Moffat Collection System Project; Denver Water Draft License Amendment Application; Gross Hydroelectric Project, P-2035.

is insufficient information to conduct such an analysis given the absence of site specific hydrologic data. It is unclear how FERC or the Corps can determine the effects of project diversions for each alternative in the DEIS on the affected streams without either PHABSIM or hydrology data.

- Contrary to FERC's conclusion that adequate information exists, PHABSIM data were NOT available for 10 of the 11 of the streams requested, thus, the Forest Service's information needs are not yet satisfied. The DEIS also inappropriately bases its assessment on PHABSIM results for one stream and the assessment for that one stream does not address cutthroat trout habitat needs which is the fish species of most interest to the USFS.
- The objective of the requested study was to determine the effects, if any, of project operations on native cutthroat trout habitat in each affected stream segment. This objective was not met in the Corps' DEIS since most of the streams the Forest Service was interested in were excluded from the analysis. The fish population data that was included in the DEIS was not requested in this study plan; therefore, that information does not meet the intent of the study request.

Study 4: Perform R2 Cross Instream Flow Study for Non-cutthroat trout Streams

The Forest Service proposed this study to quantify base-flow needs in selected project-affected streams of low fisheries value in the Fraser River basin. The information is needed to validate existing or develop new information for flow needs in the listed streams.

FERC Response: We found that the Corps' DEIS references R2 Cross studies performed on some of the streams identified by the Forest Service, which would partially address this study request.

Forest Service Response:

- Similar to comments stated earlier for the PHABSIM. FERC reached its conclusion based on information available for 25% of affected streams.
- R2 Cross data is alluded to in the Corps' DEIS on pages 3-222,233,239. R2Cross data was only provided in the Bobtail Creek discussion in the Williams Fork River basin (page 4-324). Apparently, 8 out of 31 streams in the Fraser River Basin have R2Cross data, but those data are not provided in the DEIS nor is the information available for the streams included in the FS request. Without the site specific R2 Cross data, the Forest Service cannot conduct an independent assessment of effects of project diversions on downstream resources. Therefore, Forest Service needs in regard to the requested study were not satisfied.

Study 5: Develop Unregulated and Regulated Hydrology for Project-Affected Streams

The Forest Service proposed this study to quantify the effects of the Moffat Collection System (project) operations on the hydrology of affected streams by quantifying unregulated, existing

Enclosure 4. US Forest Service Comments on FERC Study Request Determinations; Moffat Collection System Project; Denver Water Draft License Amendment Application; Gross Hydroelectric Project, P-2035.

and proposed flow regimes downstream of diversion points. The objective of this study is to develop average daily flow statistics for each diverted or augmented stream that supplies water to Gross Reservoir in order to be able to adequately assess project effects to NFS streams and habitat.

FERC Response: We found that the Corps' DEIS extensively addresses the hydrology of the existing environment and the proposed enlargement of Denver Water's Moffat Collection System.

Forest Service Response:

- *Study each of the 35 diverted streams on the west slope:* The DEIS did not model each diverted stream individually but, instead combined several of the smaller streams.

Effects of differences: Cannot determine effects on hydrology of individual streams when model combined streams.

- *Conditions in each stream for unregulated, existing and proposed conditions:* The USFS cannot locate any data in the DEIS describing unregulated conditions, and we are not certain what the data describing current conditions actually refers to as this is a moving target throughout the document. Proposed conditions are represented by no action, full use and proposed action.

Effects of differences: Data on unregulated streamflow is critical in determining cumulative effects to forest streams. We need an estimate of mean daily discharge at diversion sites for unregulated conditions. Every hydrograph and table in the DEIS could include curves or data representing the native flow condition. Displaying such information puts the proposed, incremental effects in context and the absolute effect would easily be determined. If this approach were used in the DEIS, a reader could clearly see the differences between alternatives instead of struggling to understand the baseline, then the incremental impacts of each hypothetical future situation such as full use in 2016 and 2030.

- *For each of the three streamflow conditions (unregulated, existing and proposed), at each diverted stream, provide hydrographs and tables with data on mean daily discharge in cfs units, showing inflow, amount diverted and outflow for specific wet (1980), average (1991) and dry years(1999)based on SWE on 4/1 at Berthoud Pass SNOTEL:*

The DEIS ignored the unregulated condition, combined smaller creeks which masks effects to individual streams and provided tables in appendices of current versus full use using mean annual yield. It did not evaluate the three years (or water year types) we asked for and instead used an average of the 5 wettest or driest years thru a period of record that did not match the one we used to determine representative water years. Selected representative wet, average and dry years based on estimated natural flows (created synthetic hydrographs by modeling) for the Colorado River near Kremmling gage. Hydrographs are based on mean daily flow but show an entire water year on one graphic with 8 curves displayed, rendering the graphic nearly illegible. Tables in H-1 use mean monthly instead of mean daily discharge values.

