

ADVISORY COMMITTEE MEETING SUMMARY

August 11, 2023, 9-11am
Zoom Virtual Meeting

Meeting Objectives

- Recommendation on Zooplankton Productivity and Export Criteria
- Shared understanding of Technical Assistance projects
- Shared understanding of Phase I Report Outline

Action Items

Program Team

1. cbec, SFEI
 - a. Consider recommendations on evaluation criteria:
 - i. Productivity – Review productivity evaluation criteria in relation to data supporting value of water fluctuations towards making optimal conditions
 - ii. Export – Review whether the berm overtopping and infrastructure outlets should be treated equally in the criteria
 - b. Consider how to address measuring optimal conditions for getting zooplankton to fish
2. KSN
 - a. Continue to update the Phase I Report Outline and share on the Floodplains Reimagined website
3. Kearns & West
 - a. Provide the formal title of the FlowWest study on topic of fate of food web and fish access to it

Advisory Committee Recommendations

Advisory Committee members recommended the Technical Team consider updating the value assigned to some criteria to include productivity and export. These include:

- Productivity
 - Cover – In the Habitat Suitability Criteria for juvenile salmon rearing, rice fields are considered suboptimal cover because rice is classified as suboptimal in the juvenile rearing criteria under the cover type, but part of that suboptimal classification is based on lack of variability in depth and cover as compared to wetlands.
 - Depth – Consider the value of flow fluctuations on productivity of macroinvertebrates.

- Export
 - Potential Export
 - Berm overtopping connecting to downstream
 - Weir outlet to downstream
 - Compare value of export from berm overtopping versus outlet weir

The Technical Team will consider addressing the recommendations in their presentation to the Steering Committee.

Welcome and Introductions

Julie Leimbach (Leimbach), Kearns & West, welcomed all attendees. All attendees are listed in the table at the end of the document.

Leimbach reviewed the meeting agenda and objectives and outlined the focus of the meeting:

- Priority: Floodplain Wildlife
 - Objective:
 - Increase the frequency, duration and spatial extent of inundation within the Floodplains Reimagined geographic areas to stimulate production of invertebrates to provide high quality habitats for rearing when juvenile salmon are migrating through the area
 - Evaluation Criteria: Zooplankton Productivity and Export

Leimbach presented the key questions to be addressed:

- Does the Zooplankton Productivity and Export Criteria help measure the success of the Floodplain Wildlife priority?
- Are clarifications needed regarding the Technical Assistance results?
- What would make the Floodplains Reimagined Phase I Report valuable to Advisory Committee members and their organizations?

Leimbach reiterated the role of the Advisory Committee:

- To advise the Steering Committee on the adoption of key work products and Ad Hoc Group input on decision support tools, evaluation criteria, potential actions, expected benefits, and implementation strategy;
- To participate in an open and transparent exchange of information and interests;
- To make recommendations to the Steering Committee;
- Consensus is not required in the development of recommendations.

Zooplankton Productivity and Export Potential Suitability Criteria

Jesse Rowles (Rowles), cbec, presented the zooplankton productivity and export criteria and reiterated the key question posed to the Advisory Committee: Are the criteria and approach adequate to capture zooplankton productivity suitability and export potential for use in evaluating the performance of scenarios?

Rowles shared the following criteria goal:

- To evaluate “productivity”, i.e., suitability of zooplankton production, and “productivity export”, i.e., releasing of productive water downstream, potential as part of the suite of benefits evaluated.

Rowles explained the criteria development process taken by the Technical Team:

- Outlined suitability analysis approach similar to juvenile salmon-rearing floodplain habitat criteria;
 - Reviewed literature to establish parameters and possible criteria values;
 - Held informal discussions with technical experts from the California Department of Fish & Wildlife (CDFW) and the University of California (UC) at Davis;
 - Incorporated feedback from the Floodplains Reimagined Technical Team to refine the criteria based on model assumptions, behavior, and outputs.

Rowles presented the proposed criteria.

