

SCENARIO DEVELOPMENT AD HOC GROUP MEETING

March 30, 2023, 12-2pm
Zoom Virtual Meeting

Meeting Objectives

- Begin reviewing preliminary model results.
- Begin applying parameters to preliminary model results that will help guide the development of scenarios.

Action Items

Program Team

- Tech Team – Bring 3,000 and 6,000 cfs scenarios and present the modeled results and their related habitat benefits at the April Advisory Committee meeting.
- Tech Team – Consider modeling lower flows as low as 1,000 cfs for modeling Tech Team – Keep discussing the modeled scenarios for Colusa Basin to inform Phase I: Feasibility Report.
- Kearns & West – Add FWS compatibility determination for FWS easements for inundation between .5 and 2ft water depth.

Key Takeaways

- Ad Hoc Group members expressed support for modeling overtopping notch flows at Moulton and Colusa Weirs.
- Some members proposed modeling expressed concern that 3,000 cfs and 6,000 cfs were too high and represented too high a cost for the farmlands, birds, hunting clubs, and roads for landowners to be willing to consider that level of inundation. This may lead to exploring a set of lower modeled flows.

Welcome and Agenda Review

Julie Leimbach (Leimbach), Kearns & West reviewed the objectives and agenda for the meeting.

Baseline Hydrodynamics Model Results

John Stofleth (Stofleth), cbec, presented the hydrodynamic model results for Butte and Colusa basins. The Sutter Bypass baseline results have already been developed and accepted as part of the Sutter Bypass Butte Slough Water Users Association modeling effort.

The Facilitation Team solicited clarifications and feedback from the group on the baseline model results.

Comments / Questions

The group generally expressed support for the baseline model results and requested the following clarifications.

- For context, to interpret the potential benefits of these modeled inundation flows, can you provide a review of the previously discussed depths for salmon and birds? [Program Team]
 - The depth previously discussed for shorebirds was less than 4 inches, waterfowl was between 10 and 12 inches. There is no upper depth for salmon, but the sub-optimal depth is 0.6 to 0.9 feet with anything above being optimal. [Technical Team]
- The optimal depth for salmon is 10.8 inches and above, waterfowl and salmon is 10 to 12 inches. However, there is no beneficial overlap for waterfowl, shorebirds, and salmon, correct? [Virginia Getz, Ducks Unlimited]
 - Given the criteria that we have approved to date, that is correct. [Technical Team]
 - I'd be cautious stating that 10-to-12 inches is within "optimal" depths for baby salmon on the floodplain. This may not be the right term for fish, in this case. Maybe it is the lower end of a potentially suitable or usable range for salmon across various floodplain surfaces. I think 10-to-12-inch depths may be better termed as that portion of a potentially suitable depth range "compatible with the other resource uses" on certain floodplain surfaces. That shallow depth for fish, while potentially providing some level of "suitable" habitat for the smallest sized salmon, is not likely an "optimal" condition, generally, for them on floodplains. In fact, DWR concluded that deeper is generally better for overall salmon survival for the Yolo Bypass flood periods. [Keith Marine, ARCS/Consultant to RD108(From Chat)]

Preliminary Actions

Moulton and Colusa Weirs

Chris Campbell (Campbell), cbec, presented on preliminary model results to aid in screening potential actions at Moulton and Colusa Weirs. The facilitator solicited feedback on the proposed modeled overtopping notch flows for the Moulton and Colusa Weirs as follows:

- Moulton Weir
 - 3,000 cfs
 - 6,000 cfs
- Colusa Weir
 - 3,000 cfs
 - 6,000 cfs

In summary, the key takeaways for informing scenario development and modeling for the Advisory Committee included:

- Participants expressed concerns about the negative impacts to birds and costs to landowners of the 6,000 cfs overtopping notch flow at Moulton and Colusa Weirs.
- Landowners around Colusa Weir expressed concern that the recent 2,500 cfs overtopping notch flow caused too much damage and they wouldn't want to modify the weir to allow those flows more frequently.
- Participants were leaning towards modeling a lower set of overtopping notch flows at both Moulton and Colusa Weirs including: 1,000 cfs, 2,000 cfs, and 3,000 cfs.

