OUTCOMES MEMORANDUM

TO: CAMT Salmon Subcommittee Members

FROM: Rafael Silberblatt

DATE: April 3, 2020

RE: March 12, 2020 CAMT Salmon Subcommittee Meeting

Attendees: Alison Collins, Brad Cavallo, Bryan Matthias, Brycen Swart, Carl Wilcox, Cathy Marcinkevage, Deanna Sereno, Frances Brewster, John Ferguson, Kate Spear, Mike Beaks, Pascale Goertler, Rene Henery, Todd Manley

Action Items:

- Bruce - Develop a list of recommended actions from the Salmon Action Matrix for Subcommittee to vet prior to sharing with CAMT. Include rationale for why it's a good fit for CAMT/CSAMP
- Rene - Find out window for injecting Salmon Action Matrix items into SIT modeling
- Subcommittee - Discuss SFEI Rearing Habitat Study next steps
- Subcommittee - Discuss Prop 1-funded study results (synthesized by Brycen and Kate)
- Dylan/Pascale - Share summaries of current DSP-funded projects and discuss opportunities/next steps for the Subcommittee to provide input
- NMFS & CDFW - Discuss steelhead monitoring
- John, Brad, Cathy - Develop salmon entrainment scope proposal
- K&W/ESSA - Reschedule April 9 CSSP in-person workshop.
- Subcommittee - Provide feedback on updated CSSP "Info Flow" example projects
- Carl - Provide advance copy of ITP to ESSA or summarize any key differences from currently available draft document that might impact CSSP survey/activity list/prioritization
- Brad, Cathy, Rene, Brycen - Refine CSSP Q statements
- Bruce/Rafi - Finalize CSSP survey recipient list. Seek to ensure a representative group
- Subcommittee – Debrief Rebecca Buchanan's CAMT presentation and consider next steps
- Cathy - Provide update on elevated fry loss and thiamine deficiency at March CAMT meeting

Discussion Highlights:

1. Agenda Review and Updates

- Updates on Salmon Actions Matrix
    - Document has been updated (by subgroup of Bruce, Carl, Rene, Brad, and Brycen) since February Subcommittee meeting
    - Next step is to develop a list of recommended actions for Subcommittee to vet
    - Comments/questions and responses
        - Prioritizing and recommending projects may be complicated by the Voluntary Agreements (VAs) process, which is conducting a similar exercise with some overlap.
            - Consider revisiting CSAMP's role as it relates to the VAs

        - CSAMP's role under the Vas would be to serve as the implementing entity for Delta actions. Upstream of Fremont weir likely wouldn't apply nor would system-wide science issues.
    - Potential recommended projects could include the McCloud reintroduction pilot plan as well as offering DWR and River Partners assistance along the Sutter Bypass.
        - The Sutter Bypass projects are already part of a large collaborative effort – what added benefit would CSAMP add?
            - Agreed – will need to determine the value-add CSAMP can provide for the Sutter Bypass or any other recommended project.
    - Consider bringing recommendations to CAMT in April and providing an update at May Policy Group meeting.
        - By the April CAMT meeting, we should commit to: identifying recommendations for CAMT's consideration; the criteria for selecting projects; and quantifying benefits of the projects recommended. This information should be vetted during the April Subcommittee meeting.
    - CVPIA has put together subcommittees to determine changes to their SIT model, this could be a good time to advocate for changes to the model and/or running projects through the model.
- Elevated fry loss and thiamine deficiency
    - The Coleman and Feather River hatcheries have observed fry losses from thiamine deficiencies (likely caused by anchovy consumption). Thiamine baths have helped, but the dry water year type could exacerbate the issue. The extent of impacts to wild populations has yet to be determined.
    - USFW and NMFS are having ongoing conversations regarding this issue.
        - Can the information coming out of the USFW and NMFS discussion be shared more broadly? There are a lot of rumors about how widespread the issue is and its impact on monitoring data.
            - NMFS will provide an update at the next CAMT meeting.

2. Coordinated Salmonid Science Plan

- Information flow mapping discussion
    - ESSA proposes to focus on:
        - Mapping flow pathways for a few existing management actions, including:
            - Operational Management (exports, flow, temperatures, salvage)
            - Habitat Restoration (habitat rest. or creation, fish passage, etc.)
            - Invasive & Predatory Species Management (weeds, fish, etc.)
            - Other Stressor Management (pollution, DO control, etc.)
        - By identifying barriers/bottlenecks and potential strategic responses, lessons learned from these case studies can be applied to future actions & decision-making pathways.
    - For example: the Operation of DCC Gates would fall under the category of Operational Management and would include Primary Level research data and collection (e.g. drought condition, salmonid survival/behavior) informing Secondary Level integration and decision support (e.g. a joint risk

assessment). The Secondary Level would then roll up to the Tertiary Level for policy development, decision-making, and implementation.

