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**Response to NMFS comments on the Draft report titled “EVALUATION OF PINNIPED PREDATION ON ADULT SALMONIDS AND OTHER FISH IN THE BONNEVILLE DAM TAILRACE, 2018”**

Reviewer’s comments are in **emboldened**.

Author’s responses and actions are in *Italics*.

All accepted comments and suggested alterations were incorporated into the document. For comments and suggested changes that were not accepted we detail the rationale below.

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Line numbers were cut from the document during the NMFS review period. We have re-inserted them to the document to facilitate direct responses to reviewer’s comments, but note that the line numbers may be slightly off due to multiple edits.

Line 48 – **Executive Summary “The purpose of these reports is to provide a summary of the monitoring and deterrence efforts at Bonneville Dam as called for in RPA 49 and RPA 69. This report appears to deviate from that purpose”**

*We object to this assertion and feel that with the inclusions of your suggested comments, the report is a stand-alone document that satisfies the intent of the work.*

Line 63 – **Switching Spring before Fall and Winter period.**

*We reject this suggestion as the chronology of sampling and reporting support fall coming before spring. To make it clear we placed “2017” and “2018” prior to the sampling period header.*

Line 71 – **Spring sampling period “There are five tables on pinniped-salmonid predation in this document. This Table and Table 9 the data match, as does Table 10 (although the date ranges differ). For the other three, some of the numbers match and some don’t. That may be ok – e.g., adjusted vs. expanded, but there is no explanation of why they differ.**



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**It's important that the information in the report be clear and unambiguous, and that if the numbers differ between Tables that a clear and thorough explanation is provided."**

*The authors' use of the Fish Passage Center's website created the problem highlighted here. Because of these issues, a re-calculation of all "Percentage of Run Taken" estimates was conducted. We have cross validated all tables on the executive summary and the tables within the report. The run estimates for Chinook Salmon and summer steelhead were inflated above the realized passage data. This correction to the passage data resulted in slightly increased impact by both species of pinniped, as seen in the new numbers presented.*

*To address the issues of date and season coordination, we added a sentence to the methods to more clearly define the sampling periods, and applied redundant statements to each of the results section for each sampling period. Moreover, we now reference just the sampling period rather than the date ranges in each of the Figure and Table headings. The result is parsimony of date ranges within the report and more accurately describes the date ranges used for each study (date ranges which have varied over the last 16 years).*

**Line 84 – Suggested removal of the last paragraph of the executive summary.**

*We reject this suggestion, due to a lack of support by the reviewer for the suggested deletion. Moreover, we feel this paragraph is justified based on our findings and is within scope. The statements and intent of the paragraph summarize our recommendations made throughout the report and warrant attention from all audiences including those that just read the summary.*

**Line 290 – Comment "As noted in the ES, the purpose of this document is to report on the results of the monitoring and deterrence program at Bonneville Dam as required by RPA 49 and 69. There is too much extraneous material in this document."**

*We object to this comment and reject the following suggestion that the entire Introduction and Background material be removed from the document. All USACE FFU reports are standalone documents with enough material and background information to provide full scope and historical context of the study that a reader can fully understand the purpose, data, and implications of findings in each document. Moreover, given the long term nature of these data and the dynamic study system they are drawn from, we believe it is important to highlight all aspects mentioned in the introduction and background.*



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Line 414 – **Suggested deletion of the final paragraph of introduction and background.**

*We make note of this suggestion, but find it of little benefit without explanation. We request reviewer identify the select locations where difficulties lay so communication with authors can occur.*

Line 456 – **“For spring monitoring, fall monitoring, or both?”**

*Chapter 2 only pertains to fall and winter monitoring. However, due to this comment and the potential issues readers would face with separating the fall and winter and spring sampling periods, we inserted the following “During the fall and winter period...” at the beginning of the paragraph.*

Line 557 – **Suggested alteration to make Coho Salmon not capitalized.**

*Throughout the document the reviewer emphasized de-capitalization of common names. This goes against the American Fisheries Societies nomenclature conventions. We adhere to the consistent use of the AFS’s nomenclature guidelines. As such, we recognize the steelhead as a life history variant and de-capitalize this species common name throughout the text except where it is the start of a sentence or a title heading. All other common names are capitalized  
Reference: [https://fisheries.org/docs/pub\\_style10.pdf](https://fisheries.org/docs/pub_style10.pdf)*

