Sites Project Fishery Group Discussion No. 4

September 1, 2022

Agenda

- Group Norms
- Diversion Criteria Update
- Exchanges Update
- Modeling Update
- Schedule
- Open Topics
- Adjourn

Group Norms

- Encourage everyone to be on video
- Mute yourself when others are speaking
- Respectful, professional dialogue
- Ask questions throughout, lets have a dialogue
  - Let the speaker finish their point
  - Use the raise your hand function in Teams if needed

Diversion Criteria

John Spranza

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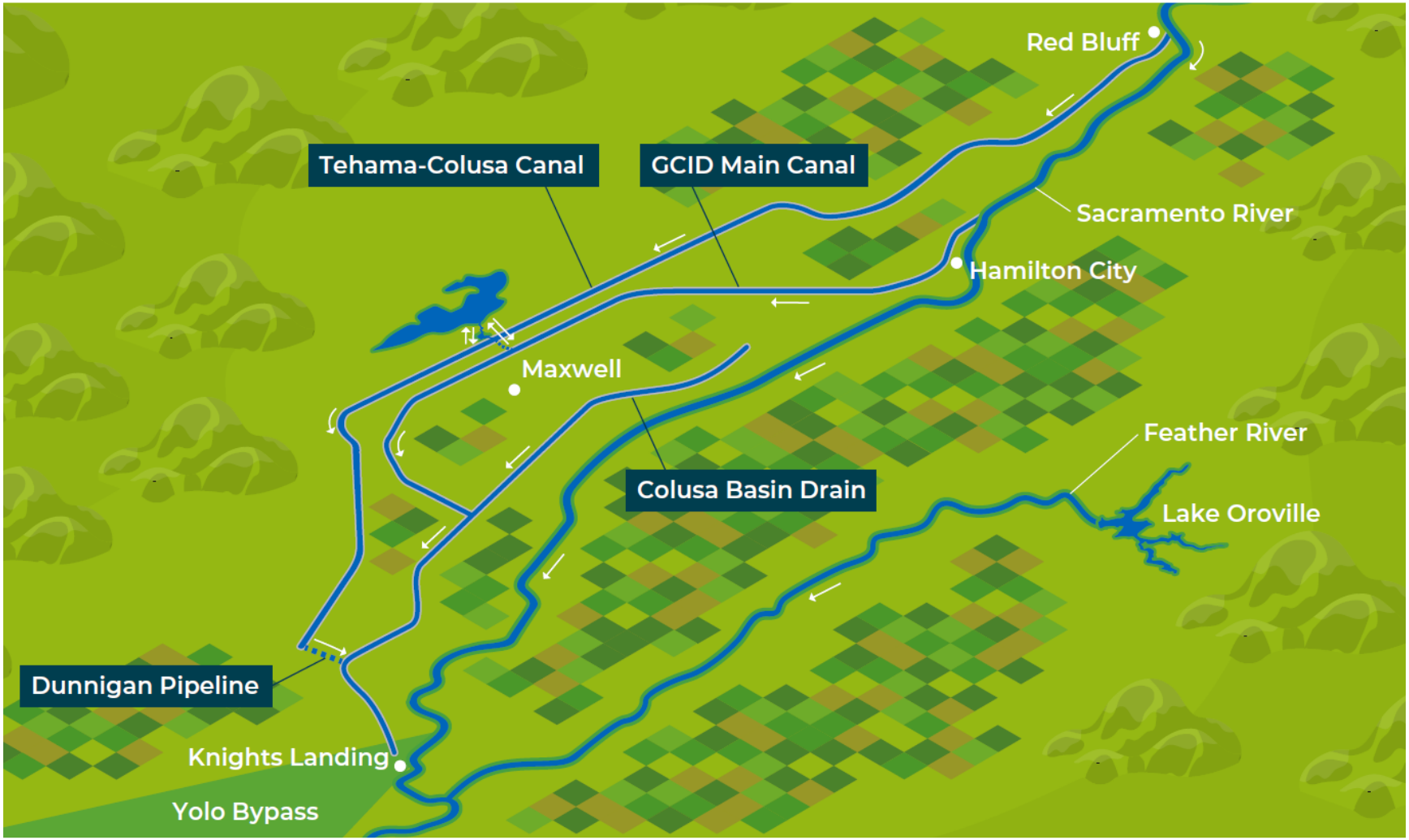
Project Water Operations



