

Preliminary Evaluation of the Planning Aid Memorandum Technical Memorandum



To: Alicia Forsythe, Sites Project Authority
CC: John Spranza, Sites Integration
Laurie Warner-Herson, Sites Integration
Date: July 14, 2022
From: ICF
Quality Review: Mike Hendrick (ICF)
Authority Agent Review: N/A
Subject: Preliminary Evaluation of the Planning Aid Memorandum

1.0 Purpose

This memorandum presents a preliminary evaluation of the August 5, 2021, Planning Aid Memorandum (PAM) provided by the U.S. Fish and Wildlife Service (USFWS) to the Bureau of Reclamation (Reclamation) for the Sites Reservoir Project (Project). The purpose of the PAM was to provide Reclamation with the USFWS's comments and recommendations regarding the Project's potential effects on biological resources for consideration in project planning and preparation of a public revised draft environmental document. The PAM was prepared under the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 *et seq.*). The Fish and Wildlife Coordination Act requires federal agencies proposing water resource development projects or involved in issuance of related permits or licenses to consult with the USFWS and provide equal consideration to the conservation, rehabilitation, and enhancement of fish and wildlife resources with other project purposes.

The PAM summarized early coordination between USFWS and Reclamation regarding potential effects of the proposed Project. It provided a high-level description of the Project and USFWS's views of potential effects of the inundation of upland habitat (i.e., upland effects), increased diversions of Sacramento River water (i.e., in-river effects), and cumulative impacts associated with implementation of other projects. The PAM also summarized information and early analysis of effects provided to the USFWS by Reclamation and identified areas and concerns where the USFWS indicated that more information or analysis was needed.

The key concerns identified in the PAM are categorized as upland effects (Section 2.0), in-river effects (Section 3.0), and cumulative impacts (Section 4.0). Responses summarizing how each key concern was addressed are provided herein. The Revised Draft Environmental Impact Report/Supplemental Draft Environmental Impact Statement (RDEIR/SDEIS) released in November 2021 contained much of the information to address these key concerns (Sites Project Authority and Bureau of Reclamation 2021). The PAM was developed based on the USFWS's review of the first administrative draft of the RDEIR/SDEIS and there were several substantive changes that occurred between the administrative draft and the publicly released RDEIR/SDEIS, which are explained below. In addition, subsequent analysis

that has been developed to date in preparation of responses to public comments on the RDEIR/SDEIS and for the development of related permitting processes was also used to address the key concerns.

It is important to note that the analysis of the comments on the RDEIR/SDEIS, the response to those comments, and the preparation of the Final EIR/EIS are ongoing. The Authority has recently changed the Project's diversion criteria and has worked with Reclamation since the issuance of the RDEIR/SDEIS to enhance the Project's anadromous species benefits, especially as reflected in the modeling framework. In addition, the Authority has moved from Alternative 1 as its Preferred Project for the purposes of the California Environmental Quality Act compliance to Alternative 3. Revised modeling is underway to reflect these adjustments and once modeling is completed, the Authority and Reclamation look forward to discussing the results and revisions to subsequent species analysis with the USFWS, National Marine Fisheries Service [NMFS], and the California Department of Fish and Wildlife [CDFW]. Therefore, the information and responses in this memorandum may change as these enhanced species protections and species benefits are incorporated into the Project.

2.0 Upland Effects

Key Concern: Provide greater specificity regarding potential mitigation lands or banks for each of the habitat types for which mitigation is proposed.

Response: Given the size of the Project, the Sites Project Authority (Authority) will rely on several mitigation strategies including a mix of mitigation banks and other mitigation mechanisms. The Project's Mitigation and Monitoring Plan (Plan) is under development and will be provided to the USFWS as part of the Project's Biological Assessment (anticipated summer 2022) and Final EIR/EIS (anticipated early 2023). The Plan includes a comprehensive mitigation planning strategy, implementation approach and general criteria for species and habitats based on anticipated Project impacts on regulated biological resources. As access is currently limited to less than 1% of the Project Area, a final analysis of impacts will be conducted once land access is obtained and following the final refinements of Project design and completion of on-the-ground, protocol-level biological field surveys.

