FISH AND AQUATICS PROPOSED STUDY PLAN (AQ1)

PSP GOALS AND OBJECTIVES	STUDY AREA	STAKEHOLDER COMMENTS	PACIFICORP RESPONSE
The goal of this study is to determine the status of aquatic organisms and their habitat and characterize the benthic invertebrate and mollusk community within the Project Area; to evaluate the effects of a planned reservoir drawdown on the aquatic community; and to relate the drawdown effects to the proposed Project operational changes and the potential effects on the aquatic community within the reservoir and the reservoir zone of influence in the main tributaries. Objectives will include: • Summarize existing information on the aquatic organisms and their habitat residing in the Cutler Reservoir and its tributaries including the Bear River up to 2-miles downstream of Cutler Dam. • Determine potential effects of the proposed fall 2019 reservoir drawdown on fish, mollusks, and macroinvertebrates and their habitat in Cutler Reservoir and downstream in the Bear River (e.g., stranding/displacement). • Based on observations during the fall reservoir drawdown, determine potential effects of proposed Project operations on resident fish, macroinvertebrate, and mollusk habitat in Cutler Reservoir and the Bear River downstream of Cutler Dam. • Provide information for National Environmental Policy Act (NEPA) analysis of the affected environment.	The study area for aquatic resources contains all Project features (encompassing the Project Boundary), which extends, for the purposes of characterization and analysis, from the edge of the Project Boundary and within the reservoir zone of influence of each major tributary to the reservoir. The study area also includes the Bear River up to 2-miles downstream of the dam.	1. The data presented in the TDML included oxygen, TP, TSS, ammonia, turbidity, a biologic and fisheries study, and water temperature. All of these will be affected, either positively or negatively, by level fluctuation. These modifications require extensive evaluation in order to protect the ecologic value of the reservoir, water quality both in the reservoir and downstream, and the surrounding properties. 2. Any studies of Cutler Reservoir should consider the potential for dredging to improve fish and wildlife habitat and control Phragmites. 3. USFWS is concerned that fish and other aquatic resources are not able to survive in this portion of the Bear River due to the inability to maintain flows and the inability to pass through the dam. USFWS requests that information on impediments to or opportunities for fish passage be provided and evaluated subject to Section 18 of the Federal Power Act. USFWS also recommends that the Project design consider the installation of fish screens at intake structures for the Project turbines and pumps in order to avoid fish entrainment 4. Requests an additional Study of Aquatic Weeds and Algae. Aquatic weeds and algae impede BRCC's ability to effectively deliver shareholder water and can represent public safety concerns. Aquatic weeds and algae can clog irrigation infrastructure and canals. Clogged infrastructure can result in costly time delays and damage to personal and real property. Accordingly, aquatic vegetative control efforts constitute the single largest annual expenditure for BRCC. Over the past 4 years, BRCC has seen its control costs double. As a potential conduit for aquatic weeds and algae, BRCC recommends FERC study whether Cutler Reservoir is a contributing source for increased aquatic weeds and algae in BRCC canals. The study will review: o the corresponding populations levels of aquatic weeds and algae in Cutler Reservoir and BRCC canals o the migration of aquatic weed and algae populations into the BRCC canal system through Cutler Reservoir by reproduction or direct relocation o preventative and mitigation measure to minimize upstream aquatic plant material or algae from flowing into the BRCC canal system. This study will supplement existing BRCC efforts to determine the cause of an increasingly vibrant aquatic weed and algae population. The aquatic weeds and algae which BRCC is most concerned about are: Filamentous Algae, Sago Pondweed, and Horned Pondweed. BRCC also recommends FERC study appropriate aquatic weed and algae prevention and mitigation measures reflecting the results of the initial study. BRCC recommends studying inserting a sample catch screen in the canals below the dam a set number of days each month. A professional biologist should be consulted to develop an appropriate protocol to adequately accomplish the goals of the study.	1. PacifiCorp PSP includes a Water Quality Study, Fish and Aquatic Resources Study, and Hydraulic Modeling Study that will provide the effects of proposed reservoir elevation changes on the prominent environmental issues that exist in the reservoir. 2. PacifiCorp's hydraulic model to be developed as part of the study will have the ability to analyze actions such as dredging, if needed. 3. PacifiCorp is interested in furthering the discussion with USFWS on impediments to or opportunities for fish passage to be evaluated as part of this relicensing. The need for this study is not clear; as the comment letter noted, there is currently no native or sport fishery downstream of the Project, nor are there threatened or endangered species or anadromous fish issues in or downstream of Cutler Reservoir. The agency resource goals and objectives (and for which species) that would be addressed by studying entrainment mortality or providing fish passage opportunities is not clear. PacifiCorp has further communicated with USFWS staff to address some of their questions and concerns resulting from SD1 and the PAD. 4. PacifiCorp does not propose to study aquatic weeds or algae during the relicensing process. PacifiCorp believes the requester has not established a Project nexus nor a proposed methodology per the Federal Power Act under 18 CFR §5.9 that would merit PacifiCorp conducting an aquatic or algae study that addresses the transport of weeds in the Project Area or in the BRCC's canals; further PacifiCorp is unaware of any appropriate methodology for such a study. Changing water conditions, especially increased water temperatures, have led to increased aquatic maintenance costs for virtually all canal operators in the region.

WATER QUALITY PROPOSED STUDY PLAN (AQ 2)