Line 662 – **Suggested deletion of “Whether the temporal shift of consumption begets sub-population differences in White Sturgeon migration (and thus relative BON abundance), or shifts in the extant population that has been exposed to pinniped predation during the spring, is unclear. Regardless, the temporal shift and increased level of predation clearly warrant investigation by fish managers.”**

*We elect to follow the perceived intent of this suggestion and remove these statements so as to cut down on jargon, remove exploratory hypotheses, and not directly suggest/implicate fish and wildlife managers. However, we alter the prior clause to include emphasis on the difference between sampling periods and state that sturgeon are now vulnerable 11 months out of the year. Hence, we now state: “Since 2016 there have been less than 100 fish killed during each five-month spring sampling season. The consumption documented during the nine-week fall and winter sampling season of 2017 exposes that white sturgeon are vulnerable to predation at almost any time of year and may now be consumed more heavily during the fall and winter period.”*



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Line 669 – **Suggested deletion of “Notwithstanding the hypothesized proximate drivers of the variable SSL numbers at BON during the fall salmonid passage season, the ultimate causation for the variability is likely the predatory drive to maximize fish consumption per unit effort somewhere in the river. As fish and wildlife managers have no SSLs management plan in place, the growing presence of SSL predation near BON will ultimately increase as long as fish are near BON. This will result in increased impacts to ESA listed fish, including Chum Salmon.”**

*In-line with the above revision, we elect to remove this statement, but reword some existing language to emphasis the pertinent points while avoiding exploratory hypotheses. We revise to have it now state: “Notwithstanding the drivers of the variable SSL numbers at BON during the fall salmonid passage season, the result is a prolonged presence of predatory SSLs that are consuming larger number of White Sturgeon and potentially consuming ESA listed Chum Salmon.”*

*The next comment applies to this section as well. The use of the term “**predatory**” in reference to SSLs may have MMPA, sec. 120 connotations or legal implication that make it a term to be avoided. However, our data have documented that they are indeed predatory on all species of fish near BON. As such, the denotation of the term fits and justifies its’ use. We request reviewer’s comment on this subject and will revise as needed to make clear, the use of the term and the author’s intent.*

Line 688 – **Suggested removal of “and the burgeoning population of BON-habituated individuals. Columbia River salmon now contend with quasi-resident SSL predators that may continue to increase in abundance, residency, and predatory impact until either: management actions occur or run specific extinctions of salmon occur.”**

*We elect to rephrase this statement to remove suggestive language. It now reads “These levels of consumption are a direct result of the increasing presence of predatory SSLs at BON and the growing population of BON-habituated SSL. Columbia River salmon now contend with quasi-resident SSL predators that have increased in abundance, residency, and predatory impact.”*

Line 851 – **Remove “s” from “lampreys”**



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*We reject this suggestion. Lamprey is singular, Lampreys is the plural form. We believe it is used correctly throughout.*

**Line 941 – Reviewer comment “ Too much conjecture”**

*We make note of this comment, but find it of little benefit without directed examples. We request reviewer identify the select locations where difficulties lay so communication can occur.*

**Line 1051 – Suggested removal of “In part due to ecological variables (e.g. cold waters) and in part due to the Steelhead’s complex life histories (e.g. iteroparity), the now diagnosed impacts of SSL predation on ESA-listed winter and B-run summer Steelhead should alarm managers and spur action.”**

*We elect to reject this suggestion due to the pertinence of each sentence in regards to the above data, and the fact that the report is structured to have no select place for “recommendations.” We did however alter the language to state that the impacts have been “assessed,” not “diagnosed” as this more directly applies.*

**Line 1065 – Suggested deletion of the next three paragraphs. With paraphrasing left in to convey simplistic message of few WTS.**

*We would like to discuss the reviewers intent with this suggested comment. If the intent is to remove all exploratory hypotheses from the report that is outside of the reviewers authorities. However, if the reviewer has issue with the hypotheses presented, we would like to have the issue expanded so communication is clear.*

**Line 1117 – Suggested removal of “The short term effects of hazing call to question the relative value of such techniques and begs for better, more effective alternatives.”**