- Productivity Suitability
 - Optimal velocity: 0 – 0.33 ft/s
 - Optimal duration: >10 days
 - Optimal cover type: marsh, managed wetlands, rice fields
 - Optimal depth: wetted
- Productivity Export
 - Managed condition – applied at the field scale
 - If berm overtopping directly connected to downstream
 - a. Value: Volume of water per cell exceeding velocity threshold on first berm overtopping day
 - If connected through an outlet weir with a downstream connection
 - a. Value: Daily export volume through outlet structures or total field volume on prior day, whichever is lower
 - Unmanaged condition - applied at the cell scale
 - Unmanaged areas
 - a. Value: Daily suitability-weighted volume of cell on previous day when velocity threshold is exceeded

Rowles outlined the assumptions to the approach.

- This approach quantifies relative effects of floodplain inundation on zooplankton production and export.
- An increase in productivity leads to more juvenile fish food and growth, and better outmigration, i.e., early ocean survival.
- These criteria should not be used to represent direct benefits for fisheries:
 - Food availability does not guarantee a benefit to fish.
 - The distance to the main river channel and complexity of canals and infrastructure affects whether the food is used.

- Fish may not be present.
- Food may be a limiting factor.

Rowles also shared assumptions and caveats to the proposed criteria.

- Duration and velocity are representative of water residence time.
- Maximum velocity threshold is based on the model results.
 - This represents flood events that reset productivity and keep water at a flow slow enough to allow the production of zooplankton.
 - There is limited published literature available to inform this threshold.
- Duration does not vary spatially.
- ‘Export’ indicates the water leaves the fields and other floodplain areas rather than tracking to the river entry site.
- Not accounted for in this analysis: water temperature, light availability, length of day, and antecedent conditions such as soil moisture, periodicity, and duration between events.

To conclude, Rowles listed considerations for a future study and analysis:

- Validate the approach using field data;
- Conduct a field-based study to compare productivity across cover types – rice fields vs. natural cover types; managed vs. unmanaged inundation;
- Include the time of year to account for length of day and temperature;
- Consider the role of turbidity and how to account for it;
- Develop criteria to account for distance to the river and/or complexity of canal networks for export potential.

Questions and Comments

The participants provided the following questions and comments.

Productivity Criteria

- What does the literature tell us about cover type that provides the rationale for optimal and suboptimal cover? [Matt Brown, USFWS]
 - Rice fields take longer to become optimal cover for producing zooplankton, but the published literature seems to indicate that given the time and right circumstances, the rice fields do produce equally to lands with marsh and wetland cover. [Program Team]
 - When we discussed land cover and connectivity in the salmon habitat suitability criteria, rice fields were presented as suboptimal, conflicting with today’s presented information. [Brian Ellrott, NMFS]
 - In the context of juvenile salmon rearing, part of the suboptimal classification is based on a lack of variability in depth and cover compared to wetlands. In this case, it warrants being classified in the ‘good condition’ category, despite a lack of available studies specifically addressing the question of which habitat type is more productive of zooplankton. [Program Team]

Export Criteria

- The two methods for exporting zooplankton water appear to have been treated the same way; is that accurate? I would expect a major difference in the biomass. [Virginia Getz, Ducks Unlimited]
 - Would there also be more water moving through the structure? It's possible those two export mechanisms could be equivalent. If not, I support treating them differently. [Ellrott, NMFS]
 - Additional support for different treatment of the mechanisms. [Paul Buttner, CA Rice Commission]
 - Technical Team to consider how the two mechanisms are not equal.
- For the export criteria, is the incoming water displacing the zooplankton-rich water? [Virginia Getz, Ducks Unlimited]
 - We're using the day of berm overtopping to determine what cells are being pushed over that water threshold, and on the following day, determining the productivity of the displaced water. [Program Team]
- [via Chat] For production of micro and macroinvertebrates, we are finding both retention time and fluctuation of water level within the units are needed. As we bring bugs back into the swells, the irrigation times and inundations are impacting productivity. [Andy Atkinson, Bird Haven Ranch]

Suggested Additional Criteria

The participants recommended additional evaluation criteria to be combined with the productivity and export criteria. They recommended the next criteria evaluate the following components:

- Fate of produced zooplankton and/or food web from field to fish
- Relative distance from production site to mainstem and/or location of fish and/or other canals
- Flood pulse relation to fate of food web and accessibility to fish and nutrient dynamic dissolved organic bound phases
- Volume of river flow relation to fate of produced zooplankton and food web for fish food availability and access
- Value of conveying productive water through drainage systems off fields into the river

Participants made the following comments:

- Recommendation to measure the staying power of the downstream zooplankton and the amount of dilution. Are target fish species being considered to measure performance? [Craig Isola, USFWS]
 - This criteria is designed to measure relative production of zooplankton, not distance to fish access, dilution, nor fish access to the zooplankton produced. [Program Team]
 - There are other efforts outside of Floodplains Reimagined that are looking at production efforts of the receding water. There are other hydrologic structures not captured in our models. We're looking at potential in a source area

- depicted by the models but will be better able to develop and incorporate greater distance for the receding water. [Program Team]
- cbec is also coordinating on a study with the Metropolitan Water District and FlowWest on the fate of zooplankton produced on fields. [Program Team]
- Support for criteria that measures the relative performance of scenarios based on distance from location of production to the river or location where fish can access. [Ellrott, NMFS]
- [via Chat] The volume or flow of the receiving water could be important as well. Exports to the Sacramento River at 5,000 cfs would be very different than at a rate of 25,000 cfs. [Program Team]
- [via Chat] The flood pulse ecology literature has begun to recognize the relationships between plant and [zooplankton] productivity of floodplains and distance from river water sources. This is related to nutrient dynamics dissolved – organic-bound phases. [Program Team]
- Since productive water doesn't reach the main river, is there still value in putting it into the drainage network? [Julie Rentner, River Partners]
 - Recommendation to bring in data from FlowWest's study and table this discussion. [Program Team]
- Recommendation to emphasize purposeful inundation through management of wetlands and rice fields has tremendous value for getting food into the river during critical years, potentially when the river is not overtopping. [Buttner, CA Rice Commission]

Technical Assistance

Leimbach and Holly Dawley (Dawley), KSN, introduced the agenda item to address Technical Assistance results. To summarize:

- To date, four technical assistance projects have been funded.
- One project is in the exploratory modeling stage.
- The Program continues to accept proposals.
- Landowners are encouraged to contact the Technical Team with questions and to arrange a site visit.

Juvenile Salmon Rearing Habitat Restoration Opportunities within the Sacramento River Corridor

Noelle Patterson (Patterson) and Chris Campbell (Campbell), both of cbec, presented the Technical Assistance study for River Partners titled: 'Juvenile Salmon Rearing Habitat Restoration Opportunities within the Sacramento River Corridor'. Key points included:

- Project objective – Identify and prioritize potential juvenile salmon rearing habitat enhancement opportunities within the Sacramento River Corridor between the north extent of Hamilton City and the south extent of Colusa.
- Task 1 – Aerial imagery data collection
 - Stitched flyover photos together into one unified image
 - Photos depicted the draining of the floodplain over a 4-day period in January 2023

- Task 2 – Calibrated 1-D hydrodynamic model analysis
 - Identified disconnected pools of water in the river corridor that could result in fish stranding. Pools were quantified by:
 - Surface area – in acres
 - Volume – in acre-ft.
 - Proximity to the main water channel – in ft.
 - Limiting filtration rate – in./hour

After analyzing the study data, the Technical Team identified the following next steps:

- Prioritize sites for fish presence and stranding monitoring;
- Prioritize areas suitable for restoration and reconnection efforts.

Questions and Comments

The participants provided the following questions and comments about the study.

- Recommendation to ensure the oxbow lakes are considered beneficial to salmon rather than a hazard for them. The oxbow lakes are among the important riparian features and hydrologic processes of the riverine meander belt that ultimately create and contribute to the shaded riparian aquatic habitat benefits for which we originally pursued conservation of the belt. [Keith Marine, Aquatic Resources Consulting Scientists]
 - Large oxbow lakes give a good focal point for visualizations, but there are many other non-perennial, shallow, and/or fast-draining, disconnected pool areas that will comprise more of our focus for subsequent monitoring prioritizations. [Program Team]
- Suggestion to examine if juvenile salmon habitat is limiting in this reach. In general, juvenile habitat is pretty good here compared to downstream of Colusa. There may be little incremental benefit to creating more. [Steve Zeug, Cramer Fish Sciences]
 - Good consideration; this will be brought up at a future Technical Team meeting. [Program Team]
 - Steve, is there a published resource that details juvenile salmon habitat across these waterways? [Dan Smith, Ducks Unlimited]
 - The Flood Board did some work on this, and others have used Habitat Suitability Index curves but in discreet locations and not for the entire system. These can be easily calculated from depth and velocity data. I can locate and share that information.

