# Water Quality Group Discussion Agenda

Affordable Water, Sustainably Managed

***Our Core Values – Safety, Trust and Integrity, Respect for Local Communities, Environmental Stewardship, Shared Responsibility and Shared Benefits, Accountability and Transparency, Proactive Innovation, Diversity and Inclusivity***
***Our Commitment – To live up to these values in everything we do***

## Meeting Information:

| | | | |
|---|---|---|---|
| **Date:** | April 29, 2021 | **Location:** | Microsoft Teams<br>Or call in (audio only)<br>(833) 255-2803,,156125785# |
| **Start Time:** | 2:00 p.m. | **Finish Time:** | 3:00 p.m. |
| **Purpose:** | Overview and discussion of the Sites Project's aquatic modeling and EIR/S analysis approach | | |

## Meeting Invitees:

| | | |
|---|---|---|
| André Sanchez | Rebecca Wu | Laurie Warner Herson |
| Dave Zelinski | Regina Chichizola | Jason Hassrick |
| Debra Lucero | Ron Stork | Jim Lecky |
| Doug Obegi | Stephanie Gordon | Marin Greenwood |
| Greg Reis | Suzanne Manugian | Melissa Dekar |
| Jerry Boles | Tom Stokely | Mike Hendrick |
| Jim Brobeck | Ali Forsythe | Natalie Wolder |
| Joe Morgan | Dan Deeds | Nicole Williams |
| Rachel Zwillinger | Erin Heydinger | Steve Micko |
| | John Spranza | Vanessa King |

## Agenda:

| Discussion Topic | Topic Leader | Time Allotted |
|---|---|---|
| 1. Introductions | John | 5 mins |
| 2. Approach to Meetings | John | 5 mins |
| 3. Proposed Project | John | 5 min |
| 4. Overview of Operations | Ali | 10 min |
| 5. Modeling and Baseline<br>a. Models used and how applied | Steve Miko | 25 mins |
| 6. Schedule and Future Meeting Topics | John/Group | 10 mins |
| 7. Adjourn | | |

# Sites Project Fishery Group Discussion

April 29, 2021

Sites

# Agenda

1. Introductions
2. Approach to Meetings
3. Group Norms
4. Preferred Project
5. Overview of Project Operations
6. Modeling and Baseline
    1. Baseline
    2. Models and how they were used
7. Schedule and Future Meeting Topics

# Approach to Fisheries Meetings

- Many diverse questions spanning aquatic system
- Sequential meetings
  - First meeting – Operations, modeling and baseline
  - Second meeting – Diversion effects above Delta
  - Third meeting – Diversion effects in the Delta
- No effects today, but will take topics for future meetings not already provided
- As always, questions on today’s material are welcome

# 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
- Topics for next meeting will be recorded and discussed at that meeting

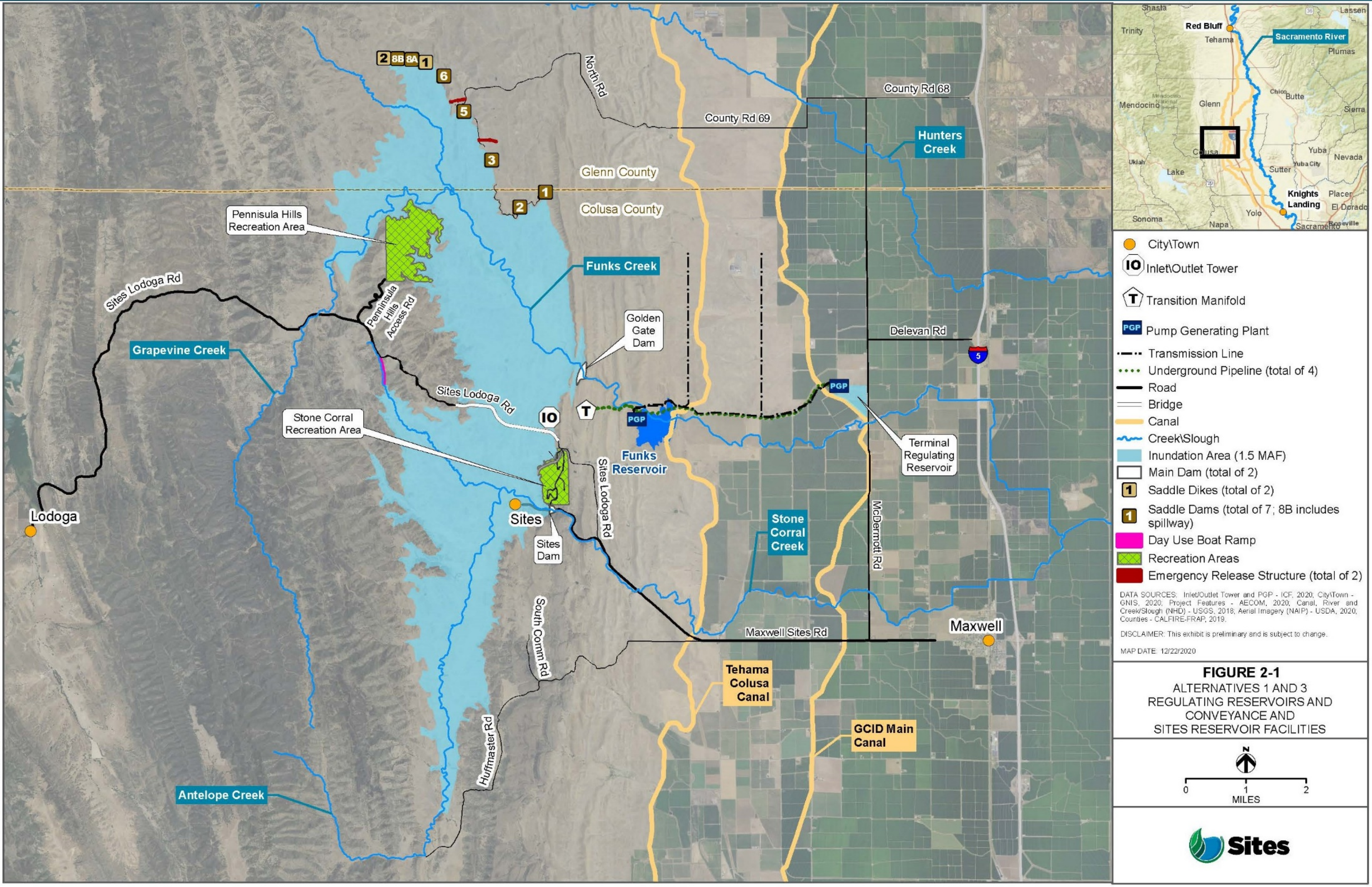
# Preferred Project

Sites

# Major Revisions to Project

- Reservoir size reduced from 1.8 MAF to 1.5 MAF
- No Delevan diversion, pipeline or outfall
  - Utilize existing facilities at Red Bluff and Hamilton City pumping plants
  - Releases to Tehama-Colusa Canal to the Colusa Basin Drain
  - New 1,000 cfs pipeline and release near Dunnigan
  - Alternative 2: a new 1,000 cfs outfall to Sacramento River near Tyndall Landing
- Max diversion rate reduced from 5,900 cfs to 3,900 cfs
- Releases reduced from 1,500 cfs to 1,000 cfs

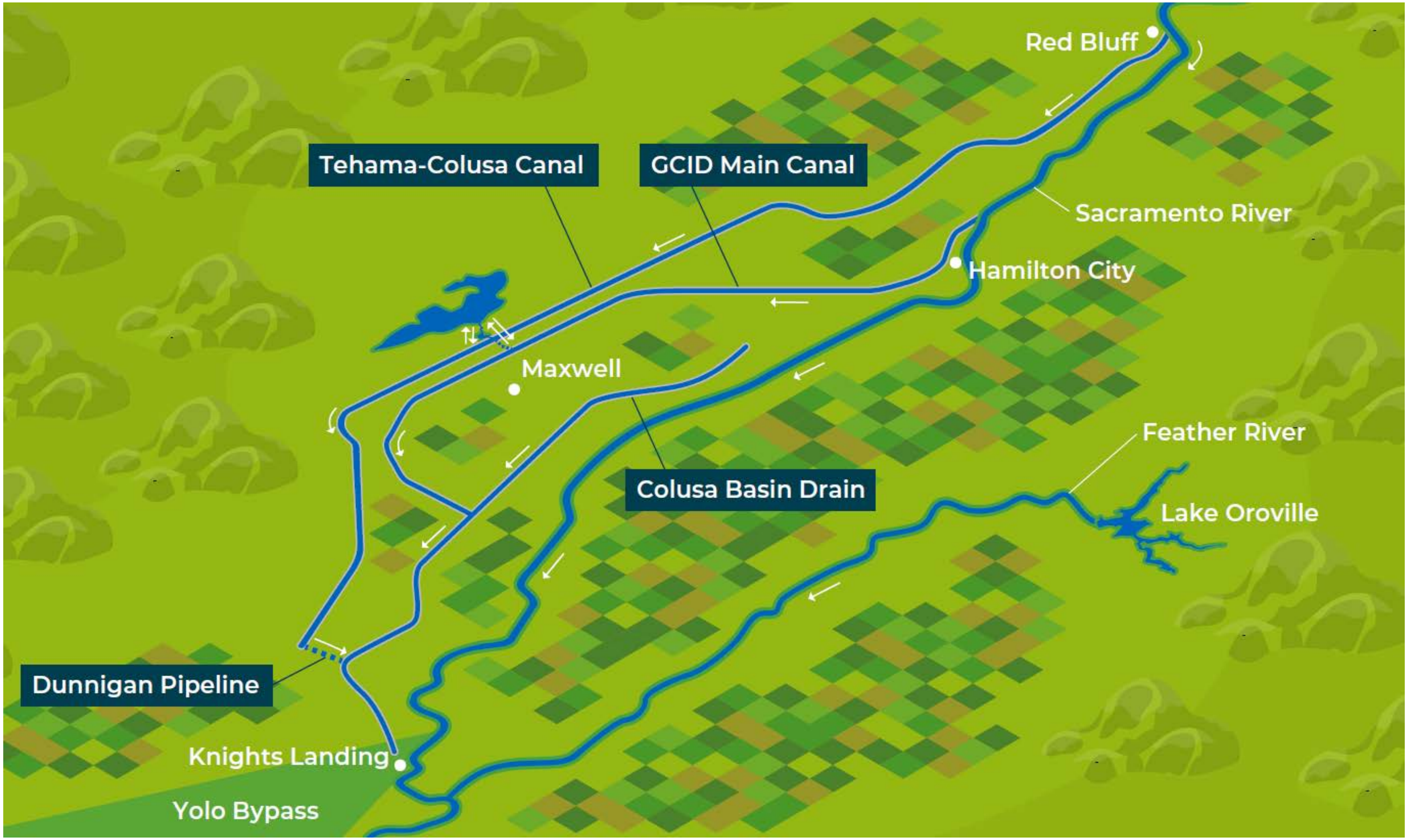
# Alt 1 – Preferred Project



# Alt 1 – Preferred Project

# Overview of Project Operations

# Project Water Operations



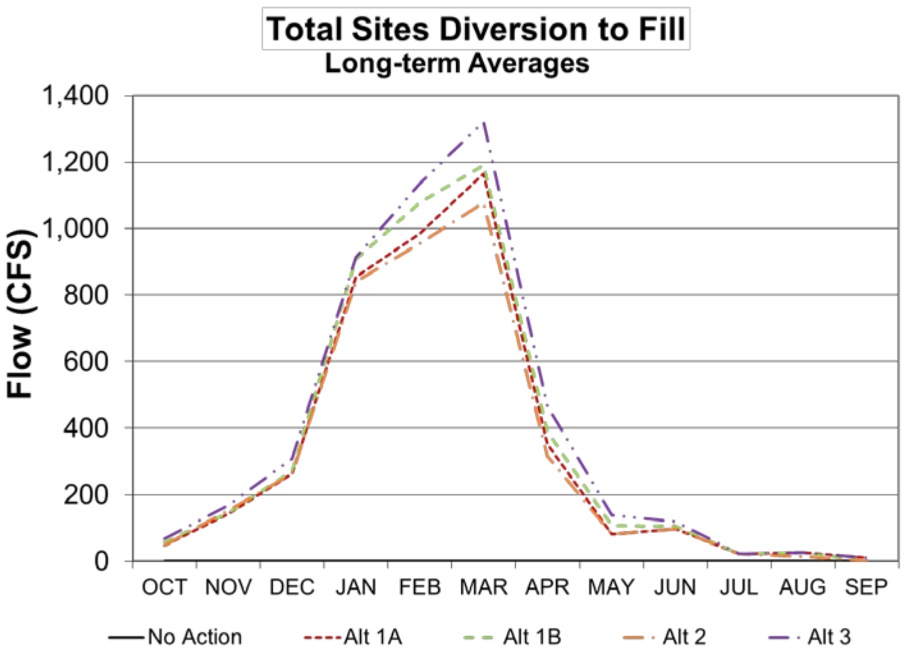
# Operations Project Description

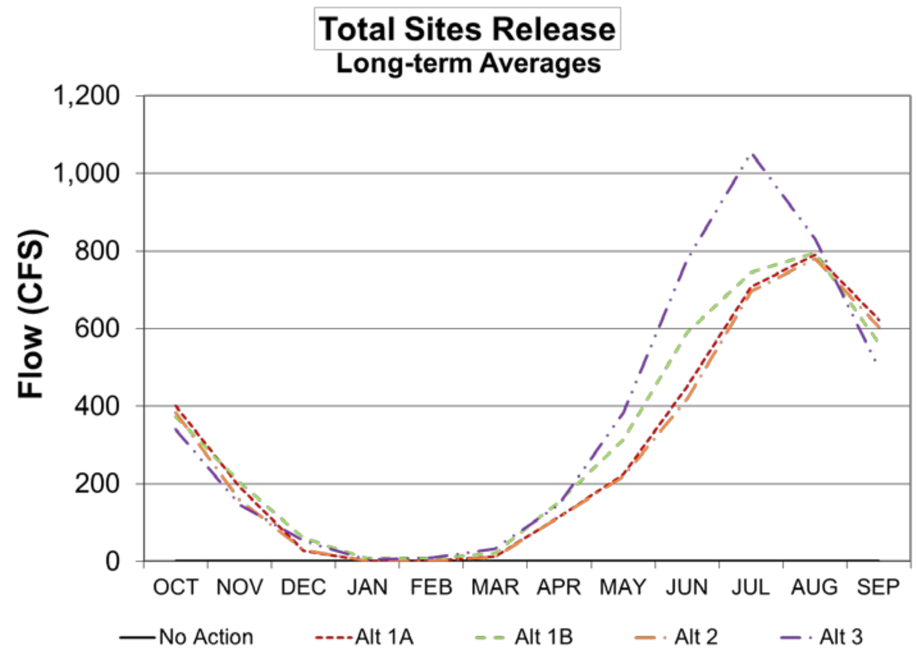
- Operational Criteria
  - Junior diverter – Diverting after all senior water rights and water quality and flow requirement are met
  - Diverting during “excess conditions” (as determined by Reclamation and DWR)
  - Diversion locations in priority:
    1. Red Bluff Pumping Plant into the Tehama-Colusa Canal
       - Up to 2,100 cfs diversion for Sites (plus losses), subject to other uses
    2. Hamilton City Pump Station into the GCID Main Canal
       - Up to 1,800 cfs diversion for Sites (plus losses), subject to other uses
  - Diversions when Sacramento River not fully appropriated (September 1 to June 15)

# Operations Project Description (cont.)

- Diversion Criteria
  - Pulse flow protection implemented at Bend Bridge:
    - Each pulse protected (previously protected one pulse per month)
    - Pulse “reset” to differentiate between pulses
  - Wilkins Slough Bypass flow requirements:
    - 8,000 cfs April/May
    - 5,000 cfs all other months
  - Fremont Weir Notch:
    - Objective is to limit changes to frequency and duration
    - Model:
      - First 600 cfs held to 1% change
      - 600 – 6,000 cfs held within 10%
      - No restriction above 6,000 cfs

# Diversions and Releases



# Modeling and Baseline

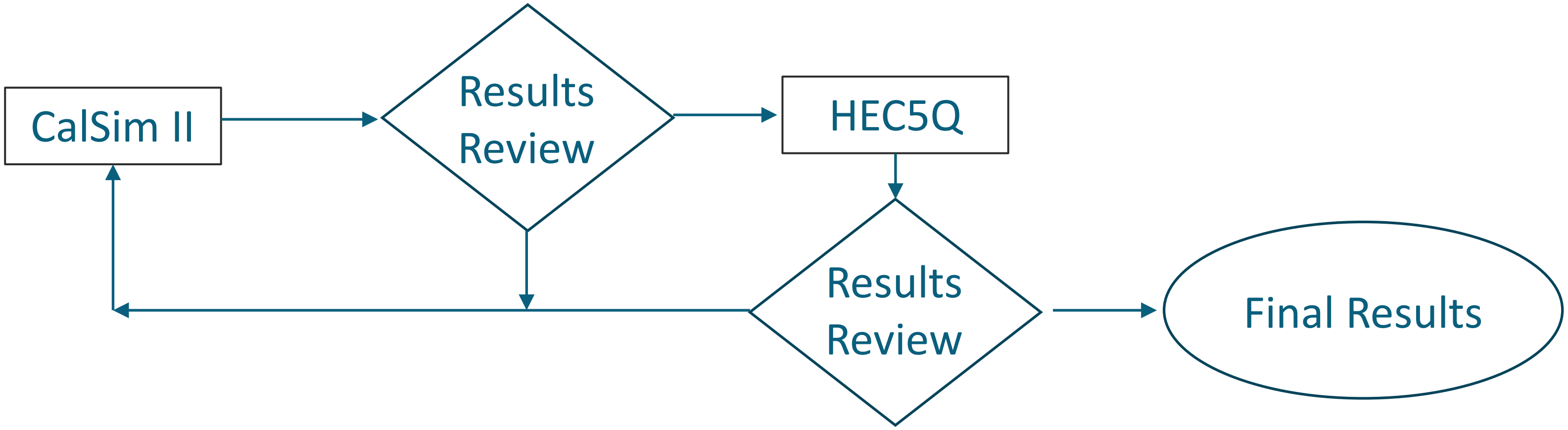
Sites

# Baseline

- 2020 Benchmark CalSim II Model
  - Existing conditions
  - 2019 BiOps and 2020 SWP ITP
- Developed by Reclamation in coordination with DWR and CDFW
- All baseline actions preserved in alternatives evaluated in Revised Draft EIR/Supplemental Draft EIS

# Modeling Framework

- Develop operations in CalSim II
- Inform secondary models with CalSim II results
- Update CalSim II based on analysis of:
  - CalSim II results
  - Secondary model results



# CalSim II Model

- Monthly hydrologic operations model
- Developed and maintained by Reclamation and DWR
- Simulates operations of CVP and SWP over a range of hydrologic conditions
- Allows for specification and achievement of user-specified allocation targets

# DSM2

- 1-Dimensional Hydrodynamic Model of the Sacramento – San Joaquin River Delta
- Developed by DWR
- Inputs are informed with CalSim II results
- DSM2 Modules:
  - HYDRO: Hydrodynamics
  - QUAL: Water Quality
- Informs aquatics models

# HEC5Q

- 1-Dimensional reservoir operation, routing and temperature model
- Sacramento and American Rivers
- Inputs are informed with CalSim II results
- Considers reservoir operations, temperature control devices (TCDs) and meteorology
- Informs aquatics models

# Reclamation Temperature Model

- 1-Dimensional reservoir operation, routing and temperature model
- Feather River
- Inputs are informed with CalSim II results
- Considers reservoir operations and meteorology

# Winter-Run Early Life Stage Mortality

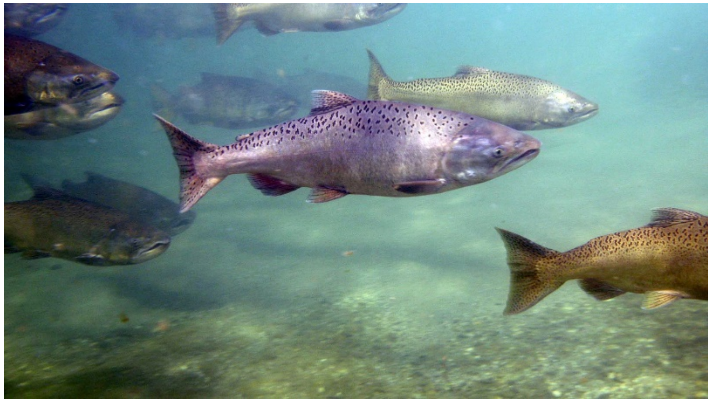
- Two methods:
  - Martin model: Considers temperature throughout redd's lifespan
  - Anderson model: Considers a 5-day "critical period" before hatching
- Relied upon for real-time operations
- Informed with results of HEC5Q model

# SALMOD

- Evaluates mortality as a function of flow and temperature
- Considers mortality at several stages of the life cycle
  - Spawning
  - Egg incubation
  - Alevins
- Not a life-cycle model
  - Assumes same number of female returning spawners each year
- Inputs are informed with results of HEC5Q model

# Additional Models

- IOS, conducted by Cramer Fish Sciences
- OBAN, conducted by QEDA
- Juvenile Chinook salmon flow-survival threshold analysis (Michel et al. 2021), conducted by ICF
- Various in-river and Bay-Delta species- and effect-specific analyses, conducted by ICF



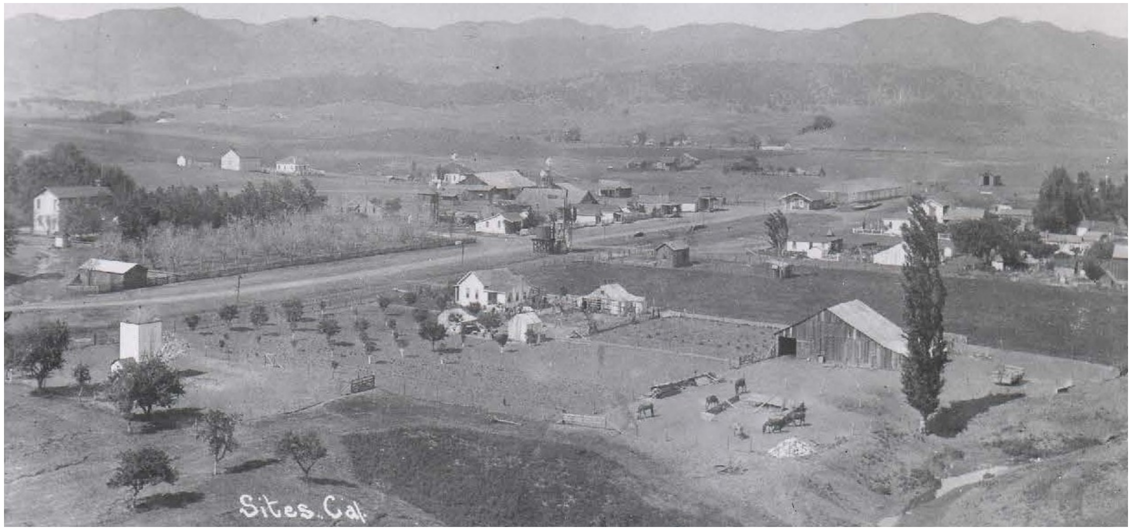
# Schedule and Next Meeting

# Schedule

- Summer 2021
  - Revised Draft EIR/Supplemental Draft EIS Released
- December 2021
  - Biological Assessment to Agencies
  - Submit State ITP Applications
- Spring 2022
  - Final EIR/EIS
- Spring 2023
  - All permits obtained
- Spring 2024 Construction Begins

# Additional Topics from the Group

- Any additional questions or thoughts?
- Topics for the next meeting?



# Action Items and Next Steps

# Thank you!

Sites

Sites

# Trinity River Small Group

## Follow up from Previous Meeting and Discussion of Possible Water Right Term

April 30, 2021

# Agenda

1. Introductions
2. Action Items and Follow up from Last Meeting
   a. AB 52 – Reconsider scope
   b. 1959 Contract “reasonably foreseeable”
   c. Discussion on 1959 Water Contract use
3. Discussion of Possible Water Rights Term
4. Action Items and Next Steps

# Action Items and Follow up from Last Meeting

- AB 52 – Reconsider scope
- 1959 Contract "reasonably foreseeable"
- Discussion on 1959 Water Contract use

# Water Right Approach and Possible Term

- Developing water right terms:
  - Implementable and under the control of the Sites Authority
  - Measurable, identifiable, reportable
  - Addresses the issue at hand
- Open to a term, but we believe that it should meet the criteria above

# Discussion of Possible Water Rights Term

- Preliminary discussion
- Any term would need to be approved by the Sites Board prior to submittal in the application

# Possible Water Rights Term

Trinity River water shall not be used to fill Sites Reservoir under this Permit unless the Trinity River Division of the Central Valley Project is releasing water to meet flood space regulatory requirements and all other diversion criteria in this Permit are met.

Furthermore, implementation of the Sites Project shall not change the Bureau of Reclamation's obligations in its Trinity River operations, including but not limited to the 1959 Contract Between the United States and Humboldt County, the Trinity River Mainstem Fishery Restoration Record of Decision, and the Long-Term Plan to Protect Adult Salmon in the Lower Klamath River Record of Decision.

# Action Items and Next Steps

# Thank you!

Sites

# Proposed Water Right Term from Humboldt County

Trinity River water shall not be used to fill Sites Reservoir unless the Trinity River Division of the Central Valley Project is releasing water as a result of storage conditions requiring "Safety of Dams" releases beyond normal operating plans and concurrently when Shasta Reservoir is making flood control releases.

Furthermore, Humboldt County's 1959 water contract with the Bureau of Reclamation, Trinity River Record of Decision (ROD) flows, and releases to implement the Bureau of Reclamation's Long-Term Plan to Protect Adult Salmon in the Lower Klamath River shall not be reduced or negatively impacted in any way as a result of any Sites Reservoir decisions, modeling, operational plans, and water right petitions.

# Group Norms

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- Ask questions throughout, lets have a dialogue
  - Let the speaker finish their point
  - Use the raise your hand function in Teams if needed
- Focus is on the Sites Project

# Water Quality Group Discussion Agenda

Sites
Affordable Water, Sustainably Managed

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***Our Commitment – To live up to these values in everything we do***

## Meeting Information:

| | | | |
|---|---|---|---|
| **Date:** | April 7, 2021 | **Location:** | Microsoft Teams<br>Or call in (audio only)<br>(833) 255-2803,,835461730# |
| **Start Time:** | 11:00 a.m. | **Finish Time:** | 12:00 p.m. |
| **Purpose:** | Overview and discussion of the Sites Project's water quality modeling and EIR/S analysis approach | | |

## Meeting Invitees:

| | | |
|---|---|---|
| André Sanchez | Rachel Zwillinger | Erin Heydinger |
| Dave Zelinski | Rebecca Wu | John Spranza |
| Debra Lucero | Regina Chichizola | Laurie Warner Herson |
| Doug Obegi | Ron Stork | Melissa Dekar |
| Greg Reis | Stephanie Gordon | Nicole Williams |
| Jerry Boles | Tom Stokely | Steve Micko |
| Jim Brobeck | Ali Forsythe | Vanessa King |
| | Anne Huber | |

## Agenda:

| Discussion Topic | Topic Leader | Time Allotted |
|---|---|---|
| 1. Introductions | John | 5 mins |
| 2. Group Norms<br>a. Approach to Meetings | John | 5 mins |
| 3. Approach to Analysis<br>a. Quantitative<br>b. Qualitative | Steve, Anne, Nicole | 15 min |
| 4. Source Water<br>a. Operations<br>b. Data Sources<br>c. Example Data | Anne | 20 mins |
| 5. Schedule and Future Meeting Topics | John/Group | 10 mins |

| | | |
|---|---|---|
| 6. Action Items and Next Steps | All | 5 mins |

# Sites Project Water Quality Group Discussion

April 7, 2021

Sites

# Agenda

1. Introductions
2. Group Norms
3. Preferred Project
4. Approach to Analysis
   a. Qualitative
   b. Quantitative
5. Source Water
   a. Operations
   b. Data Sources
   c. Example Data
6. Schedule and Future Meeting Topics
7. Action Items and Next Steps

# Group Norms

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# Sites’Preferred Project

# Major Revisions to Project

- Reservoir size reduced from 1.8 MAF to 1.5 MAF
- No Delevan diversion, pipeline or outfall
  - Utilize existing at Red Bluff and Hamilton City pumping plants
  - Releases to Tehama-Colusa Canal to the Colusa Basin Drain
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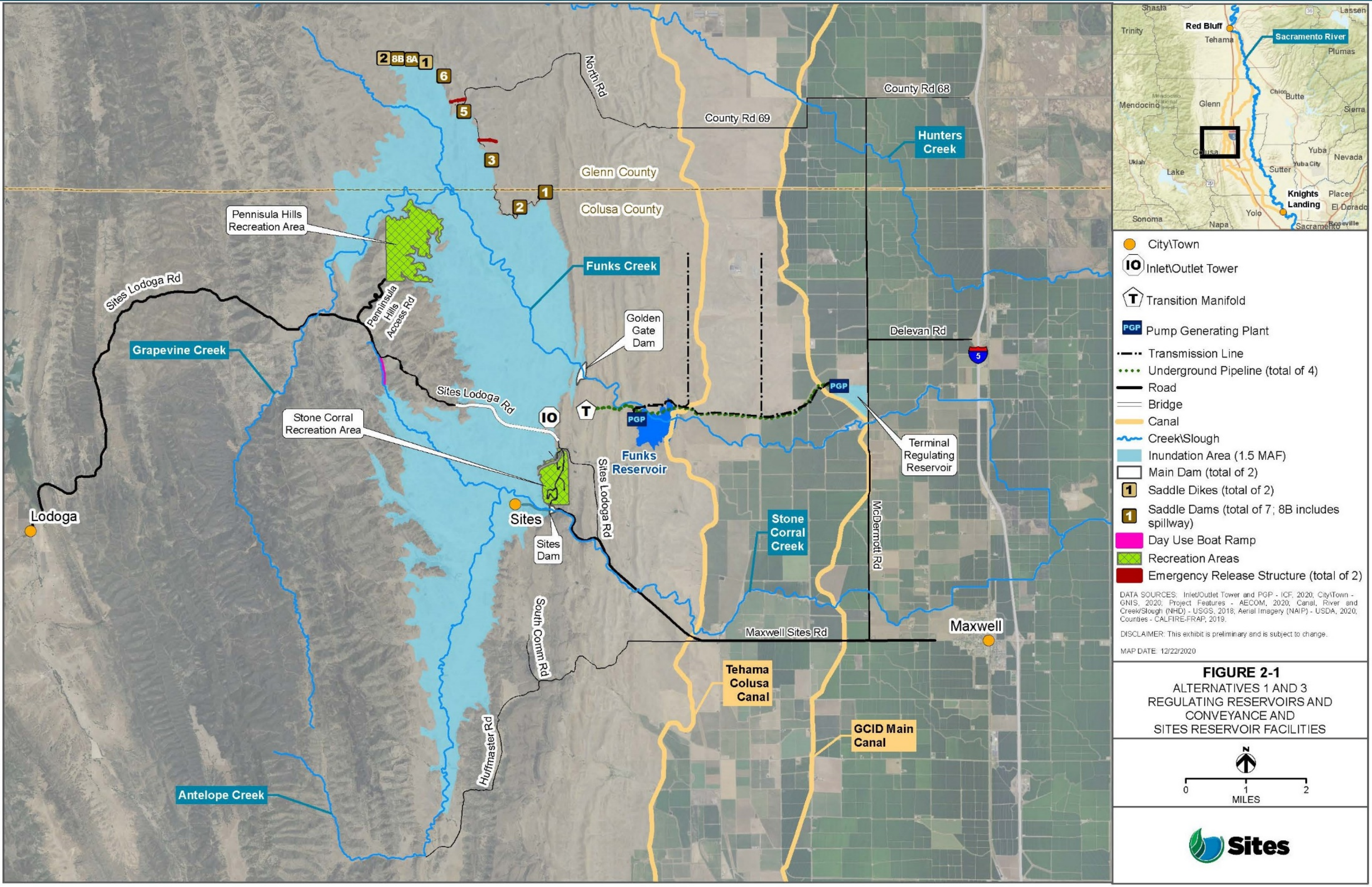
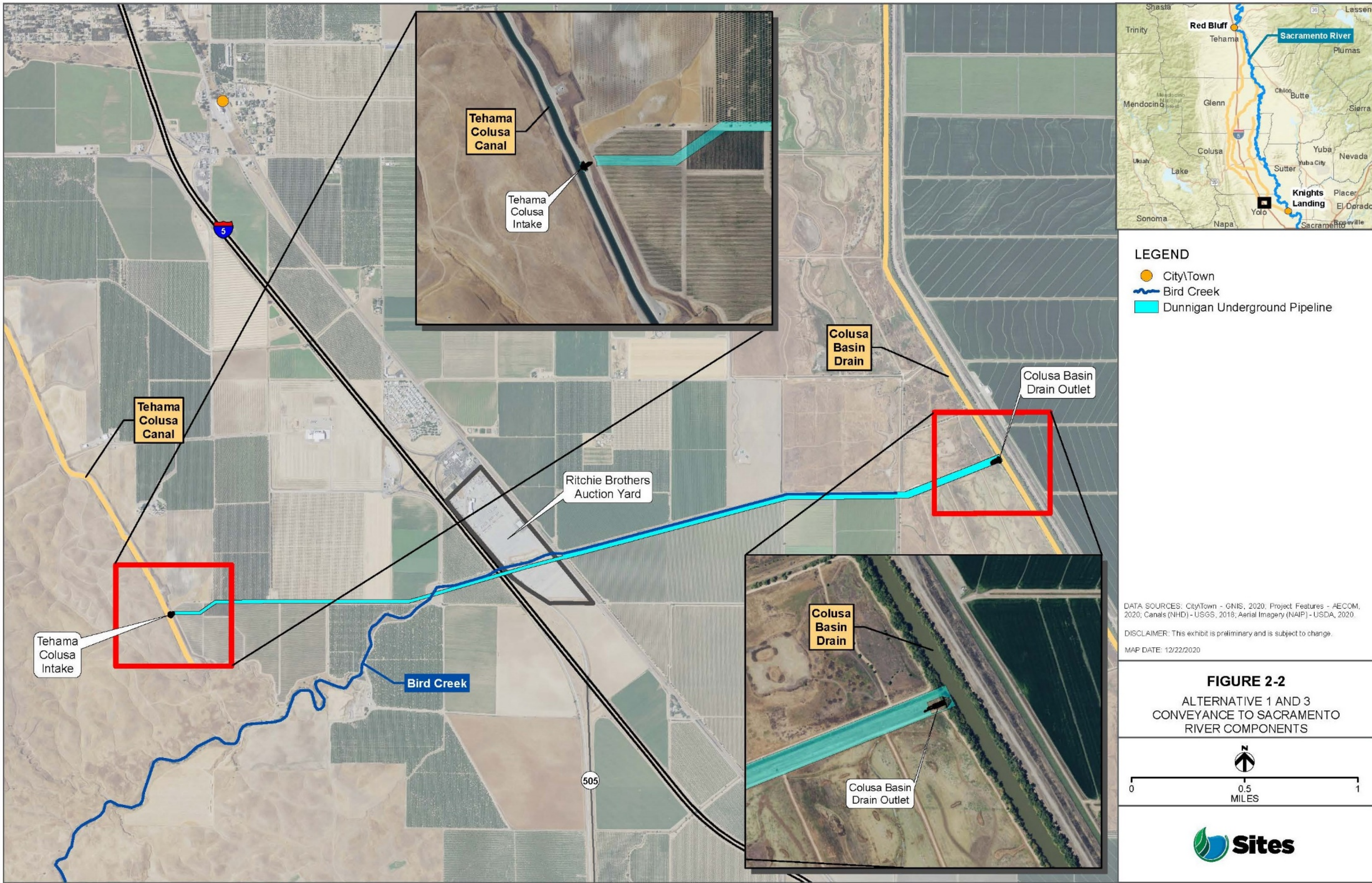


# Alt 1 – Preferred Project



# Approach to Analysis

# Method Analysis Overview

| Mechanisms by which Sites Reservoir Operations Could Affect Water Quality | Main Constituents Considered | Qualitative | Quantitative | Model Results Considered |
|---|---|---|---|---|
| Temporal Shift | Metals<br>Pesticides<br>Salinity | X | X | CalSim |
| Evapoconcentration | Metals<br>Salinity | | X | CalSim |
| In-Reservoir Processes | Mercury<br>HABs<br>Nutrients/OC/DO<br>Temperature | X | X | Reservoir temperature modeling (CE QUAL W2) |
| Change in System Reservoir Operations | Temperature<br>HABs<br>Mercury | X | X | CalSim, HEC5Q and Reclamation temperature model |
| Change in Delta Operations | Salinity<br>Chloride | X | X | CalSim and DSM2 QUAL |
| Redirection of CBD Flow to Yolo Bypass | Pesticides<br>Nutrients/OC/DO<br>HABs<br>Mercury<br>Temperature | X | X | CalSim |

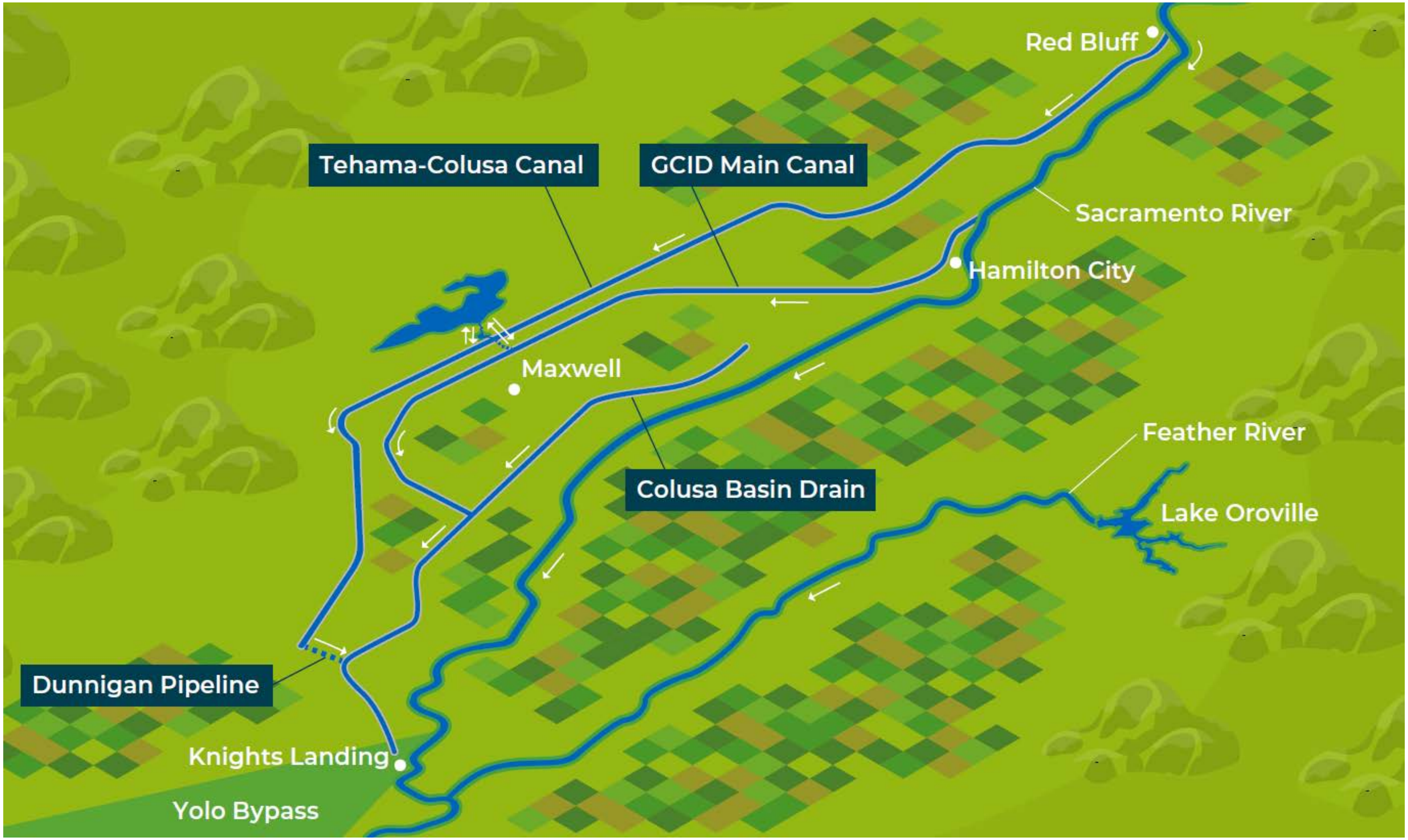
# Quantitative Models

- CalSim II used for overall operations
  - Hydrological planning tool used to represent state-wide changes that would result from Sites
  - Monthly timestep
  - Results inform water quality models
  - Comparative analysis of results
- Water quality models
  - Reservoir Temperature: CE QUAL W2
  - River Temperature: HEC5Q, Reclamation Temperature Model
  - Delta salinity: DSM2 QUAL