Following completion of Project construction, temporary impacts will be mitigated through restoration and revegetation of areas disturbed by construction in accordance with an approved habitat restoration plan. Permanent impacts will be mitigated on site and at agency-approved (USFWS, NMFS, and/or CDFW) offsite locations. Onsite compensatory mitigation may include restoration (re-establishment or rehabilitation), establishment (creation), enhancement, and/or preservation of aquatic or terrestrial biological resources that occur within the proposed Project area. Offsite compensatory mitigation for the proposed Project may include the purchase of agency-approved mitigation/conservation bank credits, the establishment of third party-responsible "turn-key" mitigation/conservation bank projects, preservation of biological resources through conservation easements with private landowners, payments to in-lieu fee programs, or the establishment of permittee-responsible offsite mitigation sites. The methods for assessing resources in the project footprint, best management practices to be applied, tools available for mitigating effects of the Project are discussed in chapters 9 – *Vegetation and Wetland Resources*, and 10 – *Wildlife Resources* of the RDEIR/SDEIS.

The Authority has conferred with USFWS about species habitat models and used this information to estimate mitigation obligations. The Authority expects to continue to work with USFWS and Reclamation as the Project moves forward and better information becomes available to define mitigation requirements.

Key Concern: Provide a better description of how increases in Incremental Level 4 refuge water will be provided and the expected benefit to migratory birds.

Response: Providing Incremental Level 4 refuge water is an environmental benefit of the Project recognized by the California Water Commission in its authorization of State funding from the Water Storage Investment Program (WSIP). The Authority envisions that CDFW will take an active role in managing the ecosystem water and the Authority would work with CDFW to schedule and adjust releases of ecosystem water to address real-time conditions and needs. The Authority also recognizes that Incremental Level 4 refuge water would be made available to federal refuges north and south of the Sacramento–San Joaquin Delta (Delta) and as such, expects that it would provide Incremental Level 4 water to appropriate destinations based on guidance from, and coordination with the CDFW, USFWS, and Reclamation. The Authority understands that Reclamation and CDFW have an existing methodology to allocate Incremental Level 4 refuge water to the National Wildlife Refuges, State Wildlife Areas, and privately managed wetlands included in Central Valley Project Improvement Act Refuge Water Supply Program. The Authority anticipates that CDFW and Reclamation would allocate the Incremental Level 4 refuge water that results from the Project in the same way they allocate all Incremental Level 4 refuge water.

Table 1 below is from the Authority’s *Water Storage Investment Program: Sites Reservoir Project Continuing Eligibility and Feasibility Determination* report (Authority 2021). It identifies the Project’s Incremental Level 4 refuge water supply benefits in terms of water supply increases to National Wildlife Refuges, State Wildlife Areas, and privately managed wetlands projected in 2030 and 2070 as estimated based on WSIP Unit Water Values. Incremental Level 4 represents the additional increment of water required for optimal wetland habitat development on the National Wildlife Refuges, State Wildlife Areas, and privately managed wetlands included in Central Valley Project Improvement Act Refuge Water Supply Program. The benefits to migratory birds of Incremental Level 4 refuge water supply were identified as part of the original foundational documents of the Central Valley Project Improvement Act and differ for each individual National Wildlife Refuge, State Wildlife Area, and privately managed wetland.

Table 1. Sites Reservoir Project Incremental Level 4 Refuge Water Supply Increases (2030 and 2070) (TAF/year)

Period	North-of-the-Delta	South-of-the-Delta ^(b)	Total
2030 Results			
Long-Term Average ^(a)	5	11	17
Wet	0	0	0
Above Normal	9	5	14
Below Normal	9	13	22
Dry	8	27	34
Critical	6	17	23
2070 Results			
Long-Term Average ^(a)	5	10	15
Wet	0	0	0
Above Normal	9	1	10
Below Normal	7	8	16
Dry	7	10	17
Critical	6	21	27

Source: CALSIM II.