Enclosure 4. US Forest Service Comments on FERC Study Request Determinations; Moffat Collection System Project; Denver Water Draft License Amendment Application; Gross Hydroelectric Project, P-2035.

Effects of differences: It is of questionable validity to use the Kremmling gage on the Colorado River, some 50 miles downstream of the affected reaches, with several large tributary junctions in between (Blue, Muddy) to represent conditions in the Upper Fraser basin to try and determine the types of water years. The assumption that modeled, rather than measured, data is more reliable or accurate is backwards. The assumption that high, average or low streamflows on the Colorado near Kremmling translate to like streamflows in the upper Fraser basin needs to be validated. The period of record used to determine representative wet, average and dry years needs to be set in a longer term context to validate the representativeness of the POR Denver selected (1947-1991) compared to the POR we suggested (1979-2007).

- *Using the data generated by the tables, complete an IHA analysis by generating statistics to address the 5 groups of hydrologic alteration:*

We were unable to locate any information regarding IHA analysis in the DEIS. The Grand County Stream management plan used the IHA process for 10 area streams, developing detailed data for only 1 station, but statistics for the remaining 34 streams are lacking.

Effects of differences: Applying this IHA process is extremely useful in identifying the portions of the natural hydrologic regime that are currently absent due to diversions and identifying means, within the current regime, of providing some of the missing flow elements that are critical to channel morphology and aquatic habitat. The IHA analysis comparing unregulated (1911-1935) to regulated hydrology (1936-2007) for the site "Fraser River at Winter Park gage" shows that "of the 33 hydrologic parameters evaluated, 18 were highly altered, 11 were moderately altered and only 4 had low alteration" (Exec. Summary, Draft Report GC Stream Management Plan).

- *Then, predict channel forming (effective) discharge for all 35 diverted streams:*

We located effective discharge calculations for 6 out of the 35 diverted streams in appendix H-9. No other information was provided.

Effects of differences: We need this information to determine the flow regime necessary to maintain the channel capacity, aquatic habitat and substrate conditions. This information is useful for understanding how the current and proposed regimes would affect frequency and magnitude of effective discharge flows.

Study 6: Aquatic, Riparian and Wetland Habitat Loss due to Inundation

The Forest Service requested this study because the agency is concerned about important stream, riparian and wetland resources being inundated by rising reservoir waters if the proposal is approved.

Enclosure 4. US Forest Service Comments on FERC Study Request Determinations; Moffat Collection System Project; Denver Water Draft License Amendment Application; Gross Hydroelectric Project, P-2035.

FERC Response: We found that the Corps' DEIS thoroughly addresses impacts that inundation would have on resources at Gross Reservoir, including geology, soils, vegetation, riparian areas and wetlands, wildlife, aquatic resources, special-status species, and transportation.

Forest Service Response:

The Forest Service proposed this study, in part, to quantify aquatic habitat loss due to reservoir inundation. Analysis in the DEIS fails to quantify this loss as specified in the study request.

It is not clear from discussion in the DEIS whether 100% of wetlands and riparian areas around Gross Reservoir with potential to be inundated by the proposed project were surveyed on the ground as specified in the study request. Riparian and wetland acres presented in Table 3.6-1 for the Gross Reservoir area appear small. Clarification is needed regarding whether 100% of wetlands and riparian areas proposed to be inundated around Gross Reservoir have been documented based on thorough field surveys and presented in Table 3.6-1.

Study 7: Project Area Sensitive and Rare Plant Survey

The Forest Service requested this study to make sure that presence of rare plants and plant communities, can be determined in the most efficient manner and that such surveys are performed to adequate industry standards.

FERC Response: We found that the Corps' DEIS adequately addresses potential impacts to special status plants (e.g. Ute ladies'-tresses, Colorado butterfly plant) and their habitat under a proposed enlargement of the Moffat Collection System, including the enlargement of Gross Reservoir.

Forest Service Response:

- “Rare plants” for this study is defined as comprising 1) plants listed or proposed for listing under the Endangered Species Act, 2) the most current Forest Service Region 2 list of Sensitive Plants, and 3) all other rare Plants of Local Concern, all three groups of which are as identified by the Forest that could occur in the project area or that could be impacted by proposed project activities, even if occurring outside the project area (e.g., riparian plants potentially impacted by downstream water depletions or changes in reservoir/downstream hydrology flow rates, levels, or timing; rare plants occupying off-site borrow pits; etc.). “Rare plant communities” include those identified by the Forest that could occur in the project area or that could be impacted by proposed project activities, even if occurring outside the project area. Note that these definitions do not necessarily include plants that are otherwise tracked by the Colorado Natural Heritage Program. The most current lists of rare plants and communities to survey must be derived in concert with the Forest.

