

Electronically filed November 15, 2021

Kimberly D. Bose, Secretary  
Federal Energy Regulatory Commission  
888 First Street, N.E.  
Washington, D.C. 20426

**Subject: Cutler Hydroelectric Project (FERC Project No. 2420)  
Filing of Response to Bridgerland Audubon Society Updated Study Report  
Comment**

Dear Secretary Bose:

Pursuant to 18 CFR § 5.15(f), PacifiCorp filed the Updated Study Report (USR) package with the Federal Energy Regulatory Commission (FERC) and held the USR meeting on August 31, 2021. On September 15, 2021, PacifiCorp filed the meeting summary, and within 30 days of the USR meeting summary filing, stakeholders were to file with FERC any comments or disagreements concerning the USR meeting summary, or request modifications to ongoing studies. On October 15, 2021, PacifiCorp received via e-mail a comment letter from the Bridgerland Audubon Society (BAS) (Attachment A). This letter does not appear to have been filed with FERC.

The USR included only two study reports; the Shoreline Habitat Characterization USR (covering only Phase 2 of the Shoreline Study, which was not completed in time to include in the Initial Study Report, filed earlier in 2021) and the Land Use USR (containing only the Bank Stabilization Downstream of Cutler Dam Study portion, which similarly, was not completed in time to include in the March 2021 ISR). However, BAS comments appear to be directed at the Fish and Aquatics Initial Study Report (ISR). The Fish and Aquatics Study and associated study report was complete in the March 2021 ISR submittal and did not have any additional components that were carried over to the USR.

BAS previously submitted comments on the ISR, specifically regarding the Fish and Aquatics Study, which PacifiCorp addressed in a May 2021 Response to Comments submittal. Subsequently, FERC concluded in their Determination on Requests for Study Modifications (issued on June 11, 2021) that the questions raised were addressed by PacifiCorp and determined that the Fish and Aquatic ISR adhered to the study plan approved by FERC on February 20, 2020 (FERC SPD 2020). Further, FERC denied BAS requests for modifications to the Fish and Aquatics Study. The current (October 2021) BAS comments appear to be an additional round of comments on the ISR. As such, PacifiCorp has not addressed each of the comments directed at the Fish and Aquatics ISR individually as the ISR is not open to comments anymore, although several comments will be addressed here generally in order to clarify some important issues that BAS has noted.

The USRs for Shoreline Habitat Characterization and Land Use summarize the data collected but do not include an analysis of potential impacts, as only results are required in both the ISR and USR per FERC regulations. The Draft License Application (DLA), filed October 29, 2021, contains the analysis of potential impacts for each resource area associated with proposed Project operational changes. PacifiCorp's replies to the relevant comments are outlined below.

- Several BAS comments noted that PacifiCorp did not/has not provided the analysis of the different types of impacts suggested in the comment letter. That is correct, and PacifiCorp has noted repeatedly that the analysis of potential impacts would be included in the DLA. On October 29, 2021, PacifiCorp filed their DLA which provides a draft Environmental Report (Exhibit E) that outlines study results, analysis, draft proposed protection, mitigation, and enhancement (PM&E) measures, and a list of draft management plans. The comment period for the DLA is open until January 31, 2021. Final analysis, including PM&E measures, will be provided in the Final License Application, after which stakeholders will have an additional comment period during which they can provide FERC feedback on the FLA.
- BAS comments suggested that the extended drawdown completed in November 2019 did not accurately demonstrate where Project operations would have an effect on benthic invertebrates and emergent macrophytes on which birds and fish depend. That is also correct, and has been previously noted regarding the fact that the 2019 full drawdown is *not* analogous to the proposed operational conditions. Most importantly, the full drawdown was conducted to ensure needed data collection for the hydraulic modeling and sediment studies (specifically to collect LiDAR data). Additionally, the drawdown reflected an exploratory level of reservoir elevation range evaluation that was eliminated as a potential proposed Project operation scenario early on (and as reflected in the Revised Study Plan) in the relicensing process and thus was not part of FERC's Study Plan Determination. PacifiCorp has since detailed the proposed Project operations (the Preliminary Application Document noted only an evaluation range, rather than proposed operations), which will, in large measure, reflect current operation elevation ranges. The proposed Project operation is described in great length in multiple exhibits of the DLA (i.e., Exhibits B and E).
- BAS noted a concern for eliminating a dewatered transect during the study conducted for the 2019 drawdown. For clarity, no transects were eliminated, although as noted below, one sample site from one transect was. Notably, even when the reservoir was lowered more than 20 vertical feet, only one sample site in a single transect was dewatered, which would not be dewatered at the proposed Project operations range. This site was not sampled because it was not representative of the conditions expected during the proposed operations, and thus negated the analysis assumptions. Exclusion of this single sample site was clearly noted in the Fish and Aquatic ISR (ISR Appendix E, Page E-3).