PSP GOALS AND OBJECTIVES	STUDY AREA	STAKEHOLDER COMMENTS	PACIFICORP RESPONSE
The Water Quality Study Plan is part of the overall Cutler Relicensing Study Plan to evaluate the environmental conditions, including proposed changes in operations, of the Project for FERC relicensing. Continued operation of the Project as proposed may have direct, indirect and/or cumulative effects on water quality resources. The rationale for this study includes: • There is uncertainty as to how the proposed Project operations may affect water quality within the FERC Project Boundary and downstream of Cutler Dam; increased levels of reservoir fluctuations may affect water quality, especially turbidity, total phosphorus (TP) release from the reservoir sediments, and dissolved oxygen (DO); • There is a need to determine the effects of the scheduled fall 2019 reservoir drawdown on water quality; especially TP, total suspended solids (TSS), and DO; and, • Water quality information from past monitoring efforts by PacifiCorp, USU, and Utah Division of Water Quality (UDWQ) is readily available. However, because several entities have collected and stored data separately, PacifiCorp proposes to synthesize all existing data and collect additional data during the proposed 2019 drawdown to provide a complete understanding of water quality conditions in Cutler Reservoir and the surrounding aquatic environment, including the 2-mile stretch of Bear River downstream of Cutler Dam.	The study area for water quality contains all Project features (encompassed by the Project Boundary), which extends, for the purposes of characterization and analysis, from the edge of the Project Boundary up each major tributary within the reservoir zone of influence. The study area also includes the Bear River up to 2-miles downstream of the dam.	1. PacifiCorp, FERC, and the UDWQ need to publish water quality monitoring reports and data from their studies from 2014 to present, early in the process rather than as a result of the process. PacifiCorp recognizes that the 2013 phosphorous data was erroneous. As a result, the ongoing monitoring has not been published since 2008. This must be published for review as soon as possible to ensure that good science is used in the review. 2. Evaluate the impacts of common carp on the water quality of the Bear River Cutler Reservoir. Studies in Utah Lake should be used to establish a correlation or comparison since both are shallow eutrophic reservoirs. The reservoir and the Bear River are impacted by the feeding habits of the large population of carp. This is reflected when the carp change their feeding habits during the winter months. 3. Evaluate the water quality impacts on the reservoir associated with upstream BMPs. These will include the construction of the Logan WWTF, JB Swift Wastewater Treatment Plant, Hyrum Wastewater Treatment Plant, water quality projects on the Logan River and the Little Bear River, efforts to eliminate feed lot discharges, conversion of flood irrigation to sprinkler irrigation from the Idaho border all the way to Cutler Reservoir, and the implementation of extensive storm water management programs by each of the cities, as well as Cache County, upstream of Cutler Reservoir, on all of the tributaries. The water quality of the reservoir is affected by all of the region. Address how those efforts have modified the water quality and how any operation modifications will either support or negate those benefits. Any modifications to the reservoir operations, particularly increase in WSLs may jeopardize the discharge, and possibly the operations of the new Logan city WWTF. This $160 million-dollar regional facility must be protected. 4. Increase water quality monitoring frequency to better understand water quality, independent of hydrologic variation. This should be completed annually and reported with all inflows from gauging stations occurring at the same time. mg/L is not adequate to truly understand the issues. Using the proposed reservoir volume mapping at various water levels and inflows, a representative mass balance can be prepared to quantify the individual impacts.	1. The assertion regarding monitoring result publication is incorrect. PacifiCorp published water quality monitoring data from 2013 in the Cutler RMP Five-Year Monitoring Report filed in March 2018; the 2008 water quality data was published in the previous monitoring report in 2013. The RMP reports are based on 5-year monitoring periods, therefore, the next report that contains data from 2013 to 2018 will be published in 2020, rather than 2023 as scheduled, due to the relicensing timeline and proposed data synthesis. All previous Cutler RMP Five-Year Monitoring reports are available for review on the PacifiCorp website. 2. PacifiCorp intends to conduct a Water Quality Study that will summarize the results of studies regarding this issue from the Bear River Refuge and other systems similar to the Cutler Reservoir. The Project nexus per the Federal Power Act under 18 CFR §5.9 for this study request is not clear. 3. PacifiCorp believes this comment is consistent with the cumulative effects analysis that FERC has specified in SD1. PacifiCorp's Water Quality Study will inform this analysis. 4. PacifiCorp believes this comment to be a request for a future PME measure, which will be established after the impacts analysis is completed. PacifiCorp intends to complete a Water Quality Study during the upcoming study season that will compile previously collected data and reports and combine it with hydrologic data collected as part of this relicensing effort.

PSP GOALS AND OBJECTIVES	STUDY AREA	STAKEHOLDER COMMENTS	PACIFICORP RESPONSE
		5. Study Request: Effects on water quality from fluctuating reservoir levels and Wheelon Dam removal. Destabilization of the stream bed or the bed of Cutler Reservoir may entrain and release nutrients and contaminants which would likely be harmful to aquatic wildlife and migratory bird habitat downstream of Cutler Dam. Specific concerns are that excess nutrients could lead to unwanted vegetation and harmful algal blooms, that heavy metals could concentrate in refuge impoundments, that low DO levels could lead to reduced food supply, and that any of these factors may lead to the spread of avian disease. USFWS recommends that a study be conducted to evaluate various water quality parameters that change as a result of greater reservoir level fluctuations and the removal of Wheelon Dam.	5. The Water Quality Study proposes to monitor TP, dissolved phosphorus, orthophosphate, and DO during the drawdown to evaluate the potential for mobilization of nutrients. That data will be used to predict the effect of proposed operations on potentially mobilizing nutrients and levels of DO in the reservoir and downstream of the dam; heavy metals and other contaminants will be assessed as part of the Sedimentation Study. These issues will also be assessed through the proposed test fluctuation flows in 2020, which will mimic some of the proposed future operations.
		6. Map areas that became stagnant due to sedimentation or other types of isolation within the reservoir which have higher temperatures and hold the water for long periods of time, thus it becomes toxic. These areas will mobilize stored TP from the sediments as the oxidation states of iron change.	6. PacifiCorp intends to complete pre- and post-drawdown LiDAR and bathymetry surveys in late 2019 that will inform areas that will potentially "pond" under a range of proposed elevation changes. A range of conditions may occur as a result of the proposed elevation changes including, but not limited to, pH, DO, and temperature changes, along with other chemical processes. PacifiCorp intends to conduct analyses on phosphorus in the bed sediments as well as other ions that may absorb or bind with cation exchange (these may include CaCo3, Al, and Fe).
		7. The data presented in the TDML included oxygen, TP, TSS, ammonia, turbidity, a biologic and fisheries study, and water temperature. All of these will be affected, either positively or negatively, by level fluctuation. These modifications require extensive evaluation in order to protect the ecologic value of the reservoir, water quality both in the reservoir and downstream, and the surrounding properties.	7. PacifiCorp intends to conduct a Water Quality Study, Fish and Aquatic Resources Study, and Hydraulic Modeling Study that will provide the effects of proposed reservoir elevation changes on the prominent environmental issues that exist in the reservoir.
		8. Commenter suggests a cross-sectional diurnal DO study. The goal of the study would be to better understand the extent of anoxic conditions during the most lethal conditions, typically early mornings in the heat of August, along cross-sections of the reservoir's shallow environments. (Page 4).	8. PacifiCorp is conducting a Water Quality Study whose analysis will use existing DO monitoring data collected during 2008 and 2009. These measurements were collected at 15-minutes frequencies for a 7-day periods during most months. This data set will be used to characterize anoxic conditions and seasonal patterns at each monitoring site.
		9. Any studies of Cutler Reservoir should consider the potential for dredging to improve fish and wildlife habitat and control Phragmites.	9. PacifiCorp's hydraulic model to be developed as part of the study will have the ability to analyze actions such as dredging, if needed.
		10. Commenter suggests looking into dredging for the positive impact on the fishery, water quality and potentially reduce the *Phragmites* problem.	10. The Hydraulic Modeling Study will analyze the impacts to the hydraulics, sediment transport, and water quality within the reservoir that would result from dredging. Additionally, PacifiCorp would like to understand the agency-specific resource management goals per 18 CFR § 5.9(b)(2) and how the requested modification to studies would inform a quantitative measures that could inform future license conditions. Per FERC, the agency should thoroughly explain how the study request relates to that management goal.