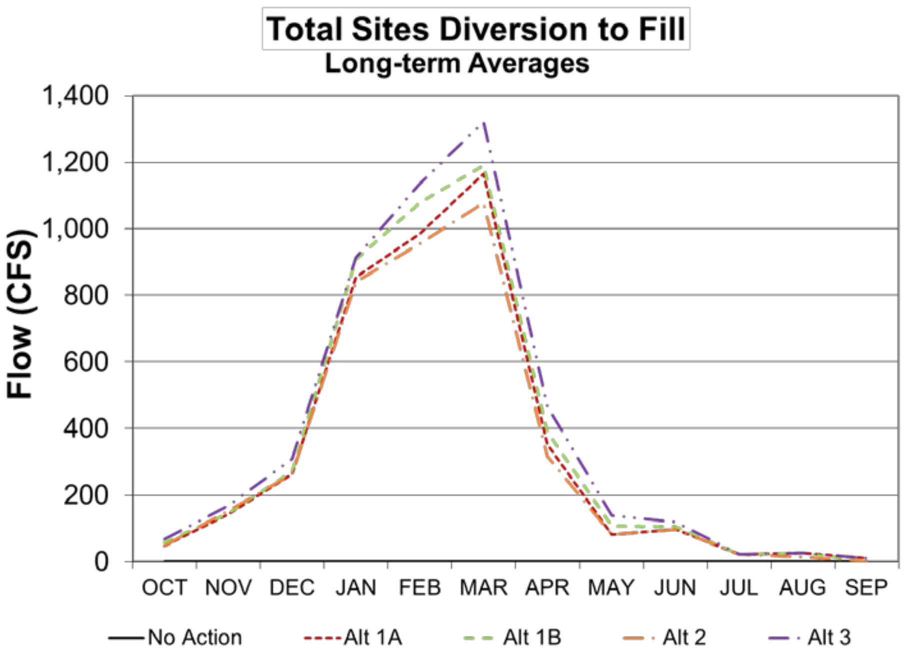
# Source Water

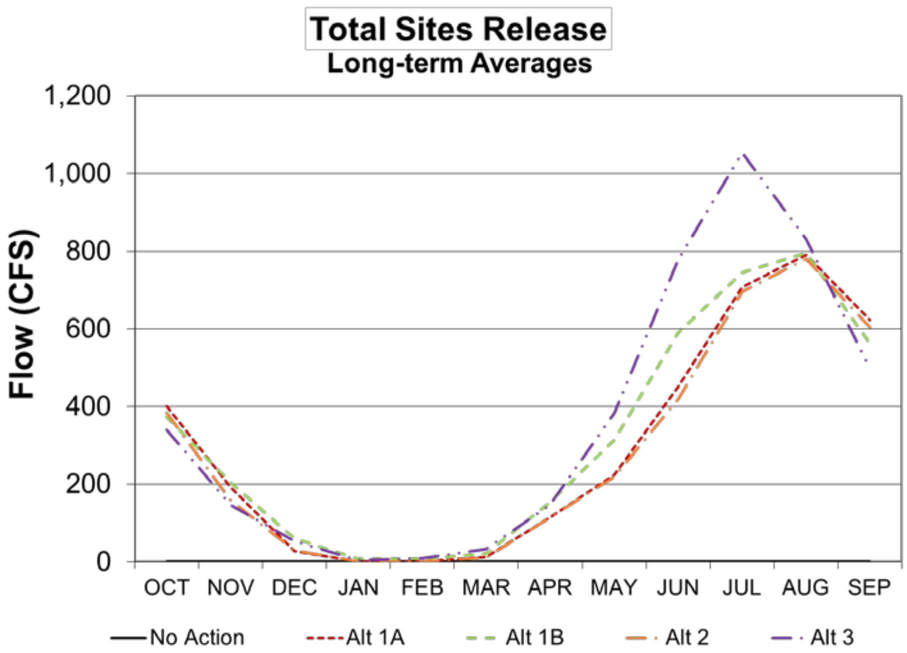
Sites

# Project Water Operations



# Diversions and Releases



# Main Data Sources

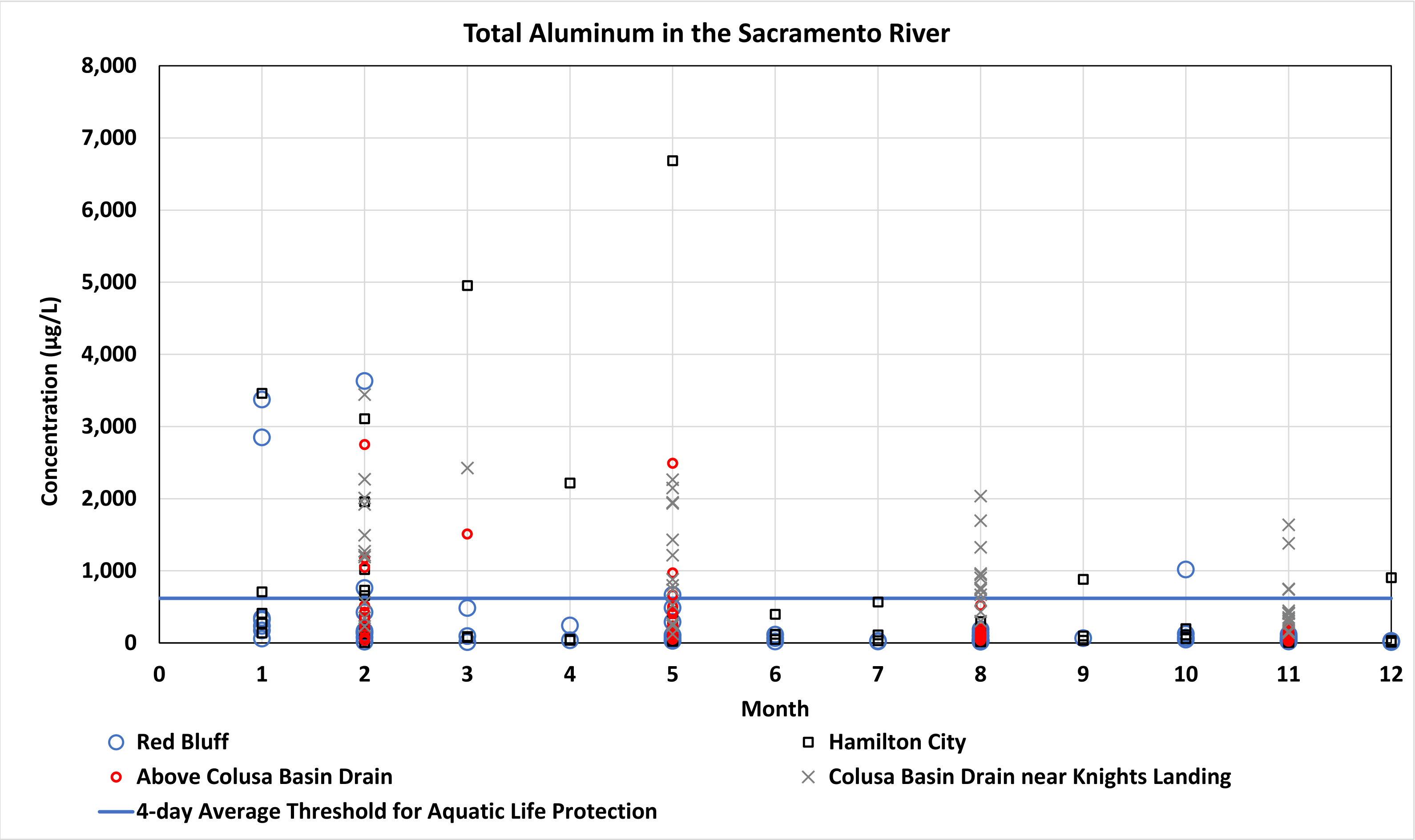
| Constituent Group | Data Source | Location |
|---|---|---|
| Metals<br>Electrical Conductivity<br>Nutrients | DWR Water Data Library (WDL) | Sacramento River below Red Bluff<br>Sacramento River at Hamilton City<br>Sacramento River above CBD<br>CBD near Knights Landing<br>Stone Corral Creek near Sites |
| Flow | USGS<br>WDL<br>CA Data Exchange Center | Sacramento River at Keswick<br>Sacramento River above Bend Bridge |
| Pesticides | CA Dept of Pesticide Regulation Surface Water Database (CDPR SURF) | Sacramento River near Hamilton City<br>Sacramento River at Colusa<br>CBD above Knights Landing<br>Yolo Bypass Toe Drain near Babel Slough |

# Average Metal/Metalloid Concentrations

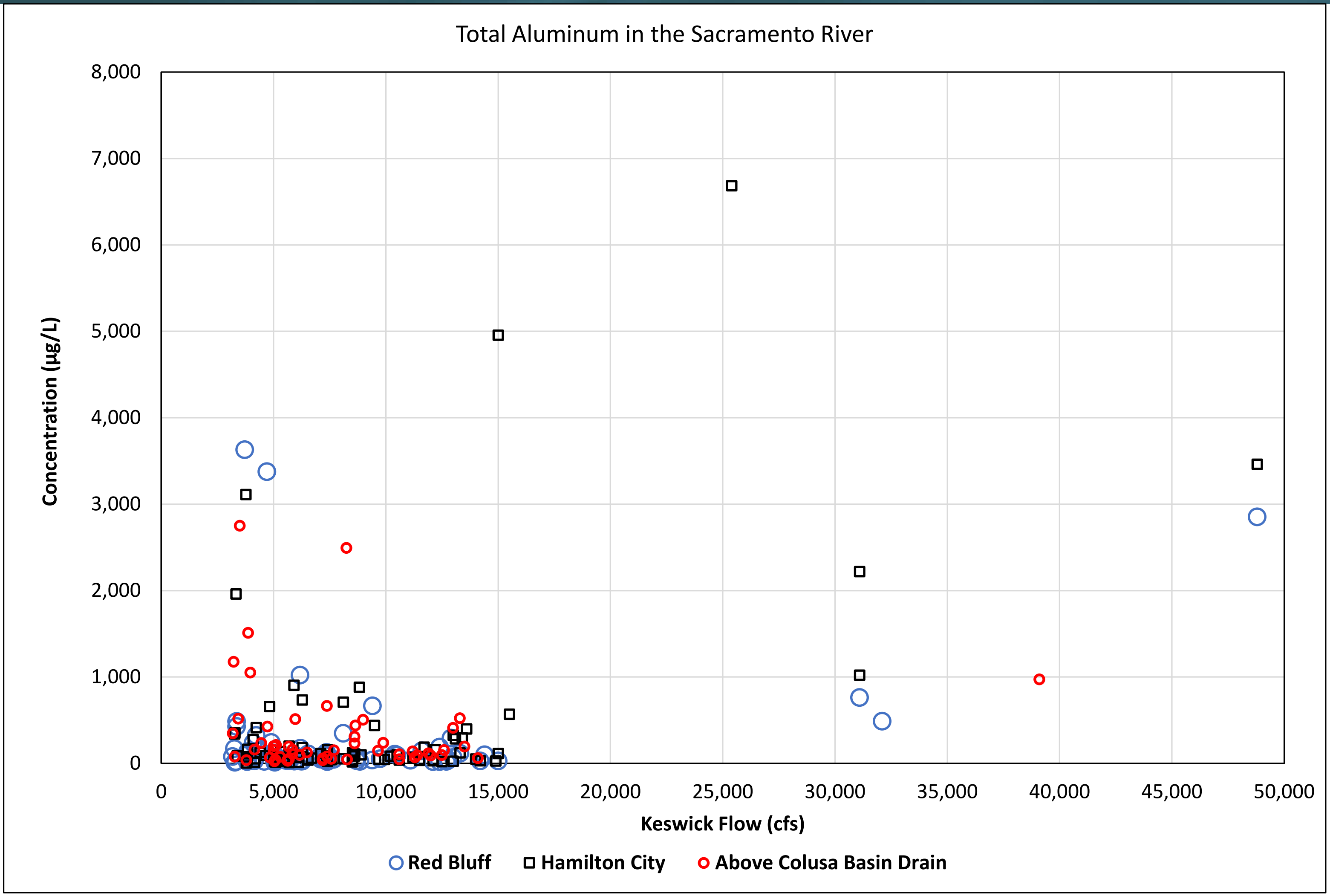
- Units are in micrograms per liter
- No available data for Funks Creek
- Source for Stone Corral Creek and Sacramento River = DWR Water Data Library. See Slide 14
- Source for groundwater is DWR NODOS study (2007)

| Metal/Metalloid | Stone Corral Creek | Groundwater in Sites Reservoir Footprint | Sacramento River at Intake Locations |
|---|---|---|---|
| Dissolved Aluminum | 149 | 3 | 94 |
| Total Aluminum | 562 | 12 | 359 |
| Dissolved Arsenic | 2.8 | 0.7 | 1.5 |
| Total Arsenic | 3.1 | 0.8 | 1.6 |
| Dissolved Cadmium | 0.05 | 0.02 | 0.04 |
| Total Cadmium | 0.06 | 0.05 | 0.04 |
| Dissolved Chromium | 2.9 | 2.6 | 0.7 |
| Total Chromium | 4.0 | 3.3 | 1.4 |
| Dissolved Copper | 2.8 | 2.7 | 1.3 |
| Total Copper | 3.9 | 3.4 | 2.3 |
| Dissolved Iron | 123 | 7 | 67 |
| Total Iron | 512 | 81 | 424 |
| Dissolved Lead | 0.08 | 0.12 | 0.03 |
| Total Lead | 0.31 | 0.27 | 0.20 |
| Dissolved Manganese | 12 | 18 | 2 |
| Total Manganese | 37 | 21 | 15 |
| Dissolved Nickel | 2.8 | 1.0 | 1.2 |
| Total Nickel | 4.0 | 1.3 | 2.2 |
| Dissolved Selenium | 6.1 | 4.6 | 1.2 |
| Total Selenium | 6.7 | 5.0 | 0.2 |
| Dissolved Silver | 0.03 | 0.00 | 0.01 |
| Total Silver | 0.05 | 0.01 | 0.03 |
| Dissolved Zinc | 1.4 | 112.5 | 0.9 |
| Total Zinc | 3.7 | 115.2 | 3.8 |

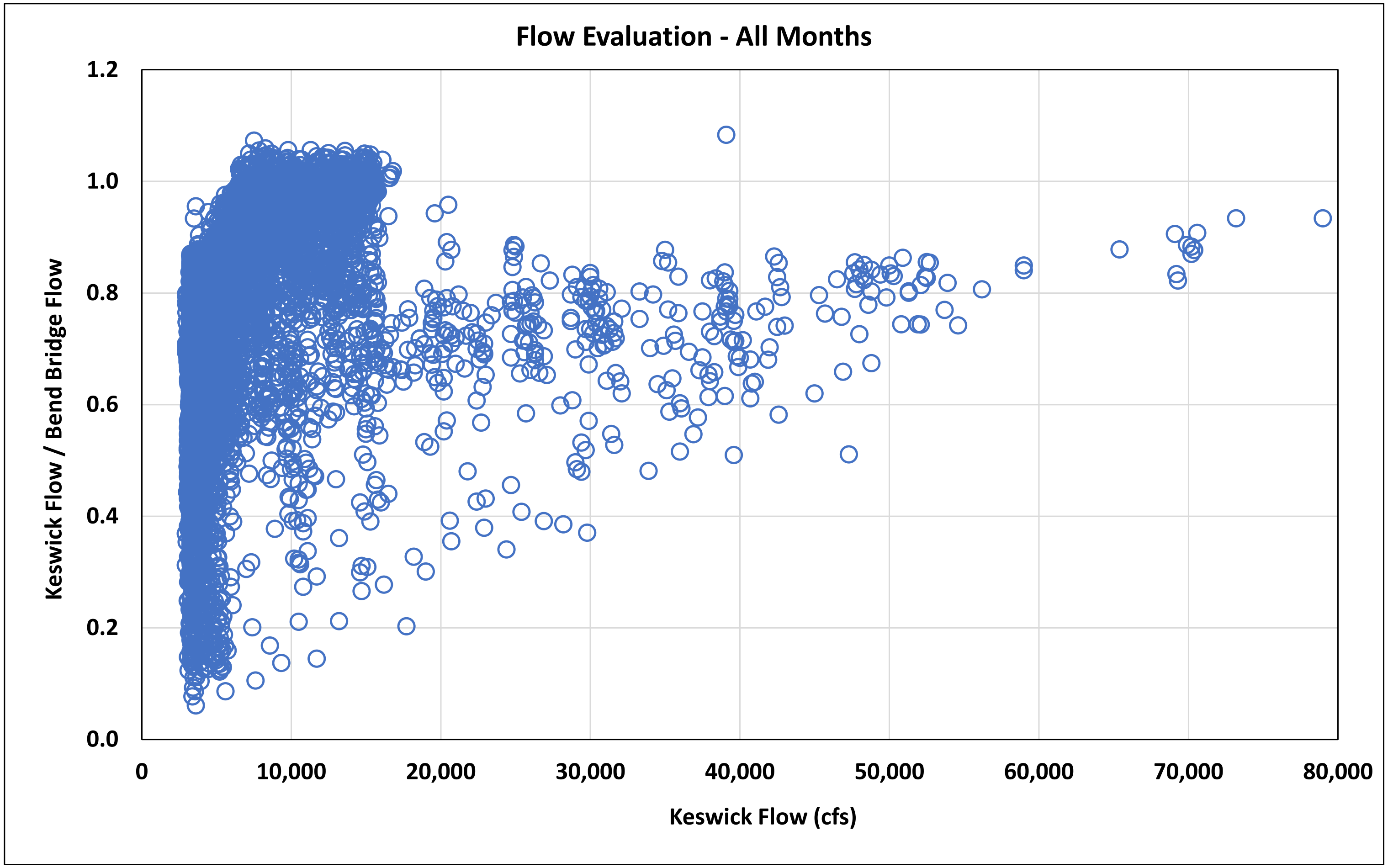
# Metals – Aluminum Example



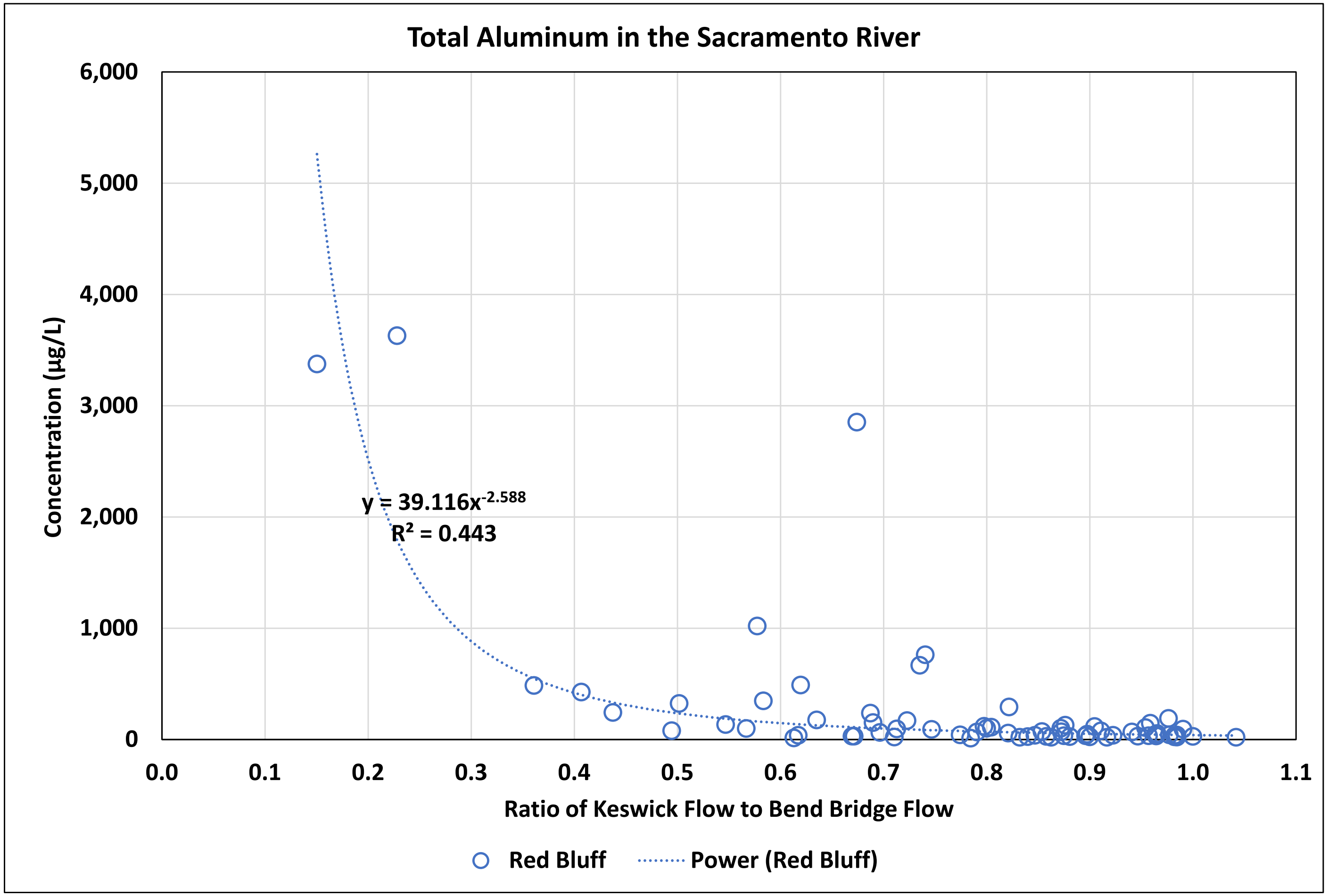
# Compared to Flow



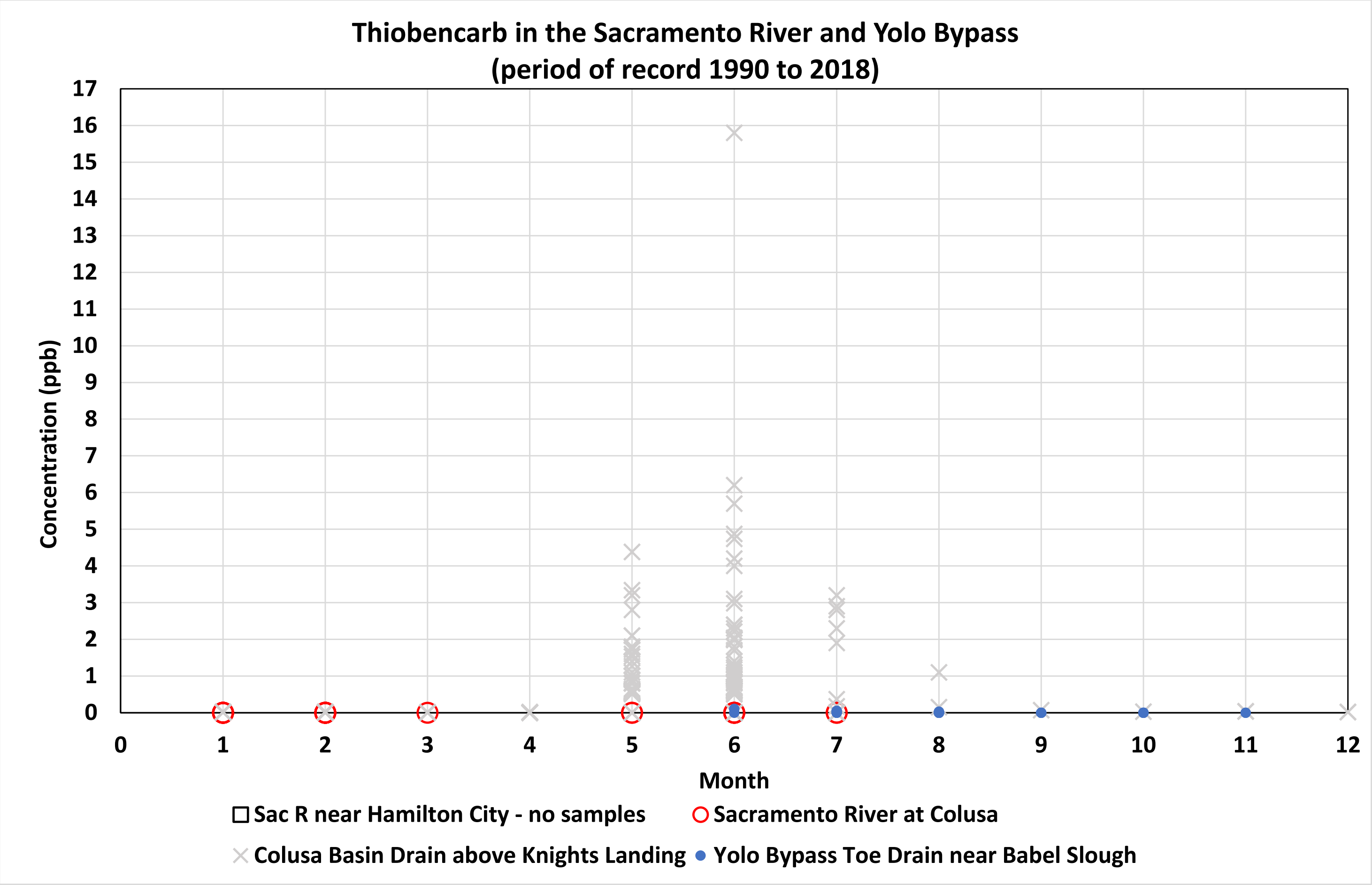
# Sacramento River Indicator of Local Runoff vs Flow



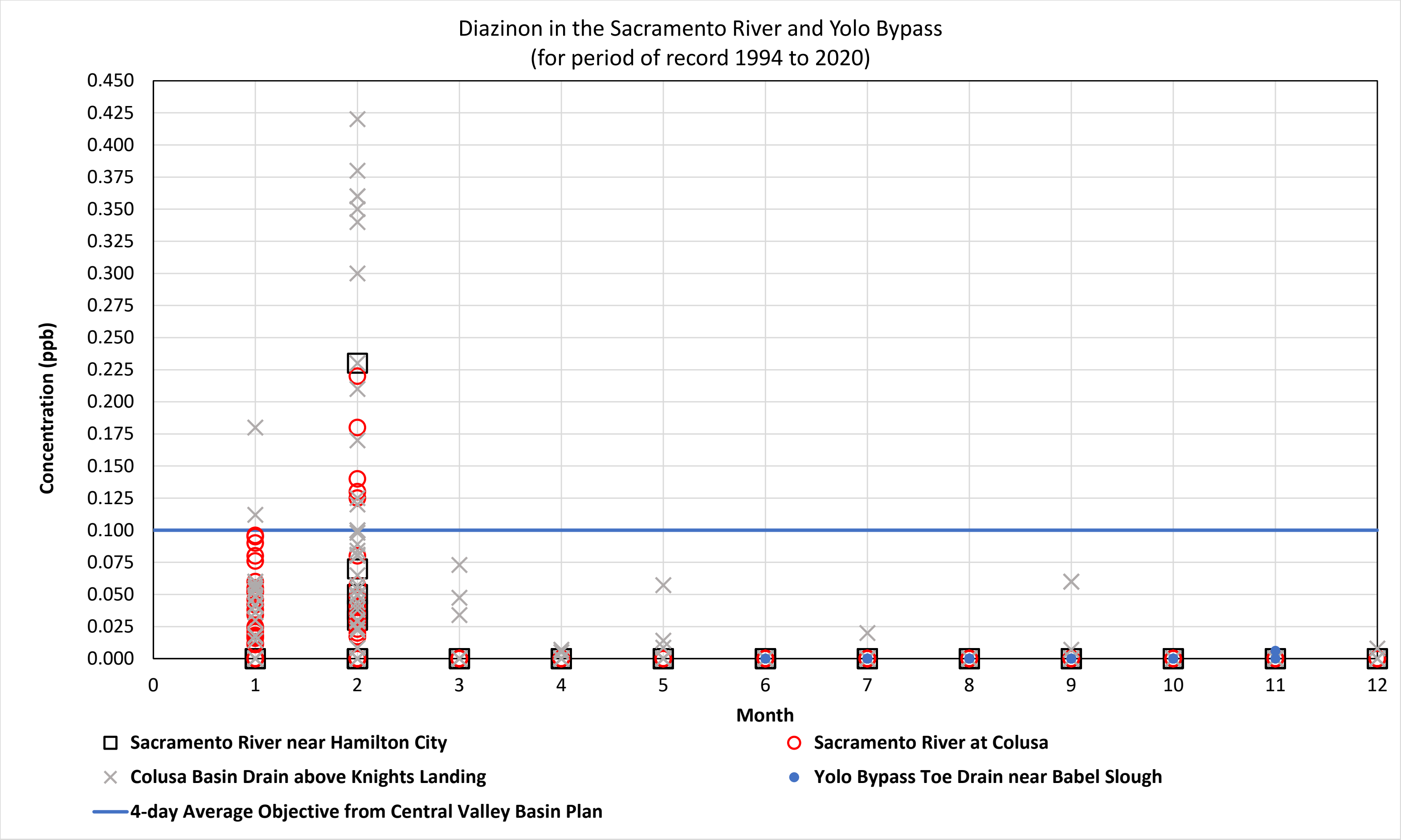
# Example Quantitative Approach



# Thiobencarb – typical pesticide pattern



# Diazinon – atypical pesticide pattern



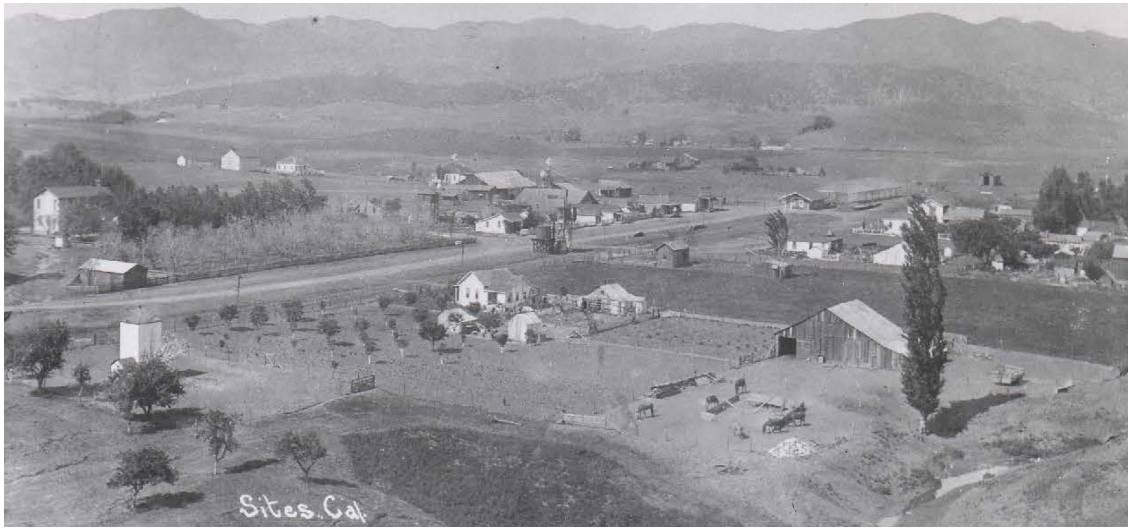
# Schedule and Next Meeting

# Schedule

- Summer 2021
  - Draft EIR and Supplemental EIS Released
- December 2021
  - Biological Assessment to Agencies
  - Submit State ITP Applications
- Spring 2022
  - Final EIR/Final EIS
- Spring 2023
  - All permits obtained
- Spring 2024 Construction Begins
- Topics for the next meeting?

# Additional Topics from the Group

- Any additional questions or thoughts?
- Topics for the next meeting?

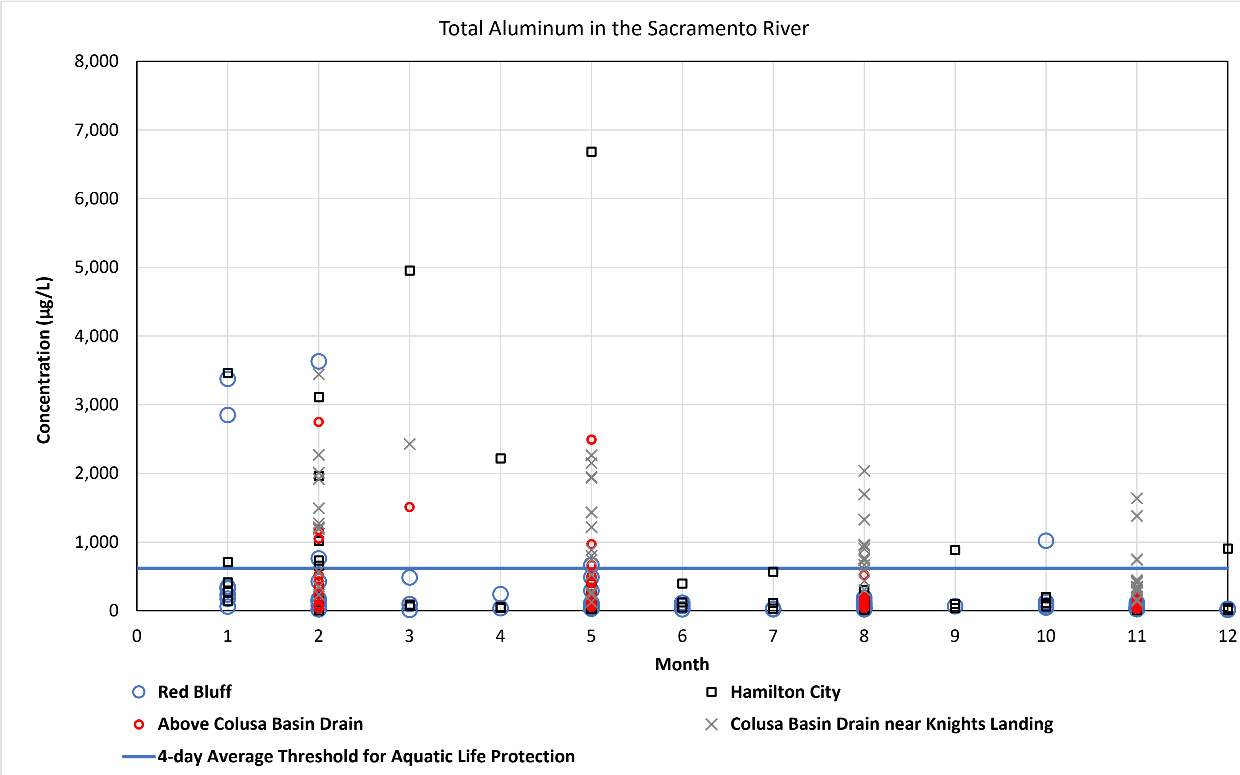


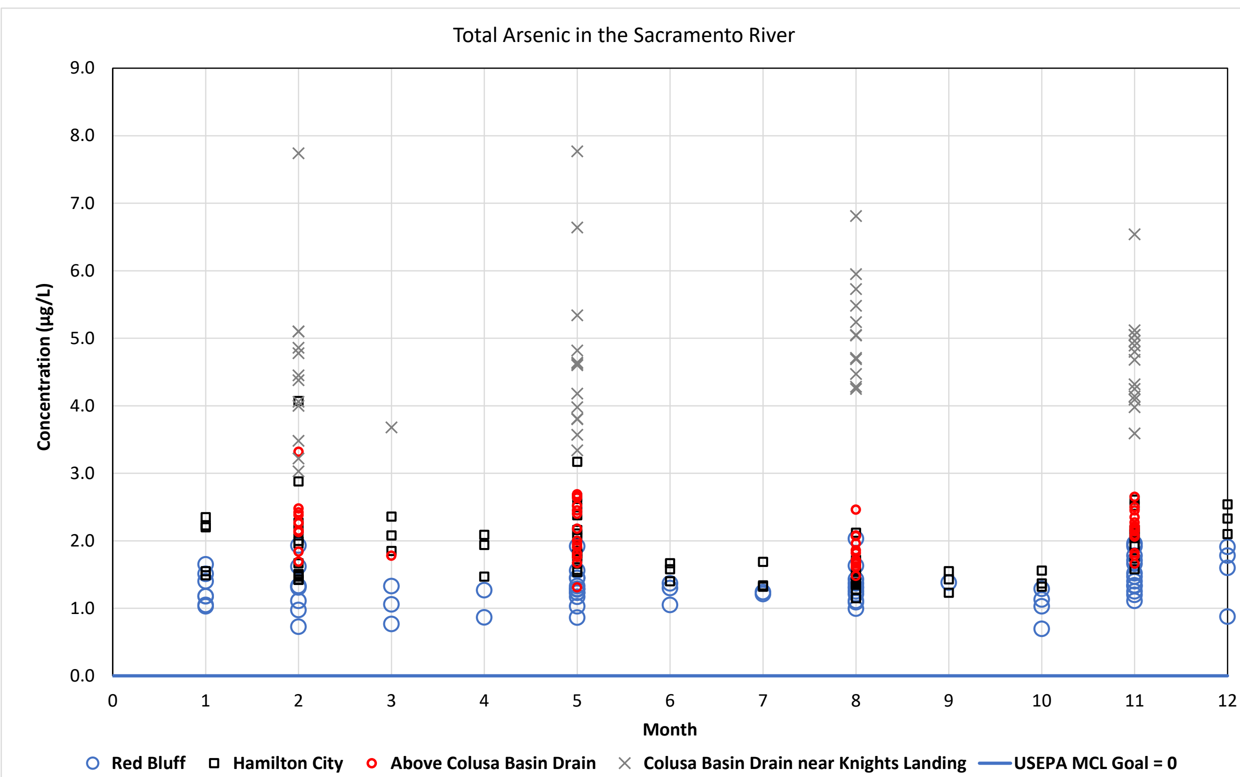
# Action Items and Next Steps

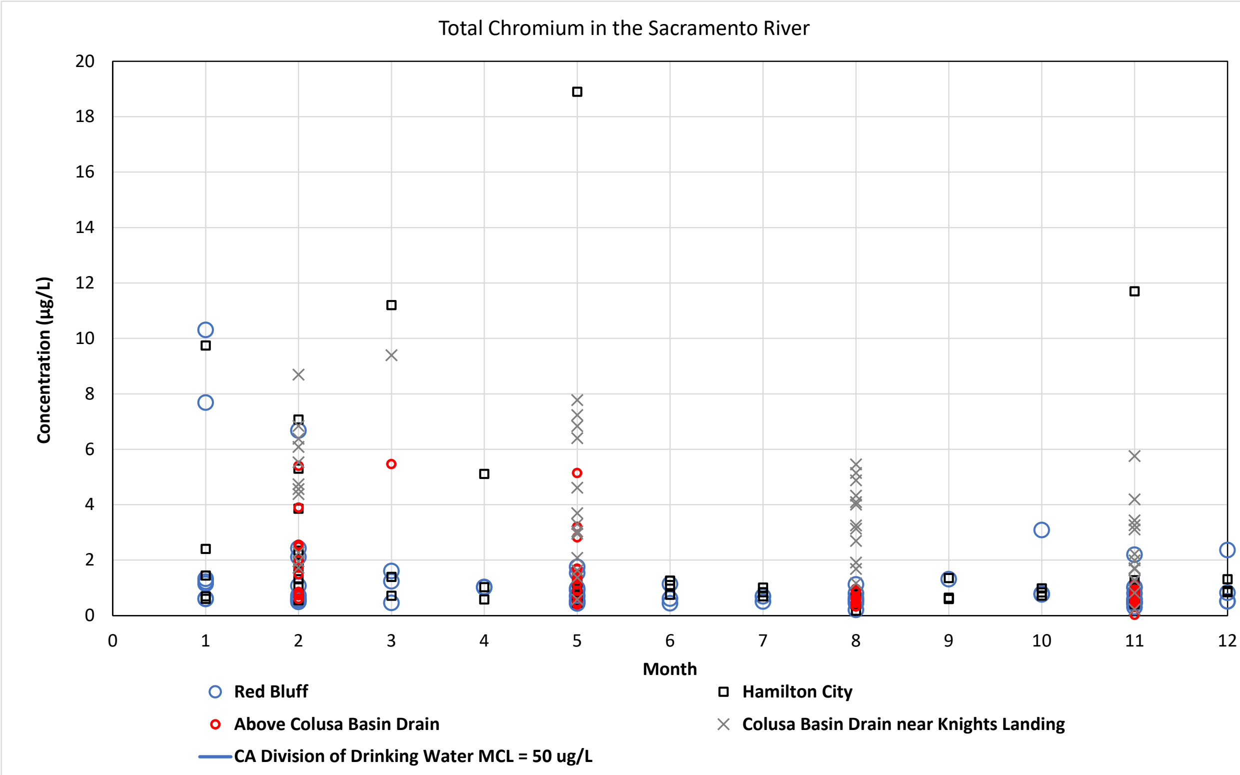
# Thank you!