Kimberly D. Bose, FERC  
Cutler Hydroelectric Project (FERC Project No. 2420)  
Filing of Response to Bridgerland Audubon Society Updated Study Report Comment  
November 15, 2021

PacifiCorp appreciates the continued support and participation of BAS in the Cutler relicensing process and encourages BAS to communicate with PacifiCorp on the comments filed in the letter by contacting Cutler Relicensing Project Manager, Eve Davies, at 801-220-2245. This letter and its attachments have been filed electronically. The security classification of each component in this filing is shown in the enclosure table.

Sincerely,

*Mark Sturtevant*

Mark Sturtevant (Nov 15, 2021 09:40 PST)

Mark Sturtevant  
Vice President, Renewable Resources

MAS:ED:BB

<b>Encl:</b>	Attachment A – Bridgerland Audubon Society USR Comment Letter – Public
--------------	--

<b>eFile:</b>	Kimberly D. Bose, Secretary via eFile at <a href="http://www.ferc.gov">www.ferc.gov</a>
---------------	--

**ATTACHMENT A**

**BRIDGERLAND AUDUBON SOCIETY USR COMMENT LETTER**

Bridgerland  
Audubon  
Society



P.O. Box 3501  
Logan, Utah  
84323-3501

Bridgerland Audubon Society's comments on  
PacifiCorp's Cutler Hydroelectric Project  
(FERC Project 2420) Filing of Updated Study  
Report Meeting Summary, Sept. 15, 2021

Ms. Eve Davies  
Cutler Licensing Project Manager  
PacifiCorp  
1407 West North Temple, Room 210  
Salt Lake City, UT 84116  
Cutlerlicense@gmail.com

Oct 14, 2021

Dear Ms. Davies,

Thank you for the opportunity to respond to your Updated Study Report (September 15<sup>th</sup>, 2021) and the Initial Study Report Response to Comments (May 2021) referred to in the Sept. 15<sup>th</sup> meeting.

We appreciate PacifiCorp's desire to provide additional peaking power to supplement wind and solar renewable sources. However, we do not feel that your studies have demonstrated that the Normal Drawdown and the additional 1.5±0.5 ft. of Extended drawdown would not harm the benthic invertebrates and emergent macrophytes on which birds and fish depend. In your comments you say that a survey of the benthic invertebrates during the 2019 experimental drawdown "... *used the widely accepted Rapid Bioassessment Method as a means of determining species and density of Benthic Macroinvertebrate Index (BMI)*", but the pre- and post-surveys were implemented in a manner that provided no information on the impact of the drawdown on the benthic invertebrates or emergent macrophytes. The problem with those surveys is that they did not measure densities of macroinvertebrates in the areas of the reservoir exposed during the drawdown. Indeed, your response says that "*These transects [for the study] were specifically selected so that the sampling sites would not be dewatered*". That is, no sampling was done in the dewatered areas after the reservoir refilled, so unfortunately, we have no idea what happened to invertebrates and emergent macrophytes.

In your responses in the Response to Comments and subsequent presentation you indicate that drawdowns will not affect the benthic invertebrates because "*almost all of the reservoir bed remains inundated under conditions representative of the proposed extended operations lower limit at water surface elevation (WSE) 4,405.0 feet.*", and you presented aerial photographs of launch areas that do show limited exposure of sediments during the drawdown, although they do reveal that the emergent macrophytes (bullrush and cattails) are exposed. However, these boat launch areas are located in deep areas not representative of reservoir as a whole. If other areas are examined, appreciable portions of the sediments and emergent macrophytes will be exposed if a 2.5±0.5 ft. total drawdown is authorized. For example, analysis of your reservoir elevation modeling results for an area north of Benson Marina (Figure ISR-1-6, Sheet 5; Inundation boundaries for proposed normal, proposed extended and normal maximum pool elevations) indicates that 28% of this area would be exposed with a 2.5-foot drawdown.