Moulton and Colusa Weirs Notch Overflow

Best Practices

- We included floodplain-level notches in parts of the Hamilton City setback levee project. They activate when the bank becomes full and did not require extensive infrastructure to construct. Happy to discuss and show folks schematics as well as video/pictures of the notches in action from a couple weeks ago. [Ryan Luster, TNC (From Chat)]

Timing of Inundation

- Why is inundation from January 1st to March 1st when the river would not be high enough to utilize the notch until mid-January. [Getz, Ducks Unlimited]
 - The notch would be open from November 1st to March 1st, but the animation runs from January 1st to March 1st because that is when you get the most notch activation. However, it is correct that the water year from early November to early January is uneventful. [Technical Team]

Flow Travel Time as a Proxy for Fish Travel Time

- Suggested using water travel time as proxy for fish travel time. Proposed to consider this information to inform the proposal to model 3,000 and 6,000 cfs notch overtopping flows. How fast is the water moving from a fish perspective, and will it impact fish egress from the rice fields? [Matt Brown, USFWS]
 - That will be difficult to establish without building upon the hydrodynamic model. Other models will consider variables such as the optimal timing for fish in the system and how landscape conditions will or will not be conducive to fish wellbeing which can imply how quickly juvenile salmon and water is passing through the system. [Technical Team]
 - The model will predict water velocity and apply a habitat value given flow rate. [Technical Team]

Impacts to Birds

- With a 6,000 cfs notch overtopping flow, there is a larger footprint with a corresponding impact for waterfowl and shorebird habitats. Would like to see the habitat impact assessment for 3,000 and 6,000 cfs overtopping notch flow inundation scenarios and their impacts on birds. [Getz, Ducks Unlimited]

- Out of the proposed scenarios for 3,000 cfs and 6,000 cfs, it looked like 3,000 cfs notch overtopping flow had less negative impacts on birds from a water depth and velocity standpoint. Anywhere water is inundated beyond two feet is an issue for migratory birds. The Moulton Weir enters the basin at the Audubon Water Sanctuary where 50,000 to 100,000 waterfowl reside, and that area may get an increase of over two feet. Elevated water levels will also impact access to properties for hunting and management. [Craig Isola, USFWS]

Regulatory Challenges

- Most of the land being inundated under either flow scenario is under FWS easements. FWS would need to do a compatibility determination for higher inundation. It would be much easier if inundation was limited to 0.5 feet instead of 2 feet. [Isola, USFWS]
- From an easement management standpoint the easements are part of the refuge system, so if inundation were increased, compatibility determination would have to be conducted.

Proposed Overtopping Notch Flow

- If it is possible to get water on the land by October with a 1,000 cfs notch overtopping flow, how would that impact results? October inundation would be better for duck hunting. [Roger Swanson, Wild Goose Club]
 - We don't see much opportunity for inundation in October because there is relatively little precipitation and the river flows are not high enough to overtop the weirs even at a 1,000 cfs notch. [Technical Team]

Colusa Basin

Campbell presented preliminary scenarios for Colusa Basin and solicited feedback on the following questions to guide the scenario development for Colusa Basin

- Is it physically possible to accommodate volitional ingress/egress on the adjoining floodplain if juvenile salmon were introduced to the basin?
- Should juvenile salmon access into Colusa Basin be considered?

In summary, the key takeaways from participants' feedback included:

- Concern about reintroducing juvenile salmon to the Colusa Basin due to tradeoffs between salmon and birds, concern about the feasibility of managing volitional ingress and egress.
- Recognition that deliberately reintroducing salmon back into the Colusa Basin would be a paradigm shift in approach which has been to exclude fish.
- Riparian function that could benefit salmon could be provided by the managed river system by allowing the river to interact with the floodplain through specific points. This would be different from historic floodplain function which inundated land through increased stage and flooding of sloughs.
- Consideration of the physical engineering feasibility of reintroducing salmon to Colusa Basin as separate from whether salmon would benefit from being reintroduced.