- Proposed process for soliciting CAMT's feedback on information flow approach:
  - Use a survey/fillable form or focused interviews guided by generalized framework to collect information on organization data needs, interactions, barriers, and decisions related to EACH class of management activities.
  - Revised approach would be distributed to members of CAMT and potentially back out to people interviewed earlier in project.
  - Results collected would be used to build abstracted conceptual models of information flows for each class of management activity
- Potential Case Studies by Management Activity Class (those italicized are related to the BiOps)
  - Operational Management
    - *Operation of DCC gates*
    - *OMR flow management*
    - *I:E Ratio*
    - *Salvage operations*
    - Operation of the Fremont Weir for Yolo Bypass fish passage
  - Habitat Restoration
    - Implementation and adaptive management of large tidal restoration projects (as opposed to multi-project restoration programs) such as the Frank's Tract Restoration Project
  - Invasive & Predatory Species Management
    - *Aquatic weed management in Clifton Court Forebay*
    - *Predator control at fish salvage facilities*
  - Other Stressor Management
    - D.O. control in Stockton Ship Channel
    - Pollution/water quality control
- Comments/questions and responses
  - If we are trying to determine how to assimilate research data into management actions, predator removal from Clifton Court Forebay would be a good case study as it is intended to connect research with operational decisions. I am aware of a lot of work being done on predator removal there but am not sure to what extent it's informing management decisions.
    - Three Subcommittee members indicated support for replacing aquatic weed management at Clifton Court Forebay with predator removal.
      - Concerned this could be a poor example as we do not know how it translated into management decisions. Is ESSA looking specifically for examples where it is known how research is translated into management decisions?
        - ESSA would ideally like to include some case studies where that connection is known. We could include one case study where that

connection is poor or unknown. We would be interested in knowing if there are existing procedures for sharing information with managers that either are not being followed or could be improved.

- Straight forward projects may be tricky to include in this process. They either do not necessitate management decisions or they are so unique that that addressing information flow issues for them would not be replicable for other projects.
- For the example case studies related to the BiOps, is the idea to map out how decisions are made now or outline how those considerations should be researched and conveyed to management? Decision making is different between former BiOp and the new one and would subsequently be characterized differently.
    - Intention is to both describe what is in BiOp and fill in between the lines when the correlation between science activities and management decisions are not clear.
- It is going to be controversial picking between two BiOps given CDFW ITP is operating under the old BiOp. Given things are in flux and ITP is not out yet, maybe we avoid what's in flux for now?
    - We should not pick something that has not started yet or is evolving. It is not so much about the science itself but flow of information; the easiest way to do that is to focus on work that is happening. OMR flow management is likely not a great candidate given the uncertainty of how that will be managed moving forward.
- D.O. in the Stockton Shipping Channel seems to be a large biological issue. It is a good case study to pursue – if there is a large biological blockage, how does that information get brought up to CAMT? Is the Bay Delta Initiative addressing it or are there other considerations needed? This is less clear cut than Clifton Court Forebay example.
    - ESSA struggled with coming up with projects within the "Other Stressor Management" (particularly as it relates to water quality projects) and considered not including one from this category.
- The Frank's Tract Restoration Project is doing a great job with outreach and conceptual design but is very unique with respect to decision making and is not representative of other habitat restoration projects. Tule Red would be a more appropriate restoration project case study.
- Scale matters with respect to restoration projects. Do we want to focus on how to effect change over a large area vs a single site? Those are different questions. We struggle with doing restoration at a larger scale that is truly impactful.
- Consider using examples from the old BiOp to show how things have worked in the past. There is a framework we could reference from the Delta smelt side of things.
    - ESSA is looking to include projects that are completed or currently ongoing so as to identify common themes on the organizational side– it has less to do with specifics, like flow management.
    - The information flow and decision making process is exactly what is currently under litigation.

- *Subcommittee supported using DCC gates as a case study for Operational Management given linkage to different studies and responses to environmental conditions.*
- *Subcommittee members agreed to include Tule Red as a case study for the "Habitat Restoration" category.*
- Do food web management and nutrient addition go into "Other Stressors Management" category or "Operational Management"? If the former, does it replace D.O. control in Stockton Ship Channel as a case study?
    - Not sure if food webs is appropriate as they focus on smelt. Also, the Stockton Ship Channel issue would be managed by the Port of Stockton.
- What information relates to management? There is not a clear understanding. How is our ability to integrate across projects working? These are the much more significant questions. The lack in success to restore habitat populations is really a reflection of the ability to collaborate across agencies and their respective goals. Utilizing a case study speaking to this need would make this process more tangible.
    - We have to bear in mind the scope of this project. To do what is suggested well is a big undertaking and likely its own project. We want to touch on it, but we need to be realistic around our time and resources. Suggest we provide examples as to why we need to look into those kind of projects. We want the group's feedback but what was suggested could apply to hundreds of management actions.
- *Subcommittee members were supportive of using the Nigiri project and its implications for Delta management as a case study.*