HYDRAULIC MODELING PROPOSED STUDY PLAN (AQ 3)

PSP GOALS AND OBJECTIVES	STUDY AREA	STAKEHOLDER COMMENTS	PACIFICORP RESPONSE
The purpose of the Study Plan is to develop and collect data for calibration of both 1 dimensional (1D) and 2-dimensional (2D) hydraulic models of the Project Area to be used for hydraulic and sediment transport analysis. This includes portions of the Bear River upstream and downstream of the reservoir. A calibrated hydraulic model will provide a tool that could be used to predict impacts to the hydraulics and sediment transport for any changes to Project operation.	The study area for the hydraulic modeling effort would include all facilities within the current Project Boundary, as well as portions of the Bear River downstream of Cutler Dam and upstream of the confluence with the Cutler Reservoir. The upstream and downstream extents of the original hydraulic model of the Project may be extended based on final model output deliverables and preliminary model results which incorporate updated data.	1. Effects of Cutler Reservoir fluctuations on flows and water levels at Bear River Migratory Bird Refuge facilities downstream of Cutler Dam USFWS is concerned that large swings in the discharge of the Bear River will inhibit water diversions to the refuge, damage refuge infrastructure, or lead to flooding of privately owned property along the Bear River. USFWS recommends that a study be conducted to better characterize the proposed changes in reservoir elevations, Bear River discharge, and what effect it has on downstream facilities (pg. 3 has full details of study request). 2. The refuge occupies portions of the historical Bear River Delta and is the natural location where sediment carried in the Bear River is deposited. Information contained in the PAD notes the potential for two management actions that may release large volumes of sediment (and associated nutrients and contaminants) into the river that may eventually settle onto the refuge: reservoir fluctuations and removal of Wheelon Dam. USFWS recommends a study be conducted to determine how greater reservoir fluctuations and/or the removal of Wheelon Dam could lead to changes in sediment and nutrient transport. 3. USFWS is concerned that fish and other aquatic resources are not able to survive in this portion of the Bear River due to the inability to maintain flows and the inability to pass through the dam. USFWS requests that information on impediments to or opportunities for fish passage be provided and evaluated subject to Section 18 of the Federal Power Act. USFWS also recommends that the Project design consider the installation of fish screens at intake structures for the Project turbines and pumps in order to avoid fish entrainment.	1. PacifiCorp maintains the Hydraulic Modeling Study plan scope is an appropriate level of effort given the direct and indirect effects identified in FERC's SD1. PacifiCorp is not proposing to change the overall quantity of water flowing downstream. Other large tributaries, multiple constriction points and an unknown number of irrigation withdrawals (potentially a very large number) downstream of Cutler Reservoir could have flow-related impacts on water in the Bird Refuge. However, operation of the Project would not incrementally contribute to these flow-related impacts because there would not be a change in the overall quantity of water flowing downstream as a result of the Project. The Bird Refuge will be addressed as part of the NEPA cumulative effects analysis to the extent that the Bird Refuge is within the geographic scope of effects from operation of the Project. PacifiCorp has further communicated with USFWS staff to address some of their questions and concerns resulting from SD1 and the PAD. 2. PacifiCorp's 2D hydraulic model will be constructed to explore a number of scenarios on operation water elevations and resultant effects on sediment transport. Data collection for the model will include soil classification as well as phosphorous and other potential pollutant data. The model runs will explore transport through the dam and management decisions to control sediment. These issues will be also be assessed through the proposed test fluctuation flows in 2020, which will mimic some of the proposed future operations. 3. PacifiCorp is interested in furthering the discussion with USFWS on impediments to or opportunities for fish passage to be evaluated as part of this relicensing. The need for this study is not clear; as the comment letter noted, there is currently no native or sport fishery downstream of the Project, nor are there threatened or endangered species or anadromous fish issues in or downstream of Cutler Reservoir. The agency resource goals and objectives (and for which species) that would be addressed by studying entrainment mortality or providing fish passage opportunities is not clear. PacifiCorp has further communicated with USFWS staff to address some of their questions and concerns resulting from SD1 and the PAD.

PSP GOALS AND OBJECTIVES	STUDY AREA	STAKEHOLDER COMMENTS	PACIFICORP RESPONSE
		4. Commenter requests an additional study that would model the Bear River system to include Bear Lake and the hydro plants downstream. The model should include enough to show what-ifs, impacts of different flow regimes, impacts and reservoir refill times when spinning reserve is needed, impacts and refill times when Cutler is operated at the proposed new levels, and any impacts to Bear Lake.	4. PacifiCorp is not proposing to change the withdrawals from Bear Lake nor the operations from projects upstream of Cutler Reservoir. Additionally, PacifiCorp maintains the upstream projects are not hydraulically connected or dependent on the operations of the Cutler Reservoir; nor will the reservoir have impacts to the tailwater of the nearest upstream dam. Additionally, upstream projects are not dependent on the operations of the Cutler Reservoir; nor will the reservoir have impacts to the tailwater of the nearest upstream dam. Additionally, a Public Interest Consideration per the Federal Power Act under 18 CFR §5.9 is needed to for PacifiCorp to consider merits of this study.
		5. Suggests a study looking at erosion below the Cutler Dam as a result of water level fluctuations and subsequently winter time ice fluctuations. This study can be explored through modeling effort and real time data collection.	5. The hydraulic model will quantify WSL and the volume of sediment transported up to 2-miles downstream of Cutler Dam based on the change in hydraulics during the drawdown. The hydraulic model is not able to model/predict bank sloughing quantities and locations. However, the Land Use Study will collect data during the drawdown and in the following year to identify potential impacts of proposed operational changes on Bear River bank stability and erosion. UDAF is welcome to provide PacifiCorp with Bear River channel locations where they are concerned about bank erosion or sloughing. These locations will be taken into consideration when choosing monitoring sites.

