UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
650 Capitol Mall, Suite 5-100
Sacramento, California 95814-4700

January 28, 2022

Melissa Dekar
Interior Region 10, Bureau of Reclamation
Environmental Compliance and Conservation Branch, CGB-152
2800 Cottage Way
Sacramento, California 95825

Re: NMFS Comments on the Sites Reservoir, Supplemental Draft Environmental Impact Statement (SDEIS)/Revised Environmental Impact Report (REIR)

Dear Ms. Dekar:

We are writing in regards to the Sites Project Authority and U.S. Bureau of Reclamation Supplemental Draft Environmental Impact Statement/Revised Environmental Impact Report (SDEIS/REIR) for the proposed Sites Reservoir and associated facilities (Project). NOAA's National Marine Fisheries Service (NMFS) has reviewed the draft document and is providing technical assistance comments as they relate to anadromous fishes under our jurisdiction. As a Cooperating Agency under the National Environmental Policy Act (NEPA), we have agreed to work closely with you in evaluating key sections of the SDEIS/REIR and to provide feedback regarding its level of analysis. We also identify elements of the Project that will need further scrutiny during the development of a Biological Assessment and materials required for the initiation of consultation pursuant to section 7 of the Endangered Species Act (ESA). As such, we view the analyses presented in the SDEIS/REIR as foundational for any additional analyses necessary to support the ESA consultation for the proposed action. NMFS is submitting the attached comments regarding the Project Description, Environmental Analysis, Cumulative Effects, Surface Water Quality, Climate Change, Fluvial Geomorphology and Aquatic Biological Resources. We appreciate the opportunity to comment on this important document and for continued engagement.

If you have any questions regarding our input, please contact me at cathy.marcinkevage@noaa.gov and (916) 930-5648 or Stephen Maurano of my staff at stephen.maurano@noaa.gov and (916) 930-3710.

Sincerely,

A. Catherine Marcinkevage

Cathy Marcinkevage
Assistant Regional Administrator
California Central Valley Office

Enclosure

Cc: To the file 151422-WCR2022-SA00005
Vanessa King
Hydrologist and Interim Project Manager for Sites Reservoir Project
Division of Planning
U.S. Bureau of Reclamation
2800 Cottage Way, MP–720
Sacramento, California 9582