Alternatives Considered in the Revised Draft EIR/Supplemental Draft EIS

Facilities / Operations	Alternative 1	Alternative 2	Alternative 3
Reservoir Size	1.5 MAF	1.3 MAF	1.5 MAF
Hydropower	Incidental upon release	Same as Alt 1	Same as Alt 1
Diversion Locations	Red Bluff Pumping Plant and Hamilton City	Same as Alt 1	Same as Alt 1
Conveyance Release / Dunnigan Release	1,000 cubic feet per second (cfs) into new Dunnigan Pipeline to Colusa Basin Drain	1,000 cfs into new Dunnigan Pipeline to Sacramento River. Partial release into the Colusa Basin Drain	Same as Alt 1
Reclamation Involvement	1. Funding Partner 2. Operational Exchanges a. Within Year Exchanges b. Real-time Exchanges	Operational Exchanges a. Within Year Exchanges b. Real-time Exchanges	Same as Alt 1**, but up to 25% investment**
DWR Involvement	Operational Exchanges with Oroville and storage in SWP facilities South-of-Delta	Same as Alt 1	Same as Alt 1
Route to West Side of Reservoir	Bridge across reservoir	Paved road around southern end of reservoir	Same as Alt 1

Sites Diversion Criteria Evolution

	2017 Draft EIR/EIS	2021 RDEIR/SDEIS	2022 Final EIR/EIS
Bend Bridge Pulse Protection	Protection of all qualified precipitation-generated pulse events (i.e., peaks in river flow rather than scheduled operational events) from October to May based on the detection of fish presence and migration during the beginning of the flow event. For each event where fish presence and migration is detected, diversions would cease for 7 days	Same as 2017 DEIR/EIS	Similar except the following: (1) a qualified precipitation-generated pulse event is determined based on forecasted flows and (2) pulse protection may cease earlier than 7 days if flows at Bend Bridge exceed 29,000 cfs and Project diversions subtracted from Bend Bridge flows continue to be at least 25,000 cfs.
Minimum Bypass Flows at Wilkins Slough	Diversions allowed when flows below Wilkins Slough are above 5,000 cfs	10,700 cfs in March through May; 5,000 cfs all other times as mitigation measure	10,700 cfs October through June; 5,000 cfs September. Moved to Project Description
Minimum Bypass Flows in the Sacramento River	3,250 at RBDD and 4,000 cfs at Hamilton City; rate of diversion controlled by fish screen designs	No change	No change

Sites Diversion Criteria Evolution

	2017 Draft EIR/EIS	2021 RDEIR/SDEIS	2022 Final EIR/SEIR
Fremont Weir Notch Protections	No specific criteria	No more than 1% reduction in flow over weir when spill over the weir are less than 600 cfs. No more than a 10% reduction in flow over weir when spills over the weir are between 600 cfs and 6,000 cfs.	No longer included. Revised minimum bypass flows in the Sacramento River at Wilkins Slough and Bend Bridge Pulse Protection provide protections for Fremont Weir Notch
Sacramento River Fully Appropriated Stream and Delta Conditions	No specific criteria	Diversions allowed only when the Sacramento River is not fully appropriated (September 1 through June 14) and when Delta is in excess conditions as determined by DWR	No change
Freeport, Net Delta Outflow Index, X2, and Delta Water Quality	Diversions only be allowed when a Sacramento River flow of 15,000 cfs is present at Freeport in January; 13,000 cfs in December and February through June; and 11,000 cfs in other months.	Operations consistent with all applicable laws, regulations, biological opinions and incidental take permits, and court orders in place at the time that diversion occurs	No change

Exchanges

Steve Micko

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Operations Overview

- Diversions
  - Red Bluff Pumping Plant
  - Hamilton City Pump Station
- Releases
  - TC Canal
  - GCID Canal
  - North Delta (Yolo Bypass)
  - South of Delta
- **Exchanges**
  - **Reclamation**
  - **DWR**
- Exports through the Delta