SEDIMENTATION PROPOSED STUDY PLAN (AQ 4)

PSP GOALS AND OBJECTIVES	STUDY AREA	STAKEHOLDER COMMENTS	PACIFICORP RESPONSE
The Sediment Study Plan outlines a three-tiered study designed to address sediment composition, sediment deposition, and phosphorus in sediment throughout Cutler Reservoir. The objective for defining sediment composition in the Project is to assess the role of potential sediment mobility under a range of operating conditions. Data collected will help provide the foundation for the sediment transport model discussed in the Hydraulics Study Plan. The combination of data collection and modeling will provide a management tool for PacifiCorp to model a range of operational conditions and examine the effects on sediment. Defining the volume and location of accumulated sediments in the reservoir will provide a detailed understanding of sediment deposition. A base map will be generated and used to determine pre-reservoir bed elevations and sediment depth. This will aid in decision-making processes and developing options to control sediment movement. A final component of the sediment study is examining phosphorus composition and distribution in the Project Area. Phosphorus movement in the reservoir could affect water quality. Phosphorus is one of the identified pollutants in the Middle Bear River and Cutler Reservoir Total Maximum Daily Load.	The sediment distribution analysis will encompass the wetted surface area of Cutler Reservoir with an attempt to survey all critical areas located inside the Project Boundary. Areas assessed for sediment composition will be divided into a number of strategic zones, based on factors such as inflow, cutting potential, constrictions that increase velocities, potential for erosion at different elevations, and other factors defined by PacifiCorp's resource specialists. Strategic study reaches within the Project Boundary are defined as follows: • Wheelon Reach from Cutler Dam to Wheelon Dam, to account for sedimentation at the base of Cutler Dam. • Canyon Reach from Wheelon Dam to the Highway 23 bridge, to assess the effects of the historic dam as a factor in sediment accumulation. • Reservoir Reach from Highway 23 bridge upstream to the Bear River Unit, accounting for the formation of large bars with areas of lateral flow, continued deposition, and susceptibility to erosion under lowered elevations. • Bear River Inflow Reach to the Project Boundary. The Bear River is highly channelized in this area and continues to lose volume due to forming natural levees that isolate areas of the reservoir except during high spring flows. Lowered elevations could erode this highly channelized area. • North and South Marsh Reach from Benson Marina and open water habitats south to the Logan River and southern tributaries. To better understand the interaction between phosphorus in bed sediments and lake habitat, additional data collection is proposed. Three areas are defined and will be the primary focus of this study: • The south portions of the reservoir, which include the Highway 30 to Benson Marina area and the Logan and Little Bear inflow areas (defined in the Cutler RMP as the North and South Marsh Resource Management Areas, respectively). This area has a number of National Pollutant Discharge Elimination System (NPDES) permit dischargers and most likely will have the highest concentration of phosphorus in the system. A number of sample sites will be developed to identify sediment movement and potential sources of phosphorus (both external and internal) that could be	1. The expansion of the LiDAR study could establish the elevations of the channel in relation to the gates and other fixed items in the system. Through modeling, a third party can: a. model the performance of their current gate system in a variable operation system to ensure that steady delivery will occur b. determine locations appropriate for weirs c. model the quality of delivery of a weir based on the integrated system d. compare the two resulting qualities of delivery. BRCC requests this variable operation modeling occur and be taken into account by FERC when deciding whether to grant PacifiCorp a more flexible operation elevation. 2. Expand the Sedimentation Study to include the two main BRCC canals found just below Cutler Dam. The goal of an expanded sedimentation study is to: a. understand the amount of sediment that is passed from Cutler Dam to the BRCC canals each season b. determine operational practices that could reduce sediment transfer to the canal system. 3. Expand the LiDAR readings to include the two main BRCC canals to the same 2-mile-distance. PacifiCorp's contractual obligations to BRCC are directly related to the condition of the BRCC canals and an expanding LiDAR study and data will be used to: a. establish the ability of current gate automation systems to provide a steady flow of irrigation and stock water during the newly proposed variable operation b. determine viable locations for better measurement devices c. help determine an appropriate maintenance program for the upper canal system as it relates to silt deposits d. determine the true channel capacity of the respective canals. 4. Expansion of the LiDAR study would measure the current canal elevations to determine the extent of sedimentation since the last cleaning. This data could then be used to determine an appropriate cycle for cleaning of this section of the canal. The date would assist in a study determining how much sediment is transported to the canals from Cutler Reservoir. Sedimentation will be an issue of increasing concern to BRCC as it affects BRCC's ability to effectively deliver water to shareholders and remediation is expensive. Moreover, the cost to PacifiCorp to expand the LiDAR study would be limited since the river channel along the same length is already being surveyed as part of the current LiDAR study.	1. PacifiCorp has agreed to collect LiDAR data and provide the data on up to 2 miles of BRCC canals as requested by BRCC, however, a clear Project nexus between the proposed Project operations and Project maintenance of the canals has not been established. PacifiCorp believes that the reservoir and dam may be reducing the sediment in the canals since the dam acts as a trap to avoid sediment entering the canals. In the spirit of collaboration, LiDAR data should help confirm quantities of water deliveries under the proposed operations. 2. PacifiCorp intends to collect LiDAR data on up to 2 miles of the BRCC canals. The LiDAR data will not necessarily provide the quantity of sediment transported into the canals, but a simple load estimate on canal flows and TSS concentrations could be calculated by the BRCC to estimate the annual load of sediment in the canals to assist with its O&M needs. 3. PacifiCorp intends to collect LiDAR data on up to 2 miles of BRCC canals as requested by BRCC. PacifiCorp believes that the reservoir and dam may be reducing the sediment in the canals since the dam acts as a trap to avoid sediment entering the canals. The canal measuring system is calibrated annually or more frequently as needed; in 2019 the accuracy was assessed in conjunction with BRCC and found to be adequate. 4. PacifiCorp intends to collect LiDAR data on up to 2 miles of the BRCC canals. The LiDAR data will not necessarily provide the quantity of sediment transported into the canals, but a simple load estimate on canal flows and TSS concentrations could be calculated by the BRCC to estimate the annual load of sediment in the canals to assist with its O&M needs.