Table 1. NMFS Comments on the Sites Reservoir SDEIS/REIR

Reference	Comment
2-23	Has the likelihood of development around the reservoir (either planned or potential) been analyzed to determine the impacts to reservoir operations and water quality? Planned and potential recreational developments around the reservoir are noted in the project description (e.g. Peninsula Hills, Stone Corral, and a potential additional Glenn County access point) but the RDEIR/SDEIS doesn't specify whether there are any plans for additional real estate development (concessions, lodging, etc) in the watershed, or conversely, easements that would prevent future development. The current land use designation (pages 14-3 to 14-6) include agricultural uses (livestock and ranching operations, dry land farming, intensive agricultural production and agricultural processing) in addition to automotive, hotel, restaurant and retail uses. These land uses can create substantial stormwater and wastewater loadings with elevated nutrients, metals, and other pollutants. How will land use be managed in the areas draining to Sites Reservoir to maintain water quality or the impacts mitigated to reduce the pollutant loadings?
2-30	The project description asserts that, "The Project would not affect or result in changes in the operation of the CVP, Trinity River Division facilities (including Clear Creek)." However, it also states that, "The proposed operation of the Project includes exchanges of water with the CVP and SWP." More specifically, in the description of surface water resources (page 5-11) it specifies that, "Sites Reservoir would operate in conjunction with the operations of Shasta Lake, and flows in the Sacramento River downstream of Shasta Lake would be affected by Sites Reservoir diversions and releases." According to the US Bureau of Reclamation Great Basin Digital Library, “The Shasta and Trinity River Divisions catch the headwaters of the network of Central Valley Project waterways and channel the water southward. Both divisions are part of the Central Valley Project. They are close to each other, with the Shasta Division on the Sacramento River about 10 miles north of Redding and the Trinity River Division on the Trinity River about 25 miles northwest of Redding. Surplus water from the Trinity River Basin is stored, regulated, and diverted through a system of dams, reservoirs, tunnels, and powerplants into the Sacramento River for use in water-deficient areas of the Central Valley Basin. Water is used for irrigation, power generation, navigation flows, environmental and wildlife conservation, and municipal and industrial needs.” In short, Trinity River and Clear Creek operations are closely tied to Shasta and other CVP operations. If, as stated, Sites Reservoir will affect Shasta operations, then it has the clear potential to also improve, or exacerbate, conditions on the Trinity River and Clear Creek. Given the assertion that Sites Reservoir “would not affect or result in changes in the operation” of the Trinity River Division, what assurances are there that interbasin transfers from the Trinity River will not be stored in Sites Reservoir, either directly or via exchanges?
2-30	What is the basis for the cessation of the Bend Bridge Pulse Protection after 7 days (followed by the requirement for 3-day trailing average of low flows)? If flows remain elevated (for example if there are consecutive or prolonged events that increase river flow, and/or if fish remain present in high numbers) Sites Reservoir withdrawals could lead to adverse fisheries impacts. There is also a problematic lag time in the proposal resulting from the choice to use a 3-day trailing average combined with the delay inherent in monitoring (to detect fish or flow events) before initiating protection. NMFS suggests that methods be developed to implement a Bend Bridge Pulse Protection proactively, to protect fish presence and movement earlier, especially on the ascending limb of the hydrograph. For example, predictive models could use historic hydrology and fish presence data to determine what flows will likely mobilize fish. Hydrologic, meteorologic and operations tools (e.g. from the USBR Shasta & Trinity River Division and the

Reference	Comment
	California Nevada River Forecast Center) can be used to forecast operations, rainfall and flow at Bend Bridge. A proactive Bend Bridge Pulse Protection could be especially important for earlier migrants in the first pulse after a drier period, as well as for later migrants facing small windows of suitable outmigration conditions. More generally, protecting the life history diversity in outmigration timing is key to salmonid population viability.
2-31	The project description (page 2-31) estimates that Sites Reservoir annual diversions will range from 60-390 TAF attempting to fill a 1.3-1.5 MAF reservoir. The surface water resources analysis (page 5-29) reports that storage levels are expected to be greater than 1 MAF during wet conditions but could drop below 225 TAF during the fall of Critically Dry Water Years (Table 5-17). Will Sites be filled with other sources of water such as groundwater or other surface water rights not accounted for in the 60-390 TAF of diversions described above? Are the dead pool storage assumptions (120 TAF under the preferred alternative per page 5A1-27) already calculated into the 225 TAF referenced above? In summary, is it anticipated that Sites would be left with less than 105 TAF of accessible water during the Fall of Critically Dry Water Years?
2-31	The project diversion criteria sets bypass flows of 3,250 cfs at Red Bluff Pumping Plant and 4,000 cfs at Hamilton City Pump Station. NMFS would suggest developing criteria beyond these minimum static flows. Targets should better reflect the intra-annual and inter-annual variability of a natural hydrograph with criteria that vary by season and water year. The criteria should also take into consideration Reclamation's Fall Base flows (e.g. when Shasta Storage is ≤ 2.2 MAF, flow is 3,250 cfs; ≤ 2.8 MAF, flow is 4,000 cfs; ≤ 3.2 MAF, flow is 4,500 cfs; > 3.2 MAF, flow is 5,000 cfs).
2-36	The project description states that in late summer and fall (i.e., August through November) Reclamation would release water from Shasta Lake and/or the CVP share of Sites Reservoir for Storage Partners. It should be noted, however, that releases in this time period can have adverse impacts on salmon spawning, rearing, redd dewatering, and stranding. In short, the exchanges for Cold Water Pool maintenance could exacerbate the challenge of stabilizing flows to prevent stranding and redd dewatering.
2-56, 60	The document states that, “Alternative 1 is the Authority’s preferred alternative” but also that, “...two options have been identified under this alternative.” Which sub-alternative ("1A" or "1B") is preferred? Additionally, the lack of clarity regarding CVP/SWP operation agreements with Sites Reservoir creates uncertainty in the modeling assumptions and the effects determinations. The preferred alternatives (including the specific sub-alternative) and the responsible federal agency for operations and ESA consultation should be identified as soon as possible.

