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Sent: Monday, February 13, 2017 10:43 AM
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Cc: Subject: Updated AM Framework for Science Panel

Lindsay additional material for Phase 2b review regarding adaptive management, I apologize for the delay and hope the Panel has time to incorporate this information in their final report.

Attached is the most current version of the Adaptive Management Framework (Framework) for the California Water Fix and Current Biological Opinions on the coordinated operations of the Central Valley and State Water Projects (BiOps). The Framework includes existing and future ESA and CESA authorizations and future operations with the California Water Fix. The Fishery Agencies and the Project Operators have modified the Framework since the Panel reviewed it in December to clarify the role of the Interagency Implementation Coordination Group (IICG) in the collaborative science and adaptive management implementation and decision-making. We continue to review the Panel's comments provided in the 1/20/17 Draft Phase 2a Report and work to incorporate recommendations and address concerns.

As part of continued refinement of the adaptive management process we will be working to more clearly identify priority science to address management relevant uncertainties, see current examples below, and describe the process for prioritization which we expect would be primarily through the Collaborative Science and Adaptive Management Process (CSAMP), beginning with the Collaborative Adaptive Management Team (CAMT) and supported by topic specific technical teams.

Recommendations for science priorities would typically be transmitted from the CAMT to the CSAMP Policy Group and subsequently to the five agencies for implementation with the support of the IICG. There may also be priorities identified by the IICG itself.

Examples of current priorities are: 1) Role of entrainment in limiting abundance of Delta Smelt, Longfin Smelt, and Winter and Spring-run Salmon: CSAMP process is evaluating this topic for Delta Smelt and Salmon; 2) Role of Fall Outflow in supporting Delta Smelt abundance and avoiding jeopardy: currently being addressed through CSAMP and associated Interagency Ecological Program (IEP) Project Work Team (PWT); 3) Role of winter and spring outflow in supporting Longfin Smelt abundance and avoiding jeopardy: IEP PWT has identified research actions and is developing a Longfin conceptual model to guide future research and analysis to inform development of a life cycle model; 4) Effectiveness of tidal habitat mitigation required by BiOps and CESA authorizations in the Delta and Suisun Bay in improving foodweb support and providing habitat for Delta Smelt, Longfin Smelt, and salmon. IEP PWT has developed conceptual model and monitoring protocols are currently being implemented; and 5) Assessment of alternative Delta migration pathways (e.g. Yolo Bypass) and the influence on juvenile survival and fitness.

We appreciate the Panel's comments regarding the need for clarity on how monitoring for real-time operations integrates with the AM Framework. The Panel has pointed out contradictions between the agencies characterization of the relationship. As the Draft Phase 2a Report points out real-time actions informed by monitoring are intended to achieve key fish performance metrics, such as limiting the effect of entrainment at the facilities to avoid jeopardy. The monitoring to inform real-time operations is also

used along with other monitoring and research within the system to assess the efficacy of the real-time operational criteria in meeting that objective. In the event that the real-time operational criteria are not achieving the objective or other criteria are more relevant, they may be changed through the AM process. The same applies to the monitoring methods employed to inform real-time decision making. Real-time operations occur within the operational criteria authorized under the endangered species authorizations and those established through the Bay-Delta Water Quality Control Plan. The ability to conduct operational experiments, such as pulse flows, would require an experimental operations plan coupled with an experimental design to test the underlying rationale for conducting those operations, developed collaboratively by CSAMP with the support of the IICG. These experiments and their results, would be subject to independent review. The appropriate approvals under the existing authorizations would be required, which if outside the operational flexibility of the authorized criteria ("adaptive limits of operations"), could require re-initiation of consultation and permit amendment. Once approved the experimental operations would be implemented along with the associated science program for the length of time needed to address the scientific questions being addressed. Synthesis of the results would be conducted through a project work team assembled through the CSAMP. The synthesis would subsequently be independently reviewed. The final synthesis results would be used to inform development of an adaptive management action if appropriate to meet the objective of avoiding jeopardy and adverse modification to critical habitat. We have developed an example of how the AM Framework process would be applied to the formulation of changed Shasta Reservoir temperature management as part of the re-initiation process, see attached.

The Panel has pointed out the need for more information and assurances regarding the funding mechanisms for both monitoring and research to support adaptive management. Since the ESA and CESA authorizations for the existing operations of the SWP and CVP and those with CWF rely on an effective adaptive management program, clearly described funding needs and funding mechanisms is a priority for the Five Agencies for inclusion as part of the CWF BiOp and CESA permit. We hope this additional information will aid the Panel in their review as part of Phase 2b. We appreciate Panels interest in assisting the agencies through their review and constructive input in developing the Adaptive Management Framework.