*With no support for this suggested edit we elect to reject this edit and leave this important statement in the report.*



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**Line 1123 – Suggested removal of “Evaluating the efficacy of CSL removal is difficult due to the dynamic interplay of fluctuating fish runs, pinniped numbers, and the fact that the LOA removal quota has never been fulfilled for CSLs. However, for the past two years the metrics of abundance and residency have been reduced considerably.”**

*Again, with no support for the suggested edit we reject it. We do however, contract the last sentence and the one following into one sentence for brevity. It now reads “However, the abundance and residency metrics of CSL have been reduced considerably in the last two years and reduced relative to the ten year average. Habitually recurring animals continue to evade capture (i.e. removal) and keep the metrics higher than expected based on the removal effort by the states in recent years.”*

**Line 1132 – Suggested removal of “The removal of 27 predatory CSLs this year undoubtedly allowed more fish to pass, but the rate of removal has been hypothesized to be too low to significantly impact the rate of recruitment to the BON CSL population (Schakner et al. 2016).”**

*We reject this suggested edit based on the grounds that this statement is supported by peer-reviewed research and is directly pertinent to the information presented. Moreover, the regional fish and wildlife managers and concerned agencies may find value in this fact.*

**Line 1135 – Suggested removal of “Removal of predatory CSLs through the Section 120 LOA of the MMPA has requirements of observation that are difficult to meet for some individual CSLs. Some CSLs have been documented in previous years, captured repeatedly, but cannot be added to the list due to foraging in locations that make observation unfeasible (e.g. areas near turbulent water with poor footing or areas like the SPW where observations in turbulent water are difficult), foraging downstream of the dam tailraces, having tendencies to conceal prey items, or are sporadically foraging in BON tailraces proper and thus difficult to monitor. A recent request by the States to NOAA to alter the Section 120 requirements of five days and a salmonid kill to three days or a salmonid kill will, if approved, undoubtedly increase the efficiency of their removal program.”**



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*We elect to remove this paragraph due to the uncertainties surrounding the pending LOA change.*

Line 1135 – **Suggested removal of all “Closing Remarks”**

*We elect to reject the suggested edit due to the lack of support for the edit. It is unclear to the authors why this section need be removed and feel that the statements within are factual, pertinent, and warrant inclusion in the document.*

**Line 1460 – Suggested removal of “The Order Pinnipedia evolved  $\geq$  20 million years ago and has likely overlapped in distribution with anadromous Pacific salmonids for the bulk of this time (Naughton et al. 2011). The co-occurrence and predation of salmonid fish by pinnipeds undoubtedly led to long-standing anthropogenic disdain for the species in the Pacific Northwest, so much so that State wildlife agencies authorized bounty programs to kill as many pinnipeds as possible (Beddington et al. 1985). Since the Marine Mammal Protection Act of 1972, the stocks of CSLs and the Eastern stock of the SSLs have rebounded (NOAA 2014, 2016b), and are now frequently observed along the Pacific Coast.”**

*We elect to reject this suggested deletion due to lack of support for the edit. It is unclear to the authors why this section need be removed and feel that the statements within are factual, pertinent, and warrant inclusion in the document.*



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**Response to ODFW’s comments on the Draft report titled “EVALUATION OF PINNIPED PREDATION ON ADULT SALMONIDS AND OTHER FISH IN THE BONNEVILLE DAM TAILRACE, 2018”**

Reviewer’s comments are in **emboldened**.

Author’s responses and actions are in *Italics*.

All accepted comments and suggested alterations were incorporated into the document. For comments and suggested changes that were not accepted, we detail the rationale below and request review and more information from the reviewers.

Due to several reviews and alterations to the document stated line numbers stated herein may be slightly off. For that, we apologize and provide general descriptions and header titles and page numbers to describe where changes were made.