Notably, all of the emergent macrophytes (13% of the area) would be exposed, as would the invertebrates residing in them. An even greater portion of the sediments would be exposed if the reservoir were drawn down to 4,404.5 ft. within PacifiCorp's requested tolerance range. Rather than aerial photographs of limited areas, a complete analysis of expected exposure of sediments during drawdown to 4405.0' and 4404.5' of all areas needs to be completed.

We are also concerned that the study and subsequent comments do not rely on the extensive scientific literature available to assess impacts of reservoir drawdown on benthic invertebrates. In our previous letter we said that "*The published literature on reservoir drawdown effects on the biota needs to be thoroughly reviewed and the results related to the proposed operational changes for Cutler Reservoir.*" In a review article Carmignani & Roy (2017) indicated that reservoir drawdowns primarily effect aquatic benthic organisms by stranding them, desiccation, and freezing if the drawdown is done during cold seasons (Carmignani & Roy 2017), as is proposed for the new Cutler operations. This article, as well as others cited therein needs to be reviewed and integrated into your analyses of the proposed operational changes on the aquatic community.

These issues and others are addressed more fully in Table 1, which adds comments to our earlier Stakeholder Comments and PacifiCorp's Responses.

Bridgerland Audubon would be happy to discuss these issues with you or the environmental consultants assisting you in your FERC relicensing application. We know that PacifiCorp is concerned with the health of the ecosystem, and we look forward to resolution of our concerns.

Please add me to your distribution list (wayne.wurtsbaugh@usu.edu).

Respectfully submitted,



Wayne Wurtsbaugh, Ph.D.  
Water Quality Specialist  
Bridgerland Audubon Society

Cc: Hilary Shughart, President, Bridgerland Audubon Society  
Marcelle Shoop, National Audubon Society Director, Saline Lakes Program  
Bryan Dixon, Bridgerland Audubon

#### References

Carmignani, J.R., and Roy, A.H. 2017. Ecological impacts of winter water level drawdowns on lake littoral zones: a review. *Aquat. Sci.* 79(4): 803-824.

Szluha, A. T., Loar, J. M., Turner, R. R., and Hildebrand, S. G. 1979. Analysis of environmental impacts of water level fluctuation in reservoirs at hydroelectric sites. United States. 10 p. <https://www.osti.gov/biblio/5985799>.

Bridgerland Audubon’s responses to the Updated Study Report meeting (Sept. 15, 2021) with reference to the Initial Study Report Response to Comments, Cutler Hydroelectric Project (FERC No. 2420), Attachment 1, Initial Study Report Comment Response Table, May 5, 2021.