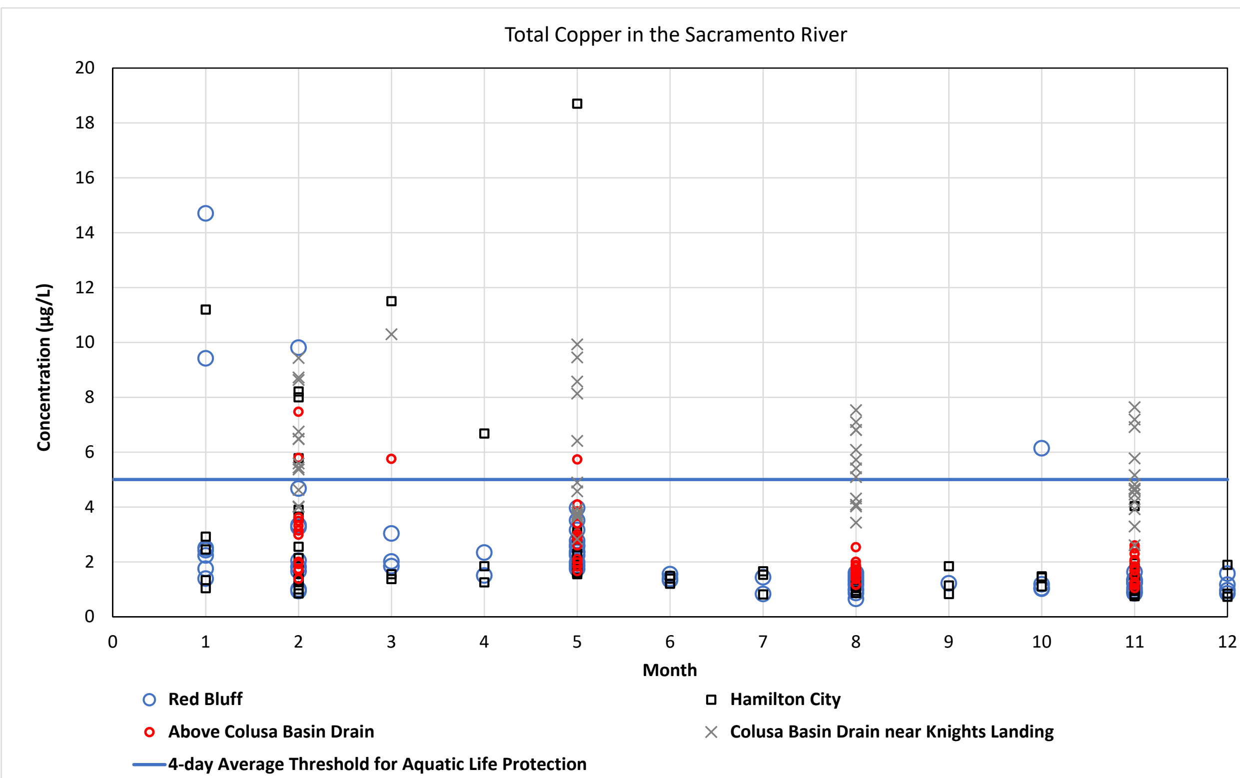
Sites

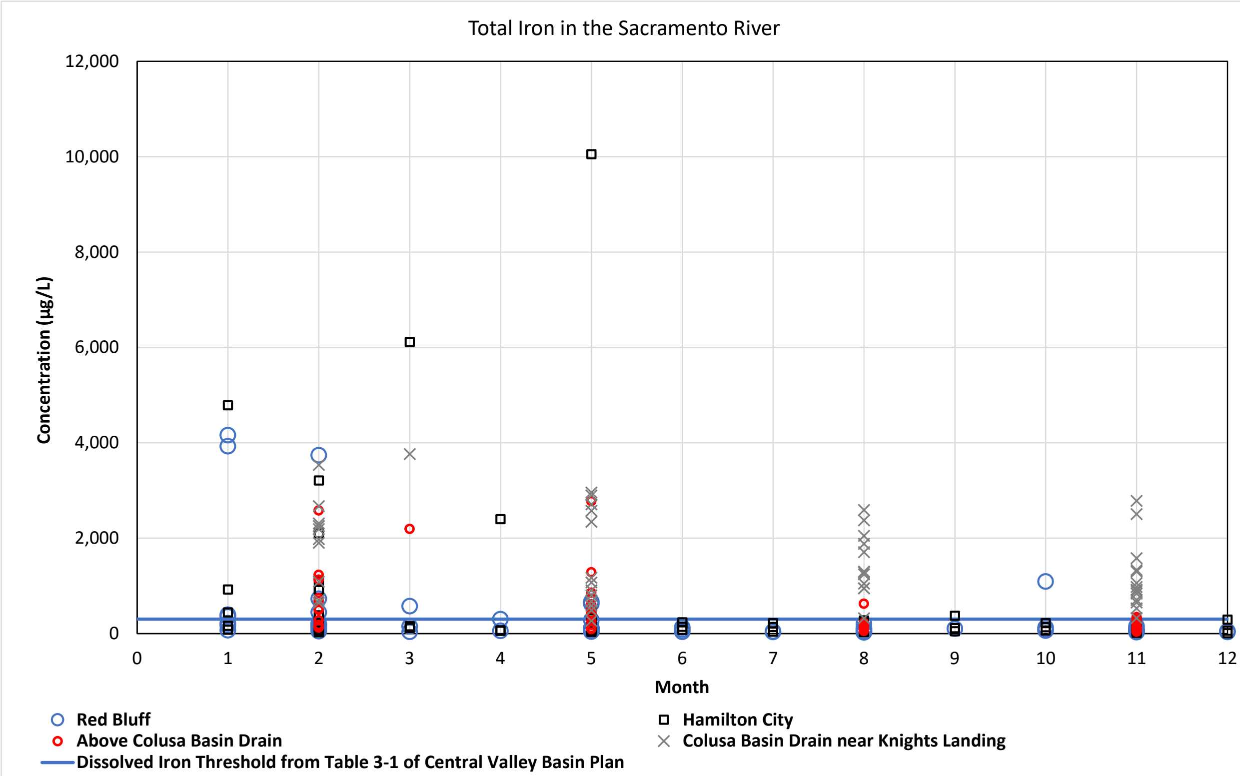
# Metals Data by Month

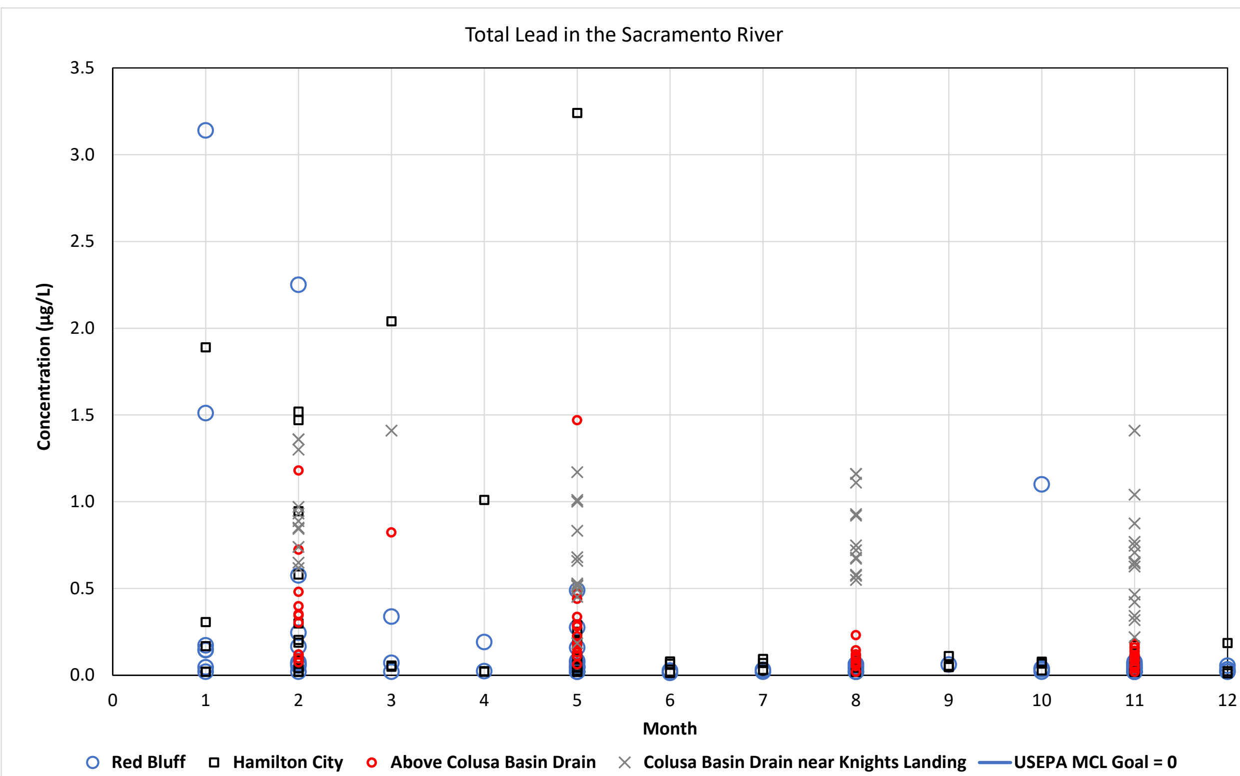


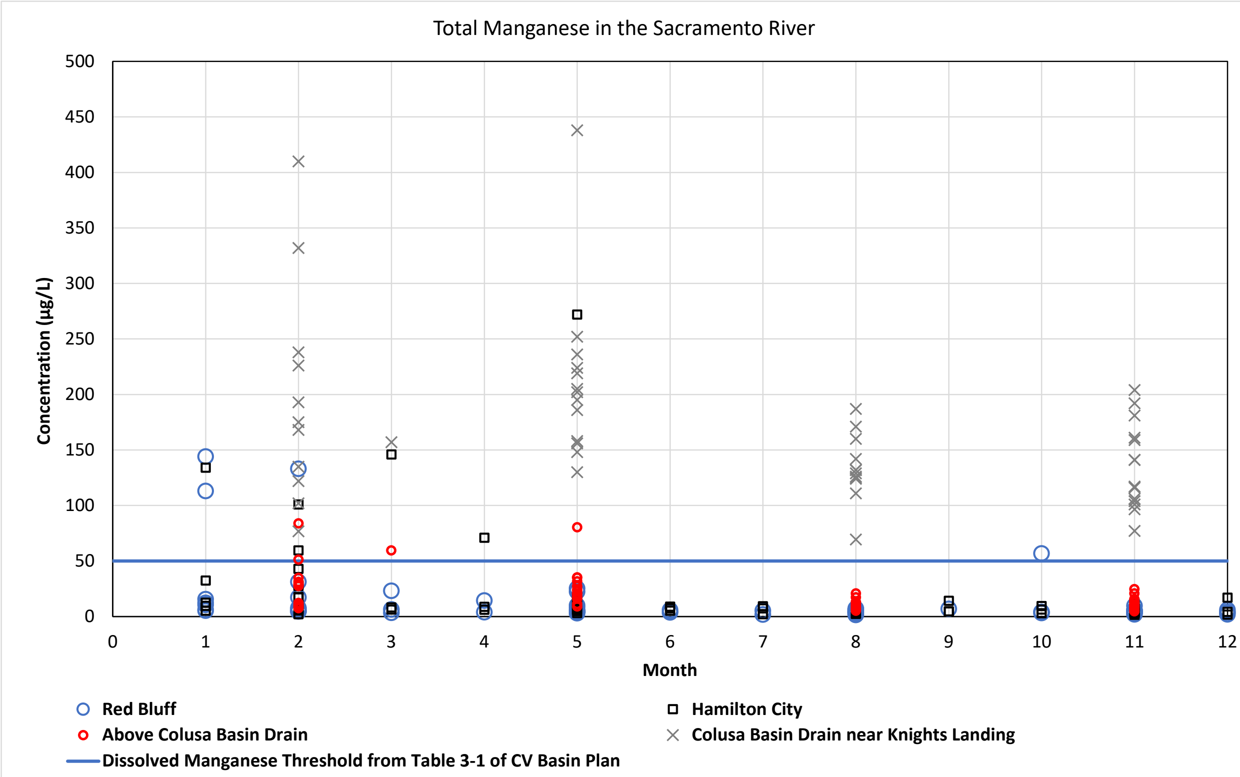



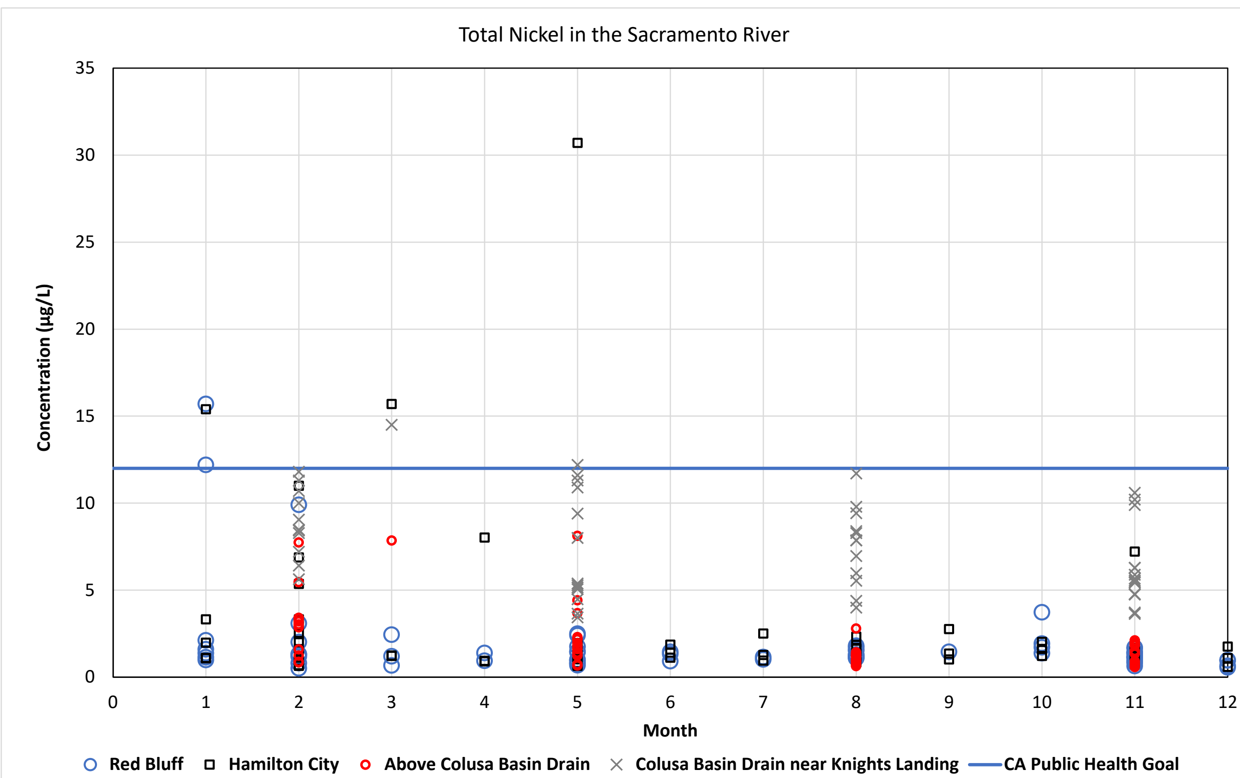

Total Chromium in the Sacramento River
Concentration (µg/L)
Month
Red Bluff
Hamilton City
Above Colusa Basin Drain
Colusa Basin Drain near Knights Landing
CA Division of Drinking Water MCL = 50 ug/L

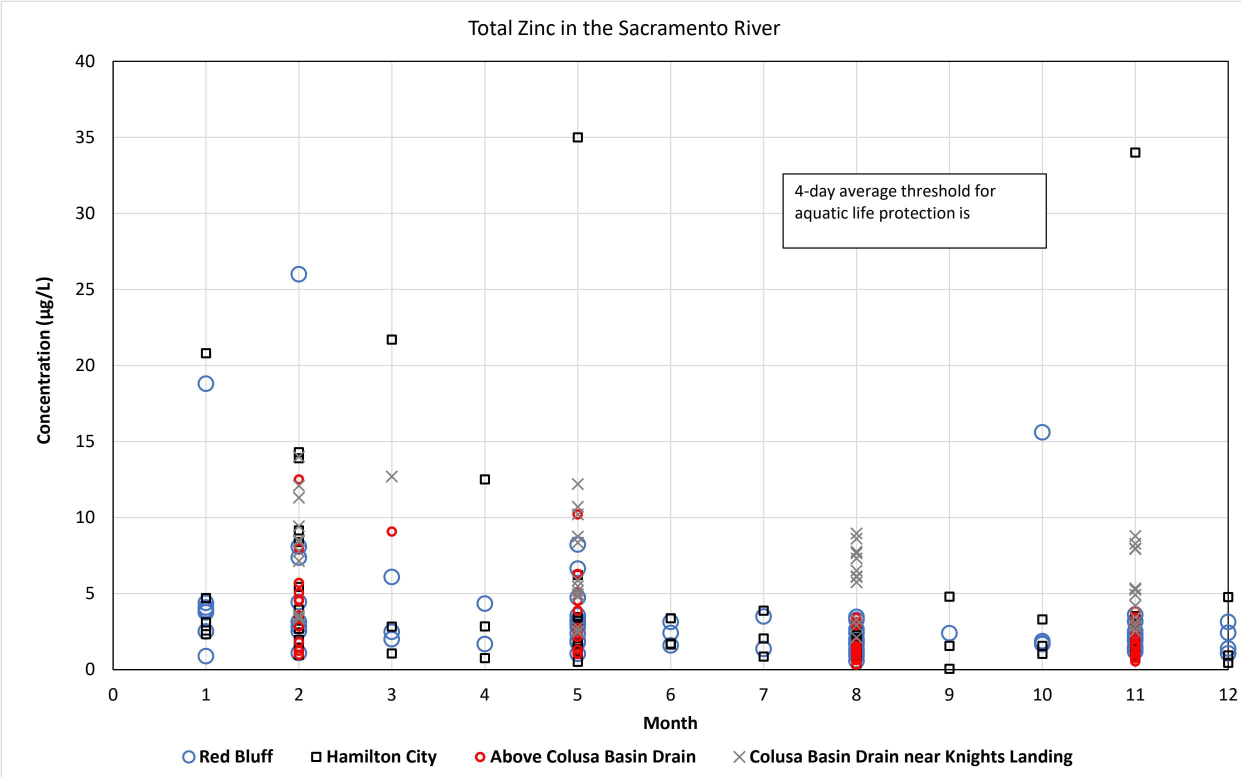

Total Copper in the Sacramento River
Concentration (µg/L)
Month
Red Bluff
Hamilton City
Above Colusa Basin Drain
Colusa Basin Drain near Knights Landing
4-day Average Threshold for Aquatic Life Protection


Total Iron in the Sacramento River
Concentration (µg/L)
12,000
10,000
8,000
6,000
4,000
2,000
0
0
1
2
3
4
5
6
7
8
9
10
11
12
Month
Red Bluff
Hamilton City
Above Colusa Basin Drain
Colusa Basin Drain near Knights Landing
Dissolved Iron Threshold from Table 3-1 of Central Valley Basin Plan

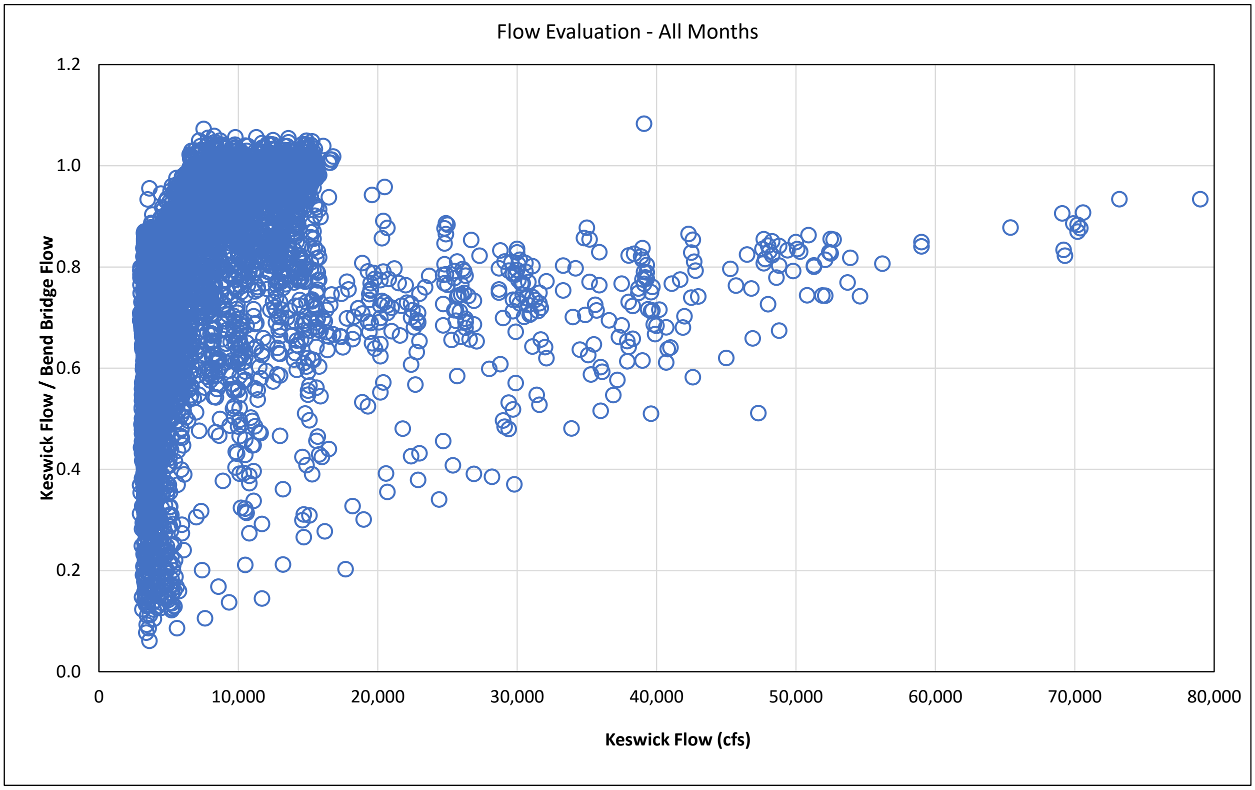

Total Lead in the Sacramento River
Concentration (µg/L)
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0
1
2
3
4
5
6
7
8
9
10
11
12
Month
Red Bluff
Hamilton City
Above Colusa Basin Drain
Colusa Basin Drain near Knights Landing
USEPA MCL Goal = 0

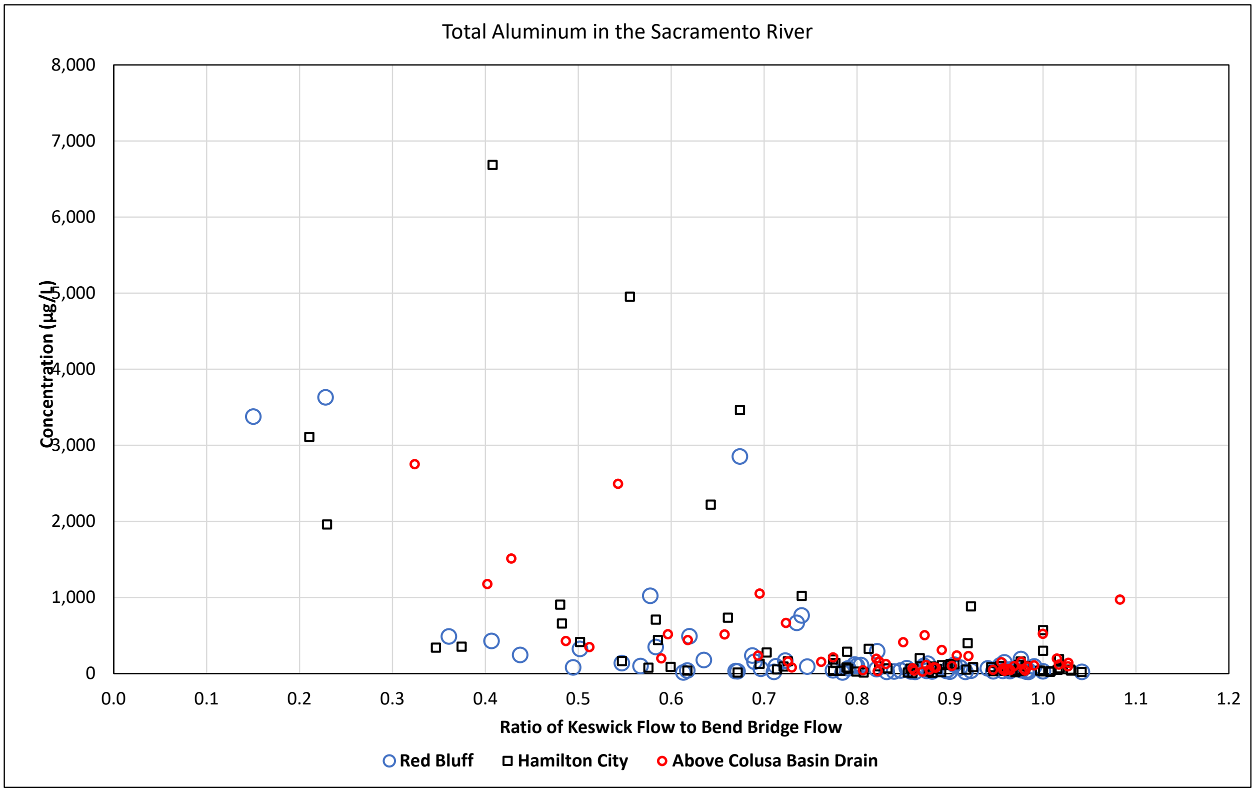

Total Manganese in the Sacramento River
Concentration (µg/L)
500
450
400
350
300
250
200
150
100
50
0
0 1 2 3 4 5 6 7 8 9 10 11 12
Month
Red Bluff
Hamilton City
Above Colusa Basin Drain
Colusa Basin Drain near Knights Landing
Dissolved Manganese Threshold from Table 3-1 of CV Basin Plan

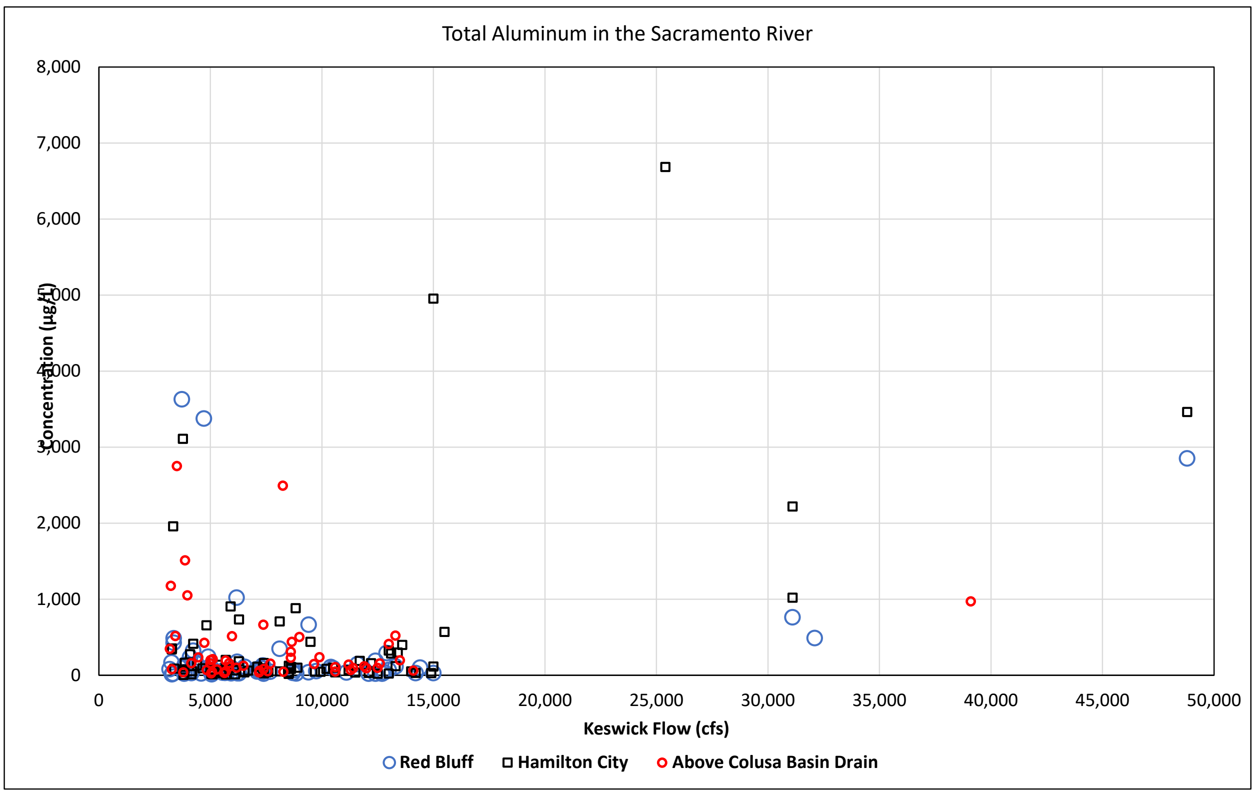

Total Nickel in the Sacramento River
Concentration (µg/L)
35
30
25
20
15
10
5
0
0 1 2 3 4 5 6 7 8 9 10 11 12
Month
Red Bluff
Hamilton City
Above Colusa Basin Drain
Colusa Basin Drain near Knights Landing
CA Public Health Goal

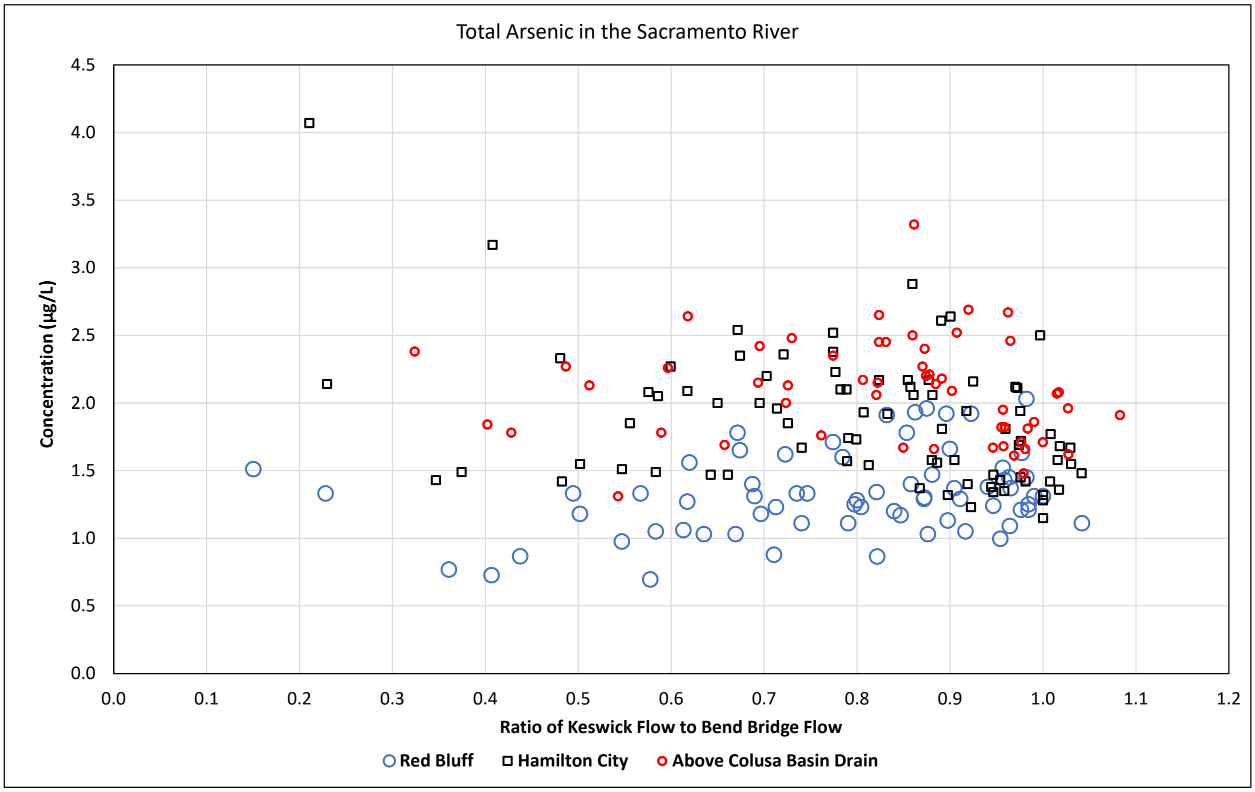

Total Zinc in the Sacramento River
4-day average threshold for aquatic life protection is
Concentration (µg/L)
40
35
30
25
20
15
10
5
0
0
1
2
3
4
5
6
7
8
9
10
11
12
Month
Red Bluff
Hamilton City
Above Colusa Basin Drain
Colusa Basin Drain near Knights Landing

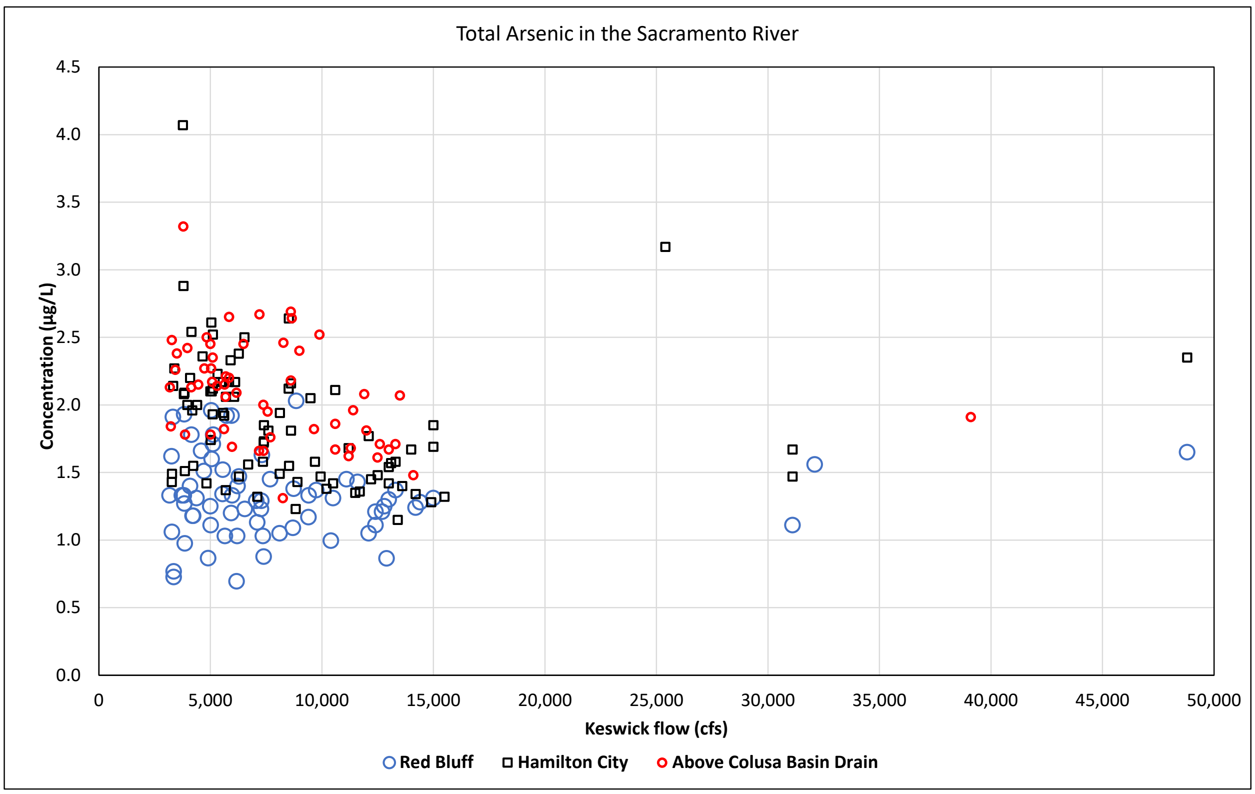
# Metals Data Versus Flow

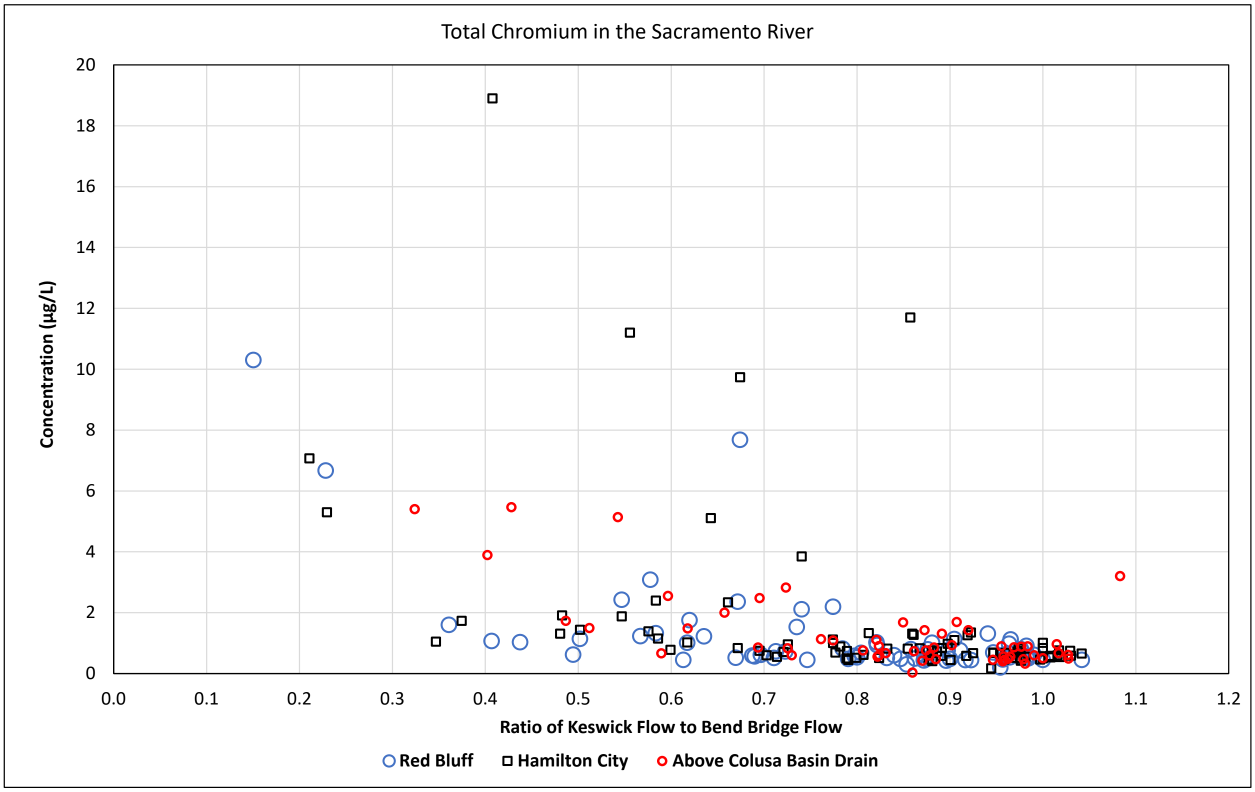


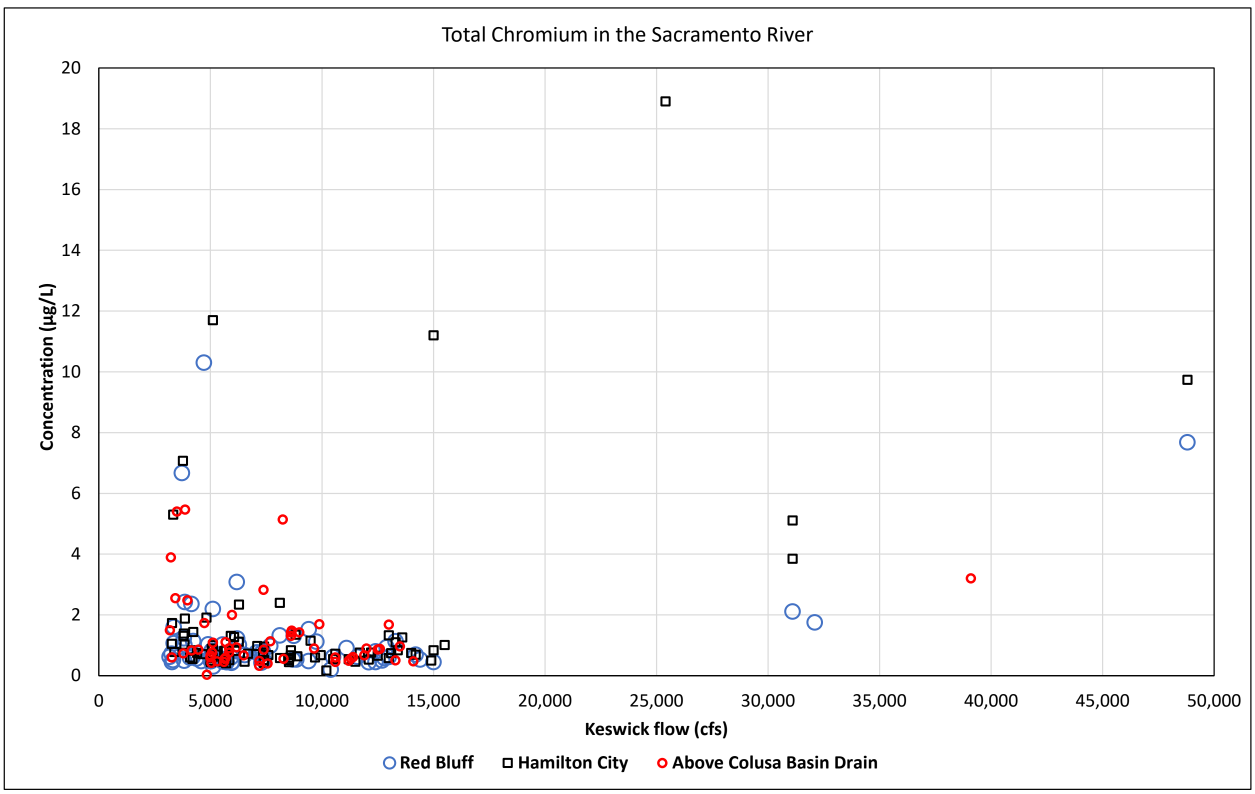

Total Aluminum in the Sacramento River
Concentration (µg/L)
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
1.1
1.2
Ratio of Keswick Flow to Bend Bridge Flow
Red Bluff
Hamilton City
Above Colusa Basin Drain

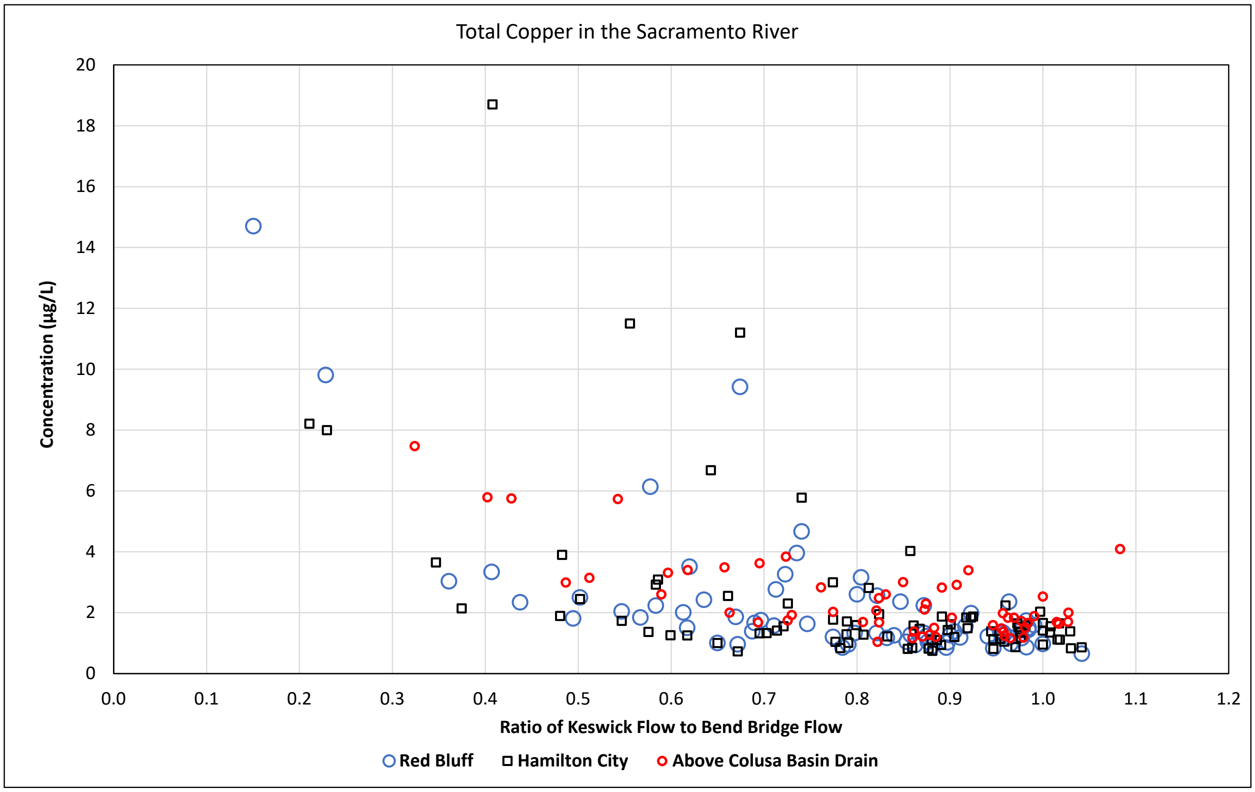

Total Aluminum in the Sacramento River
Concentration (µg/L)
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
0
5,000
10,000
15,000
20,000
25,000
30,000
35,000
40,000
45,000
50,000
Keswick Flow (cfs)
Red Bluff
Hamilton City
Above Colusa Basin Drain

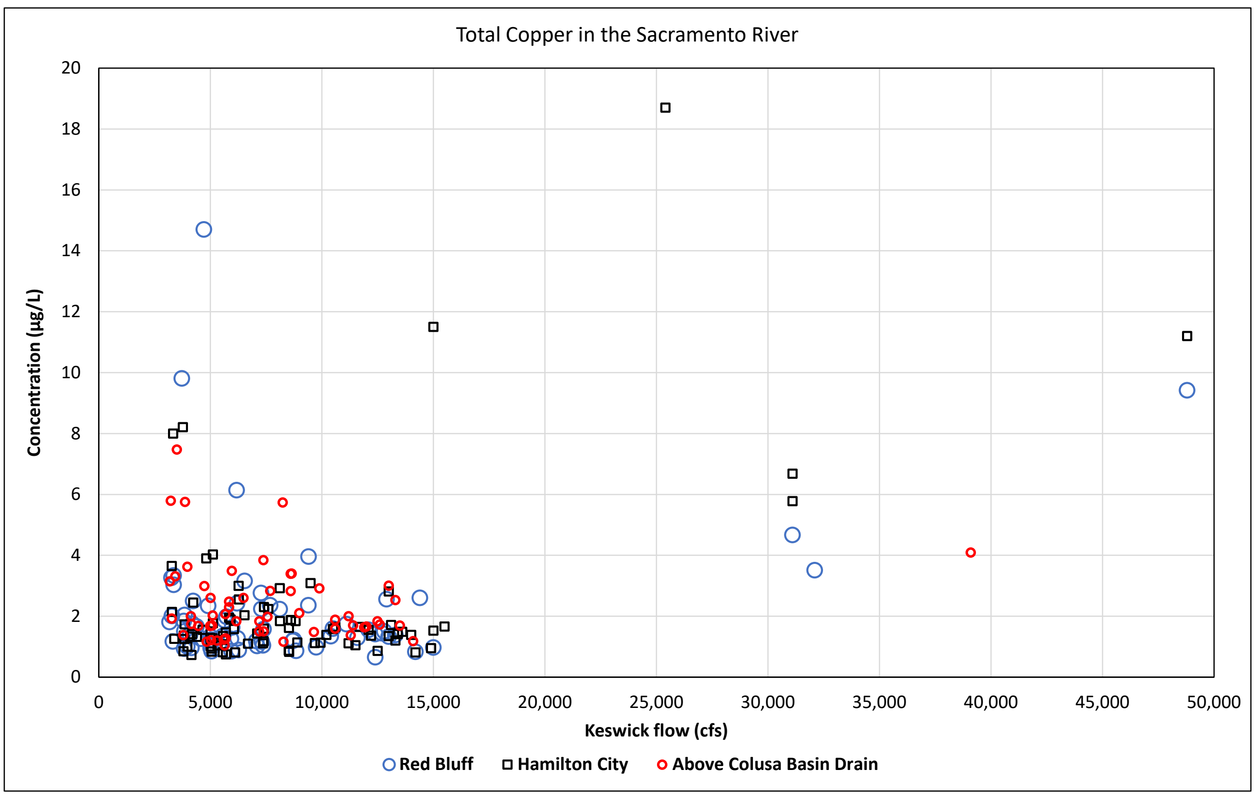

Total Arsenic in the Sacramento River
Concentration (µg/L)
Ratio of Keswick Flow to Bend Bridge Flow
Red Bluff
Hamilton City
Above Colusa Basin Drain