Shasta Exchanges

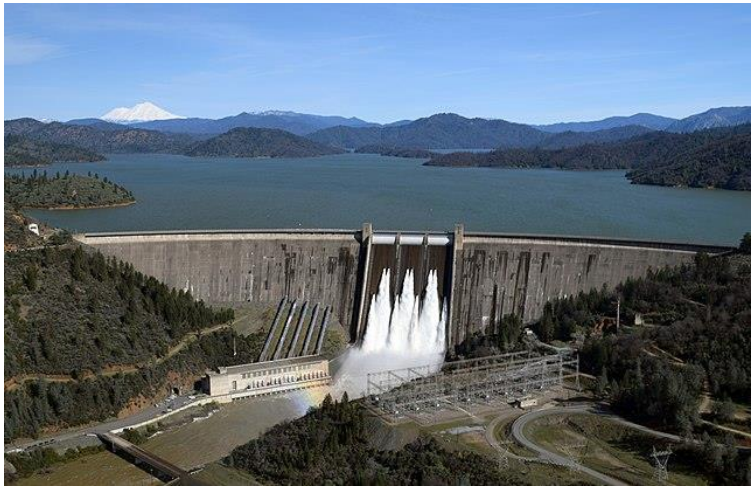
- Previous Modeling Focus:
  - Sites-Shasta exchanges focused on improving Shasta cold water pool management and incidentally improved Fall Flow Stability
- Revised Modeling Focus:
  - Shasta exchanges support Shasta cold water pool management, Fall Flow Stability and Spring Pulse Flow actions

Shasta Exchanges – Cold Water Pool Modeling Criteria

Criteria	RDEIR/SDEIS	Final EIR/EIS
Period	Dry: Apr – Jun Critical: Apr – May	Dry: Apr – Jun Critical: Apr – Jun
Water year types	Dry and Critical water years	Dry and Critical water years
Temperature Management Tier	Tier 2, 3 and 4 years	Tier 3 and 4 years
Min. flow at Sacramento River at Keswick	Apr – May: 6,000 cfs Jun: 10,000 cfs	No criteria
Temperature Criteria	Apr – Jun: Tiers 2 and 3: 53.5 deg F Tier 4: 56 deg F	No criteria
Sacramento Valley Conditions	Only occurs during Balanced conditions	Only occurs during Balanced conditions

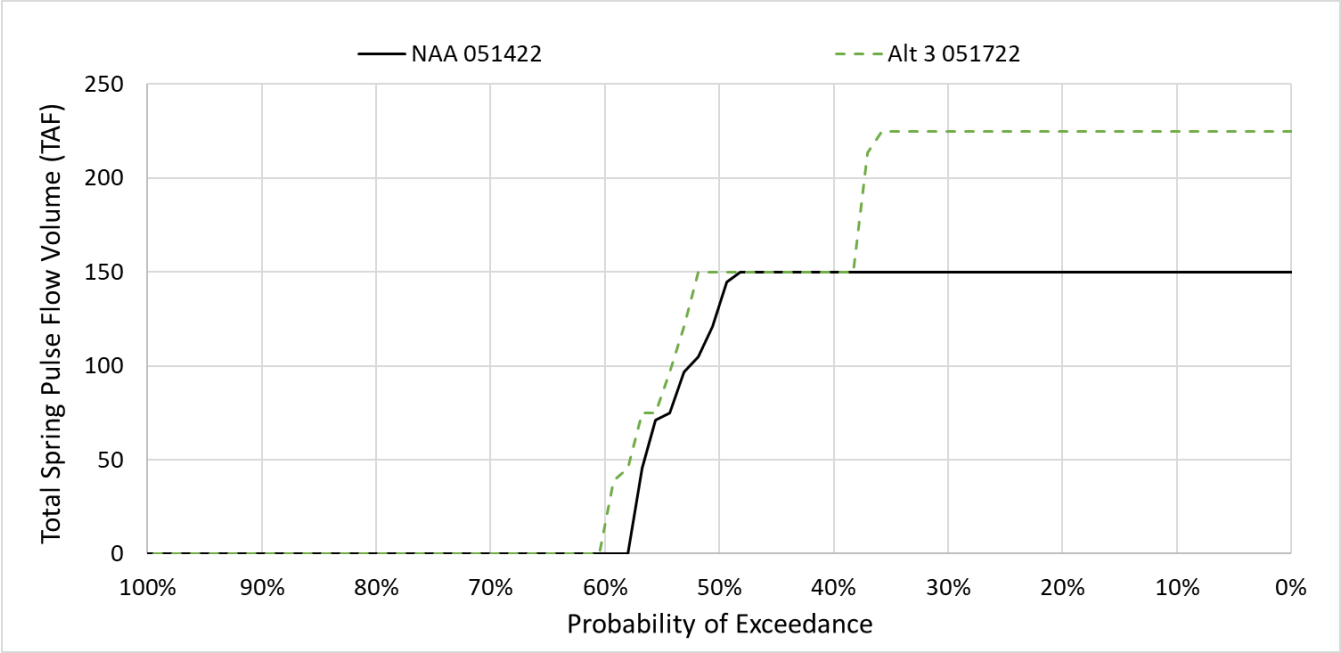
Shasta Exchanges – Fall Flow Stability Modeling Criteria