Reference	Comment
31-40	NMFS recommends using a future scenario that includes reasonably foreseeable projects and climate conditions for 2030, which is the earliest that the Project will be operational. In addition, the cumulative impacts note that the Delta Conveyance Project is reasonably foreseeable (pg 31-40), but it isn't explicitly included in the baseline (using the rationale that it would have to meet future regulatory requirements and the Sacramento River and Delta flows are already highly altered and regulated). The cumulative impacts analysis explains that, "Given the mixture of potential negative and positive effects from the actions of the past, present, and reasonably foreseeable projects, there is some uncertainty in how Alternative 1 or 3 would ultimately affect the cumulative condition" and concludes that, because effects on salmonids would be spatially and temporally limited or mitigated, they do not cause significant incremental impact when added to other reasonably foreseeable future actions. Because the Sites Reservoir and Delta Conveyance Projects are being simultaneously permitted, neither project is reciprocally analyzing the impact of the other. The proposed Delta Conveyance Project is likely to be a contemporaneous infrastructure project to the proposed Sites Reservoir with congruent potential effects on aquatic resources. Therefore the combined effects of both projects should be explicitly analyzed to understand the impact on aquatic resources.
32-17	In Table 32-8 the Water Quality and Fish Impacts (for Winter, Spring, and Fall Chinook Salmon and Steelhead) are determined under NEPA to have substantial adverse effects without mitigation. With mitigation, the water quality impacts are partially improved to an adverse effect determination, but the Fish Impacts are fully mitigated to no effect or no adverse effect determinations. The single mitigation measure proposed, FISH-2.1, is a useful operational criteria, but limited since it only maintains historic mean flow at Wilkins Slough for a quarter of the year for out migrating juvenile Chinook salmon. This limited measure is not significant enough to reduce the impacts of the project's increases in water withdrawals from the Sacramento River that result in a reduction in winter-run spawning area in Critically Dry Water Years, 8-10 days of increased water temperatures at Hamilton City above Salmon Juvenile Rearing and Emigration targets, and an over 100 acres estimated reduction in Mean Daily January through April Inundated Habitat (Acres <1 Meter Deep) for Juvenile Salmonids in the Yolo Bypass. Mitigation measures to address additional habitat, time periods, and life stages are needed.
6-102	NMFS suggests that stormwater mitigation measures include bioretention treatment that would help sequester microplastics like tire wear particles and other roadway/vehicular toxicants.
6-11	In Table 6-3, applicable regulatory water quality criteria/objectives should reference the EPA-recommended criteria for ammonia. Also, in addition to organic carbon, metrics related to eutrophication like chlorophyll-a and microcystins should be included in the table.
6-23	Selenium values from Stone Corral Creek near Sites are greater than that allowable in the San Joaquin Basin, for example, and could be more concentrated in first flush storm events. Values from Sites should be mitigated to ensure that they do not produce significant pollutant loadings downstream.
6-28	The use of CALSIM monthly data (e.g. for metals, pesticides, salinity, and HABs) lacks the temporal resolution to analyze acute water quality exceedances. Additionally, it's suggested that the CE-QUAL-W2 model being used for temperature analysis in Sites Reservoir be further developed to analyze the other potential water quality impacts in the reservoir: namely metals, including mercury, salinity, and especially eutrophication and HABs.