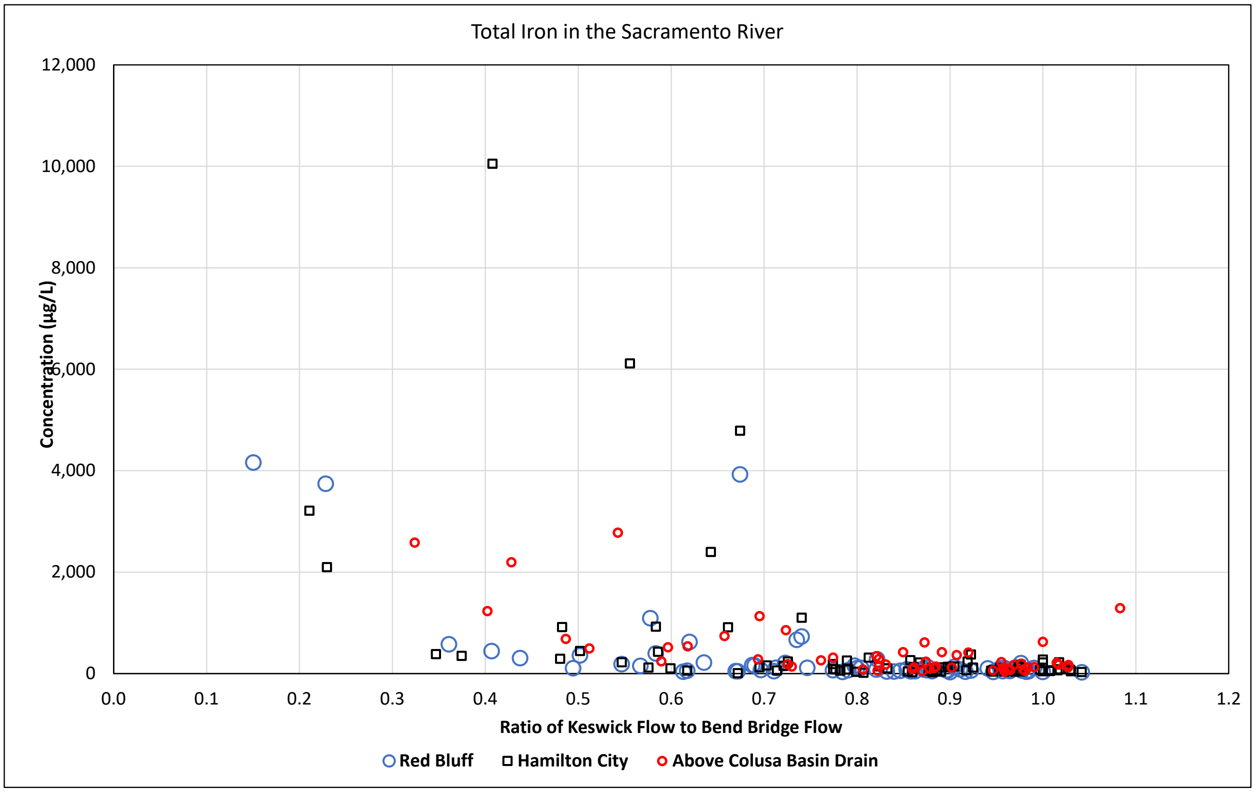

Total Arsenic in the Sacramento River
Concentration (µg/L)
Keswick flow (cfs)
Red Bluff
Hamilton City
Above Colusa Basin Drain

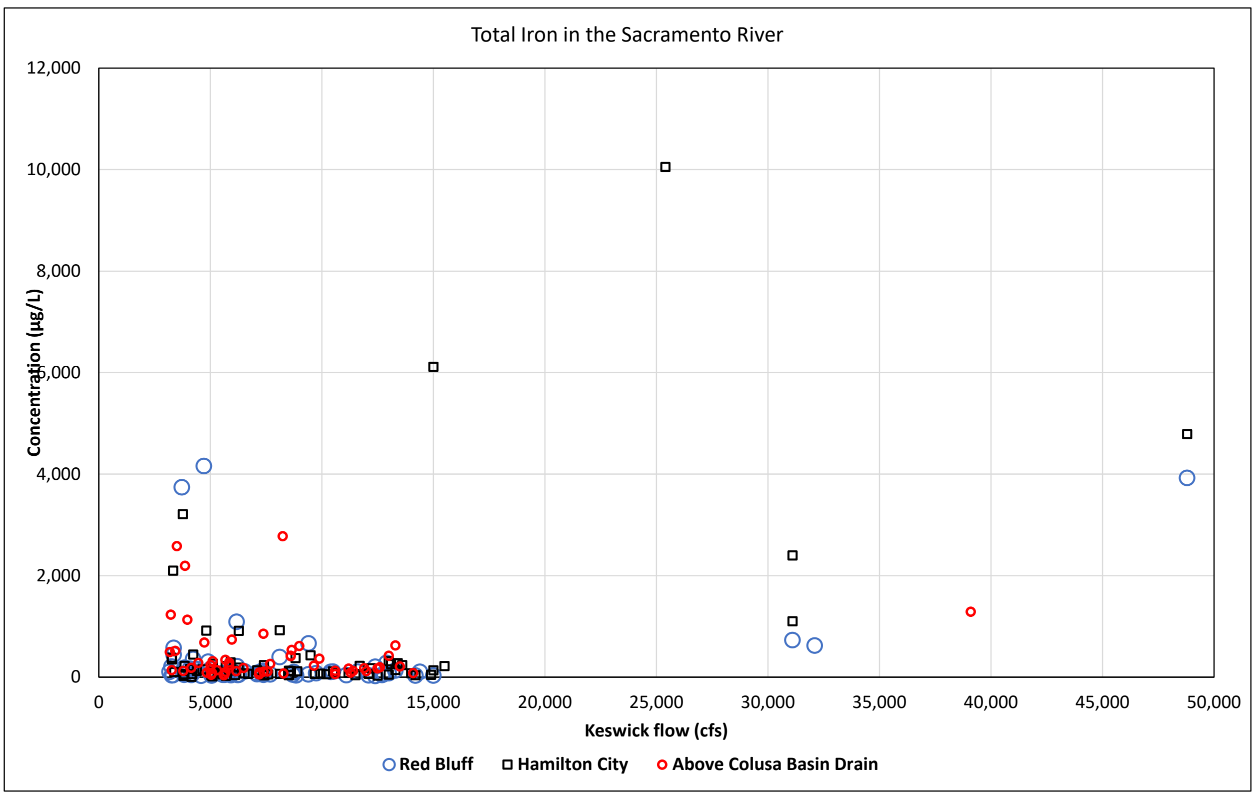

Total Chromium in the Sacramento River
Concentration (µg/L)
0
2
4
6
8
10
12
14
16
18
20
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
1.1
1.2
Ratio of Keswick Flow to Bend Bridge Flow
Red Bluff
Hamilton City
Above Colusa Basin Drain

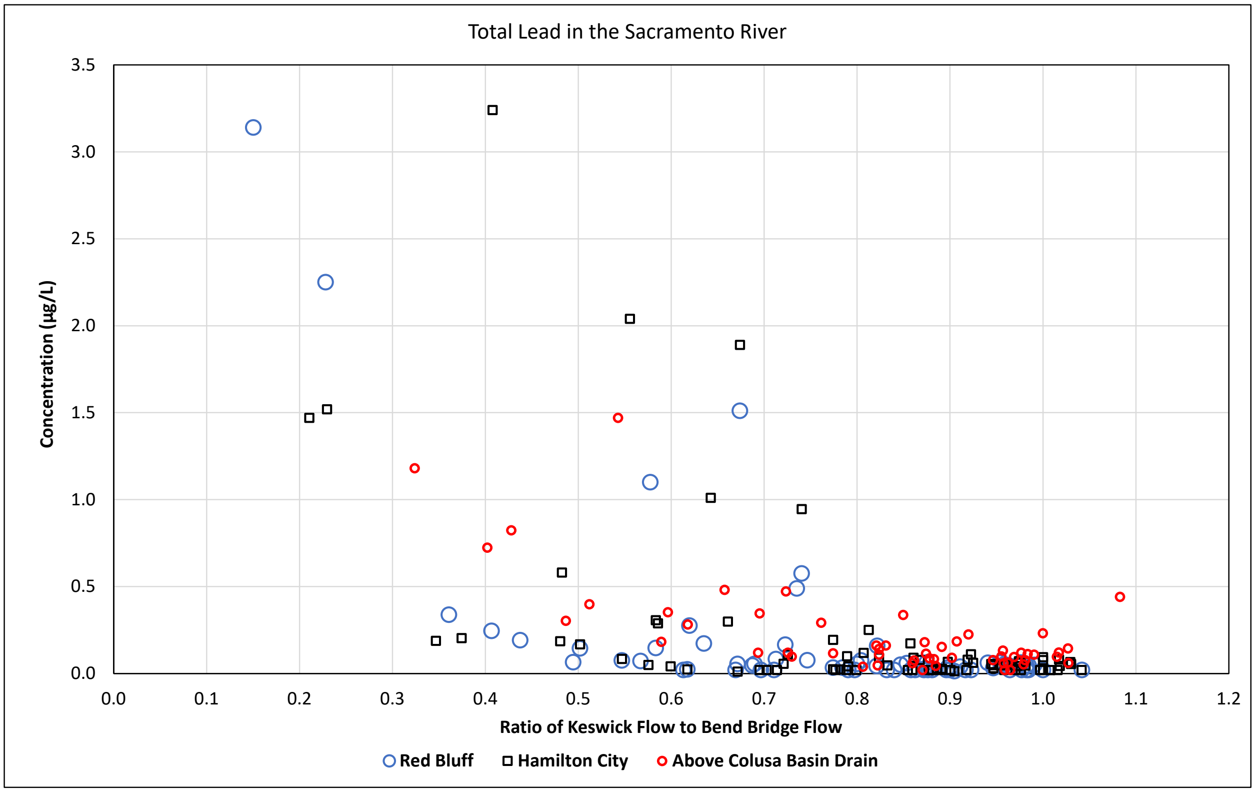

Total Chromium in the Sacramento River
Concentration (µg/L)
0
2
4
6
8
10
12
14
16
18
20
0
5,000
10,000
15,000
20,000
25,000
30,000
35,000
40,000
45,000
50,000
Keswick flow (cfs)
Red Bluff
Hamilton City
Above Colusa Basin Drain

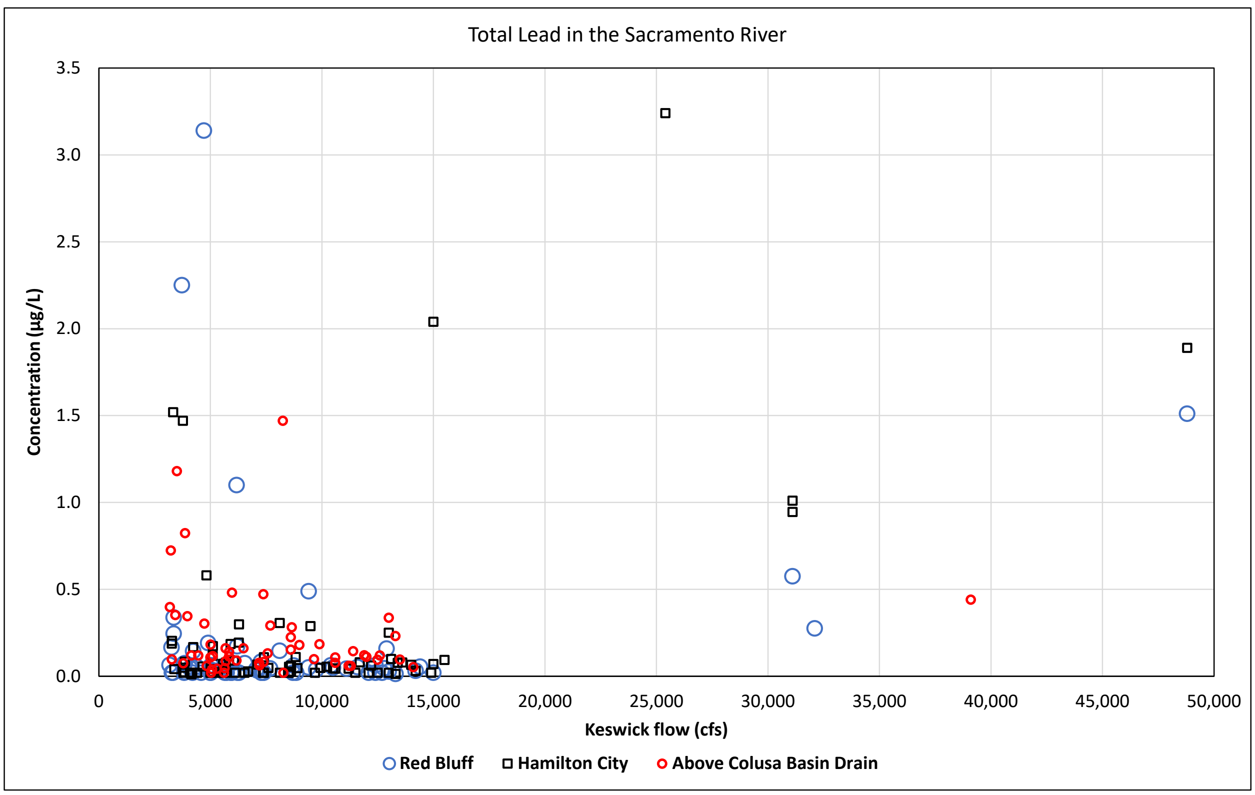

Total Copper in the Sacramento River
Concentration (µg/L)
0
2
4
6
8
10
12
14
16
18
20
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
1.1
1.2
Ratio of Keswick Flow to Bend Bridge Flow
Red Bluff
Hamilton City
Above Colusa Basin Drain

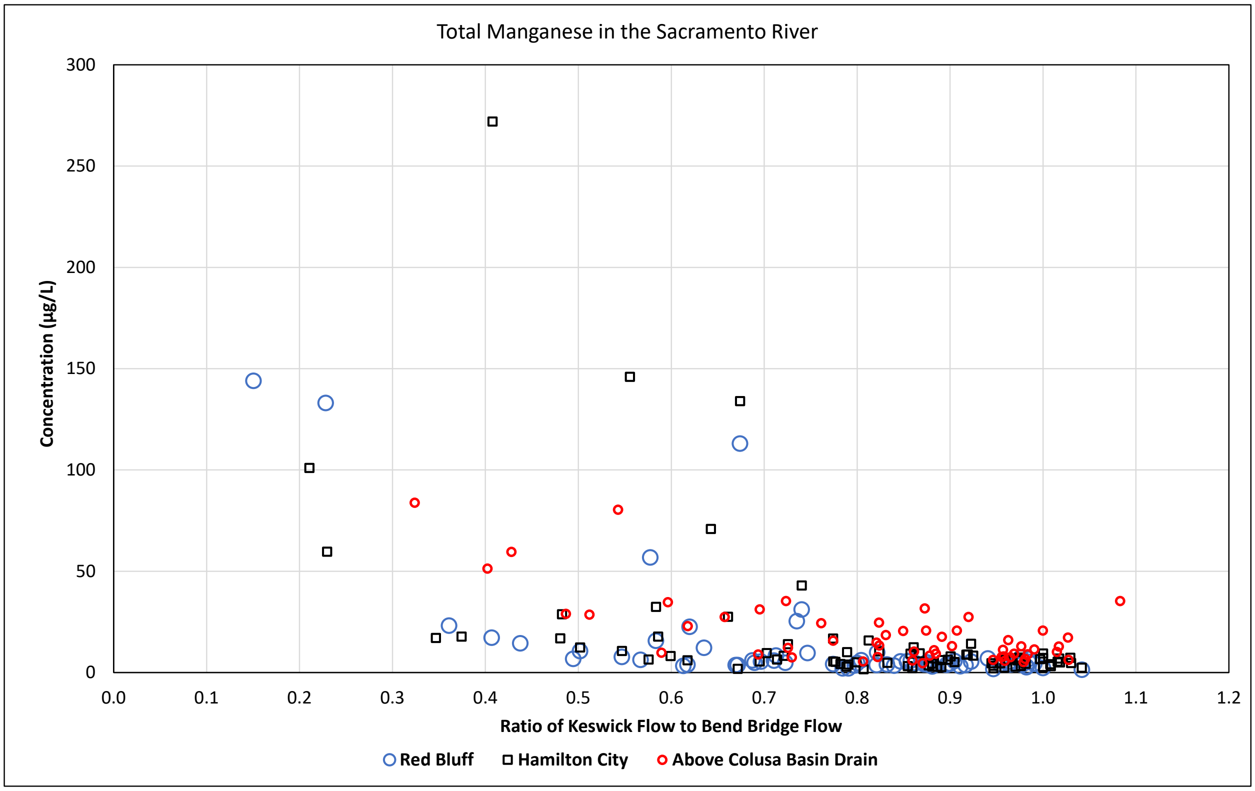

Total Copper in the Sacramento River
Concentration (µg/L)
0
2
4
6
8
10
12
14
16
18
20
0
5,000
10,000
15,000
20,000
25,000
30,000
35,000
40,000
45,000
50,000
Keswick flow (cfs)
Red Bluff
Hamilton City
Above Colusa Basin Drain


Total Iron in the Sacramento River
Concentration (µg/L)
12,000
10,000
8,000
6,000
4,000
2,000
0
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
1.1
1.2
Ratio of Keswick Flow to Bend Bridge Flow
Red Bluff
Hamilton City
Above Colusa Basin Drain

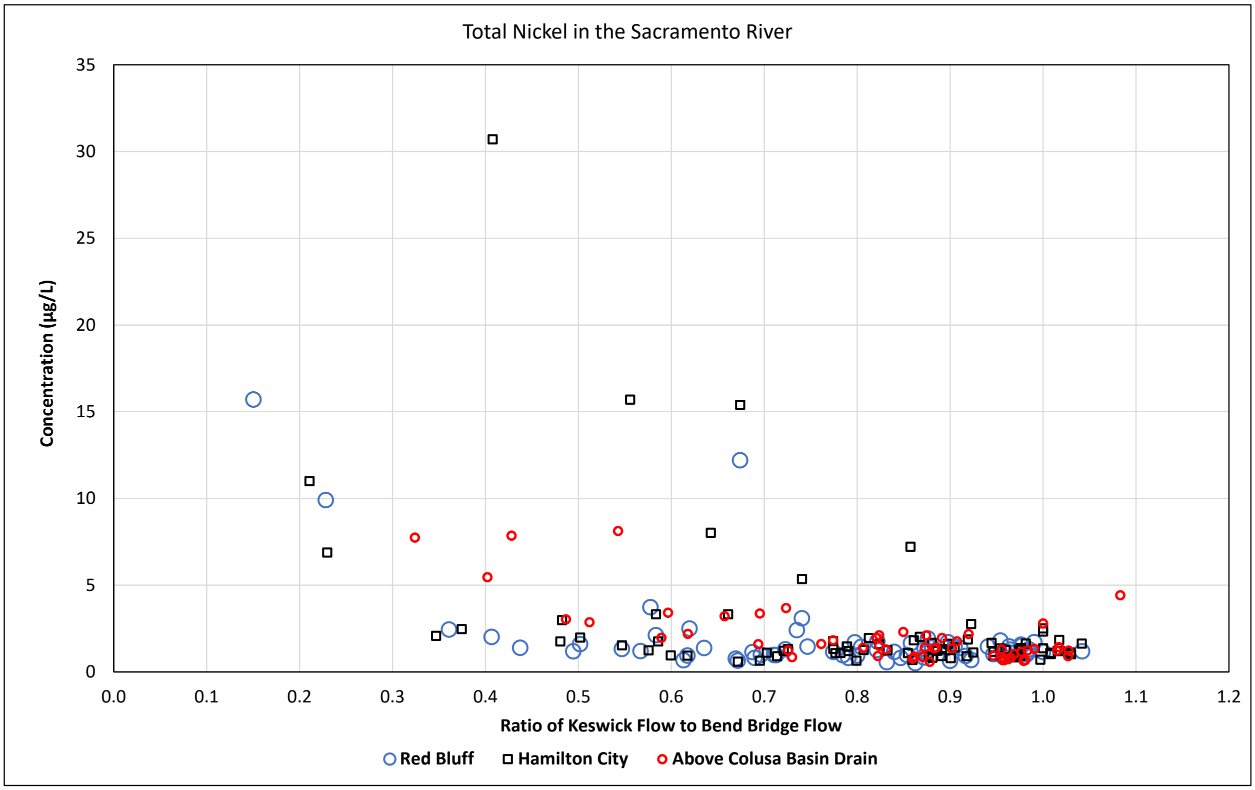

Total Iron in the Sacramento River
Concentration (µg/L)
12,000
10,000
8,000
6,000
4,000
2,000
0
0
5,000
10,000
15,000
20,000
25,000
30,000
35,000
40,000
45,000
50,000
Keswick flow (cfs)
Red Bluff
Hamilton City
Above Colusa Basin Drain

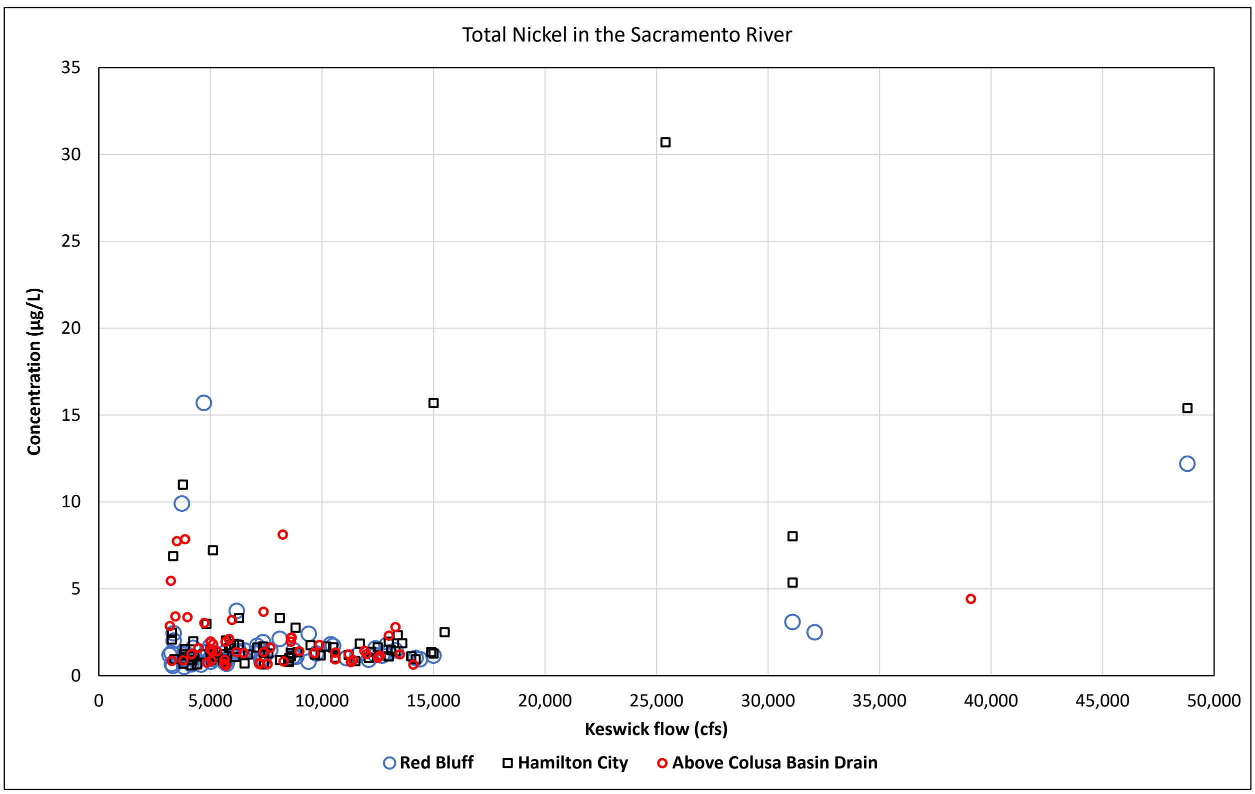

Total Lead in the Sacramento River
Concentration (µg/L)
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
1.1
1.2
Ratio of Keswick Flow to Bend Bridge Flow
Red Bluff
Hamilton City
Above Colusa Basin Drain

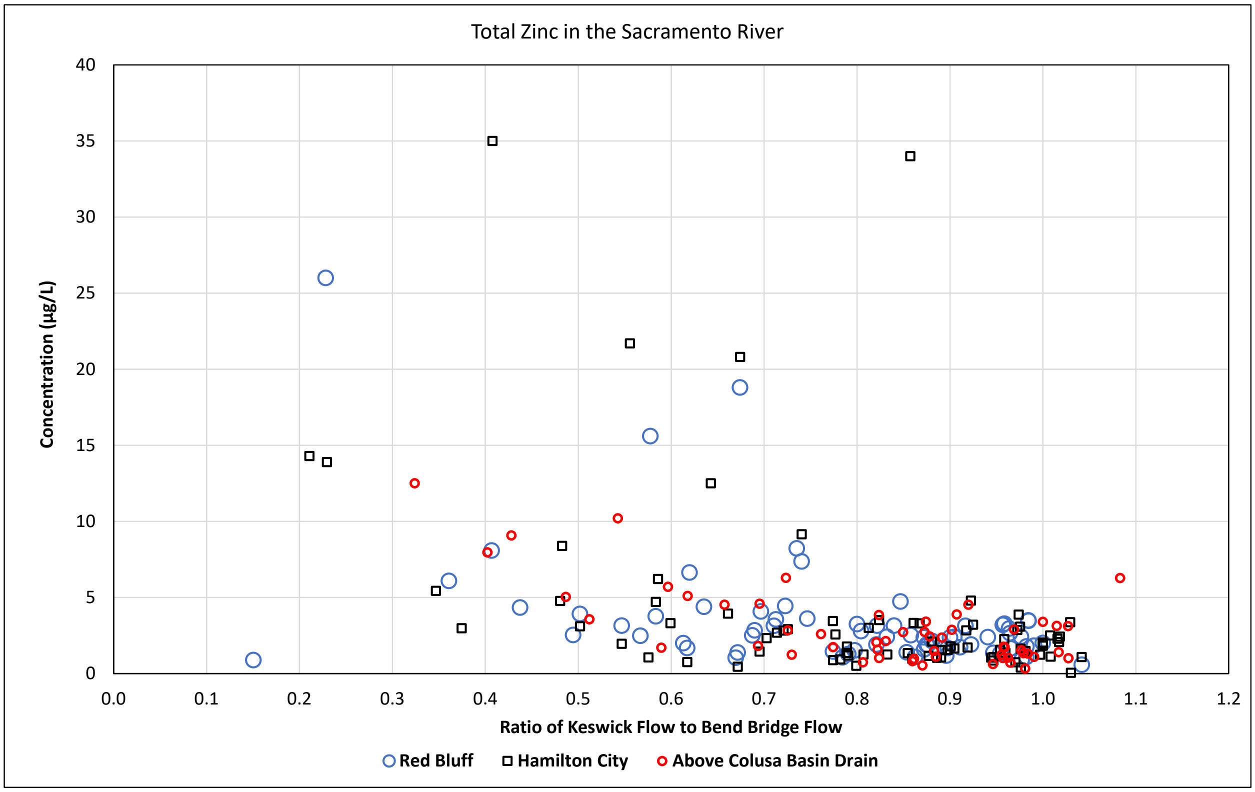

Total Lead in the Sacramento River
Concentration (µg/L)
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0
5,000
10,000
15,000
20,000
25,000
30,000
35,000
40,000
45,000
50,000
Keswick flow (cfs)
Red Bluff
Hamilton City
Above Colusa Basin Drain

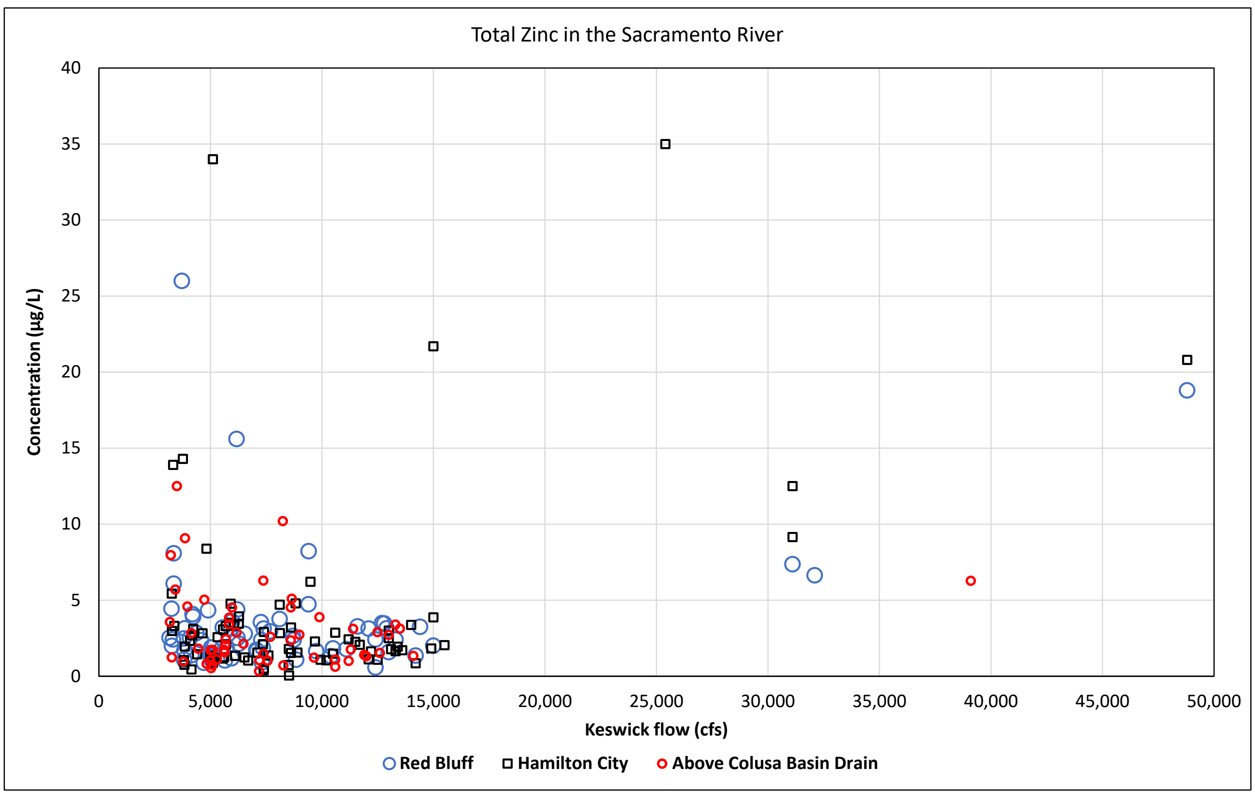

Total Manganese in the Sacramento River
Concentration (µg/L)
300
250
200
150
100
50
0
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
1.1
1.2
Ratio of Keswick Flow to Bend Bridge Flow
Red Bluff
Hamilton City
Above Colusa Basin Drain


Total Manganese in the Sacramento River
Concentration (µg/L)
300
250
200
150
100
50
0
0
5,000
10,000
15,000
20,000
25,000
30,000
35,000
40,000
45,000
50,000
Keswick flow (cfs)
Red Bluff
Hamilton City
Above Colusa Basin Drain

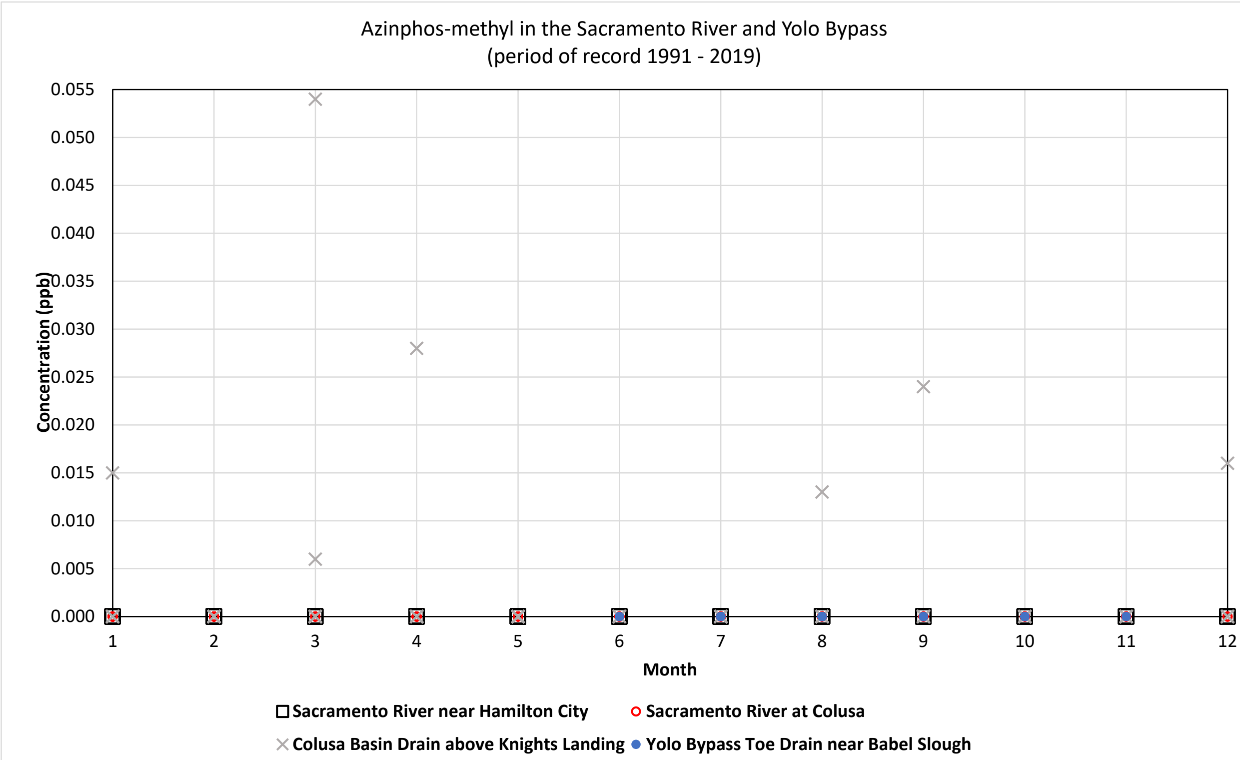

Total Nickel in the Sacramento River
Concentration (µg/L)
35
30
25
20
15
10
5
0
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
1.1
1.2
Ratio of Keswick Flow to Bend Bridge Flow
Red Bluff
Hamilton City
Above Colusa Basin Drain

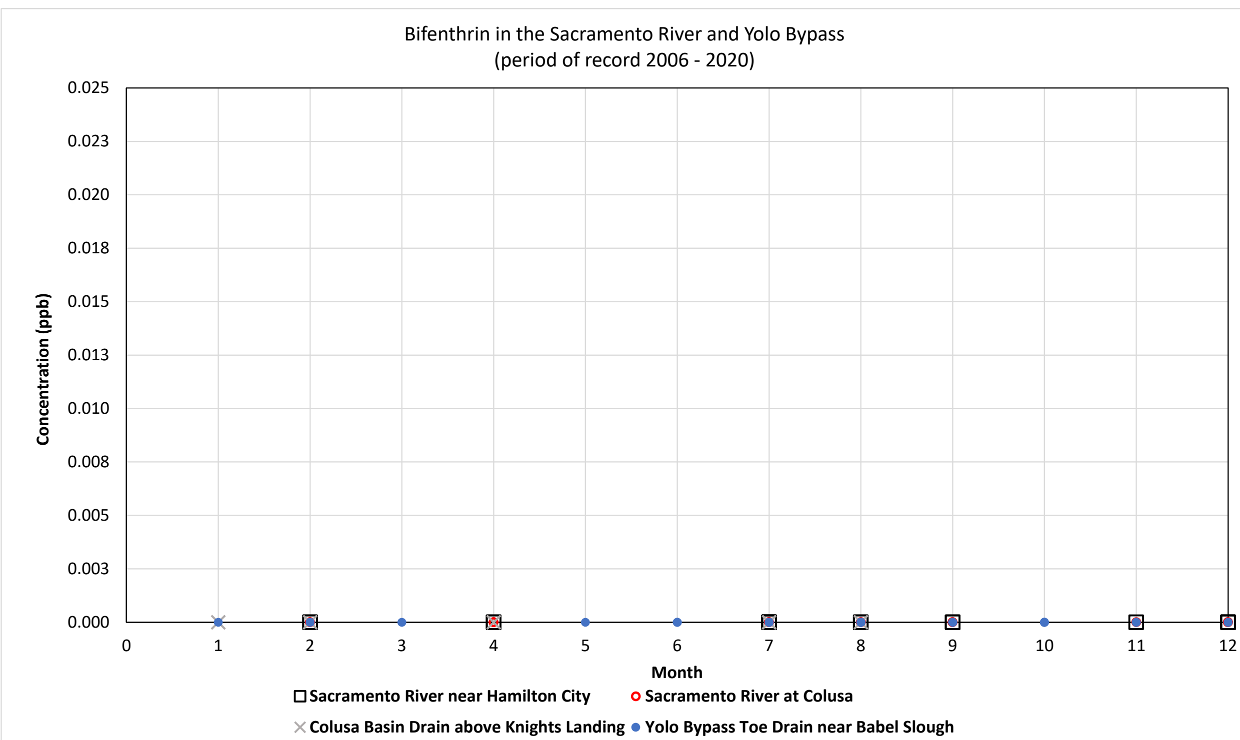

Total Nickel in the Sacramento River
Concentration (µg/L)
35
30
25
20
15
10
5
0
0
5,000
10,000
15,000
20,000
25,000
30,000
35,000
40,000
45,000
50,000
Keswick flow (cfs)
Red Bluff
Hamilton City
Above Colusa Basin Drain

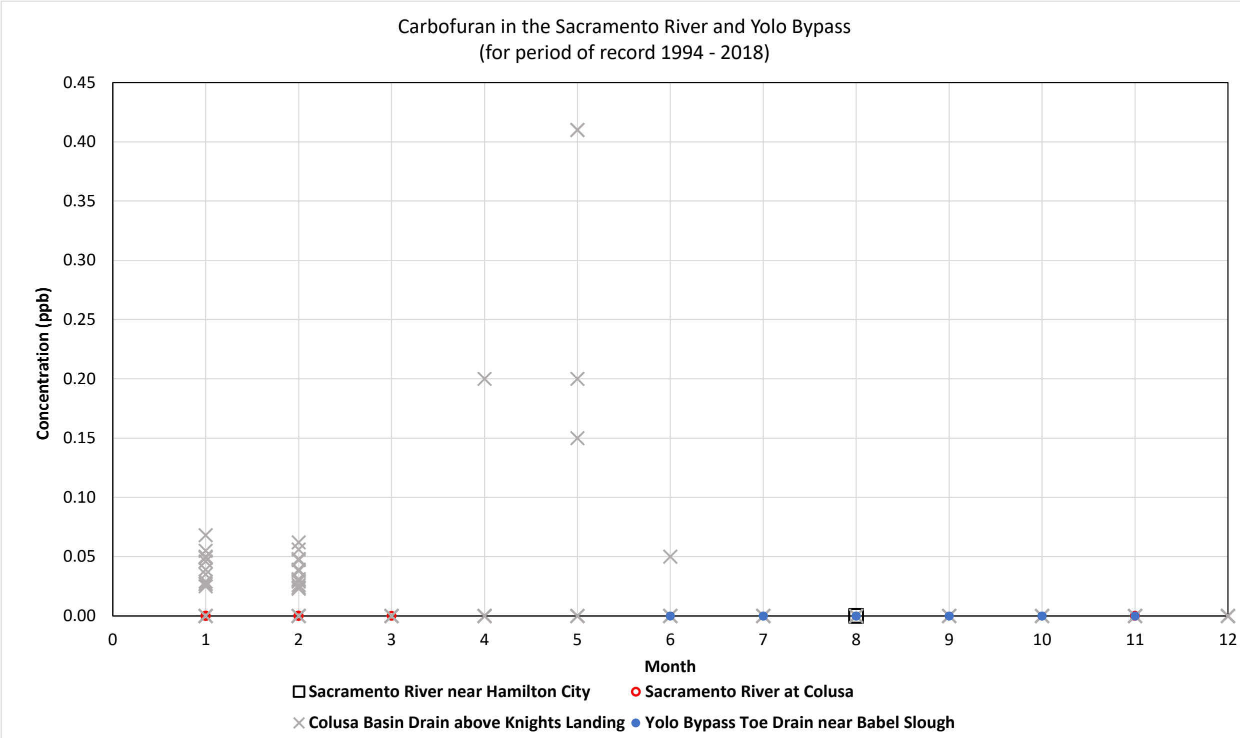

Total Zinc in the Sacramento River
Concentration (µg/L)
0
5
10
15
20
25
30
35
40
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
1.1
1.2
Ratio of Keswick Flow to Bend Bridge Flow
Red Bluff
Hamilton City
Above Colusa Basin Drain

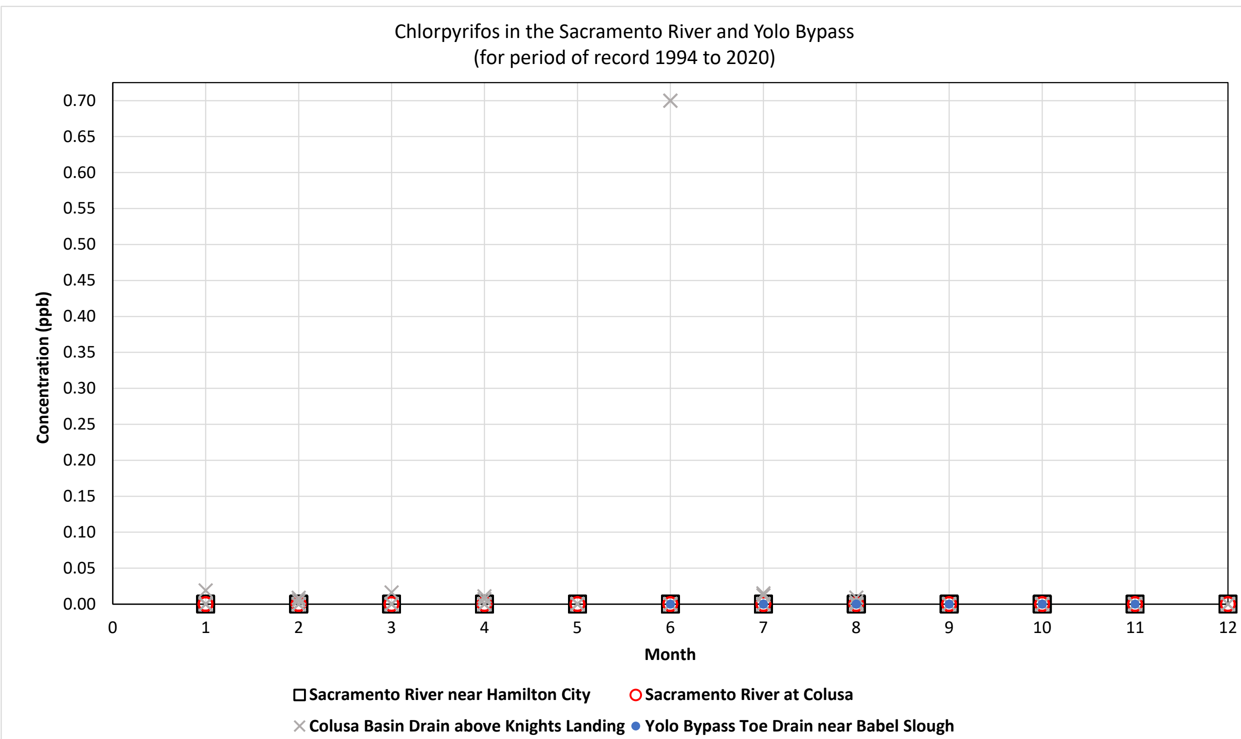

Total Zinc in the Sacramento River
Concentration (µg/L)
0
5
10
15
20
25
30
35
40
0
5,000
10,000
15,000
20,000
25,000
30,000
35,000
40,000
45,000
50,000
Keswick flow (cfs)
Red Bluff
Hamilton City
Above Colusa Basin Drain