Participants provided the following specific feedback:

Volitional Ingress and Egress

- When we talk about volitional ingress and egress in these scenarios, we are talking about giving fish ingress to areas by going over the tops of berms at the proposed water levels. Are you holding the water depths above berm height to give them volitional egress? How are they getting out? [Getz, Ducks Unlimited]
 - Under steady state scenarios the water level would be held above the berm height, and fish would have access to the outlet weirs on the field structures. [Technical Team]
 - It is important to note that the current model is simply steady states such that the value of flow through the Colusa drainage impacts the level of fields in the system.
 - Is there a way to bring fish onto the field through the inlet structure and enable egress through the outlet structure? [Getz, Ducks Unlimited]
 - The reason we looked at overtopping is because that is incorporated into the connectivity criteria within the juvenile rearing suitability criteria. The issue with managed lands is that juveniles can't get access through drainage structures as water backs up across parcels and it requires water to spread across the landscape which is why a focus was applied to overtopping. [Technical Team]
- Is it assumed that a single or multiple outlet structure(s) service fields? For hydraulic modeling purposes it's probably not an issue, but hydraulic connectivity and outlet geometries and layouts across the managed field landscape would be necessary to address Virginia's point of discussion. [Marine, ARCS / Consultant to RD 108 (From Chat)]

Water Source

- Where is the water coming from in these scenarios? Overbanking river water? Separate diversion? [Brown, USFWS]
 - Since the basin is separated from the Sacramento River it would require a new diversion. If Canal 14-A were used, then the water would be delivered at the bottom end of the managed footprint. Knights Landing Outfall Gates (KLOG) Canal would not work because the gates are at the bottom of the structures and juvenile fish are at the top of the water column. Thus, the model considers what could be done if operations were managed at bottom of the system and if volitional access could be enabled on the managed lands. This approach is theoretically possible, but also impacts land management. [Technical Team]
- Reintroducing Salmon into Colusa Basin, Leimbach, K&W – We have heard concern from other groups about bringing juvenile salmon into this part of the system.
 - Concerns about fish entrainment persist. [Brown, USFWS]
- Is it correct to say that, historically, the Sacramento River would overflow, and fish would access the land? [Program Team]

- It is not likely that this habitat was used by fish, and environmental conditions in the Sutter Bypass and Butte Sink are preferable for fish. [Brown, USFWS]
- The floodplain is highly constructed today and often constrained behind riparian levees. The river would not usually interact with the floodplain through specific points, but it would inundate land through increased stage and flooding of sloughs. The juvenile salmon would have used riparian floodplain areas on the west side. This is not to say that managed landscapes could not provide part of that riparian function. [Marine, ARCS / Consultant to RD 108]
- Holly Dawley, KSN, noted the challenges that come with the broad scale of development in the Colusa Basin. However, presentations shared during the meeting shed light on possible actions.

Adjourn

Leimbach thanked attendees and adjourned the meeting.

Participants

Ad Hoc Group Participants	
Affiliation	Name(s)
California Department of Fish and Wildlife (CDFW)	Mike Healey
Department of Water Resources (DWR)	Jesus Esparza Lori Clamurro Chew
Ducks Unlimited	Mark Petrie Virginia Getz
FlowWest	Mark Tompkins
National Marine Fisheries Service (NMFS)	Ally Bosworth Ellen McBride
River Partners	Julie Rentner Torey Byington
The Nature Conservancy	Ryan Luster
U.S. Fish and Wildlife Service (USFWS)	Craig Isola Jacob Byers Jeff Beauchamp Jim Earley Matt Brown
Wild Goose Club	Roger Swanson

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

cbec	Chris Campbell Scott Wright John Stofleth Jenna Duffin Jesse Rowles
Cramer Fish Sciences	Steve Zeug
Kearns & West (K&W)	Julie Leimbach Bethany Taylor Eric Holmes Karis Johnston
Kjeldsen Sinnock Neudeck (KSN)	Holly Dawley Barry O'Regan
Reclamation District (RD) 108	Lewis Bair
San Francisco Estuary Institute (SFEI)	Bronwen Stanford Kelly Iknayan