Reference	Comment
6-33	The Surface Water Quality Analysis notes that, "When Sites Reservoir would release water to the Sacramento River, it would constitute 6%–7% of the Sacramento River flow on average and 12%–13% when discharges are relatively high compared to river flow (i.e., 90th percentile values), depending on whether Alternative 1, 2, or 3 was implemented." Do these percentages reflect just Alternative 2 direct releases to the river, or loading indirectly (e.g. via CBD, KLRC, and/or Yolo Bypass)? Additionally, the use of the average receiving water volume to determine dilution calculations assumes instantaneous and complete mixing, but water quality impacts could exceed regulatory standards within the initial zone of dilution.
6-33	Please provide a copy of the spreadsheet blending model for monthly water temperatures in TC Canal and CBD described in Section 6.3.2.5.
6-34	The water temperature modeling, "was based on the CALSIM flows at Wilkins Slough for Alternatives 1, 2, and 3 and the temperatures were based on measured data that were the same for all alternatives. The use of a single set of temperatures for the Sacramento River allows an evaluation of the effects due to Sites Reservoir releases not confounded by changes in temperature due to changes in Shasta Lake operations. More details regarding the monthly blending model are provided in Appendix 6D, Sites Reservoir Discharge Temperature Modeling." However, this modeling assumption makes it difficult to see the net impact of Shasta Lake operations as well as the proposed Sites Reservoir operations.
6-39	Mercury impacts on aquatic life (in addition to human health and wildlife) should be further analyzed, especially for sturgeon. Mercury can affect the immune, respiratory and cardiovascular systems, reproductive organs, nervous systems, and digestive systems of fish. Mercury impacts on fish are discussed in the aquatic biological resources section (page 11-16), and an increase in mercury levels in the Delta is discussed, but dismissed for salmonids based on a short temporal overlap of the species with the contaminant and the historic data showing low tissue levels in salmon (page 11-121). However, this analysis is not discussed for sturgeon, which have been reported to have higher levels of mercury in tissues. Mercury was a cause of ESA listing for the Green Sturgeon sDPS in California's Central Valley and the impact of the Sites Reservoir increases in mercury loading should be analyzed for this species.
6-53, 59	How would the vegetation be removed prior to reservoir filling (e.g. manual removal, burning, pesticides)? Adverse effects to downstream water quality will depend on this answer.
6-55 to 56	The surface Water Quality Analysis notes that, "During initial filling of Sites Reservoir, nutrient (nitrogen and phosphorus) levels would be expected to be relatively high due to flooding of soils in the inundation footprint. This, along with warm water temperatures starting in late spring, could contribute to creating conditions conducive to promoting and maintaining HABs, and supporting the growth of nuisance algae and aquatic vegetation." However, it concludes that, "Downstream effects on water quality would not be expected if cyanobacteria and cyanotoxins were present in the releases because concentrations of cyanobacteria and cyanotoxins would be greatly diluted when eventually discharged into the Sacramento River. Furthermore, cyanotoxins undergo biodegradation and photodegradation." The assumptions behind this dilution should be fully explained. Specifically, will reservoir releases be limited during HAB events to prevent downstream release of cyanotoxins? Will any releases that could impact human health or aquatic life be timed such that the discharge can be adequately diluted?