- Additional Fall Flow Stability may occur:
  - Between October through February
  - Sites storage is greater than 80% at the end of May
  - Previous month Shasta storage is greater than 3.2 MAF
  - Fall stability flows are already active



Shasta Exchanges – Spring Pulse Modeling Criteria

- Additional Spring Pulse may occur in May:
  - Sites storage is greater than 80% at the end of April
  - End of April Shasta storage is greater than 4.1 MAF



Modeling Update

Steve Micko

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Modeling Update – Diversions and Releases

Parameter	Version	Alt 1 A		Alt 1B		Alt 2		Alt 3	
		Avg	D & C	Avg	D & C	Avg	D & C	Avg	D & C
Fills (TAF)	RDEIR/ SDEIS	240	101	255	104	229	99	279	105
	FEIR/EIS	236	98	246	96	229	98	276	103
Releases (TAF)	RDEIR/ SDEIS	217	402	234	404	209	374	260	383
	FEIR/EIS	208	361	221	372	205	345	256	369

D&C = Dry and critical years

Modeling Update – Change in End of September Storage

Change in End of Sept Storage (TAF)	Version	Alt 1 A		Alt 1B		Alt 2		Alt 3	
		Avg	D & C	Avg	D & C	Avg	D & C	Avg	D & C
Shasta	RDEIR/ SDEIS	12	23	28	39	10	18	73	107
	FEIR/EIS	20	26	36	51	21	27	102	135
Oroville	RDEIR/ SDEIS	13	24	12	21	12	19	13	15
	FEIR/EIS	14	34	12	37	13	31	11	30
Folsom	RDEIR/ SDEIS	3	5	9	12	5	9	24	21
	FEIR/EIS	1	1	2	3	1	3	11	4

D&C = Dry and critical years

Modeling Update – NMFS Lifecycle Model

- Requests to run Winter-run Lifecycle Model
  - NMFS
    - RDEIR/SDEIS comments
    - Biological Opinion analysis
  - CDFW
    - RDEIR/SDEIS comments
    - Operations ITP analysis
  - USEPA
    - RDEIR/SDEIS comments

Winter-run Lifecycle Model

- Evaluates the effects of water operations on the population dynamics of Sacramento River winter-run Chinook salmon
  - Integrate effects across entire life-cycle and multiple environmental conditions
  - Sacramento River focused
- Will inform the Authority's state and federal ESA permits
  - Initial results expected in late September
- Includes the lifecycle model and a series of sub-models