# Pesticide Data by Month

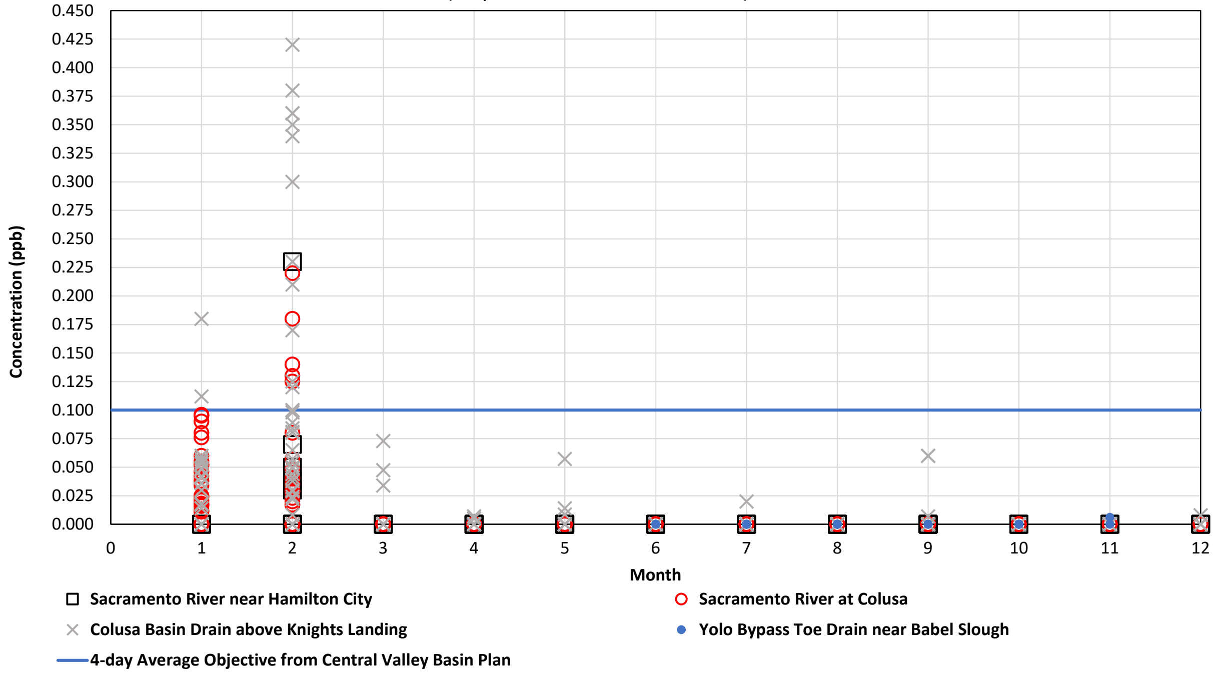


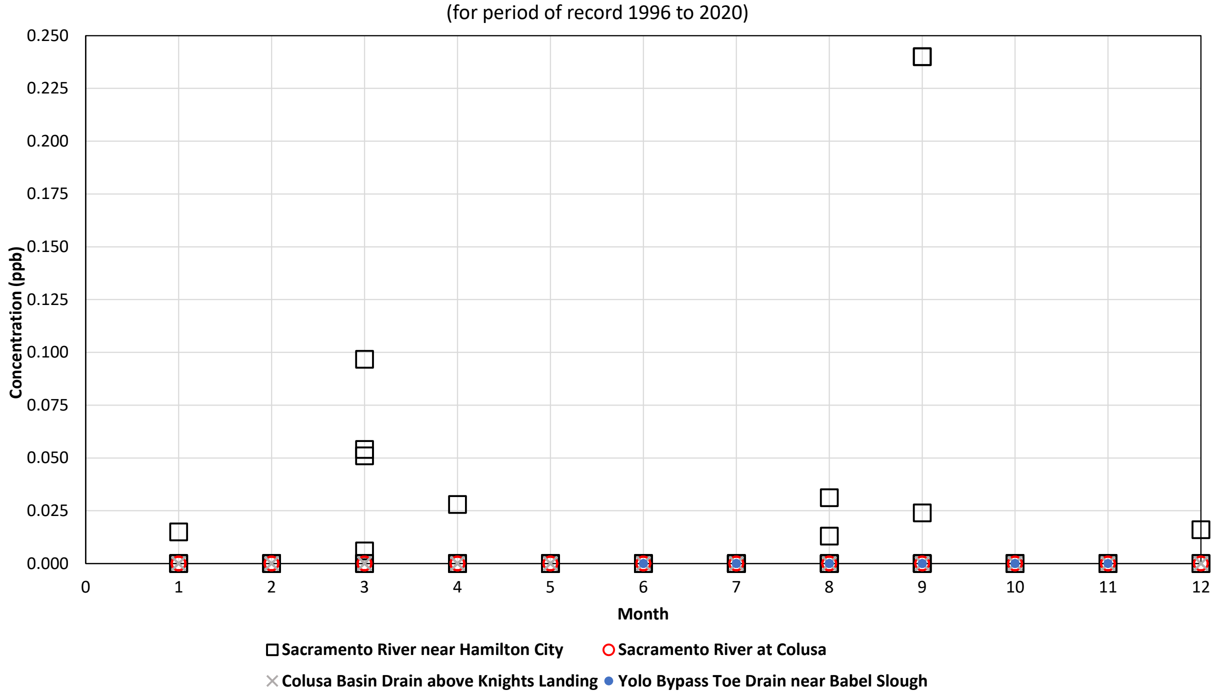

Carbofuran in the Sacramento River and Yolo Bypass
(for period of record 1994 - 2018)
Concentration (ppb)
0.45
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
0
1
2
3
4
5
6
7
8
9
10
11
12
Month
Sacramento River near Hamilton City
Sacramento River at Colusa
Colusa Basin Drain above Knights Landing
Yolo Bypass Toe Drain near Babel Slough

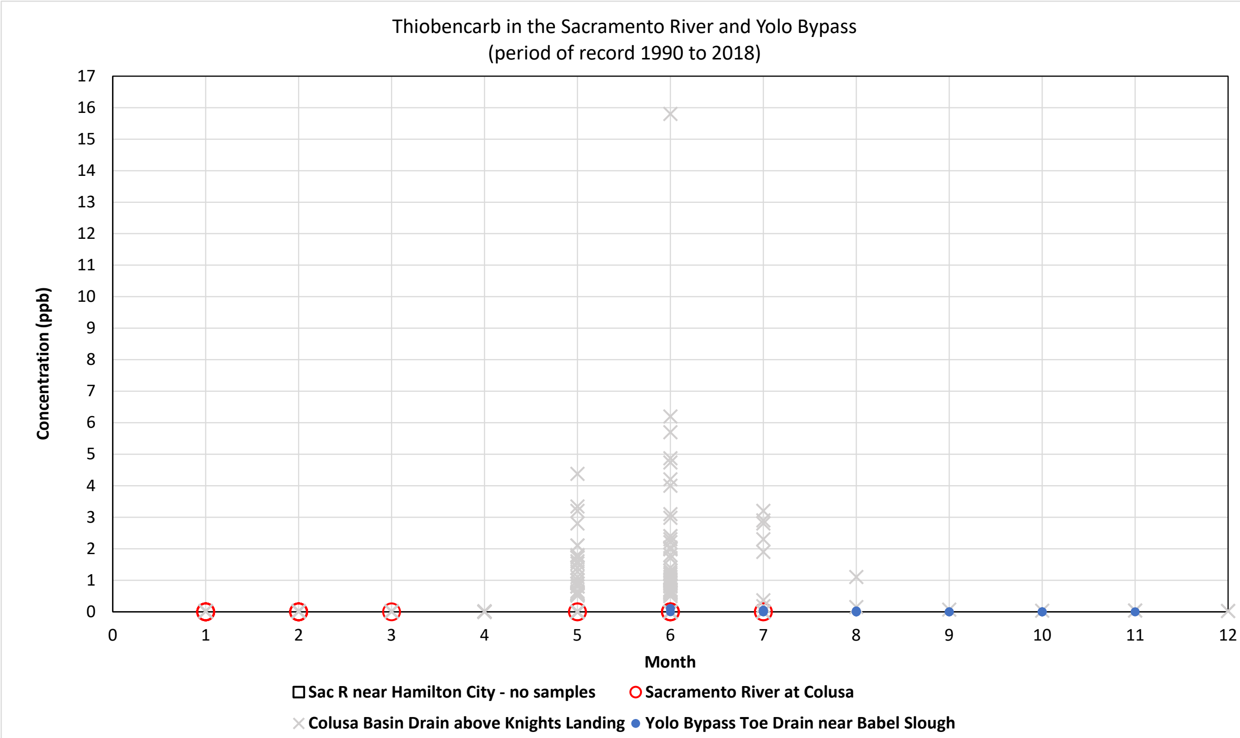

Chlorpyrifos in the Sacramento River and Yolo Bypass
(for period of record 1994 to 2020)
Concentration (ppb)
0.70
0.65
0.60
0.55
0.50
0.45
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
0
1
2
3
4
5
6
7
8
9
10
11
12
Month
Sacramento River near Hamilton City
Sacramento River at Colusa
Colusa Basin Drain above Knights Landing
Yolo Bypass Toe Drain near Babel Slough

Diazinon in the Sacramento River and Yolo Bypass
(for period of record 1994 to 2020)

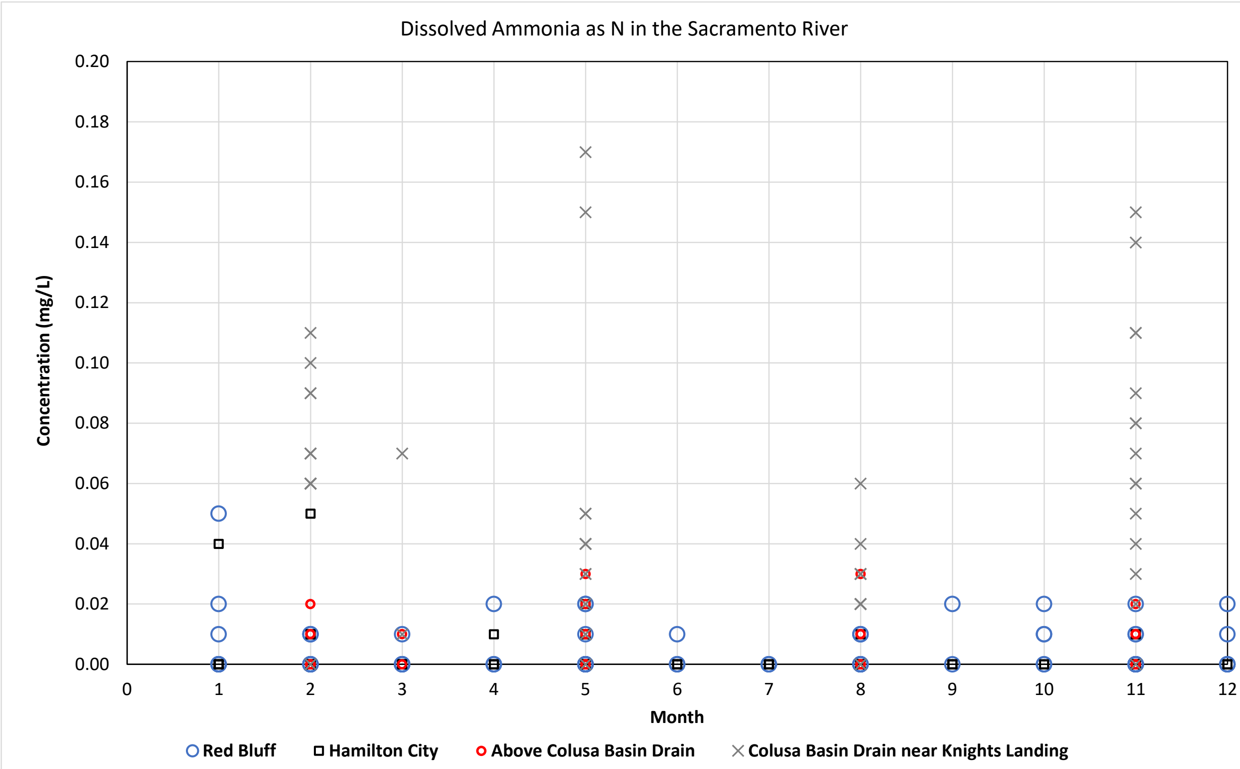


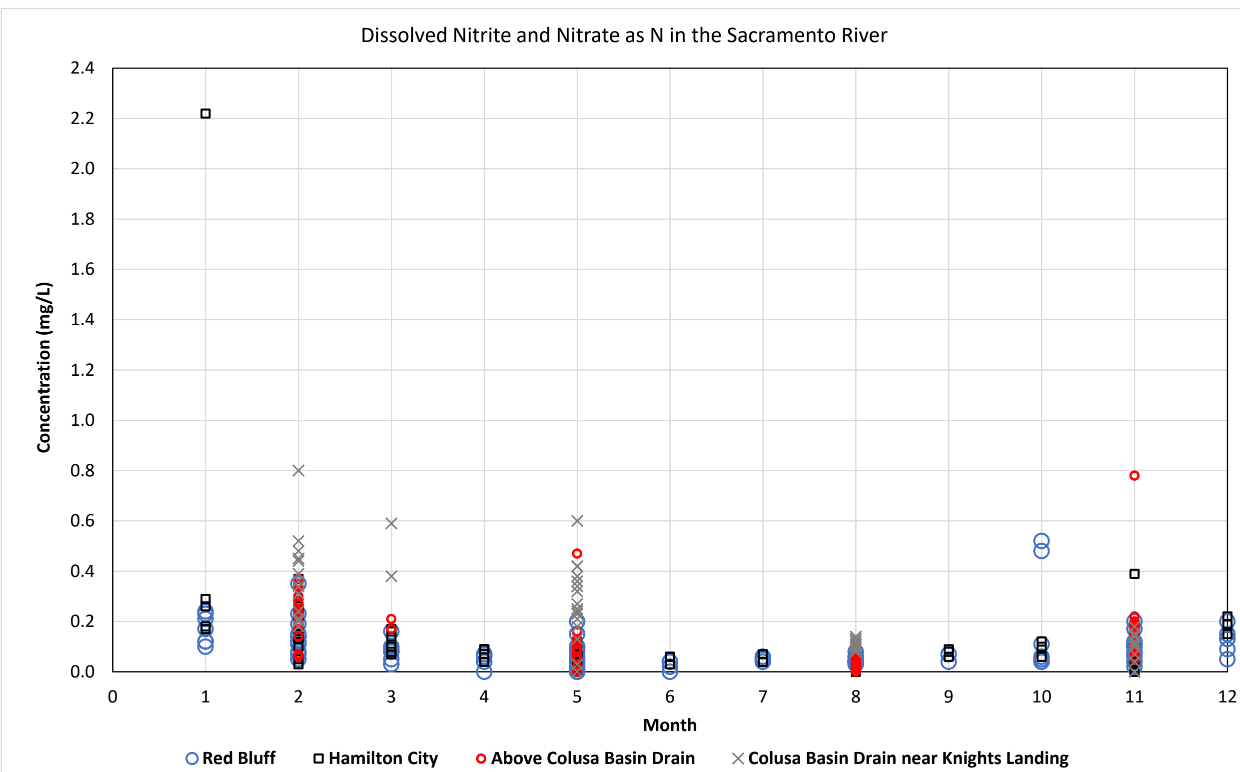

Malathion in the Sacramento River and Yolo Bypass
(for period of record 1996 to 2020)

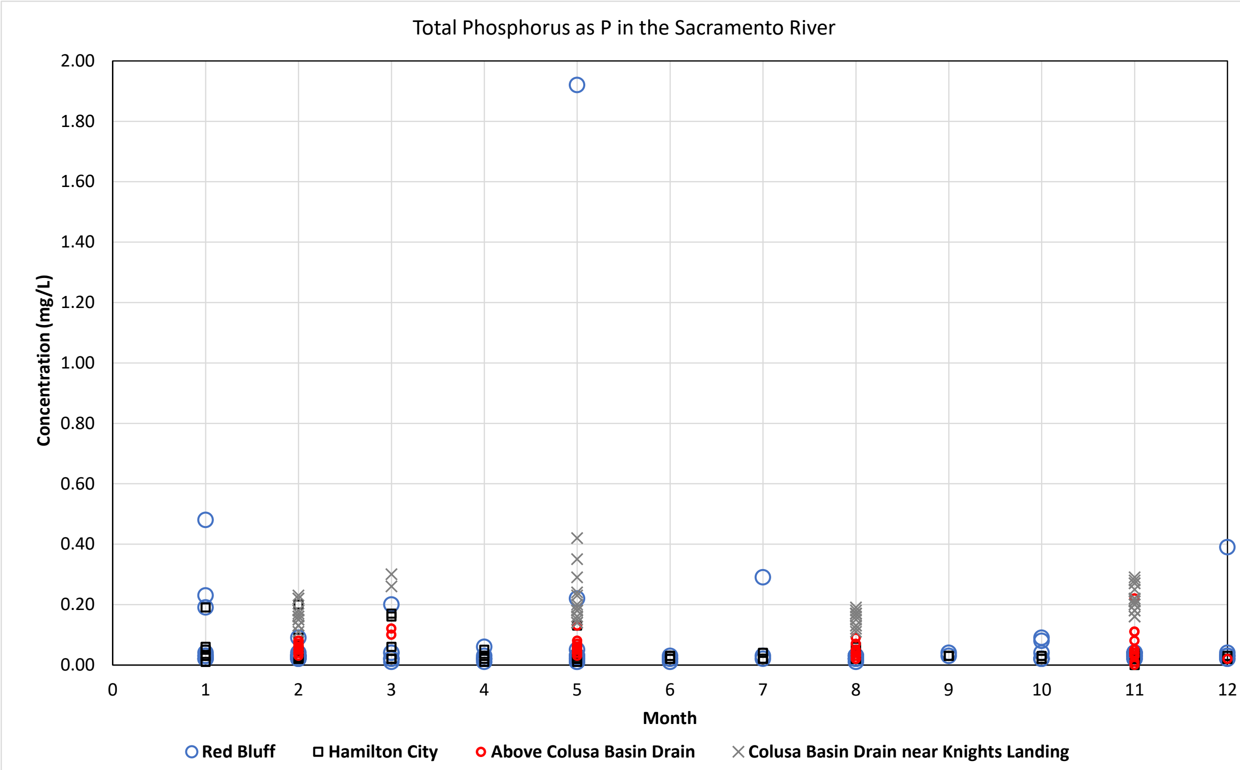


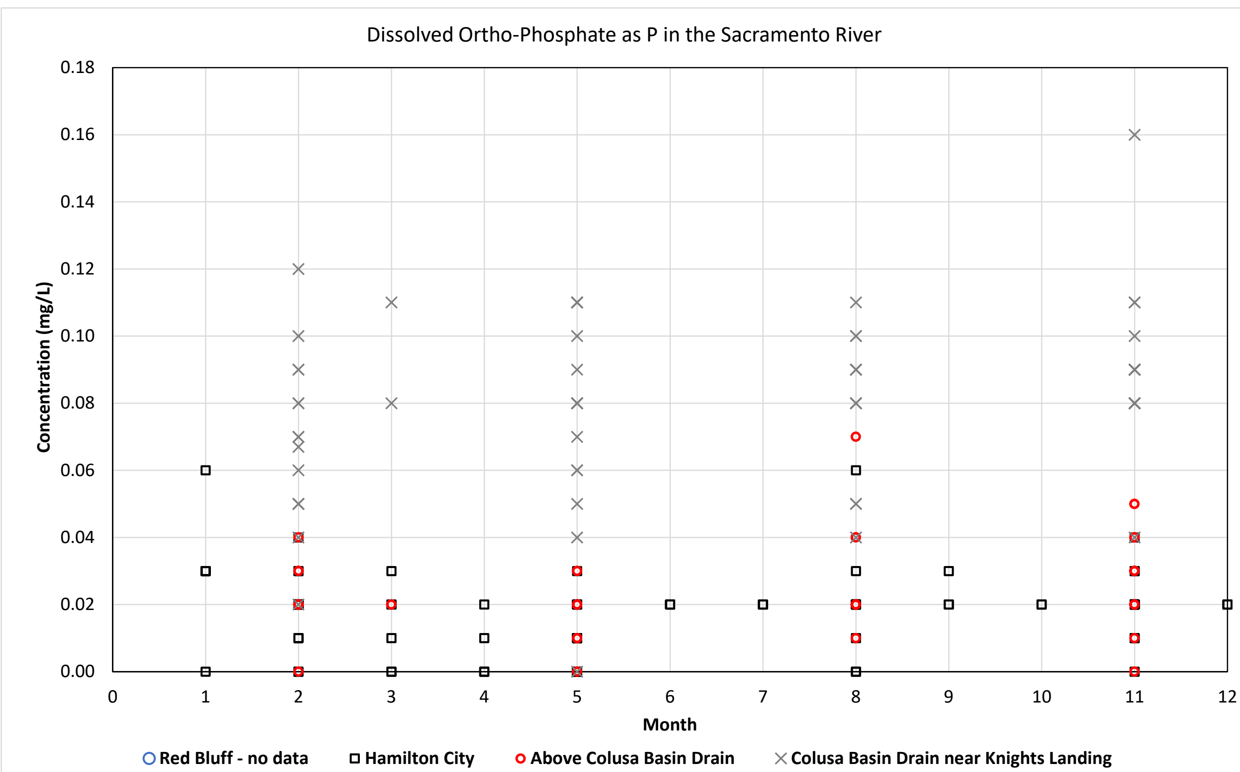

Thiobencarb in the Sacramento River and Yolo Bypass
(period of record 1990 to 2018)
Concentration (ppb)
Month
Sac R near Hamilton City - no samples
Sacramento River at Colusa
Colusa Basin Drain above Knights Landing
Yolo Bypass Toe Drain near Babel Slough

# Nutrients Data by Month




Total Phosphorus as P in the Sacramento River
Concentration (mg/L)
2.00
1.80
1.60
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
0 1 2 3 4 5 6 7 8 9 10 11 12
Month
Red Bluff
Hamilton City
Above Colusa Basin Drain
Colusa Basin Drain near Knights Landing


Dissolved Ortho-Phosphate as P in the Sacramento River
Concentration (mg/L)
0.18
0.16
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.00
0 1 2 3 4 5 6 7 8 9 10 11 12
Month
Red Bluff - no data
Hamilton City
Above Colusa Basin Drain
Colusa Basin Drain near Knights Landing

# Water Rights Small Group Agenda

Affordable Water, Sustainably Managed

***Our Core Values – Safety, Trust and Integrity, Respect for Local Communities, Environmental Stewardship, Shared Responsibility and Shared Benefits, Accountability and Transparency, Proactive Innovation, Diversity and Inclusivity***
***Our Commitment – To live up to these values in everything we do***

## Meeting Information:

| | | | |
|---|---|---|---|
| **Date:** | February 23, 2021 | **Location:** | Microsoft Teams |
| **Start Time:** | 1:00 p.m. | **Finish Time:** | 2:30 p.m. |
| **Purpose:** | Overview and discussion of the Sites Project's water right approach | | |

## Meeting Participants:

| | | |
|---|---|---|
| Doug Obegi | Craig Tucker | Andy Hitchings |
| Joe Polos | Ellen Wehr | John Spranza |
| Greg Reis | Rebecca Wu | Kelley Taber |
| Anthony Saracino | Ali Forsythe | Marc VanCamp |
| Hank Seemann | Erin Heydinger | Anne Williams |
| Tom Stokely | | Laurie Warner Herson |
| | | Melissa Dekar |

## Agenda:

| Discussion Topic | Topic Leader | Time Allotted |
|---|---|---|
| 1. Introductions | Ali | 5 mins |
| 2. Group Norms | Ali / Group | 10 mins |
| 3. Water Right Approach and Key Application Parameters<br>a. New application or taking over prior application<br>b. Purpose of Use<br>c. Source<br>d. Diversion to Off-stream Storage<br>e. Points of Diversion and Season<br>f. Points of Rediversion<br>g. Place of Use | Ali | 30 mins |
| 4. Prop 1 Water | Ali | 10 mins |
| 5. Water Right Schedule | Ali | 10 mins |
| 6. Additional Topics from the Group | Group | 15 mins |
| 7. Action Items and Next Steps | Ali | 10 mins |

# Water Rights Small Group

Overview and Discussion of the Sites Project's Water Right Approach

February 23, 2021

Sites

# Agenda

1. Introductions
2. Group Norms
3. Water Right Approach and Key Application Parameters
4. Prop 1 Water
5. Water Right Schedule
6. Additional Topics from the Group
7. Action Items and Next Steps

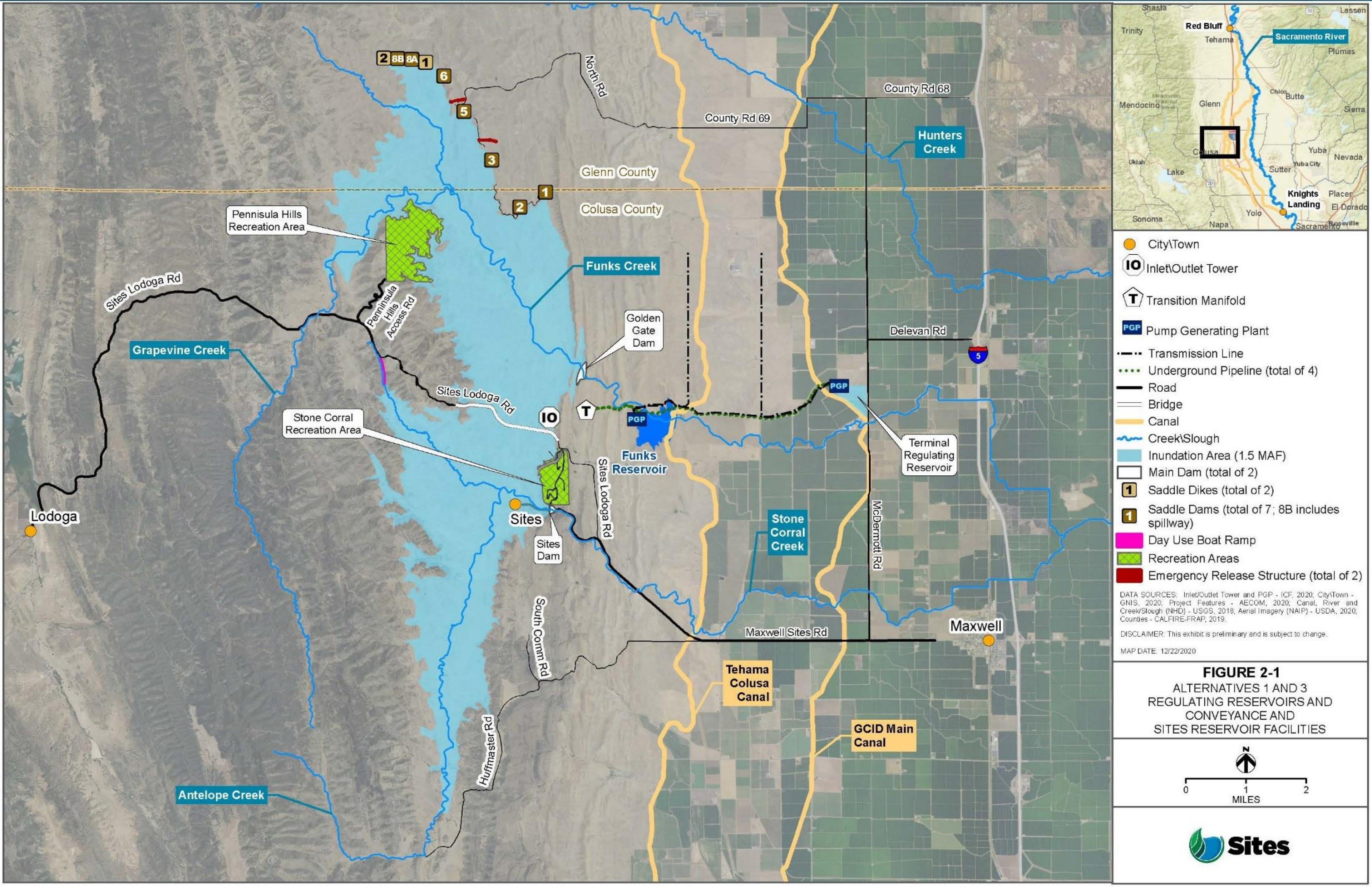
# Group Norms

- 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

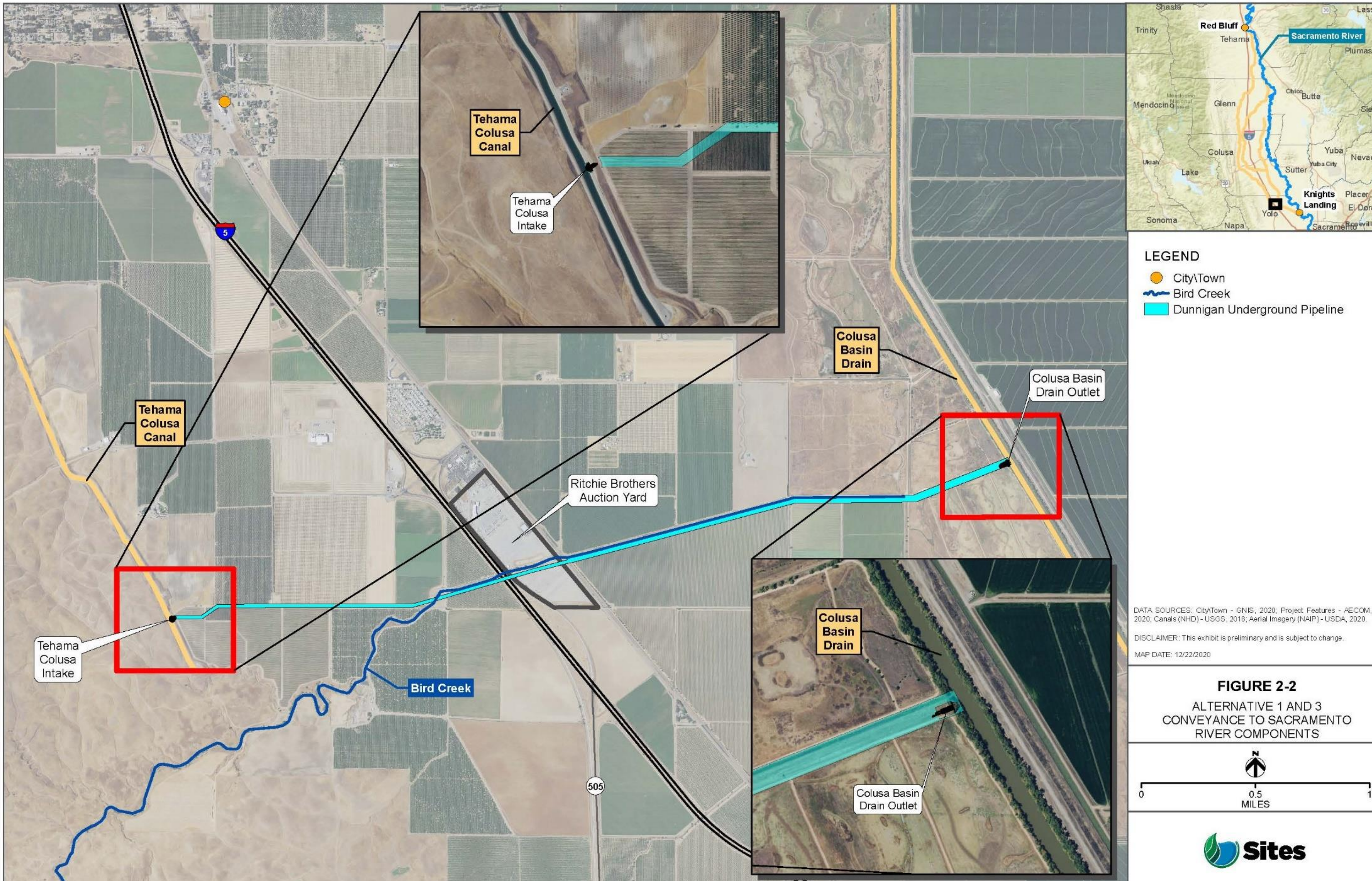
# Alt 1 – Authority's Preferred Project

| Facilities / Operations | Alternative 1 |
|---|---|
| Reservoir Size | 1.5 MAF |
| Diversion(s) | Diversion from Sacramento River into existing TC Canal at Red Bluff and the existing GCID Main Canal at Hamilton City |
| Conveyance Release / Dunnigan Release | Release 1,000 cfs into new pipeline to the Colusa Basin Drain |
| Releases into Funks and Stone Corral Creeks | Specific flow criteria to maintain flows to protect downstream water right holders and ecological function |
| Reclamation Involvement | • Funding Partner up to 7% Cost-Share<br>• Operational exchanges |
| DWR Involvement | Operational Exchanges with Oroville and use of SWP facilities South-of-Delta |
| Hydropower | Incidental power generation up to 40 megawatts each at Funks PGP and TRR PGP |

# Alt 1 – Preferred Project



# Alt 1 – Preferred Project



# Application Key Approaches

- Reinitiated efforts on water right application
- Developing key parameters for application
  - Informs and sets the foundation of our water right permit approach
  - Ensures these components are covered in the Revised EIR/Supplemental EIS

# Purpose of Use

- How water diverted into Sites Reservoir would subsequently be used
- Generally follow the purposes of use in the SWP and CVP water right permits
- Purpose of Use:
  - Irrigation
  - Domestic
  - Municipal
  - Industrial
  - Water Quality
  - Recreational
  - Fish and Wildlife Preservation and Enhancement
  - Incidental Power Generation
- Working with State Board staff on how to address groundwater replenishment, contributing to the goals of SGMA

# Source

- Sources:
  - Sacramento River
  - Stone Corral Creek
  - Funks Creek

# Diversion to Off-stream Storage

- How much the project seeks to divert and store over what time period
- Request would be consistent with the available canal capacity and facilities to move water into Sites
- Season limited to the season when the Sacramento River is not fully appropriated
- Storage of up to 1.5 million acre-feet per year from all sources

# Points of Diversion

- Locations where the project would divert water (or take “control” of water)
- Points of diversion:
  - Tehama-Colusa Canal (existing, screened facility)
  - Glenn-Colusa Irrigation District’s Main Canal (existing, screened facility)
  - Sites Dam
  - Golden Gate Dam

# Releases from Sites for Storage Partners

- Storage Partners –
  - Those that have funded and received a Storage Allocation in Sites Reservoir and the resulting water supply or water supply related environmental benefits
  - Includes local agencies, the State of California, and the Federal Government
- Partners along the TC Canal and GCID Main Canal
- Partners along the Sacramento River
- Partners along the Colusa Basin Drain, Yolo Bypass, and North Bay Aqueduct
- Partners South-of-Delta

# Points of Rediversion

- Waterways where water previously diverted for the project could be re-diverted
- Points of re-diversion:
  - North Bay Aqueduct
  - Contra Costa's facilities
  - Reclamation's Rock Slough Intake
  - SWP Delta and South-of-Delta facilities
  - CVP Delta and South-of-Delta facilities

# Place of Use

- Area where water diverted to storage could subsequently be used
- Place of Use:
  - Sites Reservoir, associated facilities and recreation areas
  - CVP and SWP place of use upstream of the Delta where water from Sites Reservoir can physically be delivered
  - All areas of Colusa County where water from Sites Reservoir can physically be delivered
  - Entire CVP and SWP area of export
- Place of use includes Yolo Bypass

# Prop 1 Water Considerations

- Cover Prop 1 Water Use in Place of Use and Points of Rediversion
  - Yolo Bypass Water
    - Yolo Bypass in Place of Use
    - Delta to Chipps Island in Place of Use
  - Refuge Water Supply
    - May need additional points of rediversion south-of-Delta (Mendota Dam and Sack Dam on San Joaquin River)
- 1707 not possible in a new application
- Working with State Board staff on best approach to protect Prop 1 water

# Water Right Schedule

- Late Summer – Revised Draft EIR/Supplemental Draft EIS
- December 2021 – Submit Application
- Early 2022 – State Board Notice
- Spring 2022 – Final EIR/EIS
- Spring/Summer 2022 – Formal Protest Resolution Period
- Winter 2022/Early 2023 – Hearing (if needed)
- Spring 2023 – State Board issues Order and water right

# Additional Topics from the Group

- Any additional questions or thoughts?

# Action Items and Next Steps

# Thank you!

Sites

# Sites Reservoir Project Update Agenda

**Affordable Water, Sustainably Managed**

***Our Core Values – Safety, Trust and Integrity, Respect for Local Communities, Environmental Stewardship, Shared Responsibility and Shared Benefits, Accountability and Transparency, Proactive Innovation, Diversity and Inclusivity***
***Our Commitment – To live up to these values in everything we do***

**Meeting Information:**

| | | | |
|---|---|---|---|
| **Date:** | December 14, 2020 | **Location:** | Microsoft Teams |
| **Start Time:** | 3:00 p.m. | **Finish Time:** | 4:00 p.m. |
| **Purpose:** | Provide an Update and Opportunity for Questions on the Sites Reservoir Project | | |

**Agenda:**

| Discussion Topic | Topic Leader | Time Allotted |
|---|---|---|
| 1. Welcome | Ali Forsythe | 5 min |
| 2. Project History and Current Status<br>a. Original Proposed Project and 2017 EIR/EIS – Comments and Key Issues<br>b. Ongoing Coordination with Wildlife Agencies<br>c. Value Planning Process – Finding the "Right-Sized" Project<br>d. Designation of the Authority's Preferred Project | Ali Forsythe | 20 min |
| 3. CEQA/NEPA Process<br>a. Decision to Recirculate the Draft EIR<br>b. Coordination with Reclamation to Continue Joint Document – Revised Draft EIR/Supplemental Draft EIS (RDEIR/SDEIS)<br>c. Ongoing Consultation with Tribes<br>d. Schedule for Release of the RDEIR/SDEIS and Opportunity to Provide Comments | Laurie Warner Herson / Kevin Spesert | 15 min |
| 4. Open Discussion / Questions from the Group | All | 15 min |
| 5. Next Steps<br>a. Survey and Focused Technical Meetings | Ali Forsythe | 5 min |

# SITES RESERVOIR PROJECT UPDATE

# DECEMBER 2020

Sites



## Agenda

- Project History and Current Status
- CEQA/NEPA Process
- Open for Discussion
- Next Steps

# Project History and Current Status

Sites

## Original Proposed Project and 2017 Draft EIR/EIS Comments

- Original Project:
  - 1.8 million acre-foot reservoir
  - 3 intakes (about 6,000 cfs diversion capacity in total)
  - New Delevan Pipeline and intake
  - Pump/generation facility
- 2017 Draft EIR/EIS – August 2017
- 137 comment letters received, 11 from conservation organizations

# Value Planning Report

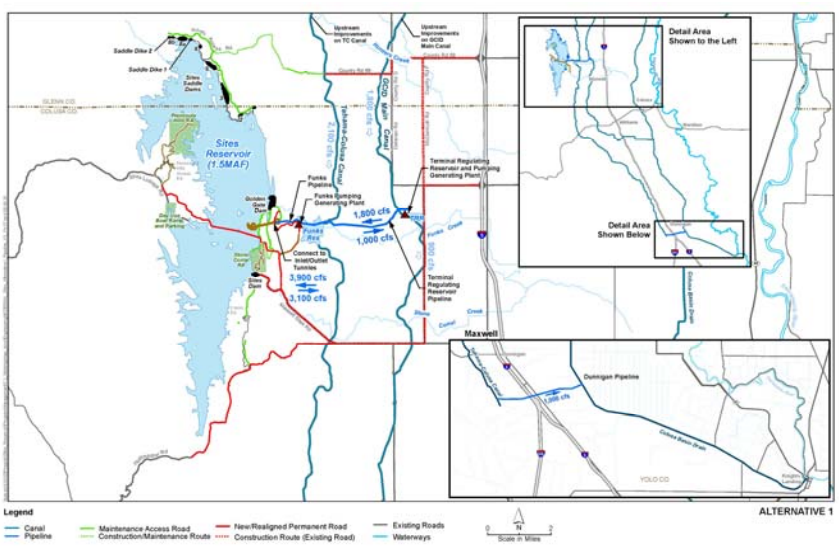
- October 2019 – Began Value Planning Efforts
  - 16 new / modified alternatives considered
- April 2020 – Board adopted Value Planning Report and recommendations

| Major Facilities | VP5 | VP6 | VP7 Recommended |
|---|---|---|---|
| Reservoir Size | 1.3 MAF | 1.3 MAF | 1.5 MAF |
| Bridge Size (avoids future traffic Interruption) | 1.5 MAF | 1.5 MAF | 1.5 MAF |
| South Road to Local Residents | Included | Included | Included |
| Misc. Local and Project Roads | Included | Included | Included |
| Diversion Locations | Funks and TRR | Funks and TRR | Funks and TRR |
| Dunnigan Release | 1,000 cfs to CBD | 1,000 cfs to River | 1,000 cfs to CBD |

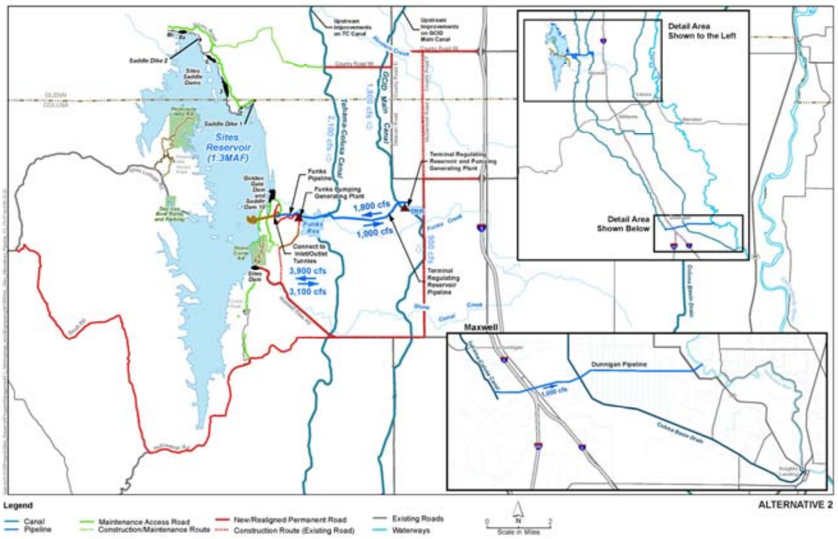
CBD = Colusa Basin Drain
MAF = Million Acre-feet
TRR = Terminal Regulating Reservoir



# Alternative 1 – Preferred Project



## Alternative 2






## CEQA/NEPA Process

## Decision to Recirculate Draft EIR

- Value Planning Process resulted in the identification of new alternatives not previously analyzed in the 2017 Draft EIR/EIS
- Key changes to the project include:
  - Changes in facility footprints and new footprint areas
  - Changes in operations
  - Changes in conveyance (Dunnigan pipeline)
  - Release to the Colusa Basin Drain



## Decision to Recirculate (cont.)

**CEQA Standards for Recirculation – Pub. Res. Code § 21092.1 & CEQA Guidelines § 15088.5**

- A lead agency is required to recirculate if "significant new information" is added after publication of the Draft EIR.
- "Significant new information" is defined as information showing any of the following:
  - A new significant impact resulting from the project or from a mitigation measure
  - A substantial increase in the severity of a previously identified significant impact resulting from the project or from a mitigation measure
  - A feasible project alternative or mitigation measure considerably different from others previously analyzed would lessen the project's impacts, but the project proponents decline to adopt it
  - The Draft EIR "is so fundamentally flawed and basically inadequate and conclusory in nature that meaningful public review and comment were precluded"
- Recirculation is "not required where the new information added to the EIR merely clarifies or amplifies or makes insignificant modifications in an adequate EIR"

## Decision to Recirculate (cont.)

- Preparation of a Revised Draft EIR allows the Authority to:
  - Address changes to the project
  - Update modeling baseline
  - Update existing conditions and cumulative projects
  - Prepare an analysis that takes into consideration all of the comments received on the 2017 Draft EIR/EIS



## Coordination with Reclamation

- Appropriate NEPA document to be a Supplemental Draft EIS
- Ongoing Coordination
  - Technical Content
  - Format (page limits, etc.)
  - Reclamation review process including schedule and Cooperating Agency coordination
- Relationship with Feasibility Report and reconciliation process

## NGO Comments / Issues Raised on 2017 Draft EIR/EIS

- Project description and range of alternatives
- Modeling approach, modeling baseline, and modeling analysis
- Operational impacts to fisheries
- Impacts to Trinity River resources
- Indian Trust Assets and impacts to Tribal Cultural Resources
- Impacts to terrestrial species
- Water quality
- Water rights
- Geotechnical and geological data and seismicity
- Cumulative impacts



## Sites Plans to Addressed Thru . . .

- Revisions to the project description to incorporate changes as a result of Value Planning
  - Develop more specifics on items (i.e., Reservoir Management Plan, Operations Plan and operational criteria, releases to Funks and Stone Corral creeks)
- Clarify baseline / existing conditions / No Action
- Clarify study areas for resource sections
- Update throughout with new information and analyses (i.e., water quality, air quality, Tribal cultural resources, terrestrial)
- Update hydrologic modeling and fisheries analyses based on new information
- Clearly identify and support that there will be no negative impacts to the Trinity River and its resources
- Closely look at impacts of the revised project along with mitigation measures to ensure they are specific, robust, supported by evidence, and address the driving factors
- Improve organization, layout and make reader friendly

## EIR/EIS Schedule

- January 2021 – Finalize and post Revised Draft EIR/Supplemental Draft EIS Project Description
- July 2021 – Release Revised Draft EIR/Supplemental Draft EIS for public review and comment
- August 2021 – Public meetings
- Mid-2022 – Release Final EIR/EIS



## We Want to Hear from You!

- We value your input.
- What topics are of most concern?
- How can we best coordinate and share information / ideas?