Notes:

(a) Average weighted based on water-year frequency rates

(b) Includes both San Joaquin and Tulare Lake Refuge deliveries and based on San Joaquin Valley 60-20-20 Index Year Class.

TAF = thousand acre-feet

Key Concern: More thorough analysis is needed of geomorphic effects of flow reduction in the higher flow range on habitat (cut bank formation, cottonwood seed dispersion/regeneration processes, wood transport) and the sensitive species that use it (e.g., bank swallows, yellow-billed cuckoo).

Response: The SRH-Meander model results presented in the RDEIR/SDEIS (Chapter 7 – *Fluvial Geomorphology*) suggested that the tendency for meander is not significant among the Project alternatives and the No Action Alternative (NAA). The river meandering, bank erosion, and deposition modeling concluded that there were no significant differences in the channel alignments between existing conditions and the modeled alternatives. Thus, operational impacts on the geomorphic regime (including natural river geomorphic processes such as sediment transport and bank erosion) and existing river geomorphic characteristics (e.g., sinuosity, channel gradient, substrate composition, channel width and depth, and riparian vegetation) of the greater Sacramento River system are expected to be minimal, and consequently, impacts on sensitive species would be negligible or minimal as well. The Authority will review these results with USFWS and Reclamation to determine whether additional analysis is warranted, or additional considerations will be added to the monitoring and adaptive management plans or the Project description.

Key Concern: Additional review may be needed of the resource protection measures identified for habitats (e.g., riparian, upland, stream, and wetland) that could support special-status species including the listed valley elderberry longhorn beetle, red-legged frog, and several rare plants, which are potentially present within the impact area.

Response: As stated above, verification of species' presence and habitat suitability has been limited by lack of access to lands that would be affected by the Project. Potential wildlife resources in the study area were evaluated by reviewing existing information and identifying potentially suitable habitat with geographic information system modeling. Sources of information and modeling techniques are summarized in Chapter 10, *Wildlife Resources*, of the RDEIR/SDEIS. The Authority will continue to work with Reclamation, USFWS, NMFS, CDFW, and other regulatory agencies to review these results and discuss the resource protection measures, including avoidance and minimization measures. These efforts have been ongoing for some time for aquatic species with more limited discussion on terrestrial species. The Authority with Reclamation would like to engage in more detailed discussion of these concerns with regard to terrestrial species.

3.0 In-River Effects

Key Concern: Provide a better demonstration of temperature benefit expected from opportunities to increase storage in Shasta Reservoir.

Response: In coordination with Reclamation, text was developed to expand the discussion of fisheries benefits related to increased operational flexibility associated with Shasta Reservoir. This text was developed after issuance of the PAM and was included in Chapter 2, *Project Description and Alternatives*, of the RDEIR/SDEIS. Additional water supply from Sites Reservoir would provide opportunities for improved management of salmonid habitat, particularly in the Sacramento River above Red Bluff Diversion Dam. By exchanging Sites Reservoir water for Central Valley Project (CVP) water, Reclamation has an additional tool to maintain and improve habitat for salmonid spawning,

incubation, rearing, and migration. By delivering water to CVP contractors from Sites Reservoir, Reclamation may maintain supply in Shasta Reservoir. Maintenance of supply can then be allocated in real-time management scenarios to uses that protect and enhance anadromous fish benefits, including protecting and enhancing the cold-water pool, which is essential for temperature control in the salmonid spawning reaches below Keswick Dam during Dry and Critically Dry Water Years. Increased storage may provide benefits beyond temperature such as providing a resource for maintaining fall flows to sustain spawning redds that persist in the wetted margins of the Sacramento River. In years when storm events are weak and naturally-occurring pulse flows are minimal, this maintenance of supply could be used to manufacture a spring pulse flow to assist juvenile salmonids in completing their migration from the upper Sacramento River to the Delta and ultimately the Pacific Ocean. The Authority is working with Reclamation to assess and enhance fisheries benefits associated with Reclamation's participation for the multiple objectives related to increased Shasta Reservoir storage.