Schedule

John Spranza

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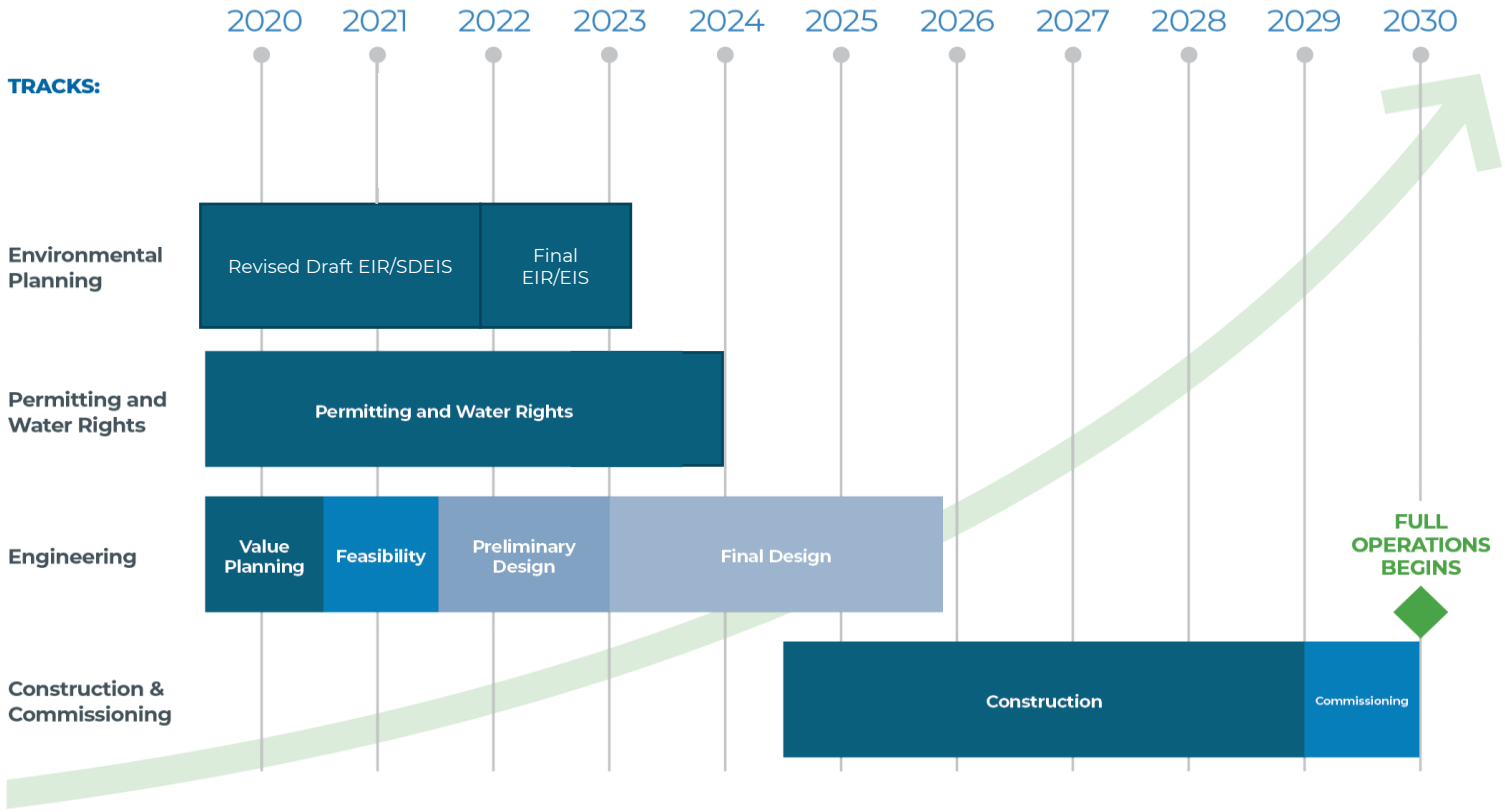
Project Schedule

Sites Reservoir Project Schedule



Permitting Schedule

- State ESA Incidental Take Permit (ITP) – Construction
  - Application submitted Jan 2022
- State ESA Incidental Take Permit (ITP) – Operations
  - Application complete Q3 2022
- Biological Assessment
  - Expected to be submitted to agencies in October or November
- Water Right
  - Submitted Application in May 2022, accepted August 26
- Final EIR/EIS
  - February 2023

Open Topics and Agenda for Next Meeting

Thank you!