# Discussion

Sites

# Next Steps

Sites

## Upcoming Activities

- Provide survey to attendees
  - Identify key areas of concern
  - Identify topics for future meetings
- Schedule focused technical meetings in early 2021



## Thank you!

Sites

# Fishery Group Discussion #2 – Project Effects
# Agenda

Sites
Affordable Water, Sustainably Managed

***Our Core Values – Safety, Trust and Integrity, Respect for Local Communities, Environmental Stewardship, Shared Responsibility and Shared Benefits, Accountability and Transparency, Proactive Innovation, Diversity and Inclusivity***
***Our Commitment – To live up to these values in everything we do***

## Meeting Information:

| | | | |
|---|---|---|---|
| **Date:** | July 26, 2021 | **Location:** | Microsoft Teams<br>Or call in (audio only)<br>(833) 255-2803,,156125785# |
| **Start Time:** | 11:00 p.m. | **Finish Time:** | 12:30 p.m. |
| **Purpose:** | Overview and discussion of the Sites Project's aquatic modeling and EIR/S analysis approach | | |

## Meeting Invitees:

| | | |
|---|---|---|
| André Sanchez | Rebecca Wu | Laurie Warner Herson |
| Dave Zelinski | Regina Chichizola | Jason Hassrick |
| Debra Lucero | Ron Stork | Jim Lecky |
| Doug Obegi | Stephanie Gordon | Marin Greenwood |
| Greg Reis | Suzanne Manugian | Melissa Dekar |
| Jerry Boles | Tom Stokely | Mike Hendrick |
| Jim Brobeck | Ali Forsythe | Natalie Wolder |
| Joe Morgan | Dan Deeds | Nicole Williams |
| Rachel Zwillinger | Erin Heydinger | Steve Micko |
| | John Spranza | Vanessa King |

## Agenda:

| Discussion Topic | Topic Leader | Time Allotted |
|---|---|---|
| 1. Introductions | John S | 5 mins |
| 2. Meeting Norms | John S | 5 mins |
| 3. Salmonid Effects | Mike H | 30 min |
| 4. Sturgeon Effects | Mike H | 20 min |
| 5. Smelt Effects | Mike H | 20 mins |
| 6. Schedule | John S | 5 mins |
| 7. Action Items Review and Adjourn | John S | 5 mins |

# Sites Project Fishery Group Discussion

July 26, 2021

Sites

# Agenda

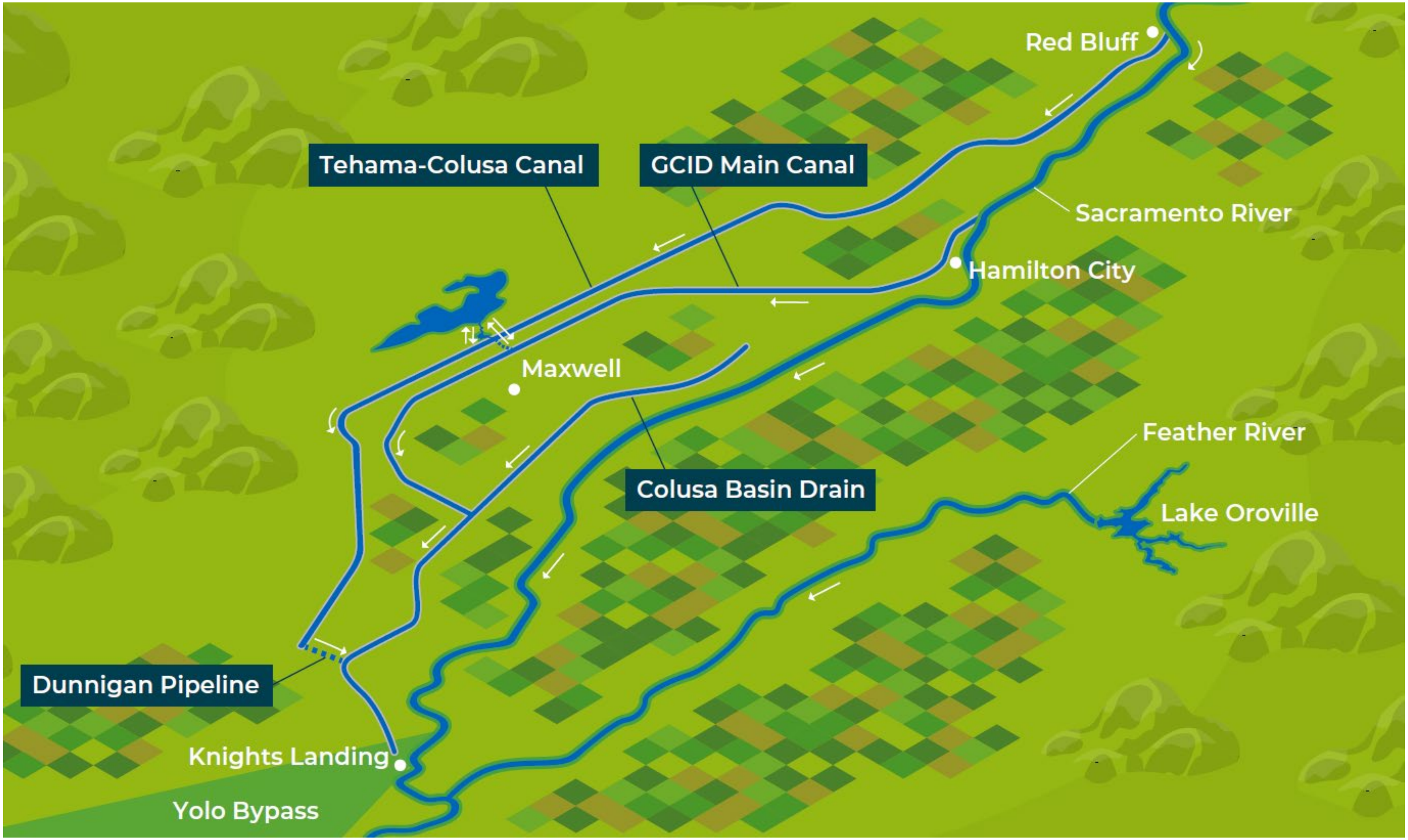
1. Introductions
2. Group Norms
3. General Review of Project
4. Salmonid Effects
5. Sturgeon Effects
6. Delta Smelt Effects
7. Schedule
8. Action Items and Adjourn

# Group Norms

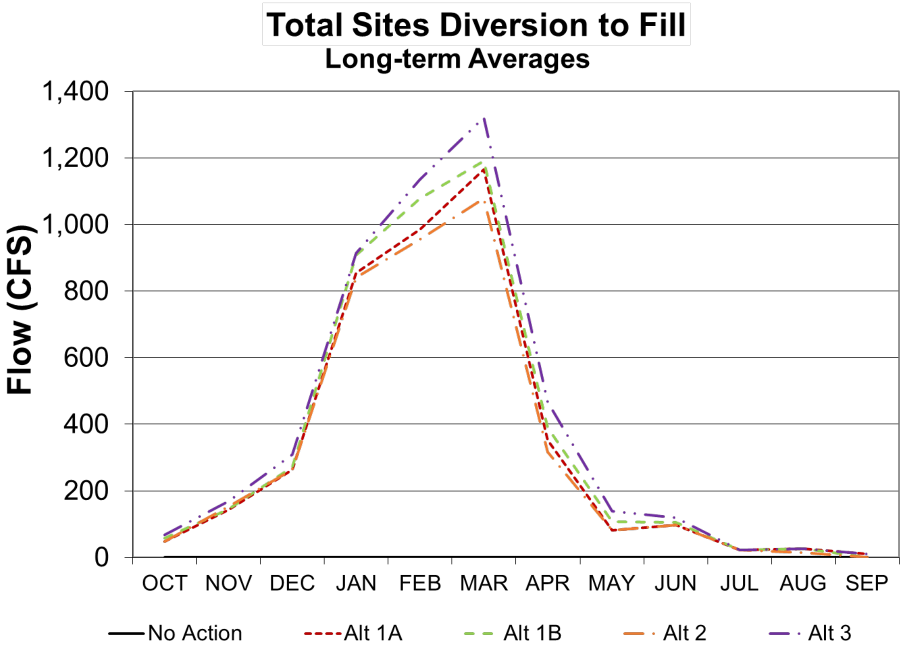
- Encourage everyone to be on video
- Mute yourself when others are speaking
- Respectful, professional dialogue
- Ask questions throughout, lets have a dialogue
  - Let the speaker finish their point
  - Use the raise your hand function in Teams if needed
- Topics for next meeting will be recorded and discussed at that meeting

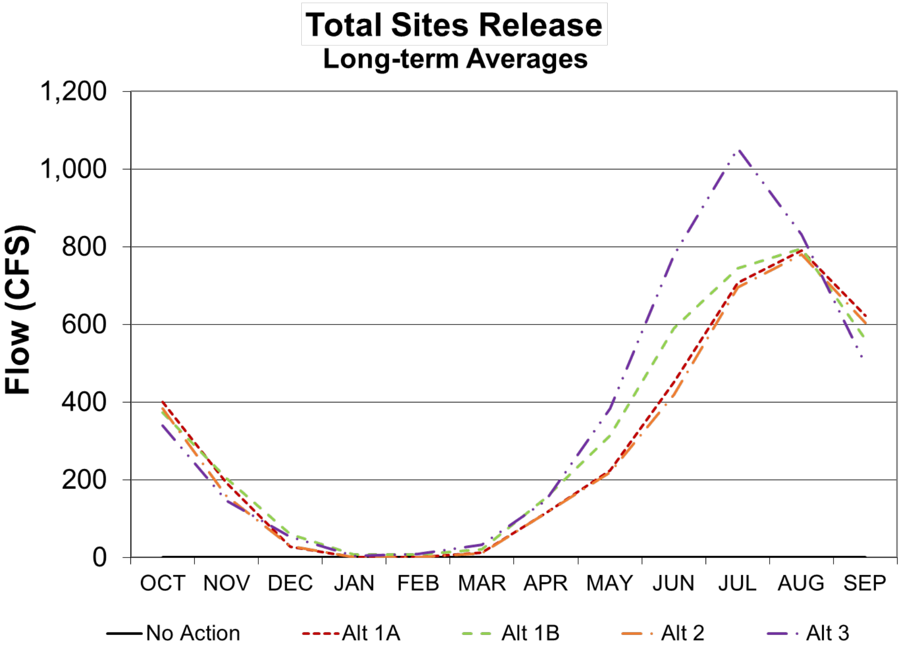
# Overview of Project Operations

# Project Water Operations



# Diversions and Releases



# Salmonid Effects Overview

# Aquatic Biological Resources – Overview

- Evaluates 20 Impacts
  - Impact FISH-1: Construction
  - Impact FISH-2 through -19: Operation effects on listed species and special status species of concern, including Killer Whales
  - Impact FISH-20: Maintenance Effects
- Impact assessments rely primarily on modeled hydrologic changes in SWP and CVP operations that would occur as a result of Project operations.  Depending on the species and location, the specifics of the assessment methodologies differ.

# Aquatic Biological Resources – Species Evaluated

| Listed Species | Other Species |
|---|---|
| Delta smelt, Longfin Smelt | California Bay Shrimp |
| Killer Whale | Starry Flounder, Northern Anchovy |
| Green Sturgeon | Pacific Lamprey, River Lamprey |
| Steelhead | Native Minnows |
| Fall-run/Late Fall-run Chinook | Striped Bass, Black Bass |
| Spring-run Chinook | American Shad, Threadfin Shad |
| Winter-run Chinook | White Sturgeon |

# Salmon Operations and Construction Effects Summary

- Impact FISH-1: Construction Effects on Special Status Fish
- Impact FISH-2: Operations Effects on Winter-Run
- Impact FISH-3: Operations Effects on Spring-Run
- Impact FISH-4: Operations Effects on Fall-Run and Late Fall-Run
- Impact FISH-5: Operations Effects on Steelhead

# Impact FISH-1: Construction Effects on Special Status Fish

- Construction would result in:
  - Ground-disturbance activities
  - Use of heavy equipment and hazardous materials
  - In-water construction (including pile driving)
  - Stream diversion and dewatering
  - Removal of riparian and stream-side vegetation (including vegetation supporting SRA cover)
  - Filling of Sites Reservoir.
  - Alt 2 includes construction of the energy dissipation structure for the Sacramento River discharge
- These activities would result in temporary impacts on special-status fish during construction activities. However, these temporary and permanent impacts would not affect any ESA-listed fish species. Exception is Alternative 2 and the construction of the energy dissipation structure for the Sacramento River discharge.

# Impact FISH-1: Construction Effects on Special Status Fish (Continued)

- Best Management Practices (BMPs) would be implemented during construction (examples include)
  - Stormwater Pollution Prevention Plan(s) (SWPPP)
  - Spill Prevention and Hazardous Materials Management / Accidental Spill Prevention, Containment, and Countermeasure Plans (SPCCPs)
  - Response Measures BMP
  - Requirements of Central Valley Regional Water Quality Control Board
  - In-water construction activities would be limited to allowable in-water work windows as part of the Construction BMPs
  - Underwater Sound Control, Abatement, and Monitoring Plan BMP

# Impact FISH-1: Construction Effects on Special Status Fish (Continued)

- Mitigation Measures
  - Will compensate for the permanent loss of riparian habitat, including SRA cover.
  - Will compensate for permanent impacts on wetlands, including riparian and freshwater marsh.
  - Will compensate for temporary and permanent impacts on state or federally protected non-wetland waters by creating or acquiring and permanently protecting suitable open-water habitat
  - Conduct Surveys for Sensitive Natural Communities and Oak Woodlands in the Project Area Prior to Construction Activities
- Construction of Alternative 1, 2 or 3 would be less than significant with mitigation.

# Impact FISH-2: Operations Effects on Winter-Run, Analysis Completed

- Fish Screen Entrainment and Impingement
- Stranding Behind Screens
- Predation at Intakes
- Temperature Effects
- Redd Dewatering and Redd Scour Entombment
- Habitat Weighted Usable Area (spawning, rearing)
- Juvenile Stranding
- Salmon Mortality and Production (via SALMOD)
- Floodplain Inundation and Access
- Delta Effects (Through Delta Survival, Juvenile Rearing, South Delta Entrainment)

# Impact FISH-2: Operations Effects on Winter-Run, Conclusion Excerpts

- Migration flow-survival effects from diversions have the potential to cause negative effects but would be limited by diversion criteria and a fish monitoring program capable of detecting a fish migratory response during the beginning of a precipitation-generated high flow event
- Mean monthly temperatures by water year type indicate that Alternatives 1, 2, and 3 and the NAA would be predominantly similar among during the period of presence of each life stage of winter-run Chinook salmon.
- Effects of proposed intakes on predation is limited. Effects of the diversions for Alternatives 1, 2, and 3 from the Red Bluff and Hamilton City intakes would be limited.
- Entrainment risk at Red Bluff and Hamilton City intakes would be expected to be similar between NAA and Alternatives 1, 2, and 3 for juvenile winter-run Chinook salmon.
- For winter-run Chinook salmon, operations impacts of Alternative 1, 2, or 3 would be less than significant.

# Impact FISH-3: Operations Effects on Spring-Run, Conclusion Excerpts

- Mean monthly temperatures by water year type indicate that Alternatives 1, 2, and 3 and the NAA would be similar during the period of presence of each life stage of spring-run Chinook salmon.
- Redd dewatering analysis for spring-run show moderate increases in redd dewatering for eggs spawned in September of Above Normal Water Years under Alternatives 1 and 3, and reductions in redd dewatering for eggs spawned in August of Above Normal Water Years under Alternative 3.
- Weighted Usable Area (WUA) analysis, indicate that Alternatives 1, 2, and 3 would have minor effects on rearing habitat for spring-run juveniles in the Sacramento River.
- SALMOD results show a minimal beneficial effect of each alternative on spring-run Chinook salmon mortality and potential production in the Sacramento River.
- WUA results indicate that Alternatives 1, 2, and 3 would lead to some moderate reductions of spawning habitat WUA during September and October, primarily under Alternative 3. However, overall Alternatives 1, 2, and 3 are expected to have no adverse effect on spring-run spawning in the Sacramento River.
- Operations impacts of Alternative 1, 2, or 3 would be less than significant.

# Sturgeon Effects Overview

# Sturgeon Operations Effects Summary

- Impact FISH-6: Operations Effects on Green Sturgeon
- Impact FISH-7: Operations Effects on White Sturgeon

# Impact FISH-6: Operations Effects on Green Sturgeon, Conclusion Excerpts

- Green sturgeon spawning habitat: Differences in mean flow between Alternatives are negligible. Similarly, for green sturgeon larvae rearing habitat in the Sacramento River, differences in mean monthly flows between Alternatives are minimal.
- Modeled results indicate that Alternatives would have a greater likelihood of having flows potentially low enough to create adverse passage conditions in the Sacramento River. This could potentially result in some delays in upstream migration; however, it is likely adults would hold and continue their migration and spawning after flow subsequently increased.
- Modeled results indicate that the Alternatives are not expected to have any substantial effect with regard to flow on spawning and egg incubation of green sturgeon in the Feather River.
- For the Feather River, modeling results indicate that Alternatives 1, 2, and 3 provide slightly improved Feather River flow conditions for upstream and downstream passage.
- In-Delta and upstream operations and their impacts associated with the Alternatives on green sturgeon and its spawning habitat would be negligible.
- Operations impacts of Alternative 1, 2, or 3 would be less than significant.

# Smelt Effects Overview

# Smelt Operations Effects Summary

- Impact FISH-8: Operations Effects on Delta Smelt
- Impact FISH-9: Operations Effects on Longfin Smelt

# Impact FISH-9: Operations Effects on Longfin Smelt, Conclusion Excerpts

- Entrainment risk under Alternatives 1, 2, and 3 would be similar to entrainment risk under the NAA.
- The analyses of flow-related effects (differences in Delta outflow/X2) suggested the potential for small negative effects under the Alternatives
- In order to get to a less than significant impact, mitigation would be required for the small, uncertain negative outflow-related effect of Alternatives 1, 2, and 3 in consideration of longfin smelt’s CESA-listed status.
- Implementation of Mitigation Measure FISH-9.1 would provide tidal habitat restoration mitigation. Tidal habitat restoration would expand the diversity, quantity, and quality of longfin smelt rearing and refuge habitat consistent with recent tidal habitat mitigation required for outflow impacts to the species. The mitigation requirement for each alternative varies between 11 and 15 acres.

# Schedule

# Schedule

- Late August 2021
  - Revised Draft EIR/Supplemental Draft EIS Released
- December 2021
  - Biological Assessment to Agencies
  - Submit State ITP Applications
- Spring 2022
  - Final EIR/EIS
- Spring 2023
  - All permits obtained
- Spring 2024 Construction Begins

# Action Items Review

# Thank you!

Sites

# Water Quality Group Discussion Agenda

Affordable Water, Sustainably Managed

***Our Core Values – Safety, Trust and Integrity, Respect for Local Communities, Environmental Stewardship, Shared Responsibility and Shared Benefits, Accountability and Transparency, Proactive Innovation, Diversity and Inclusivity***
***Our Commitment – To live up to these values in everything we do***

## Meeting Information:

| | | | |
|---|---|---|---|
| **Date:** | July 19, 2021 | **Location:** | Microsoft Teams<br>Or call in (audio only)<br>(833) 255-2803,,808172876# |
| **Start Time:** | 1:00 p.m. | **Finish Time:** | 2:30 p.m. |
| **Purpose:** | Overview and discussion of the Sites Project's in-lake water quality modeling and EIR/S analysis approach | | |

## Meeting Participants:

| | | |
|---|---|---|
| André Sanchez | Julie Zimmerman | Cam Irvine |
| Anthony Saracino | Rachel Zwillinger | Erin Heydinger |
| Dave Zelinski | Rebecca Wu | John Spranza |
| Debra Lucero | Regina Chichizola | Laurie Warner Herson |
| Doug Obegi | Ron Stork | Lesa Erecius |
| Greg Reis | Stephanie Gordon | Melissa Dekar |
| Jerry Boles | Tom Stokely | Nicole Williams |
| Jay Ziegler | Ali Forsythe | Steve Micko |
| Jim Brobeck | Anne Huber | Vanessa King |

## Agenda:

| Discussion Topic | Topic Leader | Time Allotted |
|---|---|---|
| 1. Introductions | John | 5 min |
| 2. Action Item follow-up | John | 10 min |
| 3. Flow mechanisms<br>a. Mixing of Sites water<br>b. Colusa Basin Drain flows to Yolo Bypass<br>c. Delta flows Key Concepts | Anne | 40 min |
| 4. Mercury/methylmercury | Anne, Lesa, Steve | 15 min |
| 5. Open Topics Discussion | John | 15 min |

| | | |
|---|---|---|
| 6. Action Items and Adjourn | All | 5 mins |

# Sites Project Water Quality Group Discussion

July 19, 2021

Sites

# Agenda

1. Introductions
2. Group Norms
3. Action Item Follow-up
4. Flow Pathways and Discharge Effects
   a) Local Agricultural
   b) Colusa Basin Drain
   c) Sacramento River
   d) Stone Corral and Funks Creeks
   e) Yolo and Bay Delta
5. Open Topics and Discussion
6. Action Items and Adjourn

# Group Norms

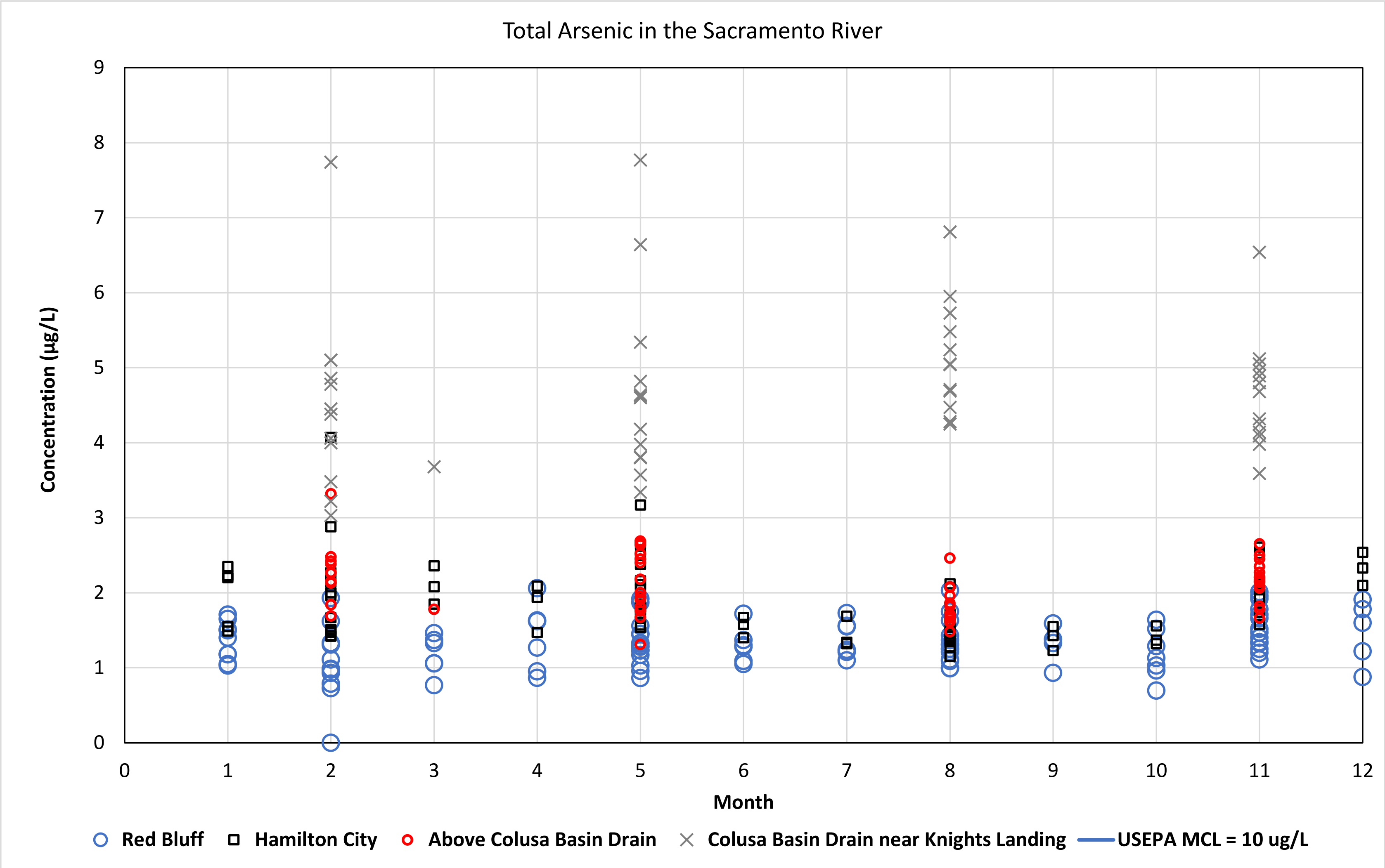
- Encourage everyone to be on video
- Mute yourself when others are speaking
- Respectful, professional dialogue
- Ask questions throughout, lets have a dialogue
  - Let the speaker finish their point
  - Use the raise your hand function in Teams if needed
- Topics for follow up will be recorded and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

# Action Item Follow-up

| Action Item | Addressed | Pending | Notes |
|---|---|---|---|
| Specificity on years for data | X | | |
| Distribute metals table | X | | |
| Effects of release temperature on rice | X | | |
| Effects of Hg and As on rice | X | | |
| Effects of reservoir operations on water quality of Stone Corral and Funks creeks. | X | | |
| Anti-degradation policy and Sites | X | | |
| Synergistic effects of chemicals | X | | |

# Flow Pathways

# Discharge to Local Agriculture - Arsenic



# Discharge to Local Agriculture - Arsenic

| Parameter | Arsenic Concentration (μg/L) |
|---|---|
| Average total arsenic concentration measured in the Sacramento River below Red Bluff and at Hamilton City during January – March (Sites primary period for diversion to storage) | 1.59 |
| Estimated average total mercury concentration in Sites Reservoir after evapoconcentration[a] | 1.84 |
| Estimated maximum total arsenic concentration in Sites Reservoir after evapoconcentration[b] | 2.35 |
| Average measured total arsenic concentration in the Sacramento River above the CBD during May – September (Sites primary period for releases to the Sacramento River) | 1.98 |
| Average measured total arsenic concentration in the Sacramento River at Hamilton City during May – September (representing water used by GCID for rice irrigation). | 1.71 |
| Average measured total arsenic concentration in the CBD during May – September | 4.91 |
| MCL for drinking water | 10.0 |
| Dissolved arsenic 4-day average threshold for freshwater aquatic life | 150.0 |
| FAO recommended maximum concentration in irrigation water (Ayers and Westcot 1985:96) | 100, but noted that toxicity to rice may occur at less than 50. |
| Arsenic concentration associated with toxicity to rice in Taiwan (Murphy et al. 2018a) | 40 |
| Dutch concentration requiring intervention or remediation (Murphy et al. 2018a) | 55 |
| For reference purposes: arsenic concentrations measured in Cambodian groundwater used for rice irrigation (Murphy et al. 2018b:4) | Up to 1,200 |

[a] 16% higher than inflow concentration based on the estimated average percent increases in concentration due to evapoconcentration (13%–16%, depending on alternative).
[b] 48% higher than inflow concentration based on the estimated maximum percent increase in concentration (41%–48%, depending on alternative), which represents one month out of the 984 months simulated by CALSIM.

# Estimated Aqueous Methylmercury in Sites Reservoir

**Estimated Concentrations of Aqueous Methylmercury in Sites Reservoir Releases**

| Estimated Methylmercury Concentration | Short-Term (1-10 y after filling) (ng/L) | Long-Term Average (>10 y after filling) (ng/L) |
|---|---|---|
| Expected | 0.20 | 0.10 |
| Reasonable Worst-Case | 0.30 | 0.15 |

- Expected Concentrations
  - Long-term: aqueous methylmercury concentrations calculated by doubling estimated concentrations determined for imports from the Sacramento River (Red Bluff and Hamilton City fractions)
  - Short-term: Twice as high as long-term concentration
- Reasonable Worst-Case Concentrations:
  - “Reasonable worst-case” is not necessarily the maximum concentrations that could occur at Sites but instead is an estimated upper bound of expected average concentration based on published literature and site-specific conditions.
  - Long-term: Maximum measured concentration in Indian Valley Reservoir (2011)
  - Short-term: Twice as high as long-term concentration

# Discharge to Colusa Basin Drain- Methylmercury

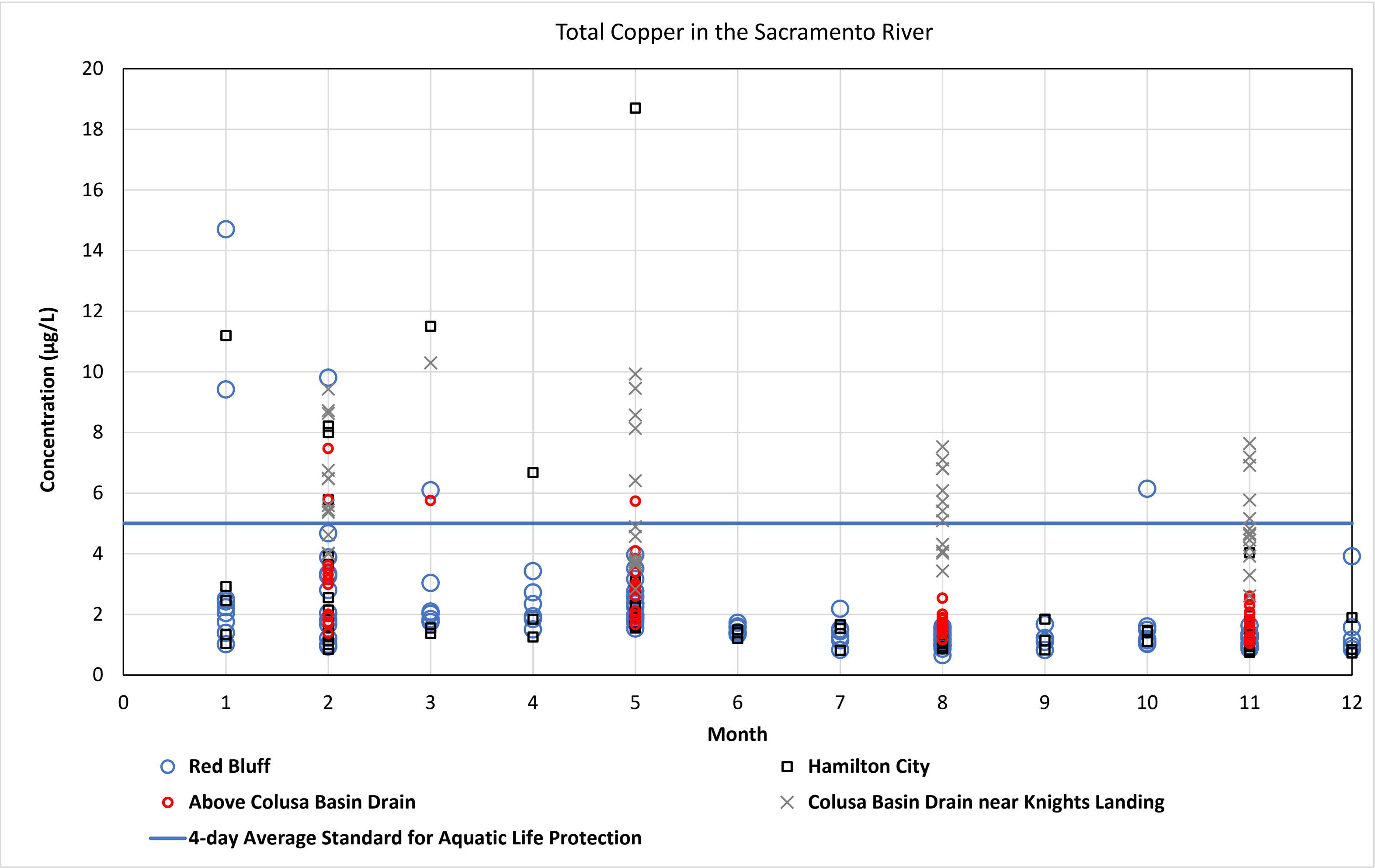
- Generally beneficial to CBD except for methylmercury
- Aqueous Methylmercury: All estimated concentrations in Sites Reservoir releases except expected long-term average (0.10 ng/L) would exceed average baseline concentrations in CBD (0.13 and 0.17 ng/L avg for 2 different data sets)
- Fish Tissue Methylmercury:
  - No long-term increases expected because releases would not occur year-round and the increase in aqueous methylmercury would be low.
  - Under short-term conditions, methylmercury in fish tissue may exceed the CA sport fish tissue objective (0.2 mg/kg, wet weight).

# Mercury Mitigation and Management

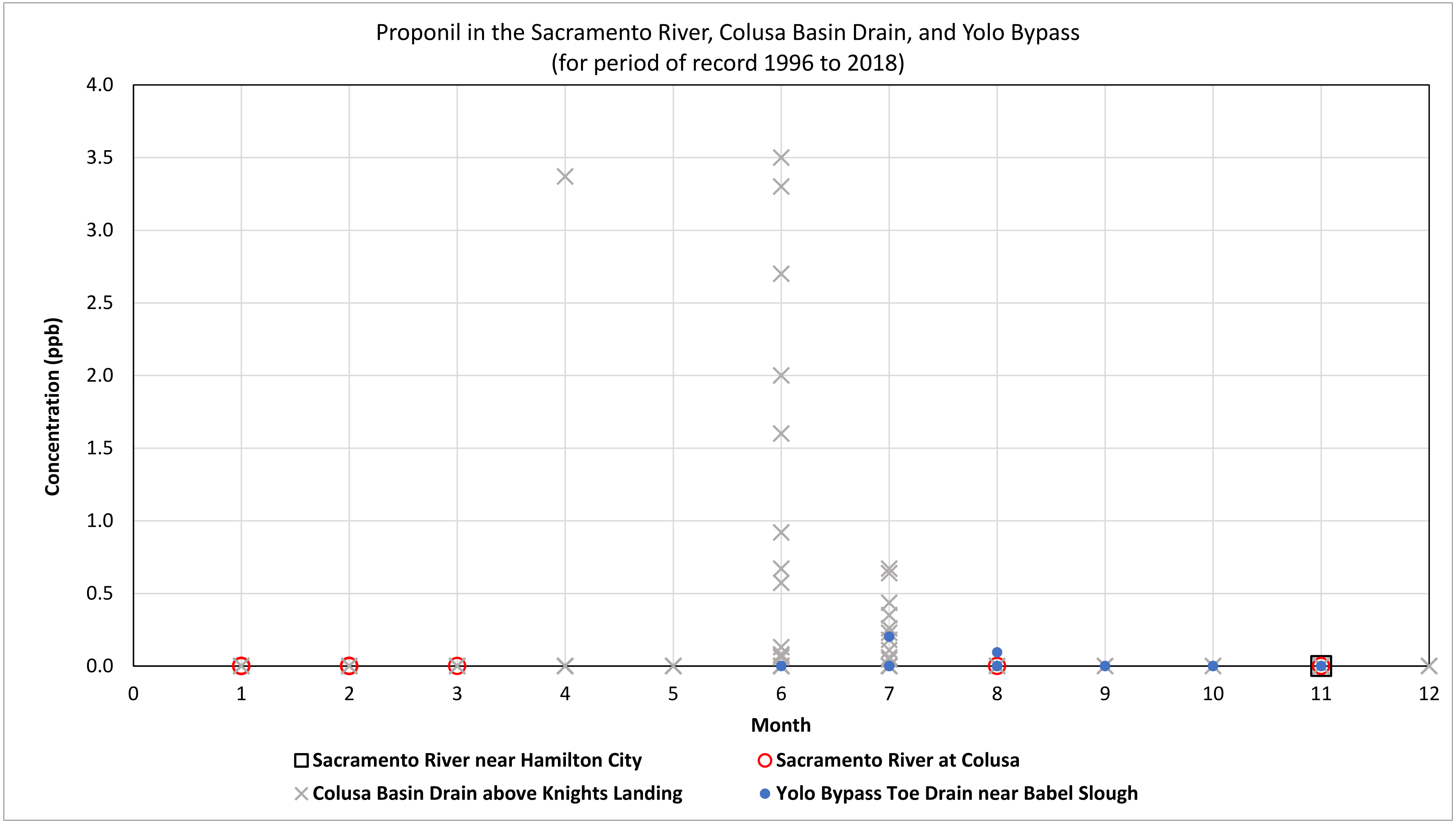
- RMP and Mitigation Measure WQ-1.1
  - Remove vegetation in inundation footprint prior to initial filling
  - Delay fish stocking- approx. 10 years after initial filling
  - Monitor reservoir fish tissue methylmercury
  - Post fish consumption warning signs if fish tissue methylmercury concentrations exceed CA sport fish objective
  - Implement methylmercury reduction actions for new reservoirs as identified in the implementation plan for Statewide Mercury Control Program for Reservoirs[a]

[a] SWRCB. 2017. *Draft Staff Report for Scientific Peer Review for the Amendment to the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California, Mercury Reservoir Provisions – Mercury TMDL and Implementation Program for Reservoirs*

# Discharge to Colusa Basin Drain-Other Metals



# Discharge to Colusa Basin Drain - Pesticides



# Discharge to Sacramento River

- Locations
  - Sacramento River at Knights Landing for Alts 1 and 3
  - Dunnigan Pipeline for Alt 2 (near Tyndall Landing)
- Substantial dilution of Sites water in Sacramento River
- Quantitative evaluation for salinity, mercury, and other metals

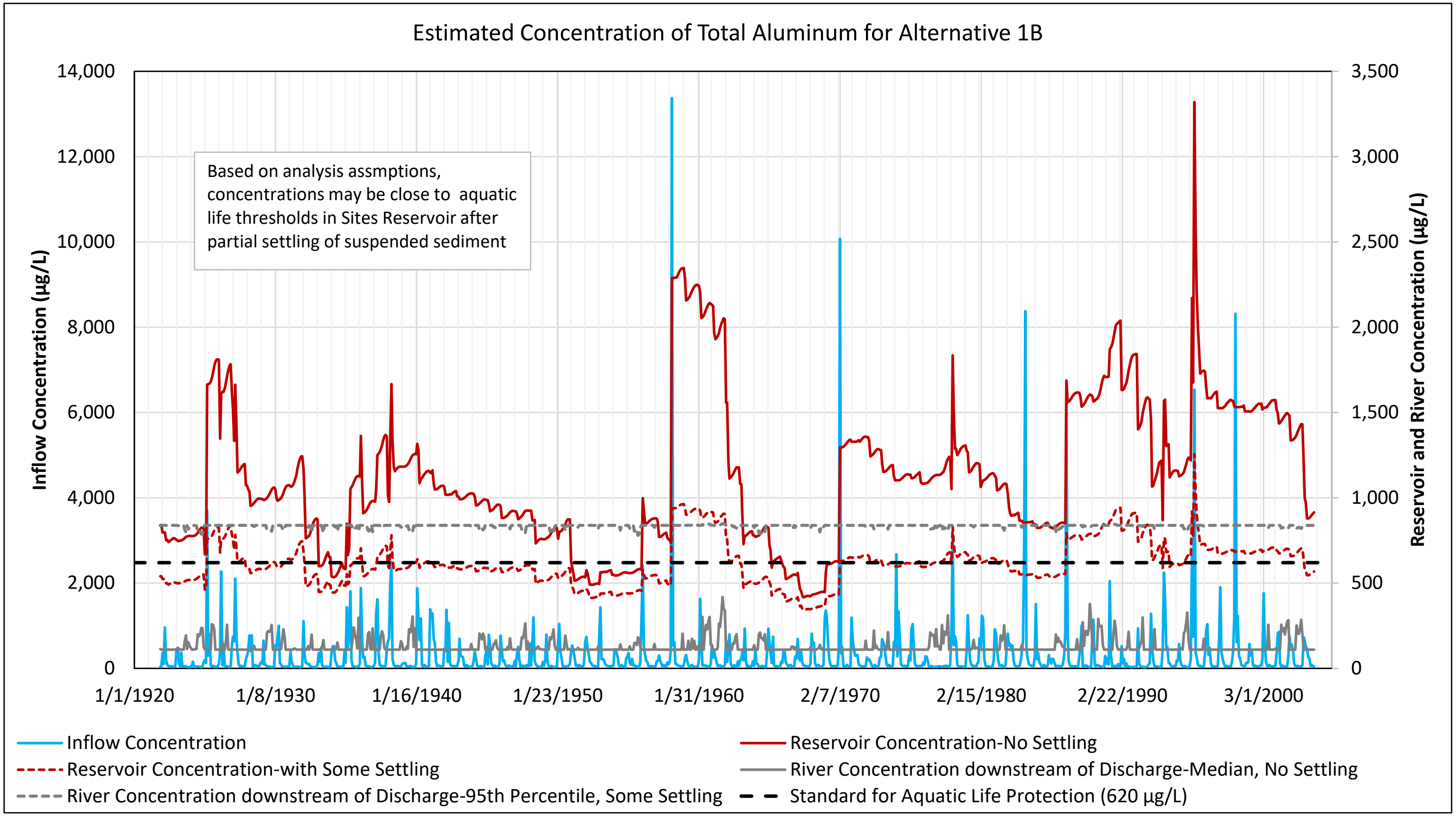
# Discharge to Sacramento River-Dilution

- Simulated Sites Reservoir Release to Sacramento River (Release to Dunnigan Pipeline minus Release to Yolo Bypass) for All Alternatives (cfs)