No.	Stakeholder Comment	PacifiCorp Response to Comment	New Audubon Response
1	<p>We are concerned that the study and the presentation did not address issues we raised in our December 11, 2019, letter addressing the study plan. In that letter we wrote:</p> <p>The current FERC permit allows for up to 2.0 feet (1.5 ft + 0.5 ft tolerance) of reservoir fluctuation during the year. Because the mean depth of Cutler Reservoir is only 2.55 feet, fluctuations of even 1.5 feet desiccate approximately 60 percent of the bottom. Additional fluctuations being requested would have even larger impacts on the reservoir and could cause considerable harm to the fish community, the sport fishery, the benthic invertebrates, and the birds that are dependent on these food resources.</p> <p>Consequently, we request that PacifiCorp’s evaluation of increased reservoir drawdowns carefully evaluate how both the magnitude, and the frequency of these fluctuations would influence the fish community and benthic invertebrates. In a review of reservoir fluctuations on aquatic communities, Szluha et al. (1979) emphasized “that efforts to develop small hydroelectric sites that entail water level fluctuation should include a careful analysis of the types of impacts described.”</p>	<p>The 2019 fall drawdown was a full drawdown at Cutler Dam and does not represent the conditions in the proposed normal and extended operations.</p> <p>Detailed analysis of the potential effects on the aquatic organisms from the proposed Project operations will take place in the Draft License Application (DLA).</p> <p>The survey data indicate an average depth of 3.2 feet in Cutler Reservoir, not 2.55 feet, which is skewed by the larger areal extent of the shallower portions of Cutler (the North and South Marshes), located upstream (south) of Benson Marina, in portions of the reservoir that are not possible to dewater (i.e., when the elevation at the dam is lowered by over 20 feet, the lowest elevation achievable at Benson is 2.8 feet lower than the normal high operating level of 4,407.5 feet). That is, the shallowest portions of the reservoir, located south of Benson Marina, are impossible to dewater at any level of reservoir drawdown, as noted again during the fall 2019 drawdown. Fluctuations in the proposed normal and extended operations would not result in 60% of the reservoir substrate exposed (see also photos in Attachment 3 of this Response to Comments). Field observations of the inundation boundaries during the fall 2019 drawdown indicate that there is little change in the reservoir varial zone between the proposed normal and extended operations; further, almost all of the reservoir bed remains inundated under conditions representative of the proposed extended operations lower limit at water surface elevation (WSE) 4,405.0 feet. Attachment 3 contains aerial images of Cutler Reservoir during the drawdown on October 28, 2019, from four recreation sites. These images illustrate that there was little change in wetted perimeter and areas inundated when Cutler Reservoir was drawn down to and below the lowest limit of the proposed extended range, WSE 4,405.0 feet (NGVD29) at Cutler Dam. Rather than the 60% postulated, there are no areas desiccated by the current reservoir operation range. Extended operations would only occur during the winter season for up to a maximum 55-day period. During this potential 55-day period, WSEs would fluctuate throughout the approved operating range (4,407.5 to 4,405.0 feet, higher than the elevations shown in Attachment 3 aerial photos) as noted in Section 1.3 of the Initial Study Report (ISR) and would not remain at 4,405.0 feet continuously.</p> <p>For comparison purposes, the inundation boundaries for the normal and extended operations were provided in Attachment ISR-1, Figures ISR-1-1 through ISR-1-7.</p>	<p>We agree that our earlier estimate of a 60% desiccation (actually, dewatering) overstated the actual drawdown. We apparently based that estimate on an old estimate of average depth and standard limnological protocols. We’ve requested updated bathymetric data from PacifiCorp but have not received it.</p> <p>Nevertheless, as mentioned in our letter, your modeling work to predict wetted areas does show that appreciable areas would be dewatered if the elevation dropped to 4405.0 ft. and even more if the tolerance allowance decreased it to 4404.5’. For example, we utilized your modeling results showing inundation boundaries for a 2.5 ft. drawdown and integrated the exposed portion in one of your figures (ISR-1-6, Sheet 5). We found that 28% of this area would be exposed if the reservoir is drawn down to 4405’ (see Figure 1 of our comments, below). Approximately 15% of this dewatered area would be bare sediments and 13% would be emergent macrophytes. This is essentially 100% of the macrophytes. Note also that your aerial photos near the deeper launch areas also show that the emergent macrophytes are exposed.</p> <p>The macrophytes are very important for many species of aquatic invertebrates<sup>1</sup>, and these areas are most vulnerable to drawdowns since they occur at the margins of the reservoir. Unfortunately, your monitoring study during the 2019 drawdown did not assess invertebrates in these areas.</p> <p>The Draft License Application should quantitatively assess the area of sediments and emergent macrophytes that would be exposed at drawdowns to 4405’ and 4404.5’ throughout the reservoir. The scientific literature should then be</p>

1			carefully reviewed and used to predict the potential loss of invertebrates and during winter drawdown with freezing temperatures. We note, however, that none of these issues were addressed in the August 17, 2019, Cutler Hydroelectric Project (FERC Project No. 2420) Filing of the Updated Study Report and Notice of Intent to File Draft License Application.
---	--	--	--

2	<p>The stated goals of PacifiCorp’s Fish &amp; Aquatic Initial Study were 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 the fall 2019 reservoir drawdown on the aquatic community; and to relate potential Project operational changes and the resultant effects on the aquatic community within the reservoir.”</p> <p>Although the study largely met the first goal of determining the status of the aquatic organisms, <b>the study methodology did not allow managers to address the effects of the 2019 drawdown on the aquatic community, and more importantly to evaluate the effects of potential operational changes [increased drawdowns] on the benthic invertebrates and aquatic macrophytes in the reservoir.</b></p>	<p>The ISR was submitted in accordance with the Federal Energy Regulatory Commission’s (FERC) Integrated Licensing Process (ILP) regulations and describes PacifiCorp’s overall progress implementing the FERC-approved Revised Study Plan (RSP) and Study Plan Determination (SPD), including an explanation of variances, if any, from the SPD for each study plan. The ISR is not a final technical report but rather documents how the study was implemented and what data were collected in accordance with the FERC SPD.</p> <p>As noted in the ISR (page E-32), detailed analysis of the potential effects on the aquatic organisms from the proposed Project operations will be presented in the DLA.</p>	<p>As mentioned in our letter and detailed in #3 below, the studies done to date have not assessed the effects on the proposed extended drawdown on the dewatered sediments and emergent macrophytes. Hopefully, the DLA will provide that assessment, but unfortunately there apparently will be no experimental support results, as these analyses were not done during the 2019 drawdown.</p>
---	---	---	--