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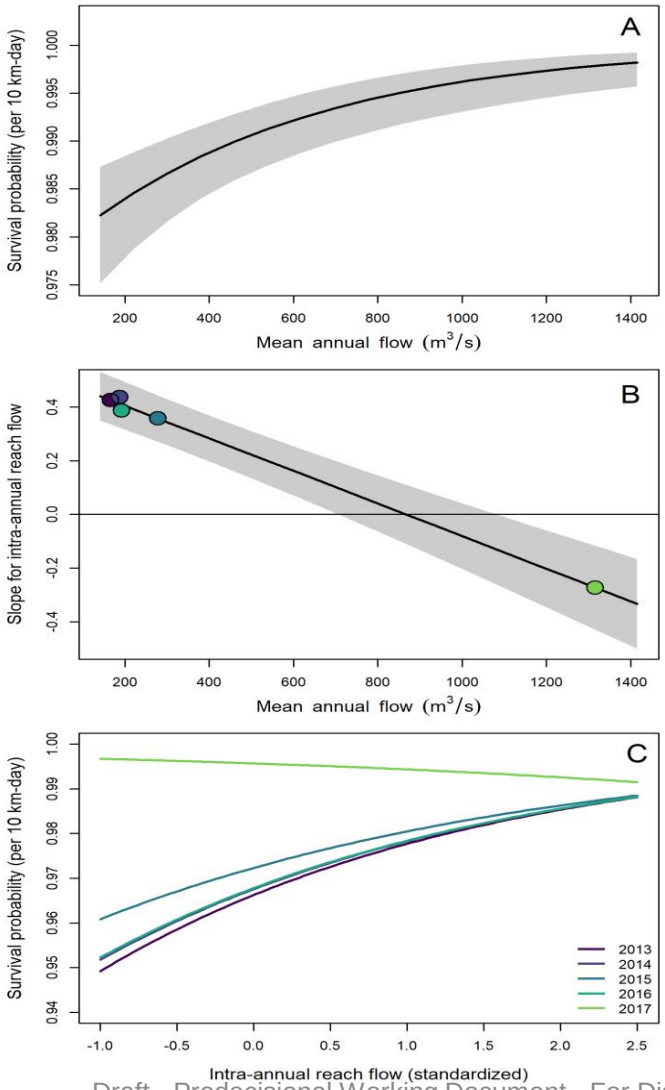
Riverscape Level – Hassrick et al. (2021)



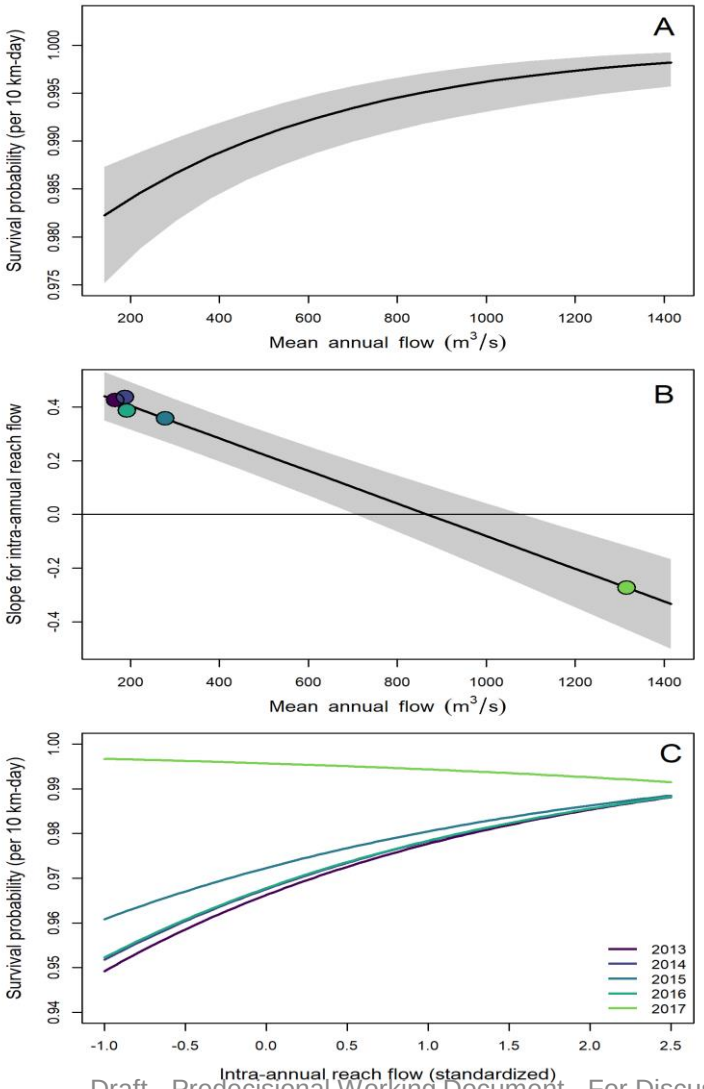
ed regions in panels A and B show 95% confidence intervals