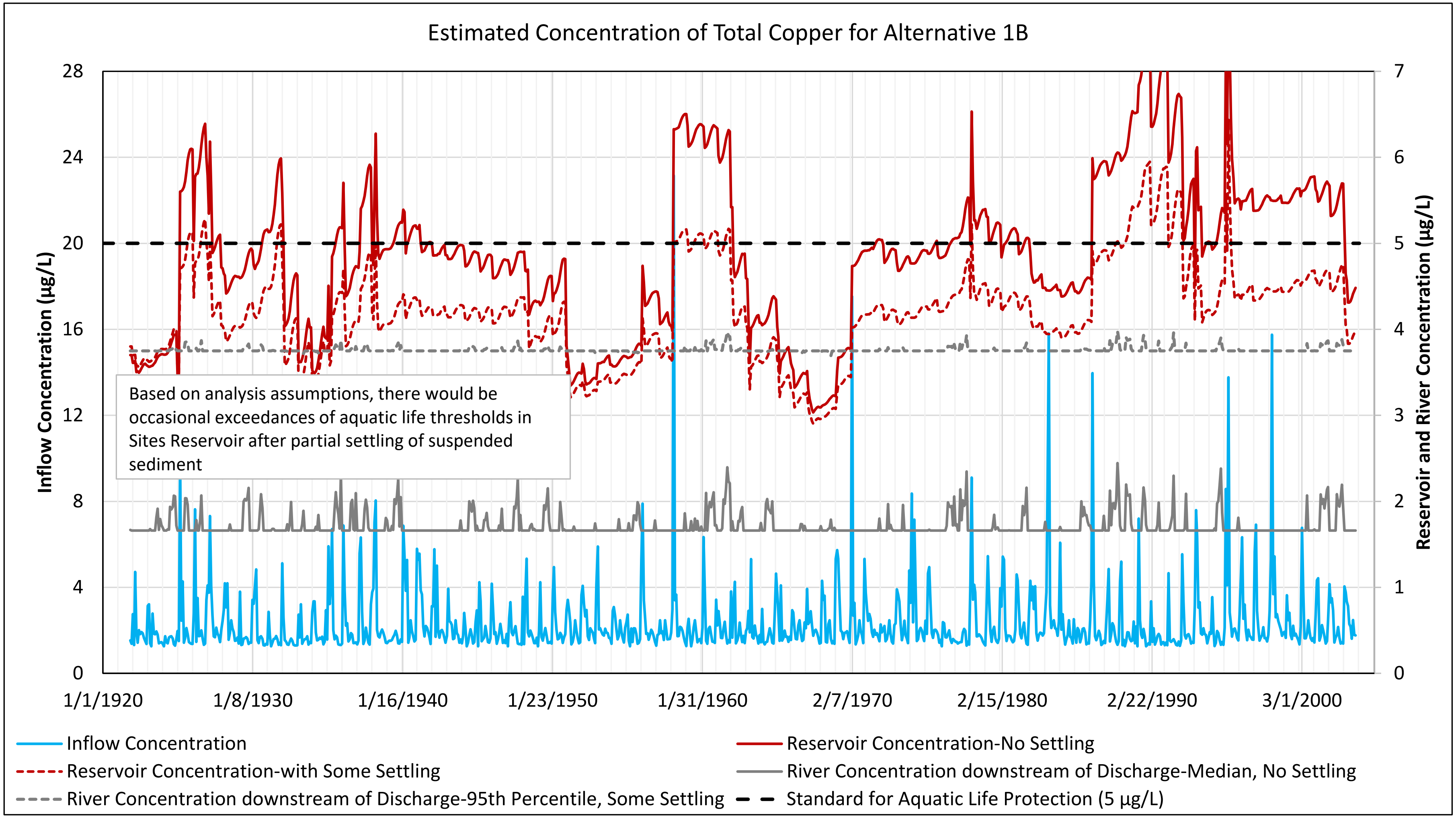
| | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Average for Critically Dry Water Years** | | | | | | | | | | | | |
| NAA | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Alt 1A | 204 | 99 | 3 | 0 | 0 | 0 | 108 | 432 | 529 | 615 | 416 | 428 |
| Alt 1B | 127 | 96 | 10 | 15 | 0 | 13 | 123 | 417 | 520 | 621 | 435 | 373 |
| Alt 2 | 131 | 100 | 3 | 0 | 0 | 0 | 109 | 425 | 497 | 605 | 346 | 319 |
| Alt 3 | 80 | 83 | 10 | 19 | 21 | 78 | 148 | 396 | 464 | 593 | 379 | 179 |
| **Average for Dry Water Years** | | | | | | | | | | | | |
| NAA | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Alt 1A | 325 | 364 | 23 | 0 | 0 | 0 | 58 | 111 | 794 | 970 | 609 | 572 |
| Alt 1B | 367 | 294 | 31 | 0 | 15 | 15 | 184 | 178 | 765 | 956 | 594 | 538 |
| Alt 2 | 251 | 206 | 26 | 0 | 0 | 0 | 58 | 111 | 750 | 966 | 583 | 487 |
| Alt 3 | 284 | 163 | 12 | 0 | 0 | 38 | 156 | 231 | 656 | 936 | 531 | 443 |
| **Average of All Water Year Types** | | | | | | | | | | | | |
| NAA | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Alt 1A | 113 | 130 | 11 | 0 | 0 | 0 | 28 | 88 | 271 | 391 | 276 | 218 |
| Alt 1B | 107 | 139 | 43 | 5 | 5 | 7 | 60 | 100 | 314 | 385 | 275 | 191 |
| Alt 2 | 87 | 102 | 13 | 0 | 0 | 0 | 29 | 87 | 257 | 388 | 254 | 184 |
| Alt 3 | 99 | 91 | 39 | 3 | 8 | 21 | 57 | 109 | 307 | 397 | 271 | 147 |
| **Average for Wet Water Years** | | | | | | | | | | | | |
| NAA | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Alt 1A | 0 | 17 | 14 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Alt 1B | 0 | 93 | 102 | 0 | 3 | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| Alt 2 | 0 | 15 | 17 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Alt 3 | 0 | 81 | 102 | 0 | 4 | 5 | 0 | 0 | 0 | 0 | 0 | 0 |

- When Sites Reservoir would release water to the Sacramento River, it would constitute 6%–7% of the Sacramento River flow on average and 12%–13% when discharges are relatively high compared to river flow (i.e., 90th percentile values), depending on Alternative

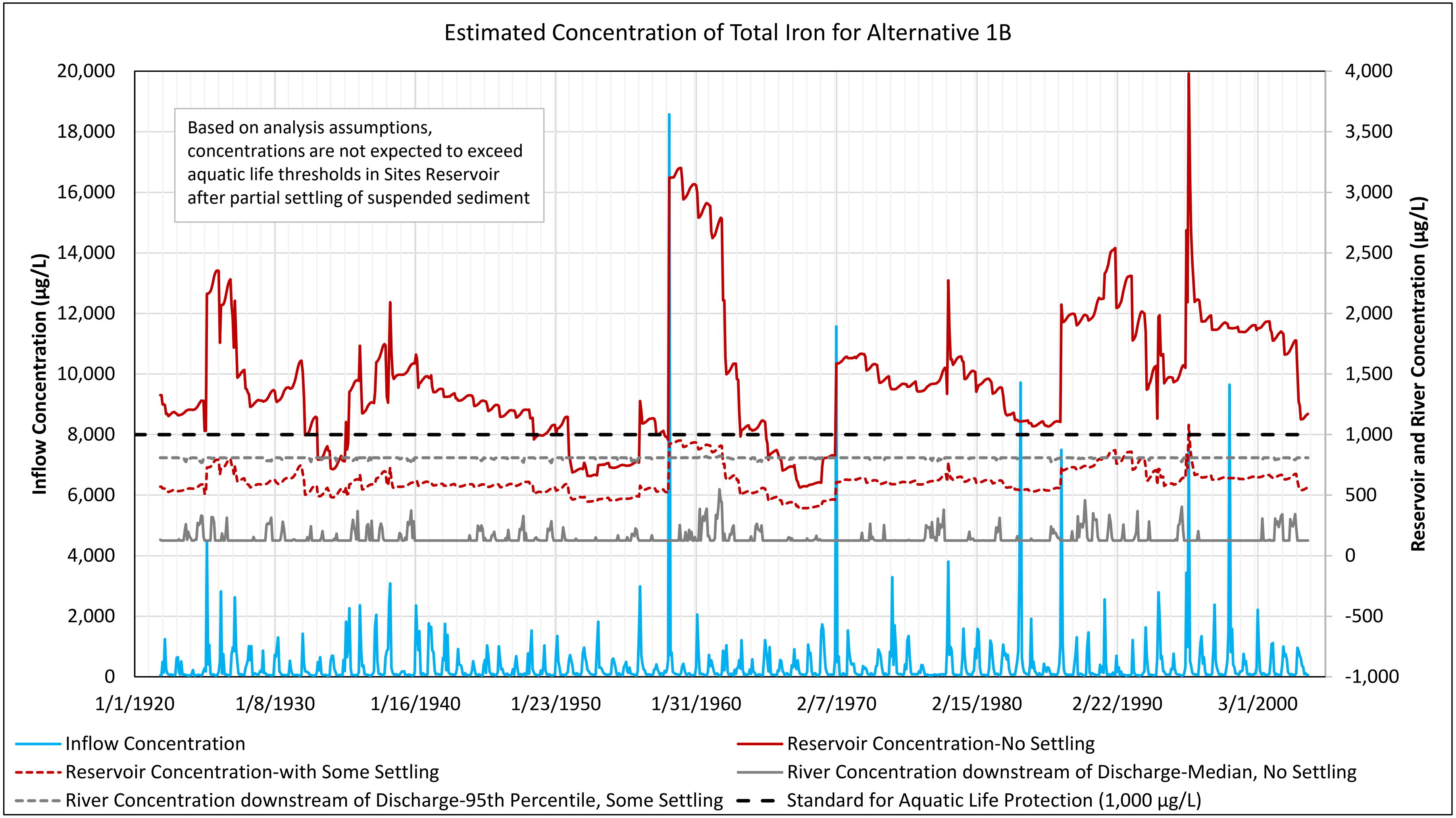
# Discharge to Sacramento River- Total Aluminum



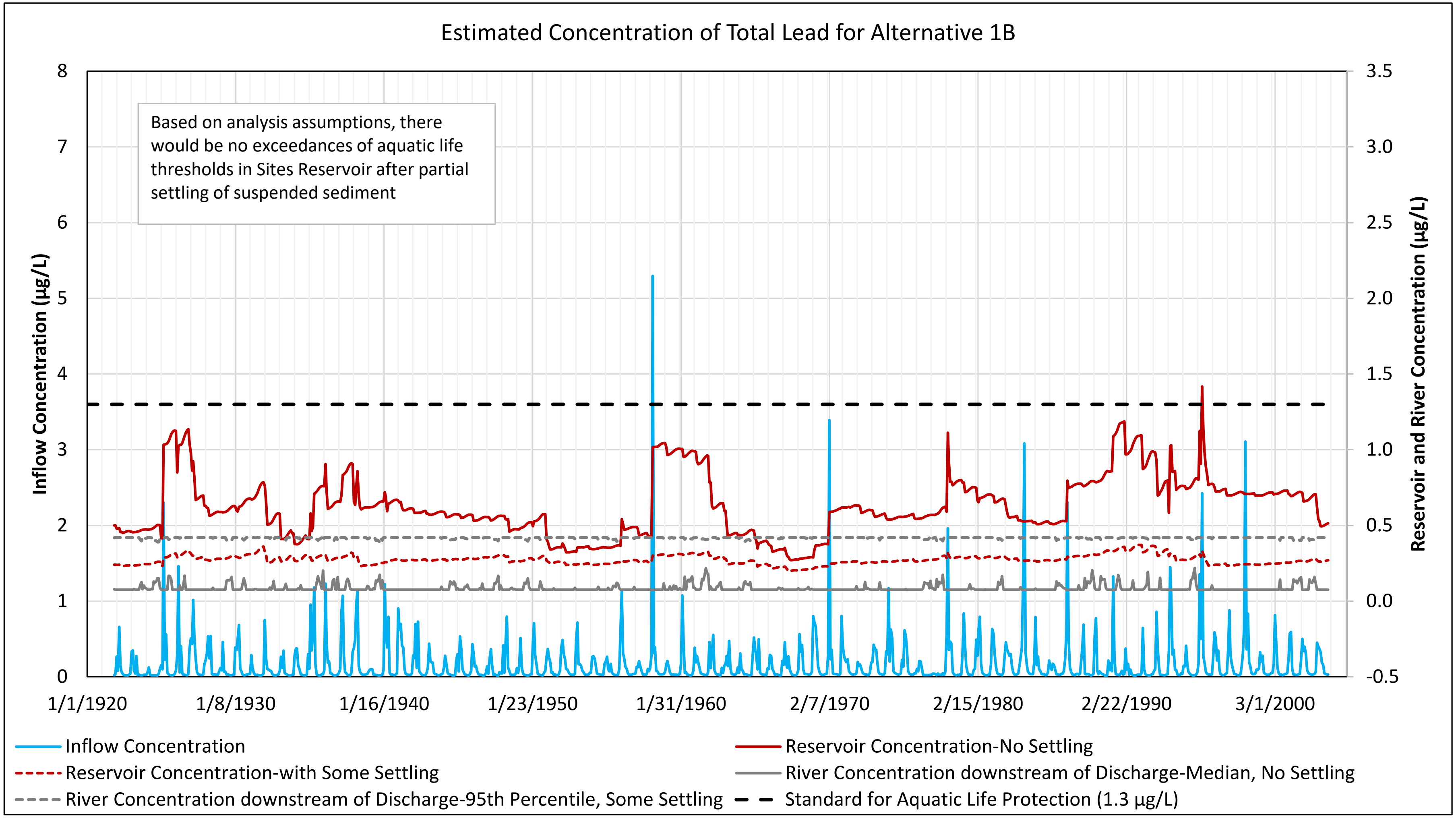
# Discharge to Sacramento River- Total Copper



# Discharge to Sacramento River- Total Iron



# Discharge to Sacramento River- Total Lead



# Discharge to Funks and Stone Corral Creeks

- Temperature studies – part of Technical Studies Plan and Adaptive Management for Funks and Stone Corral Creeks – for fish

- Stone Corral Creek – discharge from bottom of Sites Dam

- Funks Creek – discharge from I/O Tower

# Discharge to Funks and Stone Corral Creeks-Methylmercury

- Total mercury concentrations in Sites Reservoir releases > Funks and Stone Corral Creeks
  - Sites Reservoir
    - Estimated short-term total mercury: 3.8 – 4.5 ng/L
    - Estimated long-term total mercury: 1.9 – 2.3 ng/L
  - Funks and Stone Corral Creeks total mercury: 0.35 ng/L and 0.85 ng/L, respectively
- Because most of the flow in Funks and Stone Corral Creeks would originate from Sites Reservoir releases, mercury and methylmercury concentrations in these creeks would increase and this would be reflected in fish tissue.
  - Effect greater in short term vs. long term
  - Effect may be larger for Stone Corral because releases would be made from lower in the reservoir where oxygen would be lower and methylmercury may be higher

# Discharge to Stone Corral Creeks – Metals Impact

- Potentially significant during dry season due to bottom release from Sites Reservoir
- Mitigation Measure WQ-2.1 – possible actions:
  - Monitor metal concentrations to assess effect
  - Evaluate effect of modifying releases to Stone Corral Creek
  - Add vertical extension to reservoir at the withdrawal point
  - Pump water from the top of Sites Reservoir

# Prop 1 Benefits Small Group Agenda

Affordable Water, Sustainably Managed

***Our Core Values – Safety, Trust and Integrity, Respect for Local Communities, Environmental Stewardship, Shared Responsibility and Shared Benefits, Accountability and Transparency, Proactive Innovation, Diversity and Inclusivity***
***Our Commitment – To live up to these values in everything we do***

## Meeting Information:

| | | | |
|---|---|---|---|
| **Date:** | March 11, 2021 | **Location:** | Microsoft Teams |
| **Start Time:** | 1:00 p.m. | **Finish Time:** | 2:30 p.m. |
| **Purpose:** | Overview and discussion of the Sites Project's Proposition 1 Benefits | | |

## Meeting Participants:

| | | |
|---|---|---|
| Joe Polos | Rebecca Wu | Erin Heydinger |
| Greg Reis | Rachel Zwillinger | John Spranza |
| Anthony Saracino | Ryan Davis | Laurie Warner Herson |
| Tom Stokely | Ali Forsythe | Natalie Wolder |
| Ellen Wehr | | |

## Agenda:

| Discussion Topic | Topic Leader | Time Allotted |
|---|---|---|
| 1. Introductions | Ali | 10 mins |
| 2. Group Norms | Ali / Group | 5 mins |
| 3. Background | Erin | 5 mins |
| 4. Recreation and Flood Control Benefits | Erin | 10 mins |
| 5. Ecosystem Benefits<br>a. Yolo Bypass<br>b. Refuge Incremental Level 4 Water Supply<br>c. Ensuring Benefits are Realized<br>d. Storage Policy and Ecosystem Water Manager<br>e. Adaptively Changing Ecosystem Benefits in the Future | John / Ali | 35 mins |
| 6. Contract Discussions and Schedule | Ali | 5 mins |
| 7. Additional Topics from the Group | Group | 15 mins |
| 8. Action Items and Next Steps | Ali | 5 mins |

# Proposition 1 Benefits

Overview and Discussion of the Sites Project's Proposition 1 Benefits

March 11, 2021

Sites

# Agenda

1. Introductions
2. Group Norms
3. Background
4. Recreation and Flood Control Benefits
5. Ecosystem Benefits
6. Contract Discussions
7. Schedule
8. Additional Topics from the Group
9. Action Items and Next Steps

# 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

# Background

- Proposition 1 of 2014 dedicated $2.7 billion for investments in water storage projects
- Administered by the California Water Commission (CWC) through the Water Storage Investment Program (WSIP)
- CWC completed rigorous review process of projects, open to the public
- July 2018, CWC made maximum conditional eligibility determinations (MCEDs) for 8 projects
  - Amount of Proposition 1 funding available to a given project
- Dec 2020, CWC increased MCEDs for all remaining projects by 2.5% to account for some inflation

# Prop 1 Benefits Awarded to Sites

- CWC Awarded the following benefits:
  - Ecosystem Improvement – Refuge water supply
  - Ecosystem Improvement – Yolo Bypass flows
  - Recreation
  - Flood Control

| | 2018 MCED | 2021 MCED* | Early Funding** |
|---|---|---|---|
| Sites Project | $816,377,686 | $836,787,128 | $40,818,884 |

*Additional MCED added in 2021 was to account for some inflation costs
**Early funding amount included in the MCEDs

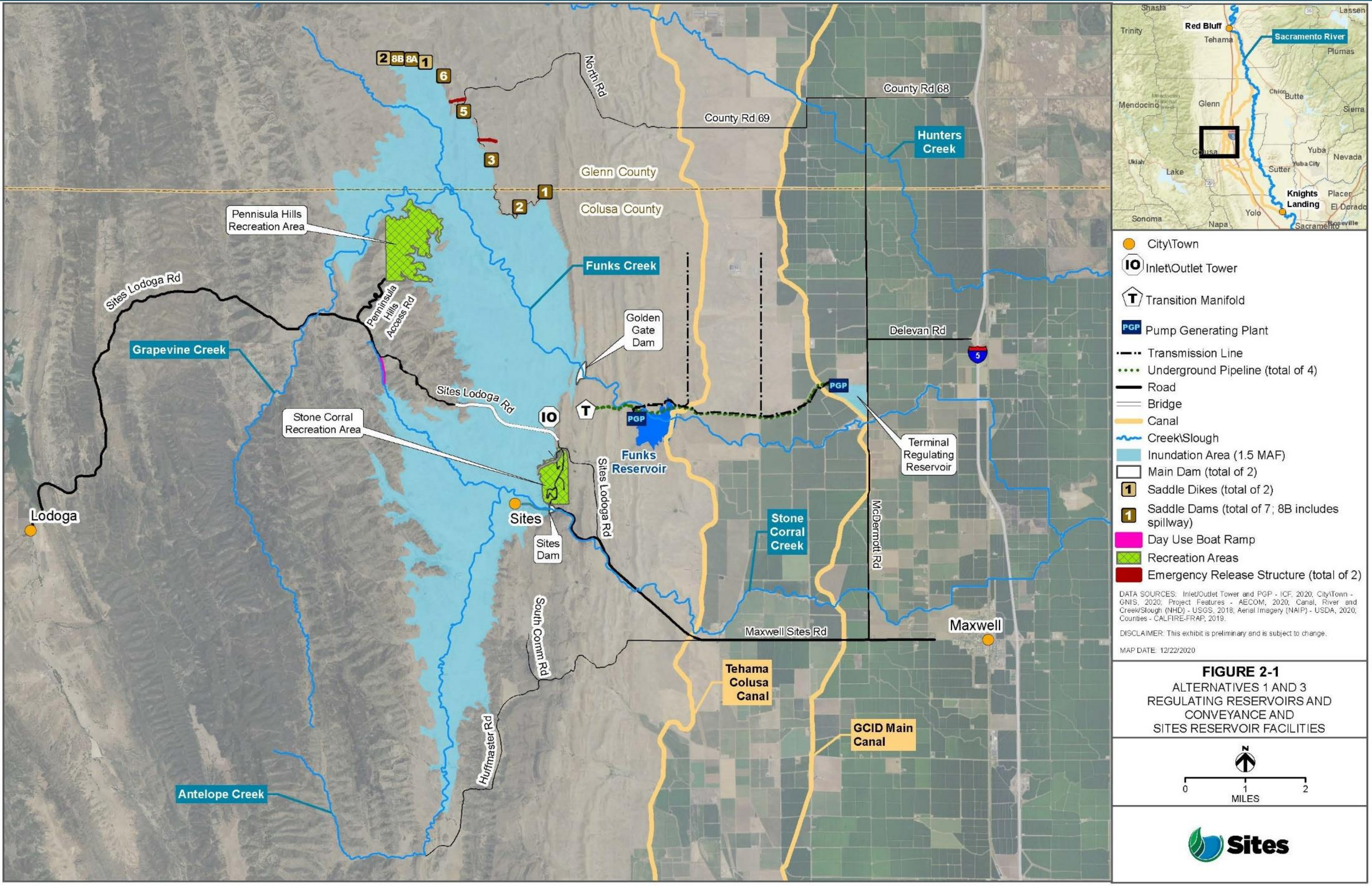
# Prop 1 Benefits Cost Allocation

| Benefit Category | Capital Cost Allocation |
|---|---|
| Recreation | $197.2 million |
| Flood | $44.6 million |
| Ecosystem Improvement | $574.5 million |
| **Total** | **$816.3 million** |

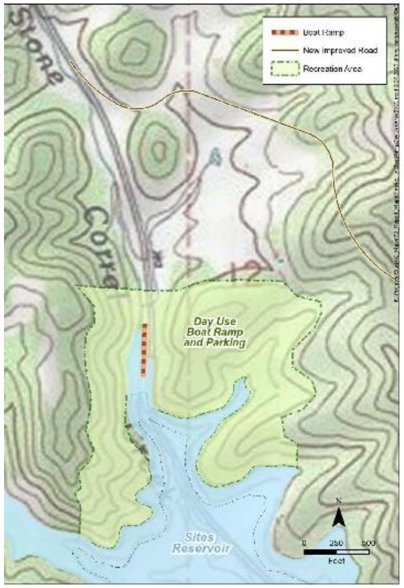
# Recreation Benefits

- Water-related and water-based recreation at 3 new recreation areas
  - Stone Corral Recreation Area – 235 acres, east side of Sites
    - 50 camp sites
    - 10 picnic sites
    - Hiking trails
    - Boat launch
  - Peninsula Hills Recreation Area – 373 acres, west side of Sites
    - 200 camp sites, 1 group camp
    - 10 picnic sites
    - Hiking trails
  - Day Use Boat Ramp – 10 acres, west side of Sites
- Phased approach to match interest – Stone Corral and Day Use Boat Ramp constructed first
- Estimated 187,000 users per year
- Contract with DWR for management of benefits

# Recreation Area Location



# Recreation Area Schematics




DAY USE BOAT RAMP


PENINSULA HILLS RECREATIONAL AREA


STONE CORRAL RECREATIONAL AREA

# Flood Control Benefits

- Local flood control benefits to town of Maxwell and adjacent agricultural lands by controlling flows
  - Funks Creek
  - Stone Corral Creek
- Provides 100-year flood protection to most of Maxwell and about 4,025 acres of ag land
- Reduce flooding of Interstate 5 in 100-year flood event
- Contract with DWR for management of benefits

# Ecosystem Improvement Benefits Overview

- Fundable ecosystem improvements must “contribute to restoration of aquatic ecosystems and native fish and wildlife”
- CDFW identified Ecosystem Priorities, physical changes and the anticipated ecosystem improvements (benefits) they could provide
  - A project affects a physical change (e.g., more river flow) and the physical change has a corresponding ecosystem improvement and benefit
- Project would contract with CDFW for management of identified ecosystem benefits – $574.5M

# Yolo Bypass Flows Benefits

- Ecosystem Priority 10: Enhance the frequency, magnitude, and duration of floodplain inundation to enhance primary and secondary productivity and the growth and survival of fish
- August through October water deliveries to benefit Delta smelt
- Long-term average flow of approximately 30-32 TAF/year
- After delivery to the Yolo Bypass could be used as Delta outflow should State choose to

# Refuge Incremental Level 4 Benefits

- Ecosystem Priority 14 (water to wetland and refuges)
- Water to enhance seasonal wetlands, permanent wetlands, and riparian habitat for aquatic and terrestrial species
- Average annual refuge water supply of approximately 20 TAF/year

# Ensuring Benefits are Realized

- Contracts with
  - CDFW to administer the ecosystem benefits
  - DWR to administer the recreation and flood control benefits
- Contracts shall contain (Regs, Section 6014)
  - Adaptive management plan
    - Public benefit monitoring metrics
    - Monitoring locations, frequencies and timing
    - Metric evaluation methodology and associated threshold or trigger levels
    - Decision making process when trigger is reached
    - Funding sources and financial commitments to implement adaptive management
  - Description of benefits being administered
  - Reporting requirements
  - Assurances regarding operations, maintenance, repair, replacement
  - Provision allowing the administrating agency to inspect during construction and operations
  - Actions administrating agency may take if project fails to comply with contract

# Ensuring Benefits are Realized (cont)

- Contract process
  - Drafted between CDFW or DWR and Authority
  - Draft provided to CWC for review and public review
  - Comments incorporated
  - Execution of final contract
- Necessary for final encumbrance of funds by the CWC
- Supersede any preliminary operations, monitoring, and management commitments made in the application
- Once operational, CWC tracks public benefits and provides access to data and reports

# Storage Policy and Ecosystem Water Manager

- Draft Revised Storage Policy identifies that Storage Partners (including the State) are purchasing storage in Sites Reservoir
  - Provides an asset to the environment for flexible use
  - Currently envisioning that the State would have all the same rights and obligations as all other members
- Envision a CDFW Ecosystem Water Manager to manage the Proposition 1 water
  - Make annual, monthly, weekly decisions on how to use ecosystem water for the environment
  - Work with Authority as conditions change or challenges arise

# Adaptively Changing Ecosystem Benefits in the Future

- Considering how to adaptively change ecosystem benefits if
  - Find that outcomes aren't being met
  - Find that there is a different/modified/greater need that isn't anticipated today
- Trying to be flexible in the contract to allow for some minor changes without contract amendment
  - Shift water from Yolo to Refuge IL4 or the other way around
  - Shift water for same purposes but different geographic area
- Larger changes likely require contract amendment (as current envisioned)

# Schedule for Prop 1 Funding Activities

- Summer 2021
  - Benefits contracts “term sheets” with CDFW and DWR
- December 2021
  - Submit State ITP Applications
- By January 1, 2022
  - State Feasibility Study and CWC makes finding that project is feasible
  - Draft environmental documentation is available for public review (released scheduled for August 2021)
  - Commitment from not less than 75 percent of the non-public benefit cost shares of the project
- Late 2022
  - Draft contracts to CWC
- Spring 2023
  - All permits obtained
  - Final benefits contracts signed
- Summer 2023
  - Final funding agreement with CWC signed

# Additional Topics from the Group

- Any additional questions or thoughts?

# Action Items and Next Steps

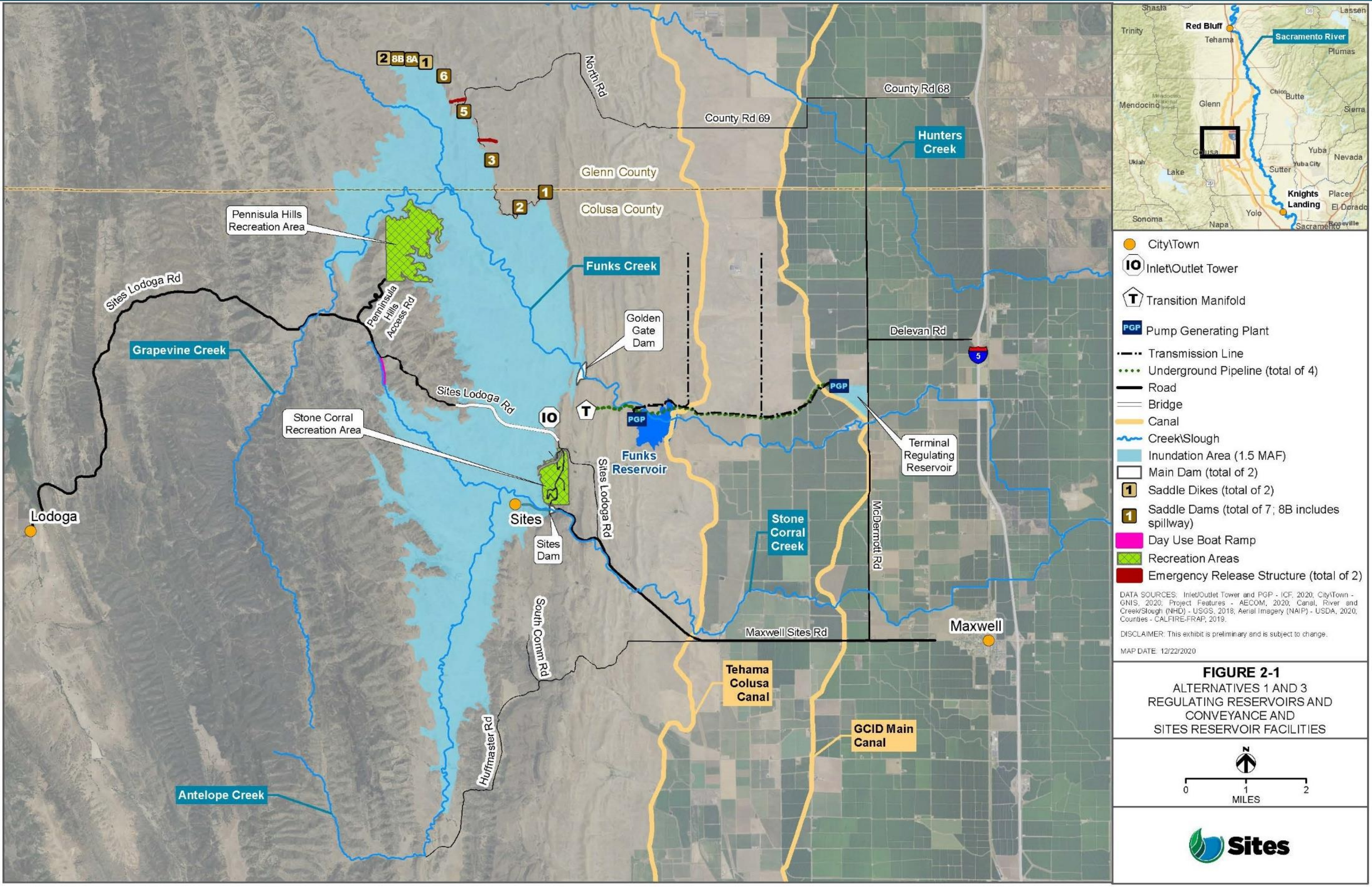
# Thank you!

Sites

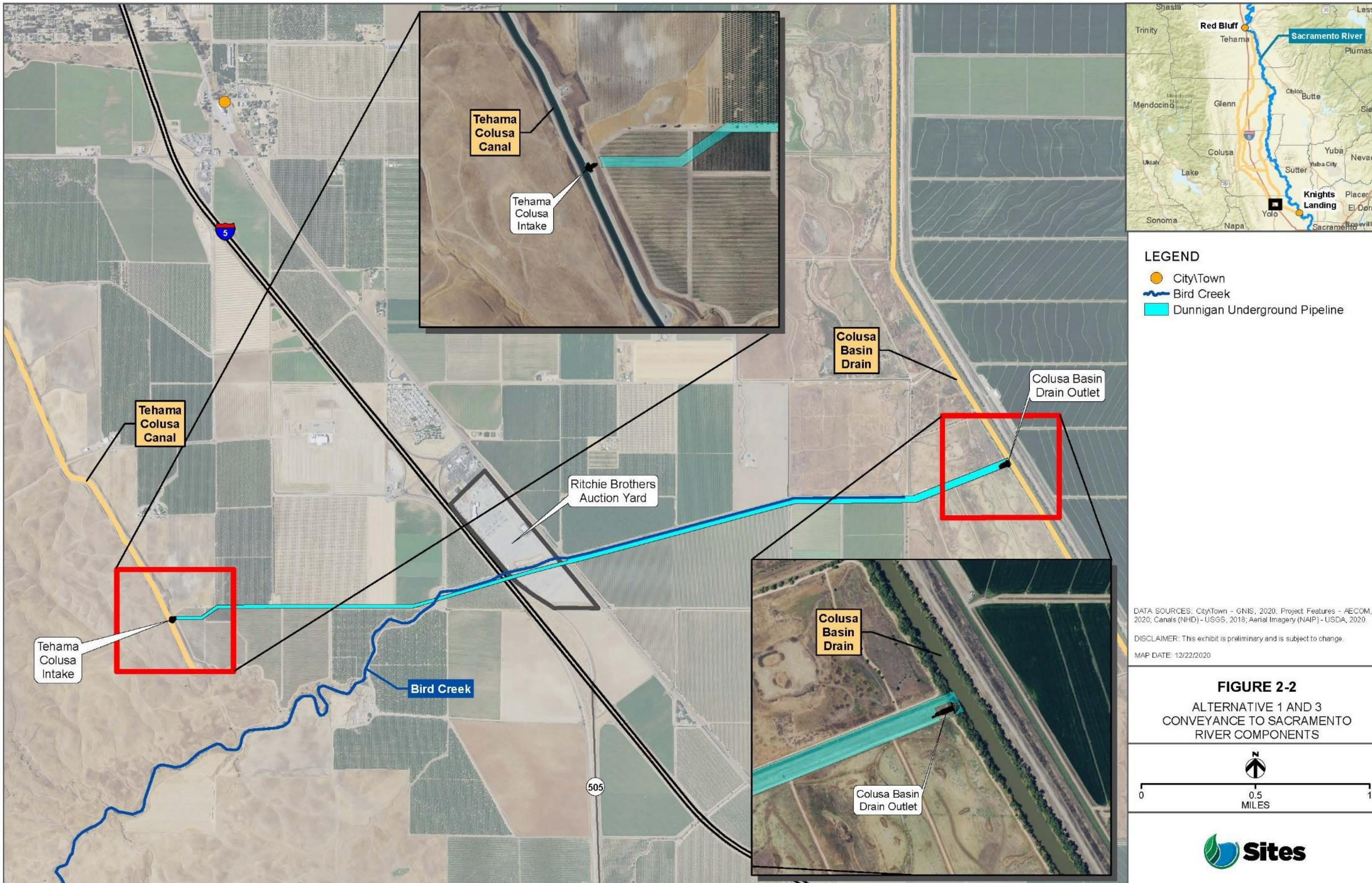
# Alt 1 – Authority's Preferred Project

| Facilities / Operations | Alternative 1 |
|---|---|
| Reservoir Size | 1.5 MAF |
| Diversion(s) | Diversion from Sacramento River into existing TC Canal at Red Bluff and the existing GCID Main Canal at Hamilton City |
| Conveyance Release / Dunnigan Release | Release 1,000 cfs into new pipeline to the Colusa Basin Drain |
| Releases into Funks and Stone Corral Creeks | Specific flow criteria to maintain flows to protect downstream water right holders and ecological function |
| Reclamation Involvement | • Funding Partner up to 7% Cost-Share<br>• Operational exchanges |
| DWR Involvement | Operational Exchanges with Oroville and use of SWP facilities South-of-Delta |
| Hydropower | Incidental power generation up to 40 megawatts each at Funks PGP and TRR PGP |

# Alt 1 – Preferred Project



# Alt 1 – Preferred Project



**Sites Project WSIP Benefits Estimates - March 2021**

| | Dol | |
|---|---|---|
| | **Sites Application Original Estimates (2017)** | **Sites Appeal Estimates (2018)** |
| **Ecosystem Benefits** | $3,176.3 | $2,921.1 |
| *Long-term Average Annual Refuge Water Supply* | $675.4 | $448.1 |
| *Long-term Average Annual Yolo Bypass Flows* | $268.5 | $259.2 |
| **Flood Benefits** | $138.3 | $44.6 |
| **Recreation Benefits** | $191.6 | $197.2 |
| **Eligible Benefit Amount** | | |
| **Total Award** ** | | |

* No finer breakdown provided by CWC

** Amount awarded is less than amount eligible for funding. Therefore, the application included

*** Analysis currently underway.

Note - Estimates are as of 3/2021. The 2021 estimats may be refined as the Authority continues

| lar Based Comparison | | | Volu | | |
|---|---|---|---|---|---|
| **CDFW/DWR Staff Estimates after Appeal Meetings (2018)** | **CWC Awarded (2018)*** | **Current Project Benefit Assumption (3/2021)** | **Sites Application Original Estimate TAF (2017)** | **Value of Ecosystem Benefit per WSIP Application Process** | **CWC Awarded** |
| $766.4 | | $574.5 | | | |
| $432.9 | | | 32.00 | $432.9 | $574.5** |
| $333.5 | | | 39.00 | $333.5 | |
| $44.6 | | $44.6 | N/A | | |
| $197.2 | | $197.2 | N/A | | |
| **$1,008.3** | | | | | |
| | **$816.3** | $816.3 | | | |

benefits that were not funded by the CWC.

to develop its State Feasibility Report. Informaton is preliminary.

| me Based Comparison | | | |
|---|---|---|---|
| **Unfunded Project Benefits** | **Sites Current Estimate TAF (3/2021) - DRAFT** | **Current Project Benefit Estimates (2021)** | **Current Approximate Sum of Refuge and Yolo Flow Benefits (2021)** |
| [-$191.9M] | 21.00<br>33.00<br>N/A<br>N/A | TBD***<br>TBD*** | TBD*** |

# Terrestrial Resources Group Discussion Agenda

**Affordable Water, Sustainably Managed**

***Our Core Values – Safety, Trust and Integrity, Respect for Local Communities, Environmental Stewardship, Shared Responsibility and Shared Benefits, Accountability and Transparency, Proactive Innovation, Diversity and Inclusivity***
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## Meeting Information:

| | | | |
|---|---|---|---|
| **Date:** | March 26, 2021 | **Location:** | Microsoft Teams<br>Or call in (audio only)<br>(833) 255-2803,,19967661# |
| **Start Time:** | 9:00 a.m. | **Finish Time:** | 10:00 a.m. |
| **Purpose:** | Overview and discussion of the Sites Project's terrestrial biological resources approach | | |

## Meeting Invitees:

| | | |
|---|---|---|
| Rachel Zwillinger, Defenders | Ali Forsythe, Sites Authority | Lisa Webber, ICF |
| Rebecca Wu | Dan Cordova, USBR | Melissa Dekar, USBR |
| Regina Chichizola, Save CA Salmon | Ellen Berryman, ICF | Monique Briard, ICF |
| Ron Stork, Friends of the River | Harry Oakes, ICF | Ryan Davis, USBR |
| | John Spranza, Sites Integration | |

## Agenda:

| Discussion Topic | Topic Leader | Time Allotted |
|---|---|---|
| 1. Introductions | John | 5 mins |
| 2. Group Norms | John | 5 mins |
| 3. Species List | Ellen | 10 min |
| 4. Approach to Analysis<br>a. Agency Coordination<br>b. Access and Survey History<br>c. Landcover Mapping<br>d. Species Models<br>e. Next Steps | John/Ellen/Lisa | 20 mins |
| 5. Mitigation Approach | John/Harry | 10 mins |
| 6. Schedule and Future Meeting Topics | John/Group | 5 mins |
| 7. Action Items and Next Steps | Ali | 5 mins |

# Sites Project Terrestrial Resources Group Discussion

March 26, 2021

Sites

# Agenda

1. Introductions
2. Group Norms
3. Species List
4. Approach to Analysis
   a. Agency Coordination
   b. Access and Survey History
   c. Landcover Mapping
   d. Species Models
   e. Next Steps
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# Group Norms

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# Species Analyzed and Approach

Sites

# Land Cover Mapping Resources and Methods

- Previous vegetation and wetland mapping of reservoir and some roads and conveyance routes in 1998-2003 and 2011
- Fall/winter 2020-2021 vegetation and aquatic resource remote mapping of all project component impact areas plus a 300-foot buffer:
  - Aerial photograph interpretation (Google Earth 1998-2020; National Agriculture Imagery Program 2018; Digital Globe 2019)
  - Additional mapping resources include soils maps, USGS topographic maps, NWI maps, existing delineation mapping from 2000 and 2011
- On-going coordination with U.S. Army Corps of Engineers to obtain available delineation data and consensus on mapping methods, aquatic resources delineation verification approach, and permitting strategy

# ESA and CESA Terrestrial Species List

| Species | Federally Listed | State Listed | Operations | Construction |
|---|---|---|---|---|
| Keck's checker-mallow | X | | | X |
| Palmate-bracted bird's beak | X | X | | X |
| Vernal pool crustaceans | X | | | X |
| Valley elderberry longhorn beetle | X | | | X |
| California red-legged frog | X | | | X |
| Giant garter snake | X | X | | X |
| Tricolored blackbird | | X | | X |
| Swainson's hawk | | X | | X |
| Western yellow-billed cuckoo | X | X | X* | |
| Bank swallow | | X | X* | |

Notes: *Depending on downstream channel effects

# CEQA Species List

## Species Data Resources:

- Non-listed special-status species with potential to occur in study area include 20 wildlife and 12 botanical
- Non-listed special-status species include fully protected wildlife species; animal species of special concern; and California Rare Plant Rank species 1B.1, 1B.2, and 3.2 (no or low potential for other ranked plant species to occur)
- Wildlife surveys of parts of the study area in 1998-2004 and 2010/2011
- Botanical surveys of parts of study area in 1998-1999 and 2000-2003

# Species Models

- Species habitat models developed in GIS using:
  - Land cover mapping
  - Species range data, CNDDB records
  - Elevations
  - Soil types
- For listed species, developed in coordination with CDFW and USFWS

# Approach to Analysis

- Current impact acreages based on
  - Species models
  - Aerial imagery
  - No current field species surveys or habitat mapping
- Subsequent refinements needed
  - Project design changes
  - Land cover mapping
  - Species surveys

# Preliminary Impacts on State and Federally Listed Species

| Species | Federally Listed | State Listed | Acres Permanent* | Acres Temporary* |
|---|---|---|---|---|
| Keck's checker-mallow | X | | 10,094 | 700 |
| Palmate-bracted bird's beak | X | X | 21 | 8 |
| Vernal pool crustaceans | X | | 330 | 37 |
| Valley elderberry longhorn beetle | X | | 13,535 | 983 |
| California red-legged frog | X | | 513 Aquatic/6,826 Upland | 22 Aquatic/426 Upland |
| Giant garter snake | X | X | 2 Aquatic/26 Upland | 21 Aquatic/19 Upland |
| Tricolored blackbird | | X | 13,487 Foraging/42 Nesting | 1,043 Foraging/19 Nesting |
| Swainson's hawk | | X | 14,170 Foraging/1,083 Nesting | 1,035 Foraging/50 Nesting |
| Western yellow-billed cuckoo | X | X | TBD | TBD |
| Bank swallow | | X | TBD | TBD |

*Based off mapped suitable habitat

# Approach to Analysis: Next Steps

## Challenge: Lack of Property Access

- How to address lack of property access
  - Impact assessment/mitigation measures in permits based on models and assumptions
  - Ground truthing and surveys when property access is granted
  - Amend permits based on refined mapping and species surveys
- The EIR/S, biological assessment  and ITP application will outline this process and frontload it into the permits

# Mitigation Approach

Sites

# Mitigation Approach

- The mitigation options to be examined will include, but are not limited to, the following:
  - On-site mitigation/restoration opportunities
  - Existing habitat and listed-species mitigation and conservation banks
  - Establishment of turn-key banks
  - Purchasing offsite lands from willing landowners to create, enhance, restore or preserve mitigation habitats
  - Obtaining conservation easement and/or in lieu fees
  - Working with local refuges, preserves, resource agencies or municipalities to fund restoration and/or research projects

# Mitigation Approach

- Ecosystem-level mitigation planning that will integrate wetland, riparian and upland communities for targeted species, other associated species & land cover types
  - Develop database of existing preserves, mitigation/conservation banks, federal/state/regional open space areas
  - Overlay CNDDB occurrences for the region; identify mitigation sites in proximity to existing populations
  - Maximize “patch” size
  - Maximize habitat connectivity benefits (provide migration corridors, promote genetic diversity)
  - Protect/enhance important habitat areas
  - Maintain/improve biodiversity

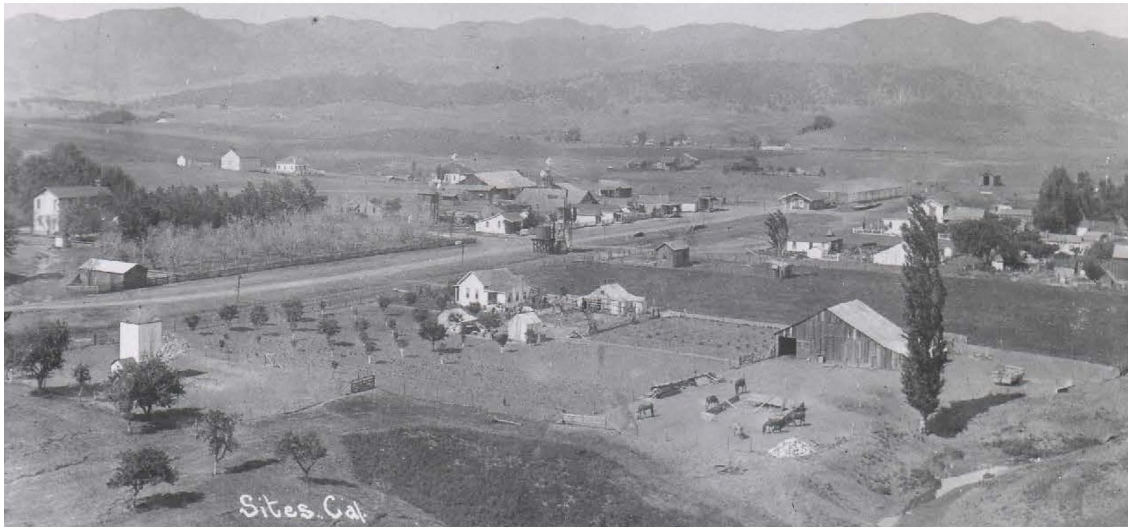
# Schedule and Next Meeting

# Schedule

- Summer 2021
  - Draft EIR and Supplemental EIS Released
- December 2021
  - Biological Assessment to Agencies
  - Submit State ITP Applications
- Spring 2022
  - Final EIR/Final EIS
- Spring 2023
  - All permits obtained
- Spring 2024 Construction Begins
- Topics for the next meeting?