Table 1 (Federally Listed Species), Table 2B (Forest Service Sensitive Plants), and Table 4 (Plant Species of Local Concern) under Study 8 Comments indicate which plant species should be surveyed for and included in analysis, and probability of occurrence in the Gross Reservoir

Enclosure 4. US Forest Service Comments on FERC Study Request Determinations; Moffat Collection System Project; Denver Water Draft License Amendment Application; Gross Hydroelectric Project, P-2035.

area. Plant species in Tables 2B and 4, particularly species that occupy riparian areas, wetlands, or fens, should also be considered for analysis for the River Segments.

No mention is made in the DEIS of surveys for Forest Service Sensitive or rare/local concern plants as part of vegetation surveys or special status species surveys, and no previous surveys are mentioned, such as the plant surveys done around Gross Reservoir for the Denver Water 2001 FERC licensing. The Forest Service provided a Study Request for a Project Area Sensitive and Rare Plant Survey that included specific requirements for determining appropriate species lists, described the need for additional surveys, and included specification guidelines for survey reports. None of this information is included or referenced in the DEIS, and there are no additional available reports or other documentation indicating that the requested surveys occurred.

Study 8: Special-Status Terrestrial Wildlife Species and Habitats, Including Amphibians and Invertebrates:

The Forest Service requested this study to assess the potential for effects to special-status wildlife species, including amphibians, and their habitats, based on known occurrences and/or the likelihood of occurrence and the scope of project activities.

FERC Response: The Corps' DEIS assesses potential impacts to special-status species in the Moffat Collection System enlargement area, including federal and state listed threatened, endangered, and candidate species; Forest Service Sensitive species listed for Routt, Arapaho, and Roosevelt Forest lands; Bureau of Land Management Sensitive species; and Colorado Natural Heritage Program listed species.

Forest Service Response:

- Analysis of effects to special-status species should include ESA-listed (endangered, threatened, and candidate) taxa; USFS sensitive species based on the current Region 2 list, and management indicator species (MIS) for the Arapaho and Roosevelt National Forests and Pawnee National Grassland (ARP); all categories currently tracked by the Colorado Natural Heritage Program (CNHP), including plants, birds, mammals, fish, invertebrates, and natural communities (plants, natural communities, and fish are covered in other study requests); species of local concern specific to the project, if any, and migratory birds not included in the above categories.
- The tables, located in Enclosure 2, (Tables 1-5, beginning on page 55) contain species lists applicable to the Arapaho and Roosevelt National Forests and Pawnee National Grasslands (ARP), current as of December 2009. Federally Proposed, Threatened, and Endangered species are displayed in Table 1; Forest Service Sensitive Species in Tables 2A and 2B; Management Indicator Species in Table 3; and Plant Species of Local Concern in Table 4. This document includes terrestrial wildlife and plant species. See Fish comments for fish and other aquatic species. All species listed in these tables should be considered for analysis for projects on the ARP, and reasons for exclusion from analysis should be documented.

Enclosure 4. US Forest Service Comments on FERC Study Request Determinations; Moffat Collection System Project; Denver Water Draft License Amendment Application; Gross Hydroelectric Project, P-2035.

- No mention is made in the DEIS of any surveys done for wildlife or special status animal species, either for the 2001 licensing or for the current proposed project, and no reference is made to additional reports that might contain this information. There are no additional available reports or other documentation indicating that the requested surveys occurred.
- No discussion is included in the DEIS regarding important wildlife habitats included in the ARP, White River and Pike and San Isabel Forest Plans and included in Study Request 8: existing old growth, old growth development areas, old growth retention, effective habitat, interior forest, and forested and open corridors. GIS data are available from the Forest Service on request. Discussion should include quantification of available amounts of these habitats in the Project Area as compared to amounts available Forest-wide, based on available GIS data and applicable surveys. Surveys for old growth would include surveys previously conducted, available from the Forest Service on request, and site-specific old growth surveys, if any, conducted specifically for this project.

In Enclosure 2, (Tables 1-5, beginning on page 55), the USFS has provided detailed lists of all special-status species that may occur in the Project area or that may be affected by water depletions or changes in water levels. These include Federally listed Threatened or Endangered Species (TES), FS Sensitive Species, FS Management Indicator Species (MIS), Species of Local Concern, and Plant Communities of Local Concern. Please refer to these lists for more details regarding plants, animals, and plant communities that should be considered in the Project analysis.