<p>3</p>	<p>Reservoir drawdowns primarily effect aquatic benthic organisms by stranding them, desiccation, and freezing if the drawdown is done during cold seasons (Carmignani &amp; Roy 2017), as is proposed for the new Cutler operations. Consequently, to determine if drawdowns influence benthic organisms one needs to measure densities and diversity before and after drawdowns in the desiccated (and frozen) areas. During the 2019 Cutler drawdown study benthic invertebrates were first sampled prior to drawdown in the shallow areas, but during the drawdown the sampled transects were moved to deeper water and no sampling was done in the desiccated area after the reservoir refilled. The study found that benthic invertebrates were somewhat higher in the areas sampled during the drawdown, but this could have either been because the organisms were always higher in the deeper water, or because invertebrates drifted from the desiccated areas to the deeper water as the reservoir was drawn down. We do not know which. Regardless, <b>no effort was made to determine invertebrate densities in the desiccated (and likely frozen) shallow areas after the reservoir refilled.</b> Indeed, “investigators took care to select sites that did not become dewatered during the drawdown.”</p>	<p>The study used the widely accepted Rapid Bioassessment Method as a means of determining species and density of Benthic Macroinvertebrate Index (BMI) in the permanently wetted zone of the reservoir. Only 1 of the transect 4 sample locations became dewatered during the full 2019 drawdown, and the other remaining 3 sites on transect 4 remained submerged—as did the 15 other sampling sites for respective transects (19 total sites). These transects were specifically selected so that the sampling sites would not be dewatered for comparison of pre-drawdown and full-drawdown conditions. That is, these specific transect site selections were made because current operations do not—and future proposed normal and extended operating ranges would not—expose large areas of reservoir bed (although some areas would be shallower at the lowest elevations), as compared to the much larger magnitude 2019 full-drawdown event.</p>	<p>We reiterate that the failure to sample benthic invertebrates in the desiccated and likely frozen areas of sediments and emergent macrophytes makes it impossible to assess how the 2019 drawdown affected invertebrates in these areas. Had the “widely accepted” Rapid Bioassessment Method been deployed before and after <u>in the dewatered areas</u> useful information would have been available. You specifically note here that you avoided areas that were going to be dewatered, indicating that you were aware of these areas.</p> <p>As noted above, significant areas of some sections of the reservoir would be dewatered if a 4405.0 (and 4404.5 ft. tolerance range) extended range were implemented. Importantly, nearly 100% of the emergent macrophytes would be dewatered with the extended drawdown, and some are already dewatered with the normal (4406.5 ± 0.5 ft.) operating range (See Appendix G, Attachment G-14, 1 ft normal operating depth, Sheet 5 of your Initial Study Report, Feb. 8, 2021).</p>
----------	--	---	---