A. Survival as a function of mean annual flow

B. Slope coefficient for intra-annual reach flow as a function of mean annual flow.

C. Combined mean annual flow and intra-annual reach flow on predicted survival

Riverscape Level – Hassrick et al. (2021)



- Figure 8b describes how the slope of the intra-annual reach flow-survival relationship changes with mean annual flow.
- This relationship can be used by managers to determine at a given level of annual flow, whether a flow pulse is likely to produce a measurable effect on survival.
- For example, when flow is less than about 700 m3 s-1, given the confidence interval, pulse flows will have a high probability of having a positive effect on survival.
- The relationship also indicates what the magnitude of the effect may be. For example, when mean annual flow is 600 m3 s-1, a pulse flow is going to have half the effect of a pulse event when mean annual flow is 200 m3 s-1.

Shaded regions show 95% confidence intervals

Diversion Criteria Update – Wilkins Slough

- Continuing discussions with CDFW and aquatics team identified further refinement
  - Wilkins Slough Bypass Flows = 10,700 cfs Oct-June; 5,000 cfs September
- Provides increased protection for anadromous species, Delta outflow and water quality
- Criteria have not yet been “approved” by the Authority Board
  - Board will consider the diversion criteria when permit applications are brought before them in March
  - Want to see and consider comments on RDEIR/SDEIS before “approving”

Diversion Criteria Update – Fremont Weir

- Greater bypass flows and pulse protection contribute to minimal effects on the Big Notch goals
  - Sites' modeling
  - TUFLOW modeling from DWR/CDFW
- Further analysis will refine the understanding of the Project's interaction with Notch Project and weir
  - Updated CalSim
  - Revised TUFLOW

Diversion Criteria Update – Pulse Protect

The following criteria, together, define a qualified pulse event:

- An outmigration pulse of anadromous fish is detected based on the Project's fish monitoring program ; and
- If a 3-day forecasted average of Sacramento River flow at Bend Bridge is projected to exceed 8,000 cfs and the 3-day forecasted average combined tributary flow upstream of Bend Bridge (Cow Creek, Cottonwood Creek, and Battle Creek) is projected to exceed 2,500 cfs, then a pulse protection event is initiated and diversion restrictions would begin when the average hourly flows in the Sacramento River at Bend Bridge exceeds 8,000 cfs and the average hourly flows in the tributaries upstream of Bend Bridge (Cow Creek, Cottonwood Creek, and Battle Creek) cumulatively exceed 2,500 cfs, provided that the previous day was not already in a pulse protection event.

A pulse event terminates on either of the following:

- 7 days after initiation; or
- Earlier than 7 days after initiation if the average daily Sacramento River flow at Bend Bridge exceeds 29,000 cfs. In the event that Sacramento River flow at Bend Bridge exceeds 29,000 cfs during the 7-day pulse protection event, Project diversions may resume in such way that average daily diversions subtracted from Sacramento River flow at Bend Bridge continues to be at least 25,000 cfs during what would have been the 7-day pulse protection period.

After completion of a pulse protection event, the following conditions must occur before another pulse protection event is triggered: (1) 3-day trailing average of Sacramento River flow at Bend Bridge was less than 7,500 cfs for 7 consecutive days; and (2) 3-day trailing average of tributary flow upstream of Bend Bridge (Cow Creek, Cottonwood Creek, and Battle Creek) was less than 2,500 cfs for 7 consecutive days.

Diversions are otherwise unrestricted by the Bend Bridge Pulse Flow protection criteria

Proposed Revised Diversion Criteria

Criteria	Purpose	Description
Bend Bridge Pulse Protection	Survival of emigrating juvenile salmon	• Each pulse protected • "Reset" to differentiate between pulses • **A focus point for Adaptive Management**
Wilkins Slough Bypass Flow	Facilitate salmonid smolt outmigration	• **10,700 cfs in Oct – June** • 5,000 cfs September
Fremont Weir Notch Criteria	Protect Notch project objectives	• **No specific criteria. Protected through higher Wilkins Slough Bypass Flows and Pulse Protection** • **A focus point for Adaptive Management considering what is learned through Big Notch Project**

No changes to other criteria