Reference	Comment
6-55, 58	The water quality analysis acknowledges short term exceedances of water column and fish tissue criteria for methylmercury. What best management practices will be implemented to control or prevent this? The SDEIS/REIR proposed to not stock fish for 10 years after initial filling, but striped bass larvae and other Centrarchids larvae may be entrained in the water withdrawal and establish in the reservoir. Have the measures proposed in methylmercury management/mitigation measures WQ-1.1 been proven to be effective in their purpose? On Pages 6-54 and 6-73, how were the "reasonable worst-case" Estimated Long-Term Average Concentrations of Total Mercury and Methylmercury in Sites Reservoir determined? The argument presented that Sites mercury loading isn't impactful because Yolo Bypass concentrations are higher (page 6-75), fails to account for mercury cycling where Hg could accumulate in Yolo Bypass sediments and fish tissues from Sites loadings, if the concentrations from Sites are lower. This mechanism is explicitly listed for metals other than mercury under Temporal Shift and Evapoconcentration (page 6-81).
6-9	The discharge of salinity and nutrients to the Sacramento River due to Sites Reservoir construction and operations (on account of increases agricultural use, routing of the water through the Colusa Basin Drain, and brine springs, seeps and salt ponds in the reservoir footprint) should be included, along with metal and pesticide effects, in Mitigation Measure WQ-2.2.
6-90	The statement "Releases from Sites Reservoir would generally have low to no concentration of pesticides and would therefore not degrade Sacramento River water quality" is not substantiated with monitoring or modeling data. The diversion of Sacramento River water through agricultural land use could cause an increase in pesticide and herbicide concentrations. For example, it's noted on page 6-91 that "There was some indication that the 2016 pulse of Sacramento River water reduced pesticide concentration at the upstream end of the Yolo Bypass, but it may have conveyed some pesticide downstream to the lower part of the bypass near Lisbon Weir." Unfortunately, the mitigation measure proposed won't reduce pesticide concentrations, but rather remove the environmental benefit of the flows entirely: depending on the state of the science and fish needs (including water quality impacts), flows would cease if there were no net benefit.
13-5 & 21-6	The Minerals analysis (page 13-5) notes the existence of nearby capped natural gas wells (e.g. specifically underlying the northeastern portion of the inundation area). What's the likelihood of natural gas being emitted into the reservoir once it is full. Ultimately what is the likelihood of that gas being emitted to the atmosphere and contributing to greenhouse gas emissions? How would it be mitigated during construction or operations? What are the anticipated reservoir carbon emissions from all sources of construction and operations? The greenhouse gas emissions discussion fails to conduct an analysis of reservoir emissions only noting that, "Such a comparison requires a detailed accounting of local and site-specific variables, including salinity, pH… type of grass, carbon content of soils, and other chemical and biological characteristics. Additionally, post-impoundment studies and sampling would be required. These types of site-specific data are not available, and, as such, a quantified analysis of potential GHG emissions from conversion of existing cattle grazing land to a surface storage reservoir is not possible and would be speculative. When the Authority takes ownership of the land in the inundation area, it may be possible to quantify GHG emissions from land conversion… It is anticipated that, at that time, the necessary data and studies would be attainable." A firmer commitment to complete this analysis is needed before construction or other project activities preclude mitigation measures. Greenhouse gas emissions from other temperate reservoirs with generally shared characteristics as Sites should be reported and considered. The California Air Resources board Current California GHG Emission Inventory, or other similar datasets, should be queried for emissions