4	<p>Given the results of other studies (e.g., Carmignani &amp; Roy 2017, Rose &amp; Mesa 2013, Szluha et al. 1979) it is highly likely that benthic invertebrates in Cutler are already influenced by hydroelectric drawdowns, and increased desiccation from the proposed operating parameters would exacerbate this problem. Although some invertebrate species might recover relatively quickly, others that are univoltine (1 generation/year) could be impacted throughout the year if they are killed by the proposed operational desiccations. The benthic invertebrates are a critical part of the food web that supports birds and sport fishes (Figure 1.; Armstrong and Wurtsbaugh, 2019; Budy et al., 2011; Budy et al., 2006). Drawdowns directly impact not only benthic invertebrates, but the submerged and emergent aquatic vegetation that many of the invertebrates and fishes depend on for cover (Carmignani &amp; Roy 2017). The 2019 drawdown study in Cutler did not address this potential impact, but additional analyses should.</p>	<p>The ISR was submitted in accordance with FERC’s ILP regulations and describes PacifiCorp’s overall progress implementing the FERC-approved RSP and SPD, including an explanation of variances, if any, from the SPD for each study plan. The ISR documents how the study was implemented and what data were collected in accordance with the FERC SPD.</p> <p>As noted, detailed analysis of the potential effects on the aquatic organisms from the proposed Project operations will be presented in the DLA. However, it should be noted that proposed normal operations would occur within the current operational ranges, which have no desiccation areas; proposed extended operations would occur largely within current operational ranges, and the additional 0.5 to 1.0 foot of potential range is not expected to substantively change areas of potential desiccation (see also Attachment 3 photos).</p>	<p>We look forward to seeing the Draft License Application (DLA) and hope that it can adequately address our concerns on how dewatering of the sediments and macrophytes will influence the benthic invertebrates. We hope that the DLA will utilize the decades of scientific research that has been done on the sometimes-serious effects of winter drawdowns on macrophytes and invertebrates in reservoirs (Carmignani &amp; Roy 2017 and others).</p> <p>As we noted previously, the photos in Attachment 2, Meeting Presentation of USR are not representative of the reservoir as a whole, as they were taken at deep water sites allowing boats to be launched. For example, on October 9, 2021, we measured distances from shore to the spot where the reservoir was 2 feet deep. At the three sites near the Benson Marina launch ramp, that depth was reached only 24-27 ft. offshore (mean = 25 ft). At the other sites that depth was reached 36-264 ft. offshore (mean = 90 ft.); that is, they were all shallower than the sites near the marina. See Table 1, Fig. 2. While our survey was limited and sites were not chosen evenly or randomly, it does demonstrate that the photographs presented in PacifiCorp’s Attachment 3 are not representative of the reservoir as a whole.</p>
5	<p>In our December 2019 letter we also requested for PacifiCorp to justify the removal of fish ‘spawning’ as a consideration for reservoir operations, since the majority of the sport and nongame species in the reservoir spawn during the April-June period that is currently protected. <b>We renew that request here.</b></p> <p><b>Additionally, we request the exact period for which increased drawdowns are being requested</b>—the current request is somewhat nebulous in this respect.</p>	<p>Extended operations would only occur during the winter season for up to a 55-day period. During this potential maximum 55-day period, WSEs would fluctuate throughout the approved operating range (4,407.5 to 4,405.0 feet) and would not remain at 4,405.0 feet for the duration of the 55 days (the proposed future operations are best described in Section 1.3 of the ISR; see also Figure 1-3 of the ISR). Contractual obligations for irrigation water delivery restrict PacifiCorp’s operations seasonally. The proposed operations for Cutler Reservoir maintain those obligations with the additional 1 foot of elevation change occurring outside the irrigation season in the late fall and winter when irrigation has ceased (the extended range also cannot be used during high flow periods, which occur starting in the early spring). In the fall and winter period, fish spawning does not occur; since there is no stranding potential with the proposed 1-foot elevation change, young-of-year fishes would also not be at risk.</p>	<p>PacifiCorp’s license renewal is not just for the period of extended operations in the winter. Indeed, it covers the entire year and consequently fish spawning remains a consideration for reservoir operations and should remain in a new license agreement.</p>