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**Line 77 - Suggested addition: “...however data has not been collected regarding pinniped predation of Chum Salmon (and others?) and has been identified as a priority for subsequent years.**

*We elect to incorporate this addition with modification to more accurately describe data gaps. It now states: “Predation of any of these ESA-listed stocks could damage run viability and make recovery efforts difficult, however quantitative data have not been collected regarding pinniped predation of these salmonids species in the Columbia River during the fall and winter months.”*

*As per the comment regarding capitalization of salmon species: throughout the document we adhere to the American Fisheries Societies nomenclature conventions which states that common names will be capitalized. As such, we recognize the steelhead as a life history variant and de-capitalize this species common name throughout the text except where it is the start of a sentence or a title heading. All other common names are capitalized.*

*Reference: [https://fisheries.org/docs/pub\\_style10.pdf](https://fisheries.org/docs/pub_style10.pdf)*



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**Line 979 - Suggested deletion: “Regardless of the mechanism for increased recurrence it is clear that the remaining individually identifiable CSLs using BON display site fidelity, likely contribute to increased recruitment, and are being removed at a slower rate than previously documented.”**

*We reject this suggestion as the reiteration and synthesis of these findings ties to the next statement and helps readers comprehend the complex materials presented in the previous three sentences.*

**Line 981 - Suggested addition,: “Regardless, patterns of site occupancy and social transmission will likely continue to increase unless federal legislation allows for an amendment of the current protocols.”**

*We rephrase to state the following: “These patterns will likely continue unless the current protocols are changed.”*

**Line 983 - Suggested edits: “However, high site fidelity is assumed based on one individual being observed for 12 consecutive years, and the majority of the identifiable animals observed for five or more years (consecutive? Over a period of ?). Although individual accounts are difficult to obtain, the high daily point counts, consistent inter-....”**

*We have re-phrased this clause to state: “The recurrence of SSLs is difficult to monitor given the low numbers of branded SSLs. However, we infer that a high level of recurrence due to high site fidelity for most animals that are branded. For example, one individual has been observed for 12 consecutive years and many have been observed every year for the last five years.”*

**Line 1036 - Suggested deletion: “We found that more than 5% of the winter Steelhead run was consumed by SSLs. This is a greater run impact than the 10 year average of both species of pinnipeds on: spring Chinook, Pacific Lamprey, or all salmonids combined crossing BON during the spring period.”**



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**Comment: “Ecologically, seems like apples to oranges when comparing stocks and impact to this stock. I’d say leave that last bit out.”**

*We reject the comment as the comparison is valid, however, we recognize the potential for the comment to be misleading. As such we have re-worded to have it now state: “We found that more than 6.8% of the winter steelhead run was consumed by SSLs. This is a greater impact than the 10 year average impact assessed for spring Chinook salmon during the spring period.”*

**Starting at line 1045 - Suggested deletion and comments involving White Sturgeon predation.**

*We revised this entire section and cut any exploratory hypotheses that might explain our observations. We now state: “Why more fish are killed in the fall and winter than the spring is unclear, but the additive mortality of white sturgeon over time by SSLs may be contributing to the declining status of the stock.”*

**Starting at line 1097 - Suggested deletion and comments involving LOA removal the impact on evaluation. . Comment: “I’d state something else rather than that because LOA removal quota is based on the entire population of CSLs on the west coast, not fish biology. I’d also argue number of removals shouldn’t make evaluation more difficult.”**

*We elect to include the suggested edits in this section and thank the reviewer for these. However, the impacts the LOA removals have on the evaluation of the efficacy of the program deserve comment. The number of authorized CSL removals under the LOA is dictated by the CSL population when the Authorization is given. As the number of” CSL at BON has been and continues to be, greater than the LOA allowed removal quota, across the board evaluation of the programs impact is difficult to assess. If the maximum allowable removals had occurred each year, the evaluation would be much more streamlined as there would be no outstanding questions about the impacts the remaining individuals are having.*

*As such, we have revised the statement to now read: “Evaluating the efficacy of CSL removal on salmonids population recovery is difficult due to the dynamic interplay of fluctuating fish runs, inter-annual environmental stochasticity, inter-annual and seasonally-abundant pinniped*



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numbers, and the variable number of CSL removals that have yet to reach the LOA limits for Potential Biological Removal.”