The Project would also provide an additional capability to address expected changes in precipitation and runoff patterns anticipated to result from climate change (see Chapter 28 of the RDEIR/SDEIS). While long-term averages in precipitation are not expected to change, more precipitation is expected to fall as rain, resulting in a decreased snowpack and changes in runoff patterns. These changes will likely present challenges for future water management, including that for environmental benefits. The ability of the Project to capture and store water that cannot be captured and stored by Reclamation and to exchange water with Shasta Reservoir creates flexibility to provide environmental benefits to anadromous fish in the upper Sacramento River under climate change scenarios.

Key Concern: In general, whenever water diversions occur, there will be an associated loss of food organisms and sediment, incidental mortality of fish at the intake screen(s), and lower survival due to lower flows and related mechanisms (predation exposure, less inundated edge cover, less food production, less suspended sediment). Specific concerns expressed are as follows:

- A. Flow criteria at Wilkins Slough (8,000 cfs [cubic feet per second] in April and May; 5,000 cfs in other months) is likely inadequate to protect downstream migrating salmon. Suggest consideration of Michel et al. (2021).
- B. Need more thorough analysis of effects of habitat reduction on survival. Weighted usable area (WUA) curves do not disclose all effects associated with reduced flow.
- C. Need more complete analysis of effects of flow reductions on sturgeon migration.

Response:

- A. Wilkins Slough: In response to the concerns expressed in the PAM and the comments on the RDEIR/SDEIS from CDFW and others, the Authority increased the minimum bypass flow requirement at Wilkins Slough during October to June to 10,700 cfs (303 m³/s), which is consistent with the step function identified to in Michel et al. (2021) for increased Chinook salmon survival in the Sacramento River. In summary, Michel et al. (2021) looked at the challenge of implementing functional flows to optimize ecosystem improvements given the limited resources. The minimum bypass flow at Wilkins Slough during September remains at 5,000 cfs. The Project will not be diverting water from June 15 to the end of August. Revisions have been made to the Project diversion criteria. These revisions are reflected in Table 2.

Table 2. Comparison of RDEIR/SDEIS and Revised Diversion Criteria

Location (Listed from North to South)	RDEIR/SDEIS with Mitigation Included	Revised and Expected in the Final EIR/EIS
Bend Bridge Pulse Protection	Protection of all qualified precipitation-generated pulse events (i.e., peaks in river flow rather than scheduled operational events) from October to May based on the detection of fish presence and migration during the beginning of the flow event. For each event where fish presence and migration is detected, diversions from the Sacramento River would cease for 7 days.	Similar except the following: (1) a qualified precipitation-generated pulse event is determined based on forecasted flows and (2) pulse protection may cease earlier than 7 days if flows at Bend Bridge exceed 29,000 cfs and Project diversions subtracted from Bend Bridge flows continue to be at least 25,000 cfs
Minimum Bypass Flows in the Sacramento River at the RBPP	3,250 cfs minimum bypass flow at all times; rate of diversion controlled by fish screen design	No change
Minimum Bypass Flows in the Sacramento River at the Hamilton City Pump Station	4,000 cfs minimum bypass flow at all times; rate of diversion controlled by fish screen design	No change
Minimum Bypass Flows in the Sacramento River at Wilkins Slough	10,700 cfs in March through May; 5,000 cfs all other times	10,700 cfs October through June; 5,000 cfs September (not diverting from June 15 to end of August)
Fremont Weir Notch Protections	No more than 1% reduction in flow over weir when spill over the weir are less than 600 cfs. No more than a 10% reduction in flow over weir when spills over the weir are between 600 cfs and 6,000 cfs. No restriction when flows over the weir are greater than 6,000 cfs	No longer included. Revised minimum bypass flows in the Sacramento River at Wilkins Slough and Bend Bridge Pulse Protection provide protections for Fremont Weir Notch
Freeport, Net Delta Outflow Index, X2, and Delta Water Quality	Operations consistent with all applicable laws, regulations, biological opinions and incidental take permits, and court orders in place at the time that diversion occurs	No change