<p>6</p>	<p>It is clear that the studies done to date by PacifiCorp have not addressed their stated goal “to relate potential Project operational changes and the resultant effects on the aquatic community within the reservoir.” Consequently, additional work is needed to address this oversight. We suggest four potential avenues of investigation: 1. The published literature on reservoir drawdown effects on the biota needs to be thoroughly reviewed and the results related to the proposed operational changes for Cutler Reservoir. 2. A second drawdown similar to that done in 2019 could be performed and the invertebrates and macrophytes in the desiccated zone could be resampled after filling. In addition to the bare sediments that were sampled in 2019, additional efforts should be done to quantitatively sample the invertebrates inhabiting the emergent vegetation on the periphery of the reservoir, as this habitat is particularly important for the larger crawling invertebrates (e.g., mayflies, dragonfly nymphs, caddisflies) that fish and some birds rely on as a food source. 3. The existing authorized drawdowns in Cutler already desiccate sediments and likely impact benthic invertebrates and aquatic macrophytes in the reservoir. A careful study of the areas periodically desiccated compared to those that aren’t may help identify the magnitude of the problem. 4. An experimental study might be possible in the three Logan Mitigation Ponds west of the county landfill that are operated by the city of Logan. If the city agreed, and if additional water resources could be obtained, it would be possible to perform a BACI analysis (Before-After-Control-Impact design; Green 1979). With this approach the ponds would need to be filled with water for approximately one year, invertebrate and aquatic macrophyte samples taken, and then 1-2 of the ponds would be partially drawn down during the appropriate season and for the proper length of time, refilled, and benthic invertebrates and macrophytes again sampled in the control pond and in the desiccated and non-desiccated portions of the treatment ponds. This is a powerful approach for looking at environmental impacts on organisms.</p>	<p>The 2019 fall drawdown was a full drawdown at Cutler Dam and does not represent conditions in the proposed normal and extended operations. Furthermore, as noted previously here and in the ISR, detailed analysis of the potential effects on the aquatic organisms from the proposed Project operations will be presented in the DLA. Section 1.3 in the Cutler ISR describes the proposed Project operations. As discussed previously, Project operations will not desiccate Cutler Reservoir. Therefore, the investigations suggested in this comment are not applicable.</p> <p>1) As noted above, detailed analysis of the potential effects on the aquatic organisms from the proposed Project operations will be presented in the DLA. The analysis will include references to literature applicable to the proposed Project operations at Cutler. Fluctuations in the proposed normal and extended operations would not result in 60% of the reservoir substrate exposed (especially as the shallower areas of the reservoir upstream of Benson Marina are not dewatered even when the reservoir is completely drained such as occurred during the 2019 full drawdown). Field comparisons of the inundation boundaries indicate there is little change in the reservoir varial zone between the proposed normal and extended operations.</p> <p>2) As noted above, the 2019 fall drawdown was a full drawdown at Cutler Dam and was not representative of the proposed normal and extended operations. PacifiCorp has no plans to schedule another full drawdown similar to the fall 2019 full drawdown.</p> <p>3) See responses 1 and 2 above.</p> <p>4) See responses 1 and 2 above; no additional studies are proposed.</p> <p>See also response to Comment 7 below.</p>	<p>Contrary to your statements here, PacifiCorp’s modeling data does show that if extended operations were instituted, substantial areas of sediments and nearly all of the emergent macrophytes would be dewatered (See Fig. 1). Consequently, it is imperative that we understand how this dewatering will influence the emergent macrophytes and the aquatic invertebrates on which birds and the fish community depend. Utilization of the applicable literature on reservoir drawdowns will be invaluable in this analysis and should be utilized. We expect, however, that additional field analyses will be needed to assess the effects of drawdowns in Cutler.</p> <p>In lieu of our suggestions for further experimental analyses (Column 2 here), an alternative would be for the license to authorize a provisional extended drawdown for up to two years. During this period analyses could be done to properly assess the impacts of the littoral zone desiccation of the macrophytes and invertebrates. FERC could then decide whether continued extended drawdowns should be allowed or not.</p> <p>Reference: Carmignani JR, Roy AH. Ecological impacts of winter water level drawdowns on lake littoral zones: a review. <i>Aquatic Sciences</i> 2017, 79(4): 803-824.</p>
----------	--	---	--