**Line 1102 - Suggested addition: “The apparent reduction in abundance and residency has contributed to the reduced number of fish killed by CSL relative to the last two years and the ten year average.”**

**Comment: “Can you add a number to this?”**

*We calculated these requested numbers and have inserted them into the document. It now reads: “The documented reduction of CSL abundance and residency relative to last year (27% and 22% decrease respectively) and the ten year average (24% and 54% decrease respectively) has likely contributed to the reduced number of fish killed by CSL.”*

**Line 1113 - Suggested deletion and comment . “The management tools developed for CSLs can be implemented for SSLs and the data to show the impact of Steller sea lions for the last 16 years, are collected and presented above.**

**Comment: “I actually disagree (respectfully). I think this paper shows a strong historical and increasing presence of SSLs at BON, and overall consumption by pinnipeds, but consumption by SSLs directly is not well-quantified and instead eluded to. I would argue this paper demonstrates the need for further examination of both SSL and salmonid dynamics, and consideration of appropriate management actions.”**

*Consumption of salmonids and White Sturgeon by SSLs has been well documented and intentionally parsed from CSL predation estimates (at the request of ODFW and WDFW) for the last 16 years. As documented in Table 8, and independently stated in all other consumption estimates, the documented predation by SSL on fish is as equally documented as that of the CSL. Indeed, with the fall and winter monitoring this season, the totality of SSL impact is further elucidated and the sampling of that period may require refinement, but the impacts the species has during the spring sampling period is well documented and supports this statement. As such, we elect to ignore this comment and keep the statement in the document.*

**Line 1124 - Suggested insertion and comment . “As Ballard Locks Steelhead are biologically extinct due to pinniped predation, the Upper Willamette River Winter Steelhead now also face the potential threat of pinniped-mediated extinction.**



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**Comment:” Can’t compare one ecological site to another. As ecologists, it’s a slippery slope to make definitive statements about things that might happen without basic data or understanding the ecological mechanisms driving it.”**

*We incorporate the suggested addition and thank the reviewer for the comment. We recognize the potential confounds and risks associated with comparing two distinct sites, however, as both sites are impoundments that impede steelhead passage, both sites are known zones of CSL foraging, and the conclusive evidence and scientific studies at each respective site find that CSL are the primary cause for either confirmed or potential species extinction, we feel comfortable making this contrast. Moreover, the similarities to BON and the rates of consumption now documented being similar to these other sites makes us comfortable with the extension of the findings to our study site.*



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**Response to Dr. Shubha Pandit's comments on the Draft report titled "EVALUATION OF PINNIPED PREDATION ON ADULT SALMONIDS AND OTHER FISH IN THE BONNEVILLE DAM TAILRACE, 2018"**

Reviewer's comments are in **emboldened**.

Author's responses and actions are in *Italics*.

All accepted comments and suggested alterations were incorporated into the document. For comments and suggested changes that were not accepted, we detail the rationale below and request review and more information from the reviewers.

Due to several reviews and alterations to the document stated line numbers stated herein may be slightly off. For that, we apologize and provide general descriptions and header titles and page numbers to describe where changes were made.

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**General comment: "Sampling duration for winter and summer are given in the executive summary but are not described in detail in the main report (chapter 2: Fall and winter sampling and Chapter 3: spring). Similarly, it was mentioned that last year's research design was modified for this year in response to NOAA Fisheries' request for collection of pinniped presence and adult salmonid predation data during the fall and winter months at BON (Page 4, lines 146---150). This made reference to an appendix for further detail, but this could not be found in the appendix as indicated. It would be good to more thoroughly discuss all of the modifications in the 2018 sampling design versus previous years in the main report."**

*We disagree that sampling duration is not clearly stated. In Chapter 2, the first paragraph clearly states the range of sampling, however we insert an end date to more explicitly state the range. It now states:*



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“Pinnipeds were not observed at BON between 2 June (end of the spring sampling period) and 20 July, 2017, after which they were omnipresent in low numbers until 11 August when the count of SSLs increased to six or more animals for the rest of 2017. Intensive (i.e. two times/day) abundance monitoring started 15 August and predation monitoring started 30 August 2017 and all observations ceased at the end 31 December.”