PSP GOALS AND OBJECTIVES	STUDY AREA	STAKEHOLDER COMMENTS	PACIFICORP RESPONSE
	contributing to the high concentrations found in the reservoir. Sites will include the Logan inflow, the Spring Creek/Little Bear inflow, the large area south of the Railroad Trail and fishing bridge (the North Marsh) where inflow from the Logan WWTF enters the reservoir, and Benson Marina between the fishing bridge and the confluence with the Bear River (Main Reservoir Resource Management Area). • The Bear River Resource Management Area upstream of any influence from the southern tributary areas of the North and South marshes. This area has the greatest inflow, a high number of cattle feeding operations, and extensive surface runoff from agricultural operations. Sample sites will include areas above and below pollutant sources to understand the changes that occur through the marsh and reservoir. • Cutler Canyon and Main Reservoir Resource Management Areas combine inflows from the North and South Marsh as well as the Bear River with the addition of Clay Slough inflows. This area combines the vast majority of all inflow and potential dischargers into the system. Samples that are collected here will help develop an understanding of phosphorus distribution in the system. Sample sites will include Clay Slough and sites below Newton Creek inflow, Reservoir at Highway 23, and near the Wheelon Dam.	5. The suspended solids cause economic loss to the shareholders of BRCC and in turn removes capital from Box Elder County. The data gathered from an expanded sedimentation and LiDAR study could be used to determine the current amount of sediment passed to the canal system. BRCC recommends FERC use the sediment studies to inform whether PacifiCorp's operations can be adjusted to minimize future sediment loading. For example, BRCC recommends FERC review whether the 7-foot low-level passage described on page 7 of the FERC Scoping document can and should be utilized to clear material from the face of the dam. If operated in times of high water (when the spill gates would normally operate), the associated high-water flows would allow additional sedimentation to be carried downstream without adverse effects. 6. The refuge occupies portions of the historical Bear River Delta and is the natural location where sediment carried in the Bear River is deposited. Information contained in the PAD notes the potential for two management actions that may release large volumes of sediment (and associated nutrients and contaminants) into the river that may eventually settle onto the refuge: reservoir fluctuations and removal of Wheelon Dam. USFWS recommends a study be conducted to determine how greater reservoir fluctuations and/or the removal of Wheelon Dam could lead to changes in sediment and nutrient transport. 7. Effects on water quality from fluctuating reservoir levels and Wheelon Dam removal Destabilization of the stream bed or the bed of Cutler Reservoir may entrain and release nutrients and contaminants which would likely be harmful to aquatic wildlife and migratory bird habitat downstream of Cutler Dam. Specific concerns are that excess nutrients could lead to unwanted vegetation and harmful algal blooms, that heavy metals could concentrate in refuge impoundments, that low DO levels could lead to reduced food supply, and that any of these factors may lead to the spread of avian disease. USFWS recommends that a study be conducted to evaluate various water quality parameters that change as a result of greater reservoir level fluctuations and the removal of Wheelon Dam. 8. Commenter suggests a study of the effects associated with winter ramping and the effects on bank erosion and water quality could be determined.	5. PacifiCorp believes the Hydraulic Modeling Study and the Sedimentation Study will help inform future Cutler operations. These results might help the BRCC plan for O&M needs of their canals, which are likely to receive less sediment than if they were withdrawing from a free-flowing river rather than a reservoir. 6. PacifiCorp's 2D hydraulic model will be constructed to explore a number of scenarios on operation water elevations and resultant effects on sediment transport. Data collection for the model will include soil classification as well as phosphorous and other potential pollutant data. The model runs will explore transport through the dam and management decisions to control sediment. These issues will be also be assessed through the proposed test fluctuation flows in 2020, which will mimic some of the proposed future operations. 7. PacifiCorp's Water Quality Study proposes to monitor TP, dissolved phosphorus, orthophosphate, and DO during the drawdown to evaluate the potential for mobilization of nutrients. That data will be used to predict the effect of proposed operations on potentially mobilizing nutrients and levels of DO in the reservoir and downstream of the dam; heavy metals and other contaminants will be assessed as part of the Sedimentation Study. These issues will also be assessed through the proposed test fluctuation flows in 2020, which will mimic some of the proposed future operations. 8. PacifiCorp would like to understand the Project nexus, methodology proposed and agency-specific resource management goals per 18 CFR § 5.9(b)(2) and how the requested modification to studies would inform a quantitative measure that could inform future license conditions. Per FERC, the agency should thoroughly explain how the study request relates to that resource management goal.

THREATENED AND ENDANGERED SPECIES PROPOSED STUDY PLAN (TERR 1)

PSP GOALS AND OBJECTIVES	STUDY AREA	STAKEHOLDER COMMENTS	PACIFICORP RESPONSE
The Threatened and Endangered Species Study Plan addresses the following goals and objectives: • Identification of federally listed and other protected plant and terrestrial/aquatic wildlife species potentially occurring in the Project Area, as described in the PAD. Ute ladies'-tresses orchid is the only federally listed species known to occur in or near the Project Area. The occurrence of the species within the study area is based on limited surveys conducted during a single season. This study will more systematically assess and survey the Project Area to estimate the extent of the occurrence of this species within the Project Area. • Assessment of direct, indirect, and cumulative impacts on federally-listed species resulting from the proposed Project operating scenarios.	The study area for the Ute ladies'-tresses orchid includes the Cutler Reservoir Project Boundary. Surveys will focus on suitable habitat for this species, which include wet meadow and shoreline habitat. All surveyed areas will be located inside the Project Boundary, represented by the red outline below.	No study requests/study comments received specific to Threatened and Endangered Species Study.	NA

