OUTCOMES MEMORANDUM

TO: CAMT Salmon Subcommittee Members

FROM: Rafael Silberblatt

DATE: July 17, 2020

RE: July 9, 2020 CAMT Salmon Subcommittee Meeting

Attendees: April Hennessy, Brad Cavallo, Bruce DiGennaro, Bryan Matthias, Carl Wilcox, Cathy Marcinkevage, Deanna Sereno, Frances Brewster, Jason Zimmerman, Jean Castillo, John Ferguson, Josh Israel, Kate Spear, Mike Beakes, Natascia Tamburello, Pascale Goertler, Rene Henery, Sheena Holley

Action Items:

- Jason – Share ICF's Entrainment Loss Model slides with Subcommittee
- Jason – Follow up with CDFW (Mike Beakes contact) re: parallel effort
- Rafi - Schedule meeting for early next week with refiners to discuss presentation of survey results
- Rafi - Schedule meeting with refiners + other interested Subcommittee members to discuss preferred case studies of Q-survey results
- All - Provide Brad and Frances any additional feedback on Salmon Entrainment Study Proposal
- Brad/Frances - Schedule follow-up call to discuss Salmon Entrainment Proposal
- Brad - Develop Salmon Entrainment Study Proposal PPT slides for July CAMT meeting
- Rafi - Schedule a call between Josh and Brett to discuss restoration project data streams in relation to the Life Cycle Models Management Brief

Discussion Highlights:

1. Agenda Review and Updates

- The Sacramento River Science Partnership (SRSP) will be holding the following webinars:
    - Fall Pulse Flow Findings 2019 and Salmon Cohort Summary on July 9
    - Temperature Modeling on the Sacramento River on July 30.
- September Subcommittee meeting rescheduled to September 17 from 1-4pm

2. Coordinated Salmonid Science Plan

- Key Takeaways from July 2 webinar:
    - Need to improve and simplify summary of Q survey method & analysis in report (apply science communications lens).
    - More interest in level of agreement than scores as the primary sorting factor.
    - Desire for more time to digest the results and raw data
    - Interest in delving deeper into alignment with parallel processes (especially given forthcoming releases of respective reports)

- ESSA noted that a lot of time was spent on fine-tuning the survey criteria and activity statements in coordination with the refiners working group; subsequently, time and budget are tight (97% of budget has been expended). Contract extension is being considered.
- Final report parameters:
    - Targeting 20 –25 pages.
    - Audience is primarily management-oriented, but valuable for scientists too (focus is on science serving management).
    - No-frills approach due to budget considerations.
- Proposed Approach for Presenting Results – Thematic Exploration by Agreement
    1. Key Activities with High Agreement: High scores, High agreement
    2. Low-Hanging Fruit: Moderate scores, High agreement, Moderate-High Implement-ability
    3. Key Activities with Low Agreement: Any scores, Lowest agreement
    4. Activities to Pursue Later: Low scores, High agreement
- General comments and questions
    - For #2, it should be all activities with disagreement.
    - For #3, when actions with disagreements have generally low scores it suggests they are less of a priority.
    - Change wording for #4. There is overlap between #2 and #4. #4 is more low hanging fruit, too.
    - For #4, indicate that there is less of a need for CAMT's help.
    - Members expressed general agreement on using a thematic approach for organizing results
    - Consider assessing Learning Benefits scores only for science activities, and excluding Learning Benefit scores from management activities.
        - We would be able to parse it out that way if that is what the Subcommittee wants to pursue.
    - Could we see how things look both ways? We've also previously discussed not including implement-ability in the same way. If we go with combined score, remove implement-ability
        - We removed implement-ability from multi-criteria scores. For something like low hanging fruit, we can add implement-ability back in. We will be sending raw data that will allow you to try sorting different ways.
    - After reviewing raw data, Subcommittee to discuss preference for sorting results. Some actions may only utilize one criteria while others may use a multi-criteria score.
    - Not many activities were scored as very easy to implement. Should we consider filtering out implement-ability scores of zero?
        - Concerned about excluding activities with low implement-ability scores. We tend not to do the things that are hardest to implement. We have also been unsuccessful in reversing decline in most critical species. This isn't coincidental. We should think through developing a web of cohesive relationships - there is a lot of benefit to working on common interests and understanding others' objectives.
    - My reaction is not to filter what is/isn't important. What caught my eye was management 22 activity – that is something we could do. Management 15 is important but not easy to implement.
    - A column should be added indicating how many Q statements are associated with a given activity statement

  - A follow up call on how to sort would need to happen early during the week of July 13. ESSA can't start drafting results until decision on rules for themes is made. Subcommittee will need to identify case studies by July 24.
- Member feedback on presenting results to CAMT
  - Don't get into specifics on Q method, it's sufficient to say that this method forced survey participants to make tradeoffs between activities to generate a from which it's possible to derive priority scoring and levels of agreement.
  - A presentation could be made in July, but full presentation should be moved to August as full draft will be out by then.
  - Share how themes are organized, example of results matrix this month to give them a sense of where things are headed.