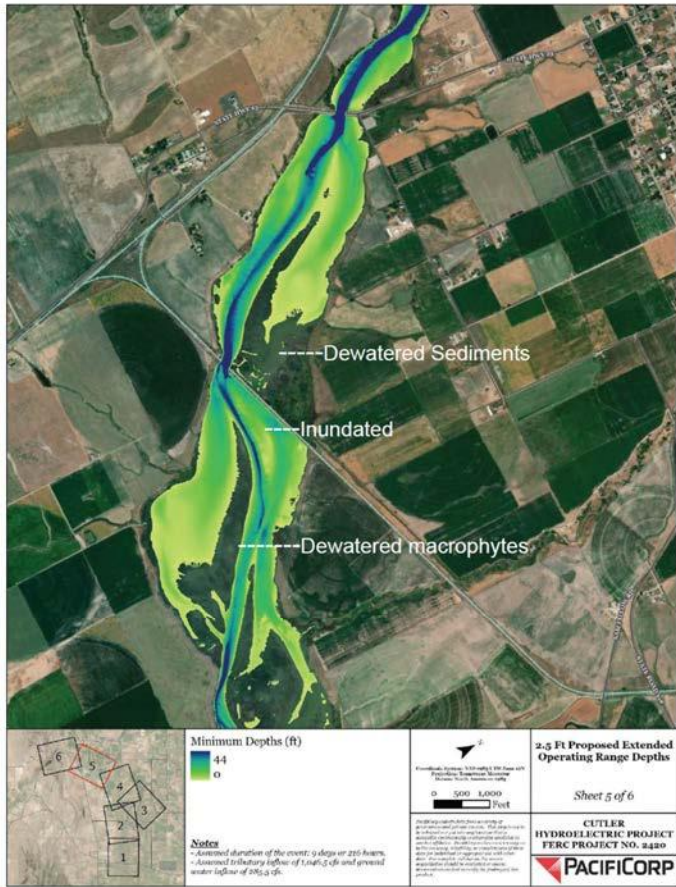


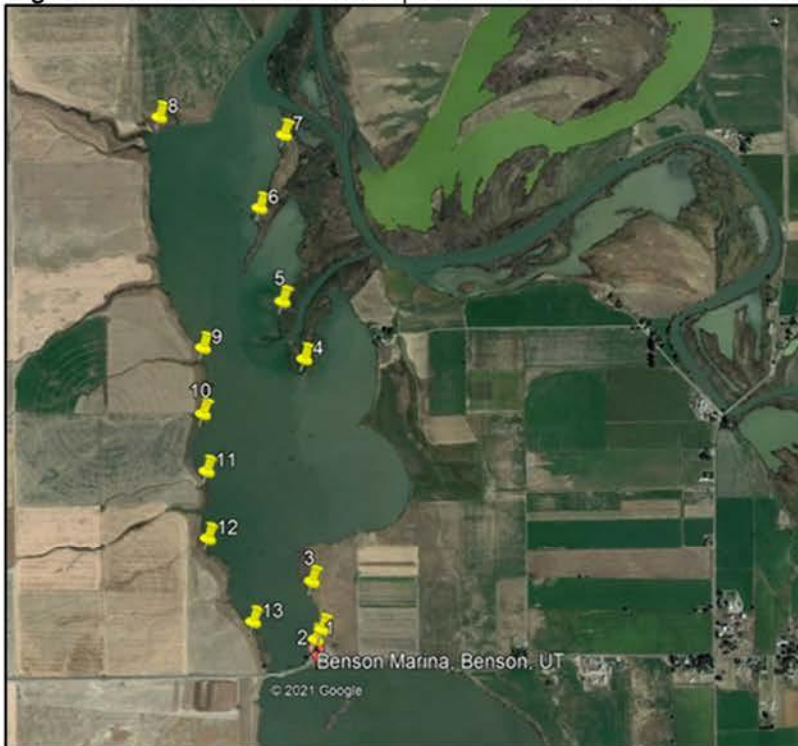
Figure 1. Modeled wetted area (light green and yellow) at the proposed extended operating range of 4405.0 feet. Note that additional areas would be desiccated at the proposed variance limit 0.5 ft. lower (4404.5 feet). The figure shows that 28% of the reservoir in this section would be dewatered by the normal plus the extended drawdown, of which approximately 13% is emergent macrophytes. From Cutler Hydroelectric Project (FERC No. 2420, Initial Study Report, Feb. 8, 2021).

Figure 2. Drawdown Photos: Benson Marina. From PDF pg. 53 of PacifiCorp's Updated Study Report



October 25, 2019, Cutler Dam elevation 4,407.22      October 28, 2019, Cutler Dam elevation 4,404.58

Figure 3. Shoreward location of depth measurements shown in Table 1.



Site	Location	Depth at edge of emergents (feet)	Distance from shore to reach a depth of 2 feet
1	9 yds S of Benson launch ramp	0.25	24
2	21 yds N of Benson launch ramp	1.20	27
3	250 yds N of Benson launch	1.25	24
	<b>MEAN</b>	<b>0.90</b>	<b>25</b>
4	NE side	0.50	264
5	NE Side	0.92	159
6	NE Side	1.50	135
7	NE side	1.42	48
8	NW side	0.00	51
9	NW side	0.50	38
10	NW side	0.50	38
11	NW side	0.42	43
12	NW side	1.00	90
13	NW side	0.08	36
	<b>MEAN</b>	<b>0.68</b>	<b>90</b>

Table 1. Depth measurements at Benson Marina and northward 1.5 miles on the east and west side of the reservoir. 9-Oct-2021, 11:30-15:00 hrs. See Figure 3.