SHORELINE HABITAT CHARACTERIZATION PROPOSED STUDY PLAN (TERR 2)

PSP GOALS AND OBJECTIVES	STUDY AREA	STAKEHOLDER COMMENTS	PACIFICORP RESPONSE
The Shoreline Habitat Characterization Study Plan addresses the following goals and objectives: • Quantification of littoral habitat types. • Characterization of emergent and adjacent wetland and upland vegetation. • Mapping of invasive species. • Assessment of the impact of proposed operational changes on these parameters and associated effects on terrestrial and amphibian wildlife. • Effects of the proposed changes in Project operations to be addressed in this Study Plan include: o The effect of reservoir fluctuations on riparian and wetland habitat and associated wildlife, including waterfowl, wetland-dependent birds, amphibian species, and other terrestrial wildlife dependent on riparian/wetland habitat. o Potential effects on upland wildlife habitat and associated wildlife. o The potential for introduction and spread of terrestrial and wetland/littoral invasive plant species within the Project Boundary.	The shoreline habitat characterization study area lies within the ordinary high-water line (OHWL), which is generally defined by the current reservoir elevation range. It includes all shoreline and littoral habitat as well as any upland islands and peninsulas that might support breeding shorebirds, amphibians, and terrestrial wildlife dependent on riparian/wetland habitat. The invasive plant component may involve uplands beyond the littoral zone. All analyzed areas will be located inside the Project Boundary.	1. Commenter suggests surveys of the Temporal and Spatial Characteristics of the Avian Community. The goal would be to quantify the temporal and spatial populations of avian species, both on the water and in the uplands around the perimeter, by conducting multiyear population surveys and correlating that data with habitat conditions. 2. Allowing PacifiCorp to open up the operational window of Cutler Reservoir would have dramatic effects on the environment and many users of the reservoir including: a. Irrigation: pumps along the reservoir could be have their ability to pump irrigation water impacted. b. Recreation: small variations of the reservoir due to its small size can flood areas or create vast mud flats. Boats and even canoes and kayaks will not be able to operate. If reservoir elevations are significantly varied, recreational use will be limited. The Watterson's host many recreational users each year and this will limit their business. c. Agriculture: high water levels impact soils and agriculture by pushing salts into the surrounding soils and impact agricultural production. d. Invasive Species: phragmites, gaotsrue, dyers woad and another species have dramatically spread through the Project and adjacent areas, increasing water consumption and damaging habitat and agriculture. .	1. PacifiCorp is not proposing a Temporal and Spatial Characteristics Study of the Avian Community as part of this relicensing. PacifiCorp would be interested in furthering this discussion with the requester after potential effects on various populations have been established in the Shoreline Characterization Study and Land Use Study. 2. PacifiCorp will address these impacts as part of the Land Use, Recreation, and the Shoreline Characterization Study plans. The Land Use Study plan will address impacts of the proposed operational changes on irrigation pumps that withdraw from Cutler Reservoir. Each known pump that withdraws from the Reservoir will be assessed. The proposed operational changes will not cause water levels to rise above the OHWL. However, changing reservoir elevations may have potential to create a wet/dry cycle in some areas and subsequently impact soil salinity. The potential for this impact to occur will be addressed in the Land Use Study plan. The Shoreline Characterization Study will address invasive species, including collecting information on where they are, and will analyze the impact of proposed operations on their distribution in the future. The effects of drawdown on recreation will be assessed during the 2019 and 2020 study season, including impacts to the usability of boat ramps and in-water recreation. The results of this study will be used to determine whether PME measures related to recreation are merited.

LAND USE PROPOSED STUDY PLAN (TERR 3)

PSP GOALS AND OBJECTIVES	STUDY AREA	STAKEHOLDER COMMENTS	PACIFICORP RESPONSE
The goals and objectives of the Land Use Study Plan center on characterizing the processes and potential impacts of fluctuating water levels on land use and aesthetic resources. The Study Plan specifically focuses on water withdrawal infrastructure, fences used for livestock management, shoreline erosive features and control structures, and large-scale impacts on aesthetic resources, specifically scenic quality, from key, high-use viewpoints and areas of frequent recreational use. Addressing impacts on these resources will help PacifiCorp meet resource management goals for Cutler Reservoir (PacifiCorp 1995).	The land use component of this Study Plan focuses on the shoreline of Cutler Reservoir, adjacent areas immediately above and below the OHWL defined by the current range of reservoir elevations, and select locations on the Bear River downstream of Cutler Dam (Figure 2 2) Existing water withdrawals occur along the reservoir shoreline. Irrigation pumps are typically used to pull water from the reservoir into canals, ditches, pipes, and other infrastructure that distribute water away from the reservoir. The proposed study area for pumped withdrawals includes all points of withdrawal from Cutler Reservoir, typically below the OHWL. The study area incorporates surface structures (e.g., weirs or headgates) that regulate flow into irrigation systems. Reservoir shorelines, stream channel banks, and other morphologic features that could be impacted by fluctuating water are included in the study area for eroding banks. The location of some existing erosion sites and erosion-control measures are currently known. There could potentially be additional sites where substantial erosion or instability exist. The study area for eroding banks is accordingly defined as the entire reservoir shoreline, reservoir tributaries, and the Bear River downstream of Cutler Dam. Eroding banks downstream of Cutler Dam will be studied at select locations. All other erosion study sites will be inside the existing FERC Project Boundary. The proposed study area for fences is limited to sites where fences terminate at the water's edge. The aesthetic resources component of this Study Plan targets developed recreational sites on the reservoir as well as viewpoints outside the Project Boundary where large numbers of viewers experience vistas that include the reservoir.	1. Commenter suggests that studies include all the area impacted by dam operations which can be observed all the way down to the Bird Refuge. 2. The soils around Cutler Reservoir are highly erosive. Rapid lowering of the water surface, particularly in a repeated nature will create unbalance hydrostatic forces. This will likely cause increased sloughing of the banks. This is a water quality, wetland, and habitat concern that must be addressed. The soils around the reservoir are highly erosive as demonstrated by the concerns in the RMP and the extensive erosion control efforts employed by PacifiCorp as part of the existing license. Any proposed modifications must be evaluated for impacts and mitigation efforts employed to protect the banks and the wetlands from erosion as well as to prevent erosion from further harming water quality in the reservoir and downstream. The rapid fluctuations would create unbalanced hydrostatic pressures in the soils and can cause bank failures and sloughing. This would impact water quality, the ecology of the banks, including wetlands and surrounding property owners. 3. It is crucial to include the 1,900 acres of PacifiCorp-owned riparian lands scattered along 35 miles of the Bear River downstream of Idaho state line into the geographical extent for analysis and management of the Cutler Hydroelectric near Benson 4. For the purposes of studying potential impacts to downstream landowners and the environment, studies should include area along the river corridor all the way to the Great Salt Lake. 5. Consider the effects on the bank stabilization efforts implemented with nearly stable WSL restrictions that would potentially no longer be effective.	1. Cumulative effects downstream at the Bear River Migratory Bird Refuge will be determined once more is known about Projects impacts on the resource. PacifiCorp would like to understand the agency-specific resource management goals per 18 CFR § 5.9(b)(2) and how the requested modification to studies would inform a quantitative measure that could inform future license conditions. 2. PacifiCorp's proposed 2D model will quantify the volume of sediment activated by the reservoir based on the changes in hydraulics caused by the drawdown. However, the hydraulic model will not model/predict bank sloughing quantities and locations. PacifiCorp does plan on collecting data before, during and after the drawdown that might provide insight into the impacts that repeated drawdowns could have on bank stability. This includes time-lapse photography of various sites that could be more susceptible to bank erosion during the drawdown. The City of Logan is welcome to provide PacifiCorp any locations of particular concern with regard to bank erosion or sloughing taking place. These locations will be taken into consideration when choosing final observation sites (see also Land Use Study Plan, section 2.3). 3. PacifiCorp is not proposing to include the 1,900 acres of PacifiCorp-owned riparian lands along 35 miles of the Bear River downstream of the Idaho state line as part of this relicensing. The upstream projects are not dependent on the operations of the Cutler Reservoir; nor will the reservoir have impacts to the tailwater of the nearest upstream parcel. 4. PacifiCorp is not proposing to include the reach down to the Great Salt Lake as part of its Hydraulic Study as part of this relicensing. A Project nexus nor a Public Interest Consideration per the Federal Power Act under 18 CFR § 5.9 has been establish that would help PacifiCorp consider if study is merited. 5. PacifiCorp intends to conduct a Land Use Study that will address existing concerns with regard to shoreline erosion and impacts of the proposed elevation changes in reservoir operations on the efficacy of past bank stabilization efforts at Cutler Reservoir.