3. ICF's Entrainment Loss Model

- The Salmon Monitoring Team and Smelt Monitoring Team meet to discuss relationship between water operations management with fish populations/salvage.
- Correlating river/Delta flows with where fish are in the system helps gauge the amount of risk associated with pumping facilities. This subsequently drives recommendations for management of water operations in the Delta but includes an unknown amount of bias (i.e., in assessing risk).
- The real-time loss prediction tool eliminates this bias by combining fish, water operations, and historical data through interactive, web-based scenario testing.
- This testing utilizes Random Forest and Quantile Regression to a identify a range of realistic outcomes based on previous conditions as well as covariate importance.
- In-season tracking of cumulative loss relative to historical timing benchmarks provide context for forecasting
- Quantile Regression Forests have many beneficial characteristics for forecasting, particularly for understanding risk
- Loss prediction model provides intervals of short-term entrainment risk
- Cross-validation and pilot testing indicate moderate predictive ability
- Web-based app is a flexible tool that could be used with alternative predictive models.
- Member comments and questions
  - Have you started on a manuscript for publishing?
    - We currently have a draft and are working on submitting it.
  - CDFW submitted proposal that's very similar to this. I would suggest you coordinate with them to see where there's overlap.
  - This methodology is really effective for winter and steelhead but doesn't work as well for spring as you can't as easily distinguish from fall run and there isn't historical genetic data available for spring run.
  - Can you clarify what the status of this is? Are the monitoring teams familiar with it?
    - We have been in touch with USBR who runs the monitoring. They haven't been using it due to lack of familiarity. They are keen on incorporating more moving forward.

4. Discussion on Salmon Entrainment Study Proposal

- Would like to better understand how the short-term actions outlined in this proposal align with the broader

questions that the entrainment subgroup is working on and the CSSP. Hope this doesn't derail the subgroup's continued work.
    - Not the PWA's intention to usurp the efforts of the entrainment working group, rather this study proposal will hopefully help keep things moving forward.
- Would be good to clarify that this is a PWA initiative (as opposed to a CAMT initiative) that's seeking input from CAMT on any red flags. We shouldn't prevent CAMT members from pursuing their own studies.
- Did the entrainment subgroup develop a study proposal aimed at answering the questions they raised?
    - My understanding is they haven't gotten to specific approaches.
    - There's been considerable interest in indirect entrainment loss, which is a more challenging concept.
        - SST report suggested that direct losses at pumps are less of an impact than indirect losses. Focus should be on losses that have an impact at the population scale - which would beget a different set of questions.
- We are proposing to bring investigators from various backgrounds, those working in Delta on similar issues for the work this document outlines.
    - You should also include the regulatory/management minded folks.
    - Determining the most important management questions should be a priority.
- The first step for Topic #3 should be augmenting existing models (if needed). Consider starting with Topic #3 to get collaborative development and buy-in from CAMT.
- For Topic #1, a study was previously published in 2014 that this analysis could help make better.
- For Topic #1, have you considered that most of the studies listed are generally for larger hatchery fish?
    - Yes.
- John Brandon has deep background in population dynamics if needed.
- Where is prescreen loss being covered?
    - Topics 1 and 2.
- Brad/Frances - Schedule follow-up call once all comments have been received

5. Steelhead Monitoring Gap Analysis

- Impetus is Proposed Action 3. 4.12 from the 2019 BiOp.
- The primary purpose of this analysis is to identify gaps in our current monitoring network and approach.
- Gaps include both physical (e.g., screw traps, PIT tag antennas) and intellectual (e.g., theoretical drivers of life-history expression) limitations.
- Analysis Goals:
    - Catalogue past and current O. mykiss monitoring efforts and program leads
    - Detail monitoring methods, spatial and temporal monitoring scope
    - Facilitate greater collaboration among agencies monitoring O. mykiss through multi-stakeholder working groups.
- This is a multi-agency and stakeholder effort that currently includes: NMFS, CDFW, USFW, DSC, and USBR.
- Analysis timeline:
    - July 2020:
        - Full proposal development

        - Primary agenda item for Steelhead PWT meeting
        - Finalize project team
    - August – November 2020:
        - Implement analysis
        - Develop draft technical memo detailing preliminary findings
        - Present draft report to CAMT SSC and/or Steelhead PWT
    - December 2020 – January 2021:
        - Integrate feedback, finalize report
        - Identify next steps (e.g. SAIL steelhead effort, field study integration, steelhead SDM)
    - February 2021
        - Present gap analysis findings at CSAMP-sponsored San Joaquin Basin Steelhead Collaborative workshop

6. Life Cycle Models Management Brief Next Steps

- Follow up on June Subcommittee Action Item: Determine whether modelers would be open to CAMT taking actions or supporting this effort in some fashion.
- Looking into developing an inventory of restoration projects and their respective data to gauge what data is available/still needed for evaluating projects for the purpose of adaptive management.
- Rafi to schedule a call between Josh and Brett to discuss restoration project data streams in relation to the Life Cycle Models Management Brief.