- Feedback on Activity List
    - As part of Subcommittee's review of the Activity List, responses to the following questions were solicited:
        - Are there activities that are largely completed or underway that should therefore be removed from our prioritization list?
        - Are there activities that are mis-classified as monitoring that would be better characterized as a science activity, management activity (and vice versa)?
        - Are any science activities considered fundamental/basic research that do not readily help discern choices surrounding management actions? If so, they should be removed from our prioritization list.
        - For any activity statement, are CAMT members able to narrow down priority locations (e.g., beyond "Full Delta")?
    - 128 comments received from seven reviewers. Key themes of this feedback included:
        - Requests for changes in language, additional details and supporting references, and updates to the status of projects.
        - Removal of activities deemed inappropriate/not pertaining to Delta
        - Adding or splitting some activities into two similar ones at two different locations (e.g., same activity at each fish salvage facility).
        - Suggestions for removing, relocating, and/or simplification of locations.
    - Remaining actions

        - Provide Subcommittee with track changes version (so that deletions/splits, changes to language, added locations, etc are clear)
        - Daylight remaining questions on specific suggestions that require additional review and discussion.
        - Review new Incidental Take Permit to update any actions if needed.
- Feedback on Pilot Q-Survey
    - Criteria has been updated to reflect feedback received as follows:
        1. Learning Benefits: The activity accelerates learning on key cause-effect mechanisms influencing salmonid survival, migration and behavior through the Delta there by directly contributing to clarifying management options or evaluating action effectiveness.
        2. Locations: Perform Q sort on locations that are the most important to reduce uncertainties influencing our understand ding of salmon survival, migration and behavior.
        3. Implementability: What is the level of agreement across CAMT participants about how easy or hard implementation of the activity would be (e.g., based on perceptions of regulatory / permitting complexity, potential litigation, need for willing cooperation of private property owners, etc.)
        4. Multispecies Benefit: The activity is expected to generate more multi-salmonid species benefits relative to typical activities.
    - Method will include a sequential series of criteria-specific Q Method surveys to gather feedback on activity statements and Q statements. A factor analysis of these results would be completed to determine the relative level of "learning benefits" (for example) that a particular activity would provide. This informs a priority ranking of a particular action.
- ESSA, Bruce, K&W will review/revise the survey recipient list to make sure it's a representative group
- ESSA, Bruce, K&W will schedule a follow up call regarding postponing the CSSP workshop/webinar (seeing as an in-person meeting is unlikely and a webinar might need to be split into two sessions)

3. Prep for Upcoming CAMT/CSAMP Presentations – Dry Run of Rebecca Buchanan's presentation

- Key themes
    - Chinook survival is associated with the magnitude of Mid-Delta Flow (Bacon Island)
    - Different regions have different flow-survival relationships – high mortality between Turner Cut Junction and Chipps Island can overwhelm survival gains upstream
    - Chinook and steelhead have different types of flow-survival relationships
- Survival Data
    - Available Data:
        - Head of Old River to Chipps Island: Chinook (2010-2014), Steelhead (2011-2016)
        - San Joaquin River: Head of Old River to Turner Cut: Chinook (2010-2014), Steelhead (2011-2016)
        - Turner Cut Junction to Chipps Islands: Steelhead (2011-2016)
    - Covariates of most importance for chinook at the Head of Old River to Chipps Island was found to be magnitude of flow at Bacon Island. For steelhead, the most important covariate was inflow.
- Lesson 1: Chinook survival is associated with the magnitude of Mid-Delta Flow (Bacon Island)

    - Data was plotted comparing: 1) Chinook survival to Chipps Islands vs. Bacon Island flow and 2) Head of Old River to Chipps Island vs Bacon Island Flow
- Lesson 2: Different regions have different flow-survival relationships
    - In modeling steelhead survival from Turner Cut Junction to Chipps Island, the most significant factor was found to be migration route. No operational or environmental covariates are associated with survival in this region.
    - Chinook survival was not modeled due to sparse data.
- The following Salmon Scoping Team findings are supported by this study:
    - Through-Delta survival has been consistently low for San Joaquin River chinook; survival data are limited for steelhead.
    - Smaller fish usually experience lower survival rates than larger fish.
    - Direct mortality at the facilities does not account for the majority of mortality experienced in the Delta.
    - The relationship between San Joaquin River inflow and survival is variable and depends on barrier status and region of the Delta.
    - The extent to which reduced negative OMR flows and I:E affect through-Delta survival is uncertain.
- Conclusions
    - Chinook survival through Delta has stronger association with conditions in Mid-Delta (Bacon Island) than with Delta inflow at Vernalis. That relationship might change if survival improves in San Joaquin River route.
    - Different regions have different flow-survival relationships. Different management approaches may be required for Turner Cut to Chipps Islands.
    - Chinook and steelhead have different flow-survival relationships and require different management approaches.
- Subcommittee is encouraged to provide feedback regarding Rebecca's presentation via email prior to CAMT meeting