PSP GOALS AND OBJECTIVES	STUDY AREA	STAKEHOLDER COMMENTS	PACIFICORP RESPONSE
		6. Commenter suggests a study looking at erosion below the Cutler Dam as a result of water level fluctuations and subsequently winter time ice fluctuations. This study can be explored through modeling effort and real time data collection.	6. The hydraulic model will quantify WSL and the volume of sediment transported up to 2-miles downstream of Cutler Dam based on the change in hydraulics during the drawdown. The hydraulic model is not able to model/predict bank sloughing quantities and locations. However, the Land Use Study will collect data during the drawdown and in the following year to identify potential impacts of proposed operational changes on Bear River bank stability and erosion. UDAF is welcome to provide PacifiCorp with Bear River channel locations where they are concerned about bank erosion or sloughing. These locations will be taken into consideration when choosing monitoring sites.
		7. Suggests a study of the effects associated with winter ramping and the effects on bank erosion and water quality could be determined.	7. PacifiCorp would like to understand the Project nexus, methodology proposed and agency-specific resource management goals per 18 CFR § 5.9(b)(2) and how the requested modification to studies would inform a quantitative measure that could inform future license conditions. Per FERC, the agency should thoroughly explain how the study request relates to that resource management goal.
		8. Allowing PacifiCorp to open up the operational window of Cutler Reservoir would have dramatic effects on the environment and many users of the reservoir including: a. Irrigation: pumps along the reservoir could be have their ability to pump irrigation water impacted. b. Recreation: small variations of the reservoir due to its small size can flood areas or create vast mud flats. Boats and even canoes and kayaks will not be able to operate. If reservoir elevations are significantly varied, recreational use will be limited. The Watterson's host many recreational users each year and this will limit their business. c. Agriculture: high water levels impact soils and agriculture by pushing salts into the surrounding soils and impact agricultural production. d. Invasive Species: phragmites, gaotsrue, dyers woad and another species have dramatically spread through the Project and adjacent areas, increasing water consumption and damaging habitat and agriculture.	8. PacifiCorp will address these impacts as part of the Land Use, Recreation, and the Shoreline Characterization Study plans. The Land Use Study plan will address impacts of the proposed operational changes on irrigation pumps that withdraw from Cutler Reservoir. Each known pump that withdraws from the Reservoir will be assessed. The proposed operational changes will not cause water levels to rise above the OHWL. However, changing reservoir elevations may have potential to create a wet/dry cycle in some areas and subsequently impact soil salinity. The potential for this impact to occur will be addressed in the Land Use Study plan. The Shoreline Characterization Study will address invasive species, including collecting information on where they are, and will analyze the impact of proposed operations on their distribution in the future. The effects of drawdown on recreation will be assessed during the 2019 and 2020 study season, including impacts to the usability of boat ramps and in-water recreation. The results of this study will be used to determine whether PME measures related to recreation are merited.