Butte Creek Flow Measurements Near the Sanborn Slough Bifurcation Facility

Scott Wright (Wright), cbec, presented the Technical Assistance study for Wild Goose Club titled: 'Butte Creek Flow Measurements Near the Sanborn Slough Bifurcation Facility.' Key points included:

- Project objective – Develop a better understanding of the flow split between Sanborn Slough and Butte Creek at the top of the Butte Sink, to support operation of the structure and hydraulic model calibration.

- Task 1 – Measured flows and stages at upstream and downstream transects over a range of conditions
- Task 2 – Calculated flow splits for the measurement periods
- Results of flow measurements showed the difference in water discharge between late 2022 and early 2023 when the weir was overtopping:
 - Flow split was approximately 70 – 80 percent down Sanborn Slough in November, prior to runoff events
 - Flow split dipped to approximately 50 percent – with equal flow down Butte Creek and Sanborn Slough – during runoff when the overflow weir was activated
 - Flow split returned to approximately 70 percent down Sanborn Slough after runoff

The Technical Team will draft a Technical Memo for this study as a next step.

Phase I Report Outline

Holly Dawley (Dawley), KSN, presented the outline for the Phase I Report and reiterated the key question posed to the Advisory Committee: What would make the report valuable to Advisory Committee members and their organizations?

Dawley shared the outline and following overview:

- The report will include the narrative of the work conducted with landowners over the last couple of years.
- The report will document next steps after Phase I.
- Digital and printable copies will be available.
- Major report sections include:
 - Executive Summary – a brochure-length description to be easily shared and digestible
 - Body of report
 - Appendices – contain the technical data and analysis

Closing Remarks and Adjourn

Leimbach reviewed the action items, thanked participants for their participation, and adjourned the meeting.

Participants

| Advisory Committee Members | |
|---|--|
| Affiliation | Name(s) |
| Bird Haven Ranch | Andy Atkinson |
| California Department of Fish & Wildlife (CDFW) | Luke Matthews Michelle Forsha |
| California Rice Commission | Paul Buttner |
| Department of Water Resources (DWR) | Jesus Esparza Josh Martinez |
| Ducks Unlimited | Dan Fehringer Dan Smith Virginia Getz |
| Foraker Properties | Andrew Foraker Erik Foraker |
| Montna Farms | Jon Munger |
| National Marine Fisheries Service (NMFS) | Brian Ellrott |
| Northern California Water Association (NCWA) | Todd Manley |
| Reclamation District 70/1660, Tisdale Irrigation District, Butte Slough Irrigation | Andy Duffey |
| Reclamation District 1500, Sutter Mutual Water Co. | Jon Scott Roger Cornwell |
| River Partners | Julie Rentner Torey Byington |
| United States Fish & Wildlife Service (USFWS) | Baker Holden Craig Isola Curt McCasland Jim Earley Matt Brown Michael D'Errico Tricia Bratcher |
| Wild Goose Club | Roger Swanson |
| Unknown | (530) 518-4490 |

| Program Team | |
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| Affiliation | Name(s) |
| Aquatic Resources Consulting Scientists | Keith Marine |

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|---|--|
| cbec | Chris Campbell Jenna Duffin Jesse Rowles Noelle Patterson Scott Wright |
| Cramer Fish Sciences | Steve Zeug |
| Kearns & West (K&W) | Julie Leimbach Bethany Taylor |
| Kjeldsen Sinnock Neudeck (KSN) | Holly Dawley |
| Larsen Wurzel & Associates (LWA) | Eric Nagy Mark Cowen |
| Point Blue | Kristy Dybala |
| Reclamation District (RD) 108 | Lewis Bair |