Reference	Comment
	data on inundated lands and reservoirs. Furthermore, desktop analysis, even with limited field data, should be pursued and methods should be explored such as those in the references below. Sites Reservoir is among the largest potential surface water storage projects to be constructed in California in decades, and an adequate analysis of greenhouse gas emissions for the life of the project will be important over the lifetime of the project. ● Keller, P. S., Marcé, R., Obrador, B., & Koschorreck, M. (2021). Global carbon budget of reservoirs is overturned by the quantification of drawdown areas. Nature Geoscience, 1-7. ● Scherer, L., & Pfister, S. (2016). Hydropower's biogenic carbon footprint. PloS one, 11(9), e0161947. ● Deemer, B. R., Harrison, J. A., Li, S., Beaulieu, J. J., DelSontro, T., Barros, N., ... & Vonk, J. A. (2016). Greenhouse gas emissions from reservoir water surfaces: a new global synthesis. BioScience, 66(11), 949-964. ● Soumis, N., Duchemin, É., Canuel, R., & Lucotte, M. (2004). Greenhouse gas emissions from reservoirs of the western United States. Global Biogeochemical Cycles, 18(3).
7-20	Alterations to the natural river hydrology and geomorphology can have adverse impacts on native aquatic biota. Specifically, the Fluvial Geomorphology Chapter notes that the preferred alternative may reduce Yolo Bypass inundation from January through June by approximately one day across most water year types and reduce in Delta outflow during the wetter months. NMFS is concerned with the impact of Sites Reservoir operations on the performance of the Big Notch project and would like to discuss in more detail the modeling and how operations will be coordinated in real time.
11-111	Mean weighted usable area in winter-run spawning grounds from Keswick Dam to ACID dam is 5-6% less than the no action alternative in May of Critically Dry Water Years. The loss of early spawning habitat during critical years is especially detrimental since there is frequently a lack of cold water to support the survival of eggs spawned later (e.g. August, July, or even June).
11-126 to 11-127	The SDEIS/REIR analysis applies the IOS (Interactive Object-Oriented Simulation) and OBAN (Oncorhynchus Bayesian Analysis) winter-run Chinook salmon life cycle models. As was previously communicated to Reclamation in conversations from January through April of this year, and in our July comment letter, NMFS recommends the use of the Sacramento River Winter-run Chinook Salmon Life Cycle Model (WRLCM) for a project of this nature and magnitude to adequately integrate effects of the alternatives on the species. Use of the WRLCM is consistent with NEPA regulations that, "...agencies may make use of any reliable data sources, such as remotely gathered information or statistical models," (NEPA Implementing Regulations 40 CFR 1500–1508 § 1502.23) and the ESA consultation requirement that, "...each agency shall use the best scientific and commercial data available." (The Endangered Species Act § 7(a)(2) and 50 CFR 402.14(f)(8)). Application of the WRLCM to Sites Reservoir analysis contrasts with IOS and OBAN based on the following factors: Comparability - It is unclear in the SDEIS/REIR how IOS and OBAN will be synthesized into a single analysis or how they can be compared to related baseline or cumulative actions such as Central Valley Project Operations or the Delta Conveyance Project (both of which apply the WRLCM). ● Level of Model Review - The WRLCM has extensive documentation and monthly stakeholder outreach meetings to discuss model developments and applications. NMFS is not aware of similar levels of documentation and outreach for OBAN and IOS.