*Likewise, the first sentence of Chapter 3 clearly states the sampling duration (January 1 – 31 May). As per the clarity of modifications to the fall and winter design, we agree that the language did not clearly state the differences between the established spring sampling design and the modified Fall and Winter period. To that end, we expanded the explanation of the modifications and design in the second paragraph of Chapter 2 and throughout the methods of Abundance and Predation Quantification (lines 443 – 461).*

**General comment: “The authors presented observed pinniped abundance for fall/winter and spring seasons separately. However the results for the fall/winter period do not contain the same level of detail in comparison with the spring season data. For example, you mentioned in the discussion for fall/winter season (page 12, lines 321) that “ we discuss the trends of pinniped abundance, residency and recruitment ...”, but in the results section there were no results about residency and recruitment of pinnipeds for the fall/winter period. These matrices need to be estimated and included in the report.”**

*An excellent point and omission of clarity on our part. We have removed this from the first line of the discussion in Chapter 2 and included a disclaimer in the Abundance Quantification section of Pg. 5. Wherein, we now state:*

“...As this is a novel pilot study that dealt with primarily SSL that have very few brands, we do not attempt to describe the residency or recruitment metrics for each species of sea lion as is done during the spring. ...”

**General Comment: “The methods section (study area, focal species, sampling method, methods of estimating fish production, etc.) has been put into the appendix of the report, but it would be easier for the readers to understand how the results were obtained if this information, at least regarding sampling designs and statistical analyses, are kept in the main text of the report.”**



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*We recognize that appending the methods is unconventional. However, with the inclusion of the comments presented herein, and the longstanding comprehension our readership has, we feel comfortable with the current design and intend to reject this suggestion. We have however, worked to include broad and generalizable statements of each important methodological section at the beginning of each section so the readers are reminded how each data set are collected.*

**General Comment: “You mentioned that pinniped observations were counted over a short period of time (i.e., <15 minutes) to ensure that animals in transit between locations were not counted twice (page 5 lines 157---158). Does this mean that the pinniped count results that you presented are based on only 15 minutes of observation at each site per day? Or did you count pinnipeds for 15 minute subsampling periods many times each day? What was the subsampling frequency, and how many minutes or hours in total per day were observations recorded to generate your estimate of pinniped abundance? These methods are not clear and require a more detailed explanation.”**

*Your comment indicates that the methodological procedures detailed in Appendix 1 are not being properly sourced in this case. As such, we add a clause to direct readers to Appendix 1 at the end of the paragraph in question at the bottom of Pg. 5.*

*To answer the question, they were counted twice each day. See Appendix 1: Line 1541 – 1556, which states:*

“We quantified the number of pinnipeds present at the BON project each day by conducting point counts of animals from a distance using field glasses. Sampling began when the first pinniped was observed in the summer, and terminated when the last pinniped left in the spring. To maximize the accuracy of point counts, we used historical data and pinniped behavior to inform the optimal times at which to perform point counts. Previous data revealed a strong diel pattern (Stansell 2004, KST unpub. data), whereby, the greatest number of pinnipeds are consistently observed hauled out during the evening and crepuscular hours, a pattern consistent with some pinniped natural foraging cycles (Boehme et al. 2016, but see: Watts, 1996, Sepulveda et al. 2012). As such, we conducted point counts twice each day: at sunrise and as late in the evening as schedules allowed.”

The abundance data provided herein represent a conservative estimate of pinnipeds at BON on any one day. All pinnipeds in the three tailraces and on Tower Island were counted,



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however, submerged animals, animals in transit between locations but out of sight, and the ingress and egress of animals to BON occurs and may potentially influence our abundance estimates. To avoid double counting animals transiting between count locations, we sampled all locations in one five-minute period at each site, a period of time short enough to individually count animals before they could move between sites and long enough to ensure submerged animals will have surfaced and could be counted.”

**General Comment: “You mentioned that there were 21 strata (weeks) between 1 January to 2 June (see line 1384, page 50), but should it not be 22 strata? Was this a typographical error or did you actually use 21 strata in your analyses? Please check your analyses and confirm the dates and number of strata.”**

*An excellent point. It was indeed 22 weeks of sampling. It has been verified as a typo and corrected.*