Note: This table mimics Table 2-5 in the RDEIR/SDEIS and the Wilkins Slough flow requirements have been incorporated into the Project Description.

The Authority is working with Reclamation to revise the modeling and determination of effects of the Project’s revised operations criteria on fisheries resources. The Authority is also in ongoing conversations with Reclamation, CDFW, NMFS, and USFWS to develop language to describe how these operational requirements will be implemented and develop the associated fish monitoring program.

- A. Upstream habitat: The Authority agrees diverting flow can have effects on habitat volume and available food that are likely more limiting, and not apparent in WUA calculations. The WUA is derived from the CALSIM runs and as such the WUA’s are based on monthly averages that may not accurately reflect real time operations. The analysis in Chapter 11, *Aquatic Biological Resources*, of the RDEIR/SDEIS considers factors such as temperature, flow, and the effects of flow reductions on side channel and floodplain habitats to support its impact determination of less than significant with mitigation for salmonids.

The Authority will revise the CALSIM analysis with the revised diversion criteria and enhanced anadromous fish benefits to reassess the effects on WUA in the Final EIR/EIS. During 2022, the Authority will work with Reclamation, USFWS, NMFS, and CDFW to review the revised modeling and related analyses to assess the adequacy of the analysis and work toward consensus on impact determinations and any measures needed to reduce impacts to less than significant levels (CEQA) and no adverse effects (NEPA).

- B. Sturgeon: Shaffter (1997) reported spawning on white sturgeon in the Sacramento River at flows of about 6,500 to 6,640 cfs (184 to 188 m³/s) after observing pulse of about 1,400 cfs (40 m³/s) over base flow conditions. This reference appears to be the source for the concern. The Authority's decision to adopt a higher minimum bypass flow at Wilkins Slough and the Project's pulse flow protection measure would ensure the Project diversion do not cause flows to decline below those likely to influence sturgeon migration and spawning.

Key Concern: The relationship between pulses and fish movement is not a precise relationship. Longer and more frequent flows may be necessary to protect downstream-migrating juvenile salmon.

Response: The Project's pulse protection measure is intended to account for the importance of pulses in stimulating and providing for the redistribution of juvenile fish from their spawning grounds to downstream rearing areas and seaward migration (Poytress 2014, Steel 2020, Michel 2021, Hassrick 2022). The Authority recognizes that the precise relationship between flow pulses and fish movement is not known at this time. As such, the Authority intends to incorporate the pulse protection criteria, and strategies for evaluating the effectiveness of the criteria, into its adaptive management plan to address this uncertainty and continue to refine the criteria as the science and understanding of fish movement is better understood.

Key Concern: Need to address pulses as a mechanism to initiate/attract adult salmon and sturgeon up stream.

Response: As presented in the RDEIR/SDEIS, the Project is not expected to impede the upstream migration of adult salmon or sturgeon. The proposed pulse flow criteria ensure pulses are protected and propagate downstream. In addition, the revised minimum bypass flow requirement at Wilkins Slough ensures that Project operations do not diminish flows below levels which may interrupt or delay the upstream migration of sturgeon.

Key Concern: Provide a better explanation of effects and benefits of fall pulse flows into Yolo Bypass for plankton production and discussion of consequences of reduced flow into the bypass due to reduction in flows attributable to diversions at TCCA and GCID diversions.