Reference	Comment
	● Egg Incubation - Temperature dependent mortality modeling has evolved over the past five years. The WRLCM integrates the most recent peer-reviewed temperature dependent mortality relationships. ● Yolo Bypass - The WRLCM models the Yolo Bypass floodplain explicitly where the entrance to the floodplain habitat is dependent upon overtopping of the Fremont Weir during the specific month of dispersal, or otherwise tidal fry move to the delta and bay habitats to rear in that month. ● Delta Passage and Survival - WRLCM has monthly timesteps for Calsim hydrology and 15 minute steps for tidal fluctuations and exports as well as mechanistic components (enhanced particle tracking) which can perform better than statistical approaches at this model function. Although some inference is attempted in the SDEIS/REIR attempting to apply the WRLCM results for California WaterFix (to conclude that the Sites Reservoir alternatives would not substantially change delta rearing habitat for juvenile winter-run Chinook salmon), that modeling is dated and the project is not sufficiently similar to Sites Reservoir to conclude that the WRLCM results will be applicable here. In summary, the better compatibility, level of review, handling of egg incubation, representation of the Yolo Bypass, and resolution in the Delta are all relevant to the proposed Sites Reservoir and suggest the use of the more robust WRLCM. The built impacts and operations of the proposed project will continue indefinitely and therefore the best available scientific models should be applied to understand the effects on winter-run Chinook salmon populations. NMFS continues to emphasize the urgency to address concerns with the life cycle modeling framework for both the NEPA process and anticipated ESA consultation. NMFS is likely to require results from analyses that are provided by the WRLCM to adequately analyze effects for the jeopardy determination required in ESA consultation. To our knowledge, no other model provides the same suite of capabilities.
11-88	The hydrologic model results report diversions as a percentage of Sacramento River Flow, averaged by month and water year type, from CalSim Modeling. Results should reflect critical conditions (e.g. drought in summer) not just average conditions (which can be highly variable in California, even when stratified by water year). In particular, the average for Critically Dry Water Years presented in Table 5-11 doesn't represent potential critical conditions since it averages across what can be a wide range of storage conditions. While the conditions of a single year may be important, prolonged dry periods (e.g. in back to back water years) in the Sacramento River can exhaust CVP/SWP surface storage capacity, leading to high river temperatures (e.g. 2014-15, 2020-21) and elevated extinction risk. NMFS suggests pursuing an analysis to understand the effects of the project on the Sacramento River during prolonged dry periods, like the severe droughts that have been experienced in recent years.
11-88	Reduction in Spring pulse flows and Summer base flows on the Sacramento River can have negative repercussions on salmon life history. For example, Alt 1A increases diversions at Red Bluff substantially in March (increasing by 11% in Above Normal years and 12% in Below Normal years). Under the preferred alternative, Hamilton City will be withdrawing about 25% of the river flow in the late spring and through mid-summer (e.g. May-August) while Red Bluff is withdrawing more than 10%. The flow and temperature impacts can combine to have additional negative effects. For July of Above Normal Water Years at Hamilton City, there is anticipated to be an increase in temperatures for the juvenile rearing and migration life stages in which there were 11.6% more days than the no action alternative (NAA) exceeding the 64°F 7-day average daily maximum (7DADM) index value and the mean daily exceedance on those days was 0.7°F greater than the NAA.

Reference	Comment
11B-11	The Water Temperature Index Value Analysis obscures temperature impacts of the project. In particular, the biologically meaningful criteria (page 11B-8) is too narrow in its definition (requiring both 5% difference in days/month and 0.5 F increase) and the temperature targets in Table 11-B-2 (page 11B-11) need refinement (e.g. Winter-run Spawning, Incubation and Alevins should target 53.6°F (consistent with the Winter-Run Chinook Salmon Egg Mortality Analysis Based on Martin et al., 2017, and described on page 11O-1). Additionally the adult holding targets for Winter-Run may need to be more lower than those proposed in order to prevent disease and decreased gamete viability in holding adults, as described
11D-1	Can the data in Appendix 11D (Fisheries Water Temperature Assessment) be provided in a spreadsheet format (e.g. .xls or .csv), since there are 634 pages of tables with no visualizations, making the results difficult to view and interpret.
11D-81	Table 11D-32 indicated that in critical years there will be 8-10 days of increased water temperatures at Hamilton City above the 64°F 7DADM target for Spring-Run Chinook Salmon Juvenile Rearing and Emigration - but also reports a mean difference of 0 to 0.1°F. How can there be an increase in days above the indicator value, but no change, or a decrease, in mean temperature? This same dynamic is seen in numerous other tables, (e.g. Tables 11D-3, 10, 11, 17, 20, etc.)
11O-6	The No Action Alternative reports annual temperature dependent mortality (TDM) of only 16.6% (10% exceedance probability) and 24.4% (the 15% of water years that were critical years). Yet, TDMs well above these were experienced in 2004, 2008, 2014, 2015 and 2021. This may indicate that the 82-year simulation period ending in 2003 fails to capture the current and future critical temperature conditions in the Sacramento River.
11P-1	Please provide a copy of the Sites Reservoir Daily Divertible & Storable Flow Tool (version 20210309 and latest version) Excel workbook.
11P-8	NMFS suggests that Figures 11P-3 & 4 show results for Sites without MM FISH-2.1 so the impact of the mitigation measure can be demonstrated.