**General Comment: “You monitored fish predation during the weeks in which pinniped numbers were greater than or equal to 20 animals (Page 5, lines 173---174). It is stated “if the abundance was below 20 animal threshold during the sampling week, that week was continuously sampled through Friday at which point sampling would cease until the threshold was reached again”. I looked at Table 4 and Figure 3, and there were no results for the number of fish killed between 12 September and 24 October. Is this data gap because the pinniped population was less than 20 individuals during that period? I.e., was the number of fish killed during that time period not calculated because of low pinniped abundance? If the weeks in which pinnipeds were < 20 individuals were not included in the analysis, does it not create a bias in your predation estimation (see your table 3, page 9) when you’re presenting an annual or seasonal predation estimate? Do you use any correction factor or extrapolation method for the weeks that are not included in your counts? It would be worthwhile to explain this in detail.”**

*The data were collected as stated. When there was < 20 animals, like the period 12 September – 24 October, there was no predation monitoring and thus no estimates.*



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*As per the analyses of these weeks, we calculated each week independently to provide bounded estimates of predation for each week using the total available daylight hours for that week and incorporated the observed hours for each sampled week (e.g. Table 4 data).*

*For the total estimate of all salmon killed across all nine weeks (Table 3), we collapse the analysis by using the hours sampled and available daylight hours for only the nine sampled weeks in aggregate and calculate how many fish were killed during those sampled weeks, understanding that this essentially treats the data as one continuous data set. However, the data only apply to the weeks sampled and for only the sampled tailrace. This is a similar method to our treatment of days not sampled during the spring sampling season, wherein, the days not sampled are collapsed into the strata above or below.*

*For clarity of this point we have added the following to the “Sampling Design For Predation Estimates” portion of Appendix 1 on Pg. 51:*

*“For the fall and winter periods when no sampling occurred due to pinniped abundance being below the 20 animal threshold, we bootstrapped across only the sampled weeks accounting for available daylight hours and the number of hours observed.”*

**General comment: “Was the result presented in Table 5 (page 16) derived from the data collected only during spring (January – June)? If you have included the data for both seasons (fall/winter and spring), please provide a clarification in the table’s legend. If the result was based on only spring season, can you create similar result (table) based on the data collected during the fall/winter season too?”**

*Table 5 is in Chapter 3 and is drawn only from spring data. However, the ambiguity likely derives from the table caption which did not clearly state the time period. We have revised the caption as seen below in the abbreviated table:*

*“Table 1. Minimum estimated number of individual pinnipeds observed at Bonneville Dam tailrace areas and the hours of observation during the spring sampling period, 2002 to 2018.*

Year	Total Hours Observed	California Sea Lions	Steller Sea Lions	Harbor Seals	Total Pinnipeds
2002	662	30	0	1	31



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2003	1,356	104	3	2	109
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2017	1,142	92	63†	1	156
2018	1,410	67	66†	1	134

\* Observations did not begin until March 18 in 2005.

† In 2015, 2016, 2017, and 2018 the minimum estimated number of Steller sea lions (SSL) was 55, 41, 32, and 35 respectively. These counts were less than the maximum number of Steller sea lions observed on one day, so the maximum number observed on one day was used as the minimum estimated number. This difference is driven by a focus on CSLs and lack of brands or unique markers on SSL.”

*As per the request to add a table with the same data, Table 2 in Chapter 2 has the same data format and layout. See below:*

Table 2. Minimum number of pinnipeds observed per day at Bonneville Dam tailrace areas for August – December each year. \*Note: first pinniped not present at dam until 10/3 in 2011, 10/1 in 2012, 9/3 in 2013, 8/20 in 2014, 8/26 in 2015, 8/15 in 2016, and 7/21 in 2017.

Year	California Sea Lions	Steller Sea Lions	Total Pinnipeds
2011	1	12	13
2012	2	7	9
2013	1	25	26
2014	1	26	26
2015	3	30	33
2016	1	56	57
2017	3	36	39

*Table 2 does lack Harbor Seal counts and the number of hours observed, but as 1) harbor Seals have yet to be observed in the fall and winter [albeit limited sampling over the years], and 2) this is the first sampling done during this period, we do not agree that these variables need be included in Table 2 as they would not provide comparative value to the data presented.*

**General comment: “For fall/winter, you provided maximum number of pinnipeds observed per day (page 7, line 230---232); whereas for spring season, you have presented median**



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**daily abundance (page 17). I am wondering whether it is possible to report the median daily abundance for the fall/winter season too.”**

*As requested, we added the median estimates and language justifying the use of the measure at the end of the “Daily Pinniped Abundance” section of Chapter 2.*