Response: An analysis of the expected timing and benefit of the Yolo Bypass flow measure to stimulate food production and convey forage species to the north Delta for the benefit of delta smelt (*Hypomesus transpacificus*) and other planktivorous fish is presented in Chapter 11 - *Aquatic Biological Resources*, of the RDEIR/SDEIS. The benefit of this measure has been acknowledged by CDFW in the review of the Project during the California Water Commission's WSIP approval process. An analysis of the consequences of reduced flow into the Yolo Bypass due to reduction in flows attributable to diversions at TCCA and GCID diversions is provided in the section, *Impact FISH-2: Operations Effects on Winter-Run Chinook Salmon, Floodplain Inundation and Access*, in Chapter 11 - *Aquatic Biological Resources*, of the RDEIR/SDEIS, as well as in Appendix 11M. The analysis concludes that Sites diversions result in minor reductions in Yolo Bypass acreages inundated during the winter and spring, but that when the net effect

of all differences between the NAA and Alternatives 1, 2, and 3 are examined, the differences are small and the effect on fish populations is expected to be minor.

Key Concern: Address expected increase in loss of fish at South Delta export facilities associated with July through September increases in Delta exports.

Response: The effect of moving Sites Reservoir water across the Delta to the Delta export facilities on the location of X2, flows in Old and Middle River, and expected loss at the export facilities are addressed in Chapter 11 - *Aquatic Biological Resources*, and Appendix 5B3, *Delta Operations*, of the RDEIR/SDEIS. The results of these analyses suggest there would be little difference in south Delta loss between the NAA and Alternatives 1, 2, and 3, primarily due to absence of juvenile ESA-listed fish in the Delta between July and September.

Key Concern: More thorough analysis may be needed of the effects of exchanges on spawning and rearing habitat in the American and Feather Rivers.

Response: The effects of Project operations on temperatures in the American and Feather Rivers are discussed in Chapter 11, *Aquatic Biological Resources*; Appendix 11B, *Upstream Fisheries Impact Assessment Quantitative Methods*; and Appendix 11D, *Fisheries Water Temperature Assessment*, of the RDEIR/SDEIS. The results indicate impacts from changes in temperatures are less than significant. The effects of Project operations on availability of spawning and rearing habitat in the American and Feather Rivers are also analyzed in Chapter 11 and Appendix 11K, *Weighted Usable Area Analysis*, of the RDEIR/SDEIS. The analysis suggests no significant differences between Alternatives 1, 2, and 3 and the NAA with respect to WUA. An analysis of the potential redd dewatering in the American and Feather Rivers was also conducted and discussed in Chapter 11. The results of that analysis suggested no significant differences among the alternatives and the NAA.

These analyses will be revised to reflect the revised diversion criteria and enhanced anadromous fish benefits in revised CALSIM and other model runs. Once the updated modeling is completed, the Authority will be available to present and discuss those results with Reclamation, USFWS, NMFS, CDFW and the other regulatory agencies.

4.0 Cumulative Impacts with Other Projects

Key Concern: Reclamation should consider the benefits of these other projects, how they would interact with the Project, and explain the sequence of construction/completion relative to the Project.

Response: The Authority understands the interest in exploring how the Project may operate in conjunction with other projects such as the revised Delta Conveyance Project and the Shasta Raise Project. However, these projects are presently not sufficiently developed to assess how they would be constructed and operated, and any analysis of cumulative effects would be speculative. The Authority thinks adding speculative results to the cumulative effects analysis could be misleading; therefore, it does not plan to pursue such an analysis. For additional details, refer to Chapter 31, *Cumulative Impacts*, in the RDEIR/SDEIS. Chapter 31 states “The cumulative analysis is primarily qualitative. The cumulative analysis qualitatively addresses projects listed in Table 31-1, such as Delta Conveyance Project. For many of the projects in Table 31-1 it would be speculative to define multiple parameters and assumptions within a numerical modeling effort.”

5.0 References

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