RECREATION RESOURCES PROPOSED STUDY PLAN (REC 1)

PSP GOALS AND OBJECTIVES	STUDY AREA	STAKEHOLDER COMMENTS	PACIFICORP RESPONSE
The goals of the Recreation Resources Study are to identify the existing recreation opportunities, facilities and visitor use that may be affected by operation of the Project, and develop measures that could be implemented to mitigate Project effects and/or enhance recreation activities. The specific objectives to meet the goals of the study include: • Describe existing recreation opportunities and facilities in the Project Boundary • Quantify visitor use and carrying capacity for Project recreation facilities • Evaluate if or how changes in Project operations could affect recreation opportunities, patterns in visitor use, public access to the reservoir, and recreation facility usability • Identify current and projected trends in recreation based on recent or newly conducted surveys and interviews and consultation with stakeholders, regional and statewide plans, and other available data • Evaluate how changes in Project operations may affect existing visual resource conditions in the vicinity of the Project • Evaluate how other proposed ongoing actions may affect existing recreation facilities (widening State Road 30) Recreation planners will gather information on recreation opportunities, facilities, and visitor use in the Project Boundary using a combination of data collection methods that include the following: • Desktop Recreation Assessment; • Project Site Assessment; • Recreation Use Counts; • Visitor Survey; • Structured Interviews; and • Evaluate Effects of Proposed Project Operational Changes	The study area for this plan is the area inside the Project Boundary, including the portion of the Bear River directly downstream of the powerhouse.	1. Dropping the water level by 1 to 2 feet would make the current boat ramp unusable for most boats and will also increase the risk of boaters encountering dangerous obstacles that are usually submerged by water. Does not want to see the area made more restrictive as the public originally agreed to the reservoir with the caveat that it would remain a multi-use recreational area. 2. Commenter suggests that the concrete boat ramp needs to be extended at Cutler Canyon Marina. Suggested the boat ramp be extended 6 to 8 linear feet to prevent scraping and damage to boat trailers to launch boats. 3. The majority of the area used for recreation is only 4 to 5 feet deep and a reduction in operating levels would leave the area unusable for motorized boaters. Suggests to limit the time period PacifiCorp is allowed to lower the water level to 1 week or less, or during a period of the year when the impact would be minimized. 4. Commenter identified numerous improvements at the following recreation sites to make sites accessible for individuals with disabilities: ▪ Cutler Canyon Marina: ▪ Benson Marina: ▪ Upper Bear River Access: ▪ Logan River Recreation Site: ▪ Cutler Marsh Marina: 5. Allowing PacifiCorp to open up the operational window of Cutler Reservoir would have dramatic effects on the environment and many users of the reservoir including: 1. Irrigation: pumps along the reservoir could be have their ability to pump irrigation water impacted. 2. Recreation: small variations of the reservoir due to its small size can flood areas or create vast mud flats. Boats and even canoes and kayaks will not be able to operate. If reservoir elevations are significantly varied, recreational use will be limited. The Watterson's host many recreational users each year and this will limit their business. 3. Agriculture: high water levels impact soils and agriculture by pushing salts into the surrounding soils and impact agricultural production. 4. Invasive Species: phragmites, gaotsrue, dyers woad and another species have dramatically spread through the Project and adjacent areas, increasing water consumption and damaging habitat and agriculture.	1. PacifiCorp's Recreation Resources Study Plan will inform the effects the proposed operations will have on the usability of boat ramps and in-water recreation. The results of this study will be used to determine whether PME measures related to recreation resources are merited. 2. PacifiCorp's Recreation Resources Study Plan will inform the effects the proposed operations will have on the usability of boat ramps and in-water recreation. The results of this study will be used to determine whether additional PME measures related to recreation resources are merited. Commenter spoke with PacifiCorp staff and was chiefly interested in measures that could address a boat ramp use concern immediately rather than as a future PME measure; the situation will be assessed during the proposed 2019 Cutler drawdown. 3. PacifiCorp's Recreation Resources Study Plan will inform the effects the proposed operations will have on the usability of boat ramps and in-water recreation. The results of this study will be used to determine whether PME measures related to recreation resources are merited. 4. PacifiCorp appreciates the accessibility survey conducted by the NPS in June of 2019. The information provided will be used to improve some items in the short term (prior to license submittal), and will inform the Recreation Resources Study Plan which will assess the adequacy of recreation sites, including any needed improvements required by the ADA. The results of this study will be used to determine whether PME measures related to recreation resources are merited. 5. PacifiCorp will address these impacts as part of the Land Use, Recreation, and the Shoreline Characterization Study plans. The Land Use Study plan will address impacts of the proposed operational changes on irrigation pumps that withdraw from Cutler Reservoir. Each known pump that withdraws from the Reservoir will be assessed. The proposed operational changes will not cause water levels to rise above the OHWL. However, changing reservoir elevations may have potential to create a wet/dry cycle in some areas and subsequently impact soil salinity. The potential for this impact to occur will be addressed in the Land Use Study plan. The Shoreline Characterization Study will address invasive species, including collecting information on where they are, and will analyze the impact of proposed operations on their distribution in the future. The effects of drawdown on recreation will be assessed during the 2019 and 2020 study season, including impacts to the usability of boat ramps and in-water recreation. The results of this study will be used to determine whether PME measures related to recreation are merited

CULTURAL RESOURCES PROPOSED STUDY PLAN (CULT 1)

PSP GOALS AND OBJECTIVES	STUDY AREA	STAKEHOLDER COMMENTS	PACIFICORP RESPONSE
The goals and objectives of this Study Plan are to more completely identify those cultural resources that are potentially subject to effects from Project operations under the renewed license. Better understanding of the nature of these resources will inform the management actions to be outlined in the HPMP. Three general categories of studies related to cultural resources are proposed: archaeological, historic architectural, and ethnographic. The information to be obtained from these studies will include that contained in standard cultural resource recording forms (e.g., Utah Archaeology Site Forms [UASFs], an amended National Register Registration Form), consisting of locational and descriptive information about each identified resource and its setting, as well as an evaluation of its National Register of Historic Places (NRHP) eligibility with the applicable NRHP significance criterion/a noted. In addition, further information on the general historic and prehistoric context of cultural resources in the area will be obtained to assist in NRHP eligibility evaluations. Ethnographic information will be obtained by a qualified ethnographer in coordination with participating tribes. This information, as well as resource recording forms will be included in reports that meet FERC and Utah Division of State History (UDSH, which houses the Utah State Historic Preservation Office [SHPO]) guidelines for archaeological and historic architectural studies.	PacifiCorp proposes, per FERC guidance (FERC 2008), that the Project's Area of Potential Effects (APE) for purposes of Section 106 consultation be defined as the Project Boundary, plus any areas upstream or downstream of the Project Boundary that planned hydraulic modeling indicates may be affected by changes in river flow regime. The proposed APE is shown as the Project Boundary in **Error! Reference source not found.**; this figure does not include any upstream or downstream areas that may be added to the APE following hydraulic modeling because any such areas are not yet known.	No study requests/study comments received specific to the Cultural Resources Study.	NA