# Additional Topics from the Group

- Any additional questions or thoughts?
- Topics for the next meeting?



# Action Items and Next Steps

# Thank you!

Sites

# Alt 1 – Authority's Preferred Project

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|---|---|
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| Diversion(s) | Diversion from Sacramento River into existing TC Canal at Red Bluff and the existing GCID Main Canal at Hamilton City |
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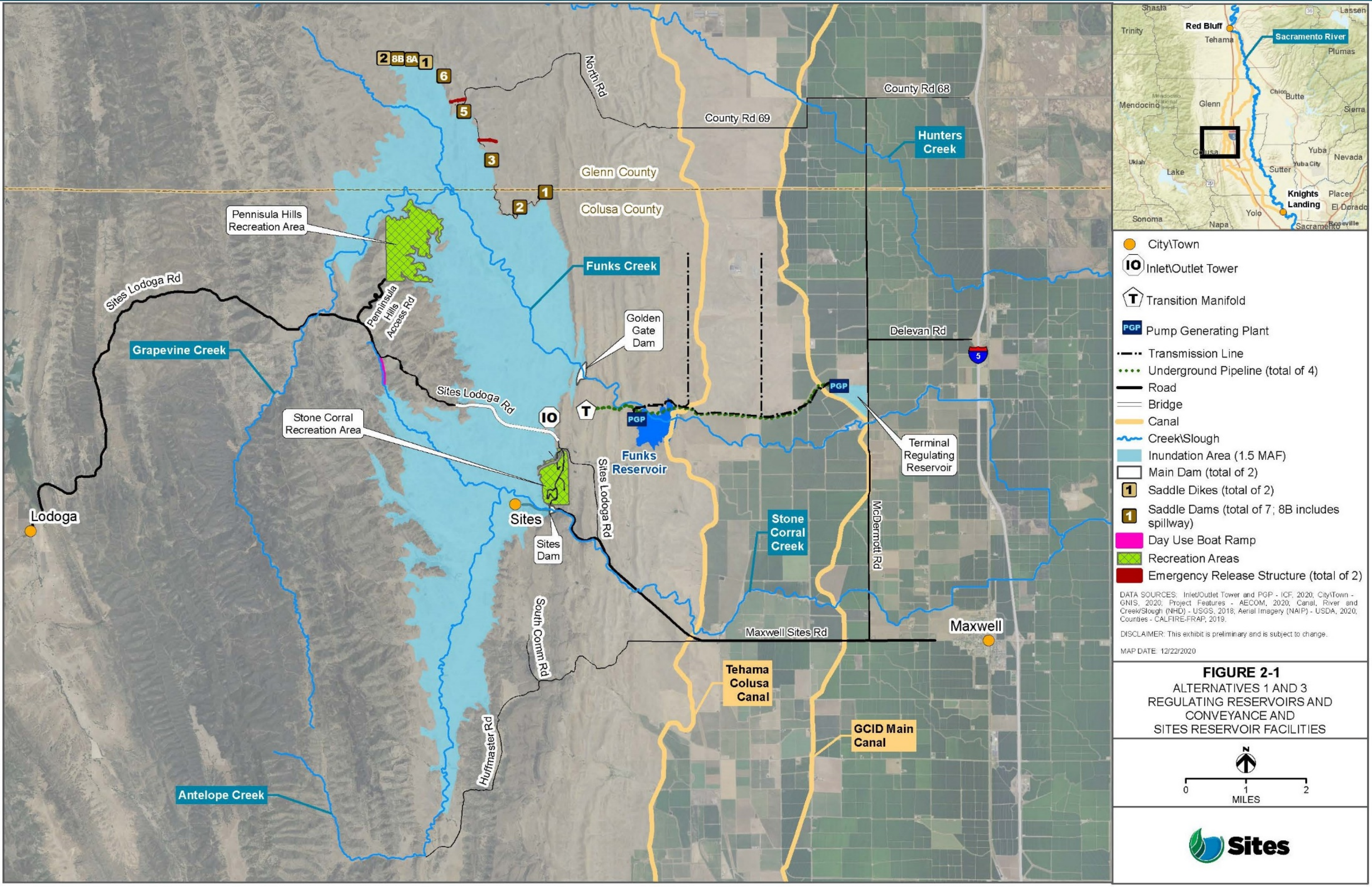

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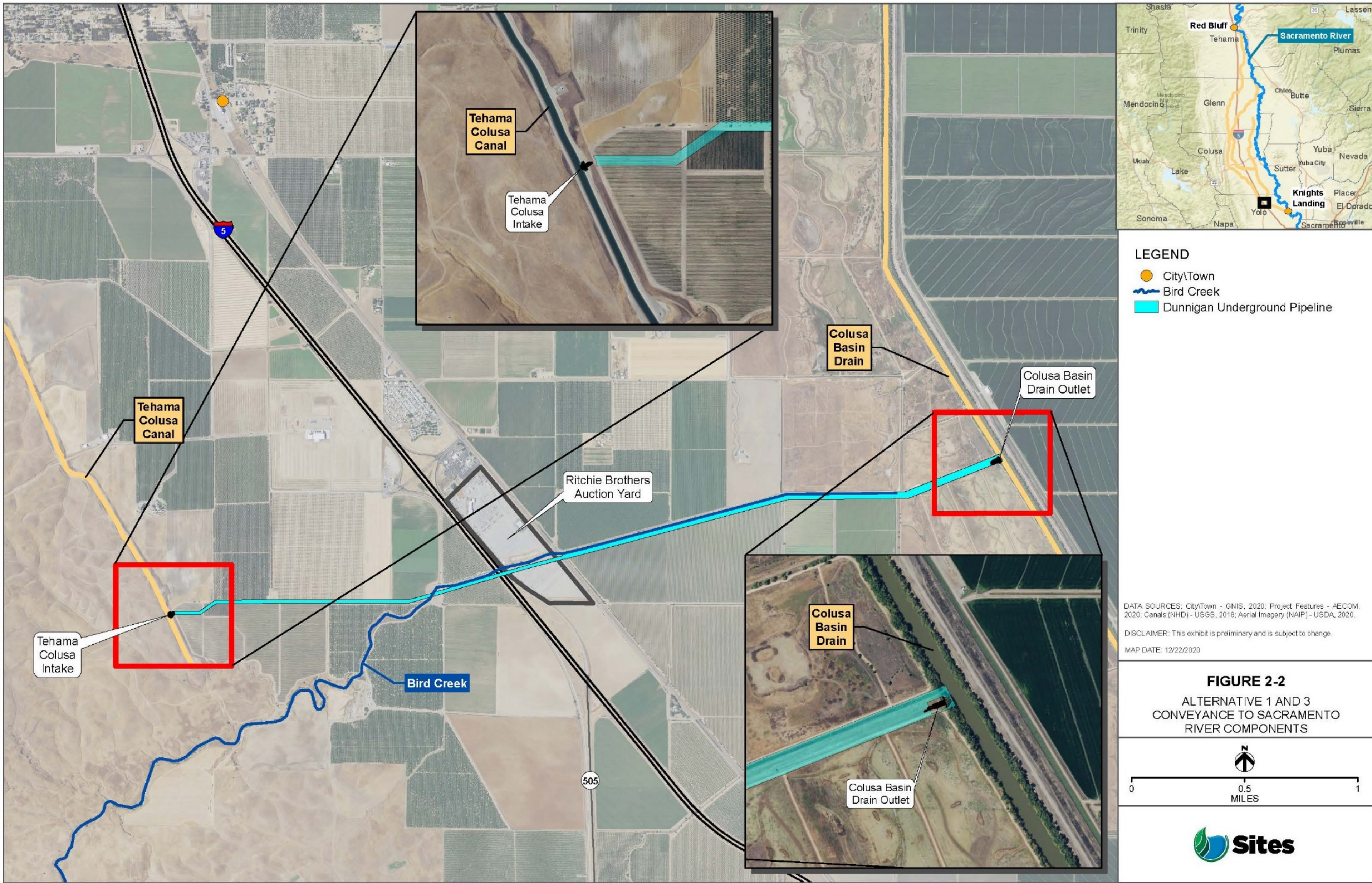

Sites

# Trinity River Small Group Agenda -- DRAFT

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## Meeting Information:

| | | | |
|---|---|---|---|
| **Date:** | March 22, 2021 | **Location:** | Microsoft Teams |
| **Start Time:** | 10:00 a.m. | **Finish Time:** | 11:30 a.m. |
| **Purpose:** | Overview and discussion of the Sites Project's Trinity River effects | | |

## Meeting Participants:

| | | |
|---|---|---|
| Regina Chichizola | Craig Tucker | Rob Leaf |
| John McManus | Rebecca Wu | Steve Micko |
| Joe Polos | Ryan Davis | John Spranza |
| Hank Seemann | Melissa Dekar | Marc VanCamp |
| Tom Stokely | Ali Forsythe | Laurie Warner Herson |
| Ron Stork | Erin Heydinger | Natalie Wolder |
| | | Paul Zedonis |

## Agenda:

| Discussion Topic | Topic Leader | Time Allotted |
|---|---|---|
| 1. Introductions | Ali | 5 mins |
| 2. Group Norms | Ali / Group | 10 mins |
| 3. Brief Overview of Project Description and Water Rights Approach | Ali | 15 mins |
| 4. Trinity River CalSim Modeling Approach | Erin | 15 mins |
| 5. Water Right Approach and Possible Water Right Term | Ali | 20 mins |
| 6. Additional Topics from the Group | Group | 15 mins |
| 7. Action Items and Next Steps | Ali | 10 mins |

# Trinity River Small Group

## Overview and Discussion of the Sites Project's Trinity River Effects

March 22, 2021

Sites

# Agenda

1. Introductions
2. Group Norms
3. Brief Overview of Project Description and Water Rights Approach
4. Trinity River CalSim Modeling Approach
5. Water Right Approach and Possible Water Right Term
6. Additional Topics from the Group
7. Action Items and Next Steps

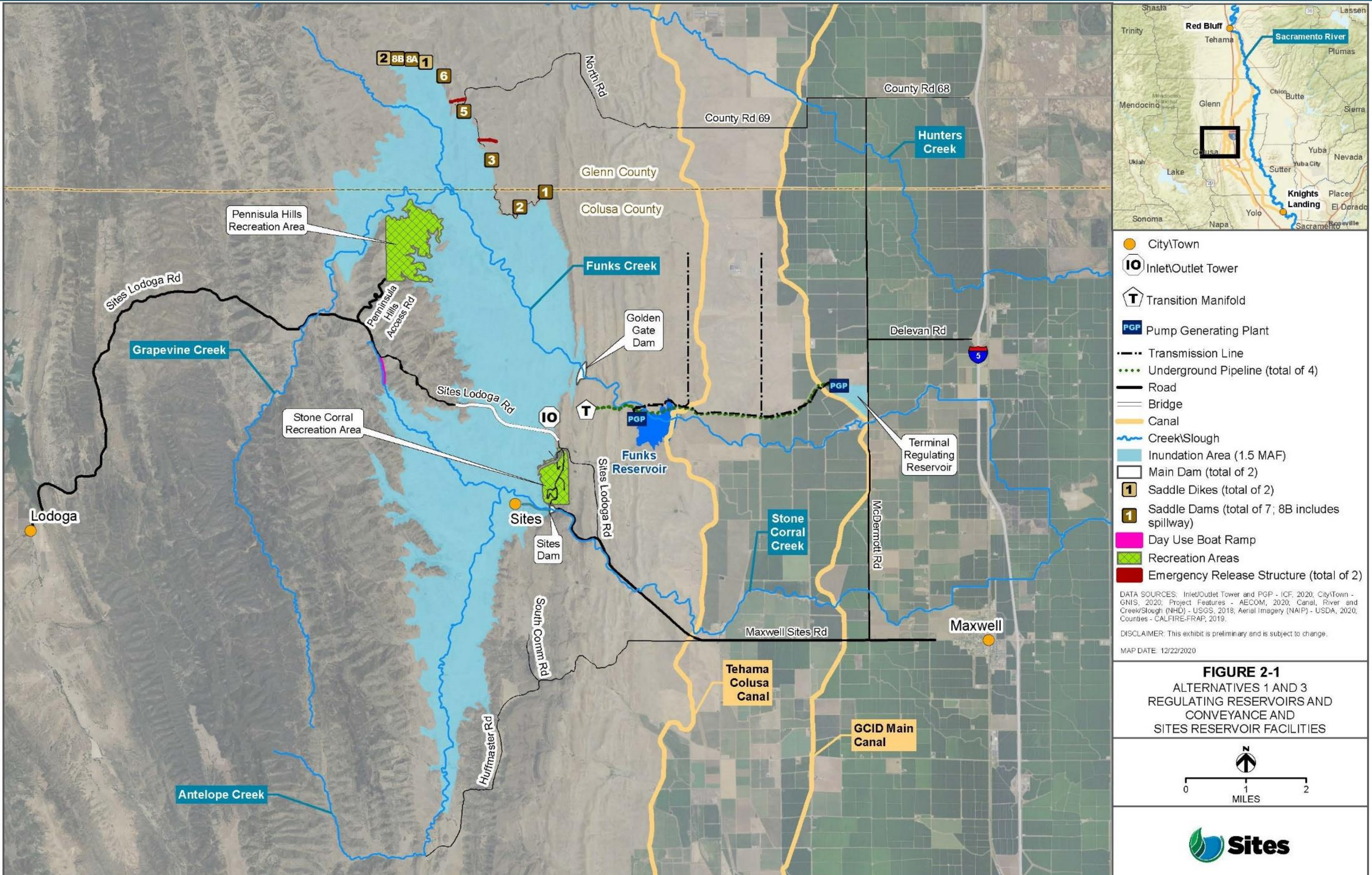
# Group Norms

- 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
- Focus is on the Sites Project

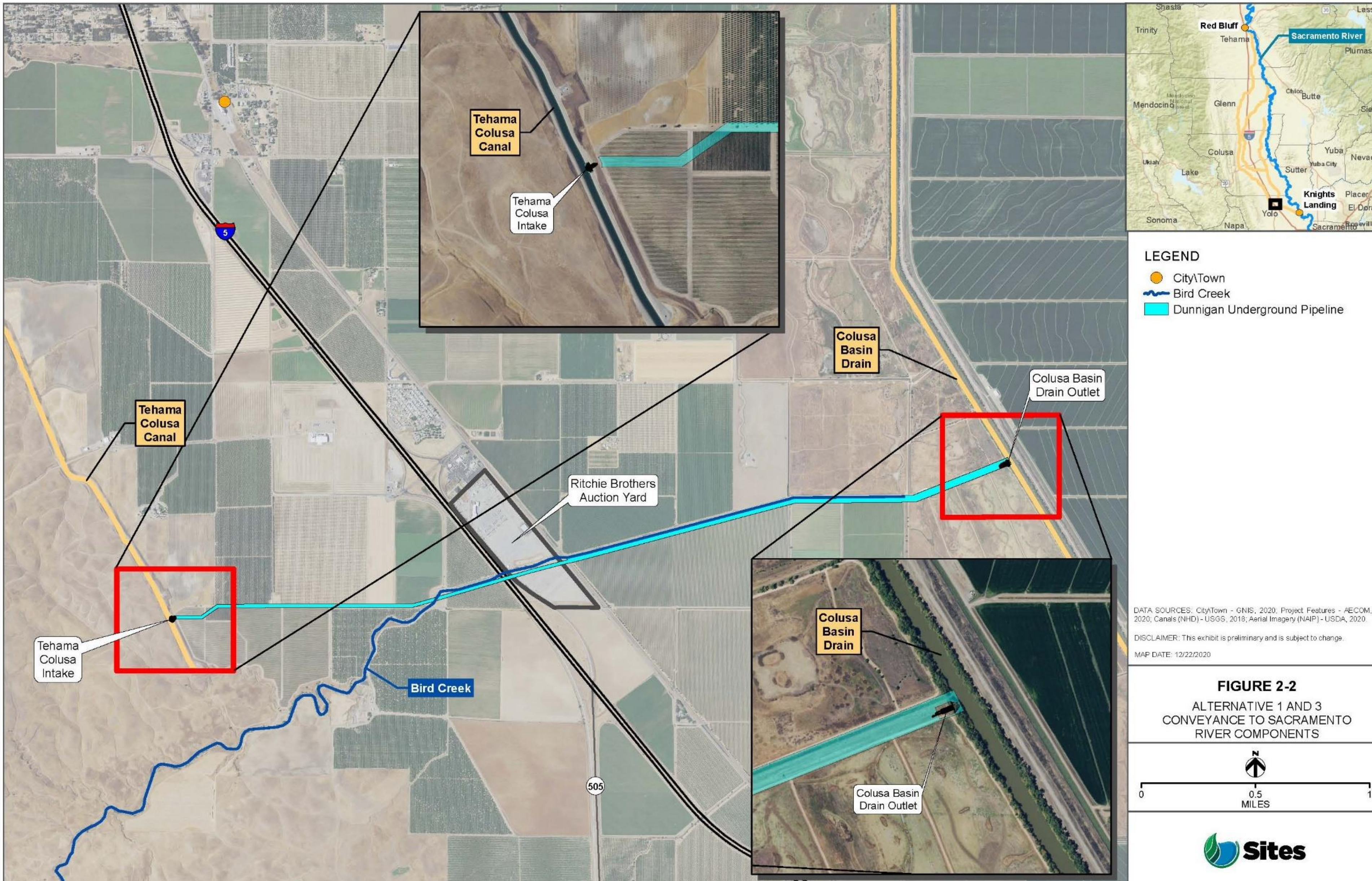
# Alt 1 – Authority’s Preferred Project

| Facilities / Operations | Alternative 1 |
|---|---|
| Reservoir Size | 1.5 MAF |
| Diversion(s) | Diversion from Sacramento River into existing TC Canal at Red Bluff and the existing GCID Main Canal at Hamilton City |
| Conveyance Release / Dunnigan Release | Release 1,000 cfs into new pipeline to the Colusa Basin Drain |
| Releases into Funks and Stone Corral Creeks | Specific flow criteria to maintain flows to protect downstream water right holders and ecological function |
| Reclamation Involvement | • Funding Partner up to 7% Cost-Share<br>• Operational exchanges |
| DWR Involvement | Operational Exchanges with Oroville and use of SWP facilities South-of-Delta |
| Hydropower | Incidental power generation up to 40 megawatts each at Funks PGP and TRR PGP |

# Alt 1 – Preferred Project



# Alt 1 – Preferred Project



# Water Right Approach

- Sources:
  - Sacramento River
  - Stone Corral Creek
  - Funks Creek
- Points of diversion:
  - Tehama-Colusa Canal (existing, screened facility)
  - Glenn-Colusa Irrigation District's Main Canal (existing, screened facility)
  - Sites Dam
  - Golden Gate Dam
- Seeking to appropriate unregulated flows that come into the Sacramento River below Keswick

# Water Right Approach

- Sites seeking to divert Sacramento River flows when all of the following conditions are met:
  - Flow exceed minimum diversion criteria
  - Delta is in “excess” conditions
  - Senior downstream water rights and other more senior flow priorities have been satisfied
  - Flow are available above those needed to meet all applicable laws, regulations, BiOps and court orders in place at the time of diversion
- Sites would operate within all applicable laws, regulations, biological opinions and incidental take permits, and court orders in place at the time
- Sites is not applying for a water right to divert or redivert Trinity River water

# Modeling Approach

- Calsim II used for overall operations of Sites
  - Hydrological planning tool used to represent state-wide changes that would result from Sites
  - Monthly timestep
  - Results are comparisons, not absolute values
- Updates made to Sites Calsim model – baseline now contains actions within:
  - 2019 Reinitiation of Consultation on the CVP and SWP
  - 2020 SWP Incidental Take Permit

# Trinity River CalSim Modeling Approach

- Modelled No Action Alternative
  - Includes:
    - Trinity ROD Flows
    - Lower Klamath Augmentation Flows
- Held Trinity River operations consistent with No Action Alternative when modelled the Project alternatives
- Reclamation has same obligations and operating principles in operating the Trinity River with and without Sites
- Sites is not limiting, constraining, changing, or affecting Reclamation’s obligations in their Trinity River operations

# Water Right Approach and Possible Term

- Developing water right terms:
  - Implementable and under the control of the Sites Authority
  - Measurable, identifiable, reportable
  - Addresses the issue at hand
- Open to a term, but we believe that it should meet the criteria above

# Water Right Approach and Possible Term

- What are the key factors that the group is concerned about?
- How might we put those into a water right term?
- Could we address in a different way?  For example, through a statement from Sites Board

# Additional Topics from the Group

- Any additional questions or thoughts?

# Action Items and Next Steps

# Thank you!

Sites

# Proposed Water Right Term from Humboldt County

Trinity River water shall not be used to fill Sites Reservoir unless the Trinity River Division of the Central Valley Project is releasing water as a result of storage conditions requiring “Safety of Dams” releases beyond normal operating plans and concurrently when Shasta Reservoir is making flood control releases.  Furthermore, Humboldt County’s 1959 water contract with the Bureau of Reclamation, Trinity River Record of Decision (ROD) flows, and releases to implement the Bureau of Reclamation’s Long-Term Plan to Protect Adult Salmon in the Lower Klamath River shall not be reduced or negatively impacted in any way as a result of any Sites Reservoir decisions, modeling, operational plans, and water right petitions.

# Water Quality Group Discussion Agenda

Sites
Affordable Water, Sustainably Managed

*Our Core Values – Safety, Trust and Integrity, Respect for Local Communities, Environmental Stewardship, Shared Responsibility and Shared Benefits, Accountability and Transparency, Proactive Innovation, Diversity and Inclusivity*
*Our Commitment – To live up to these values in everything we do*

**Meeting Information:**

| | | | |
|---|---|---|---|
| **Date:** | May 13, 2021 | **Location:** | Microsoft Teams<br>Or call in (audio only)<br>(833) 255-2803,,808172876# |
| **Start Time:** | 1:00 p.m. | **Finish Time:** | 1:30 p.m. |
| **Purpose:** | Overview and discussion of the Sites Project's in-lake water quality modeling and EIR/S analysis approach | | |

**Meeting Participants:**

| | | |
|---|---|---|
| André Sanchez | Julie Zimmerman | Cam Irvine |
| Anthony Saracino | Rachel Zwillinger | Erin Heydinger |
| Dave Zelinski | Rebecca Wu | John Spranza |
| Debra Lucero | Regina Chichizola | Laurie Warner Herson |
| Doug Obegi | Ron Stork | Lesa Erecius |
| Greg Reis | Stephanie Gordon | Melissa Dekar |
| Jerry Boles | Tom Stokely | Nicole Williams |
| Jay Ziegler | Ali Forsythe | Steve Micko |
| Jim Brobeck | Anne Huber | Vanessa King |

**Agenda:**

| Discussion Topic | Topic Leader | Time Allotted |
|---|---|---|
| 1. Introductions | John | 5 mins |
| 2. Group Norms<br>a. Approach to Meetings | John | 5 mins |
| 3. Action Item follow-up | John | 5 min |
| 4. Key Concepts<br>a. Reservoir Management Plan<br>b. Temperature Model<br>c. Evapoconcentration | Ali, Steve, Anne | 15 min |

| | | | |
|---|---|---|---|
| 5. | In Lake Analyses<br>a. Mercury<br>b. Metals (non-Hg)<br>c. HABs<br>d. Other Topics<br>i. Salt Pond<br>ii. Bank Erosion<br>iii. Metal Leaching | Cam, Anne, Lesa | 50 mins |
| 6. | Action Items and Future Topics | All | 10 mins |

# Sites Project Water Quality Group Discussion

May 13, 2021

Sites

# Agenda

1. Introductions
2. Group Norms
3. Action Item Follow-up
4. Key Concepts
    a) Reservoir Management Plan
    b) Temperature Model
    c) Evapoconcentration
5. In-Lake Analyses
6. Action Items and Next Steps

# 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
- Topics for next meeting will be discussed and recorded

# Action Item Follow-up

| Action Item | Addressed | Pending | Notes |
|---|---|---|---|
| Specificity on years for data | X | | |
| Distribute metals table | X | | |
| Effects of release temperature on rice | | X | Email out to Tim Johnson |
| Effects of Hg and As on rice | | X | Email out to Tim Johnson |
| Effects of reservoir operations on water quality of Stone Corral and Funks creeks. | | X | Next meeting |
| Anti-degradation policy and Sites | | X | Next meeting |
| Synergistic effects of chemicals | | X | Next meeting |

# Key Concepts

# Reservoir Management Plan

- Part of the Project
- Purpose: describe the management of water resources in Sites Reservoir
  - Water Quality: describe metrics, standards, testing and monitoring protocols, and outcomes
- Constituents currently included:
  - HABs
  - Methylmercury
  - Metals
  - Water Temperature
  - Salt and Minerals (Salt Pond)

# Temperature Model: CE QUAL W2

- CE QUAL W2
  - 2D Reservoir Temperature Model
  - Daily timestep
  - Version 4.1
- Assumptions:
  - Reservoir size
  - Estimates surface area with storage volume
  - Considers I/O Tower

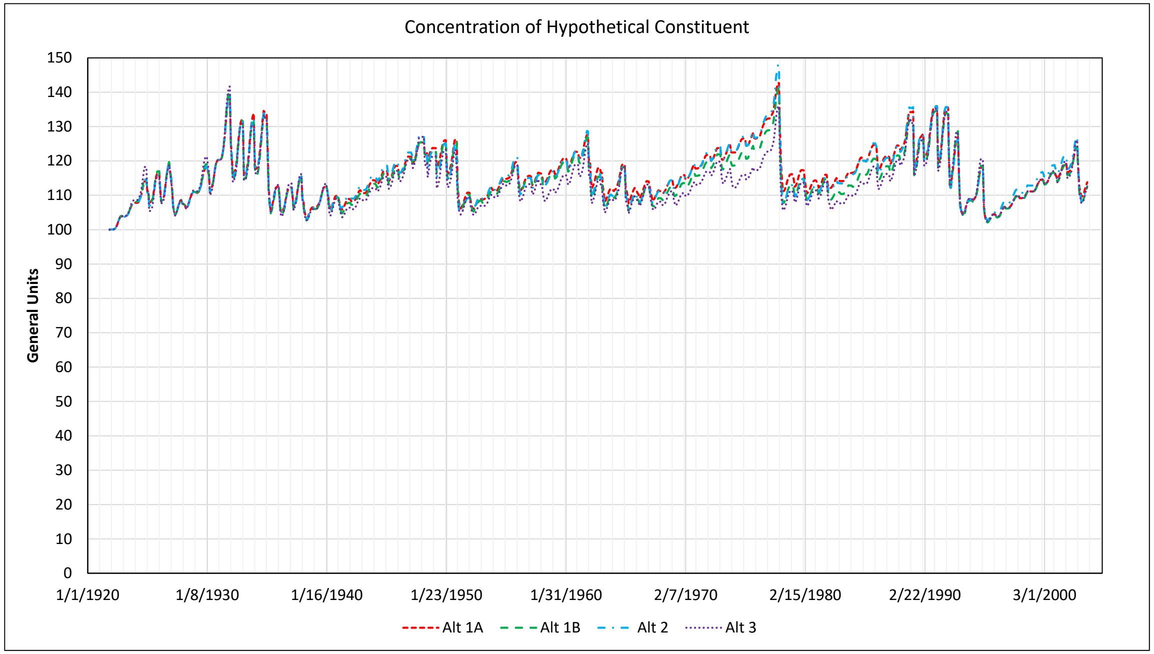
# Temperature Model: CE QUAL W2

- Inputs
  - Daily flows from operations model (USRDOM)
  - Daily temperature from Sacramento River temperature model (HEC5Q)
  - Daily net evaporation rate (consistent with CalSim II)
- Outputs
  - Surface water temperature
  - Release temperature

# Evapoconcentration

- Calculations using water balance information from CALSIM
- Increase in concentration limited by freshening due to release and refilling
- Most relevant to conservative constituents

- Average concentration approximately 13-16 percent higher than the inflow concentration
- Maximum of 41 – 48 percent depending on alternative



# In-Lake Analyses

Sites

# Mercury

- Approach
  - Input sources
  - Transformation processes
  - Comparison with similar/nearby reservoirs
    - Concentrations in surface waters and in fish tissues
    - Annual reservoir water level fluctuation
- Key Data Sources
  - California Environmental Data Exchange Network (CEDEN)
  - DWR Water Data Library
  - SWRCB 2017 – Reservoir TMDL draft staff report

# Mercury

- Long-term (~10 years after initial filling)
  - Comparable to existing reservoirs
  - 1.6 to 1.9 ng/L total mercury
  - 0.10 to 0.15 methylmercury
- Short-term (up to ~10 years after initial filling)
  - Conditions are conducive to mercury methylation
  - 3.2 to 3.8 ng/L total mercury
  - 0.2 to 0.3 ng/L methylmercury
- Total mercury concentrations would not exceed California Toxics Rule Objective (50 ng/L)
- Tissue concentrations among other reservoirs > CA sport fish objective (0.2 mg/kg ww in 350 mm largemouth bass)

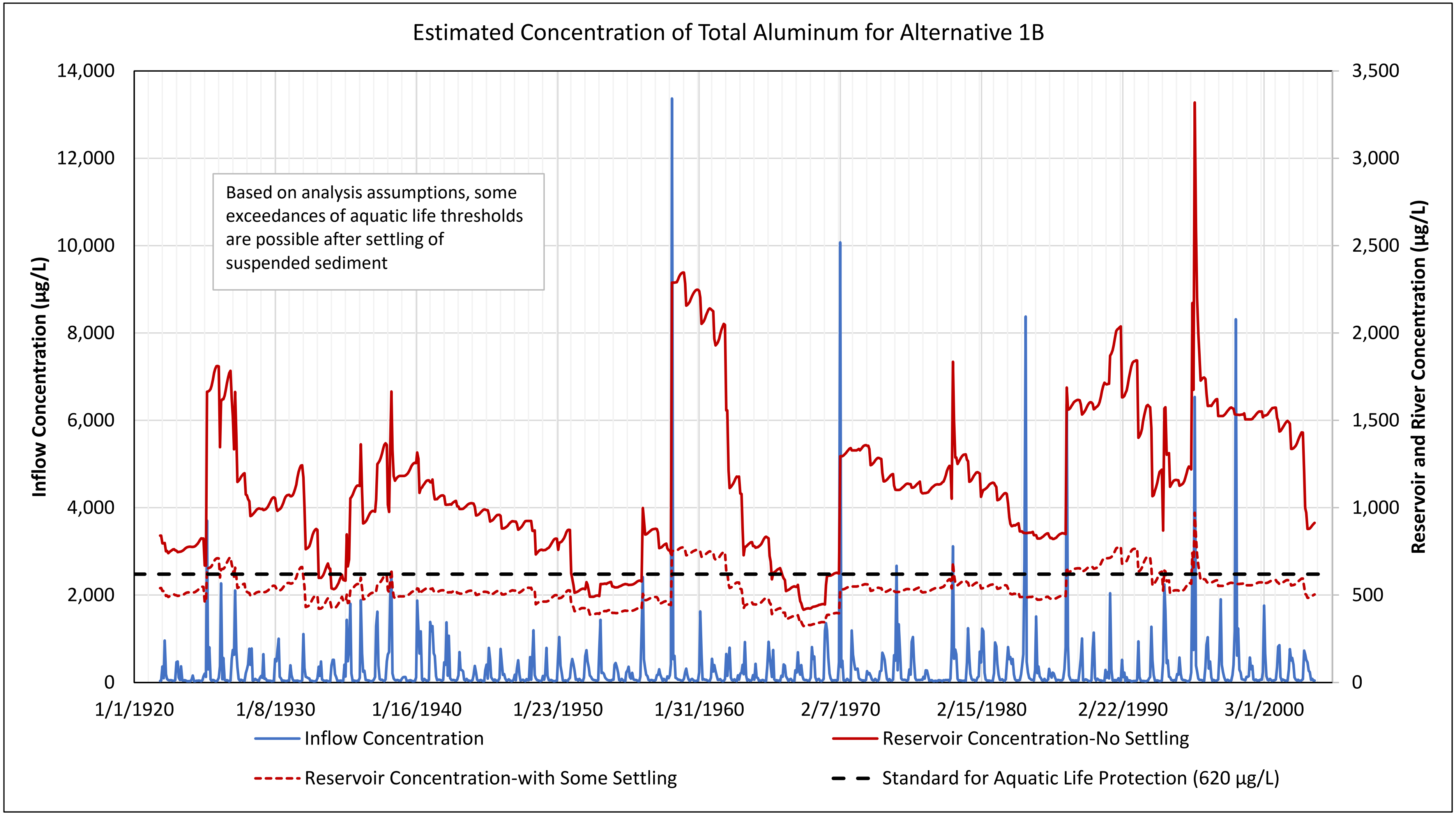
# Mercury

- Reservoir Management Plan
  - Remove vegetation in inundation footprint prior to initial filling
  - Monitor reservoir fish tissue methylmercury
  - Post fish consumption warning signs if fish tissue methylmercury concentrations exceed CA sport fish objective
  - Adhere to the State Water Board TMDL for mercury in reservoirs, once adopted

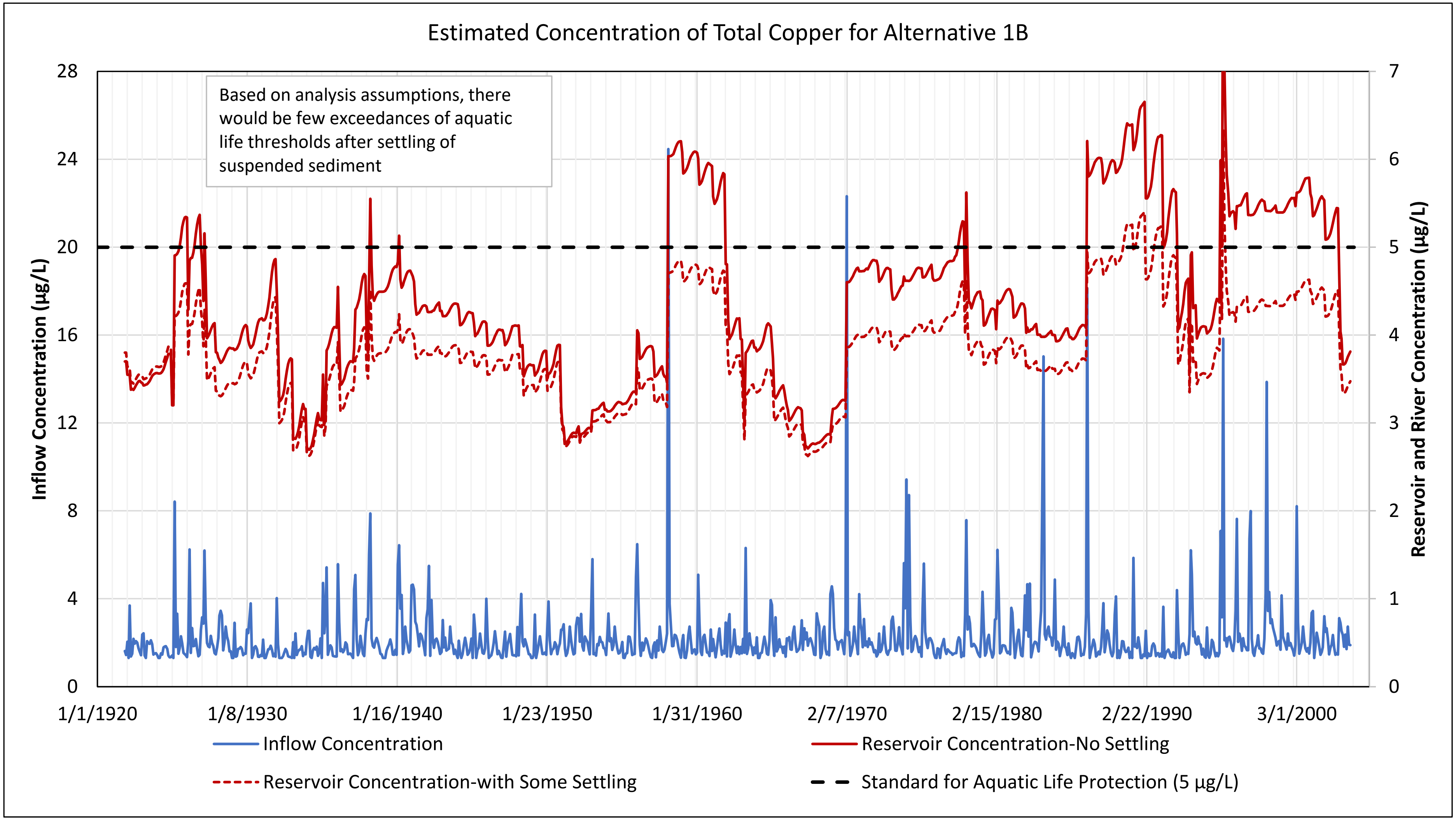
# Metals

- Calculations include:
  - Improved estimation of inflow concentration (based on both flow at Keswick and Keswick/Bend Bridge)
  - Evapoconcentration
  - With and without settling of suspended sediment
- Reservoir Management Plan
  - Monitor concentrations of aluminum, copper, iron, and lead upstream of, in, and downstream of Sites Reservoir

# Metals

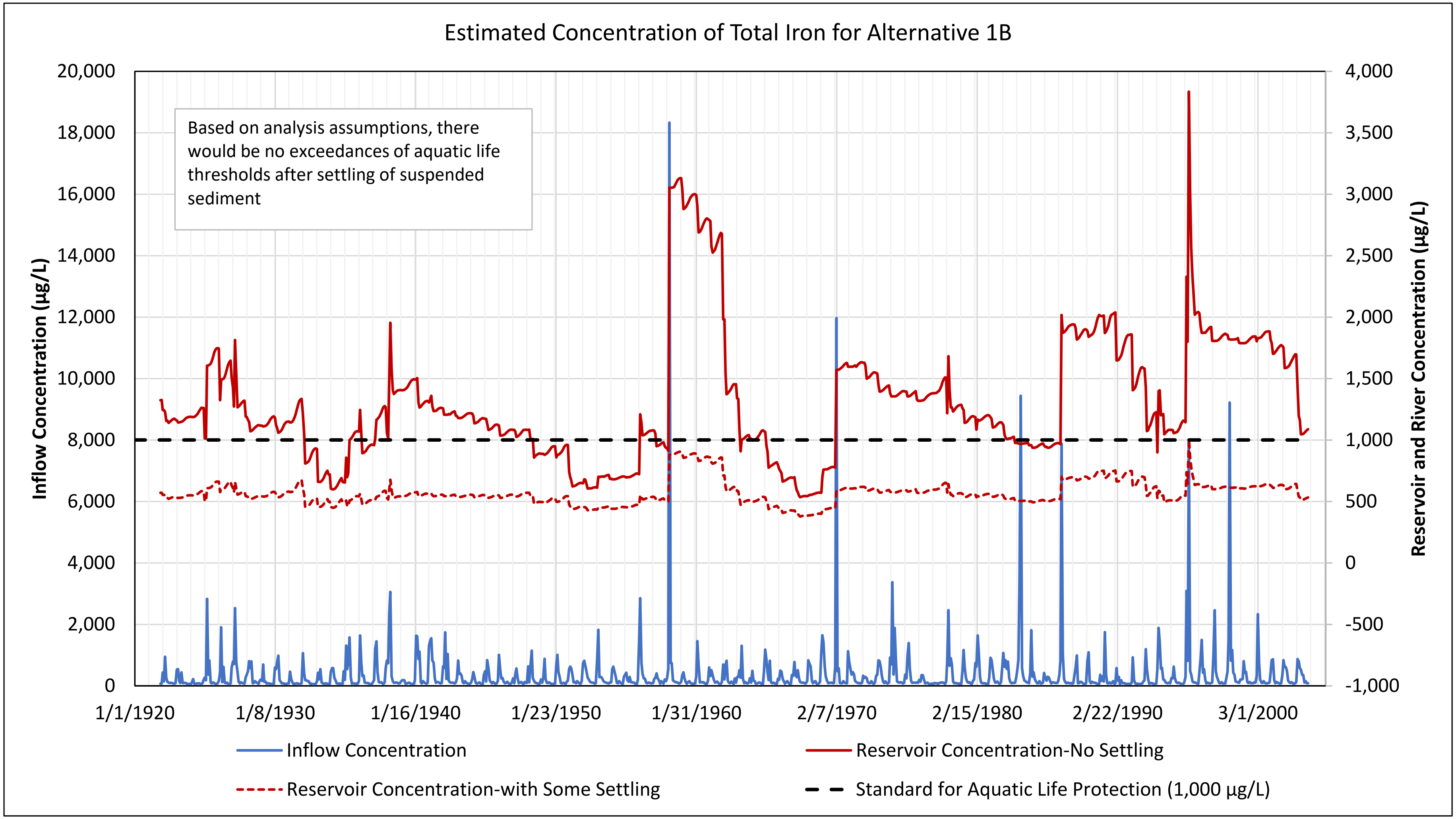

Estimated Concentration of Total Aluminum for Alternative 1B
Based on analysis assumptions, some exceedances of aquatic life thresholds are possible after settling of suspended sediment
Inflow Concentration (µg/L)
Reservoir and River Concentration (µg/L)
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
3,500
3,000
2,500
2,000
1,500
1,000
500
0
1/1/1920
1/8/1930
1/16/1940
1/23/1950
1/31/1960
2/7/1970
2/15/1980
2/22/1990
3/1/2000
Inflow Concentration
Reservoir Concentration-No Settling
Reservoir Concentration-with Some Settling
Standard for Aquatic Life Protection (620 µg/L)

# Metals



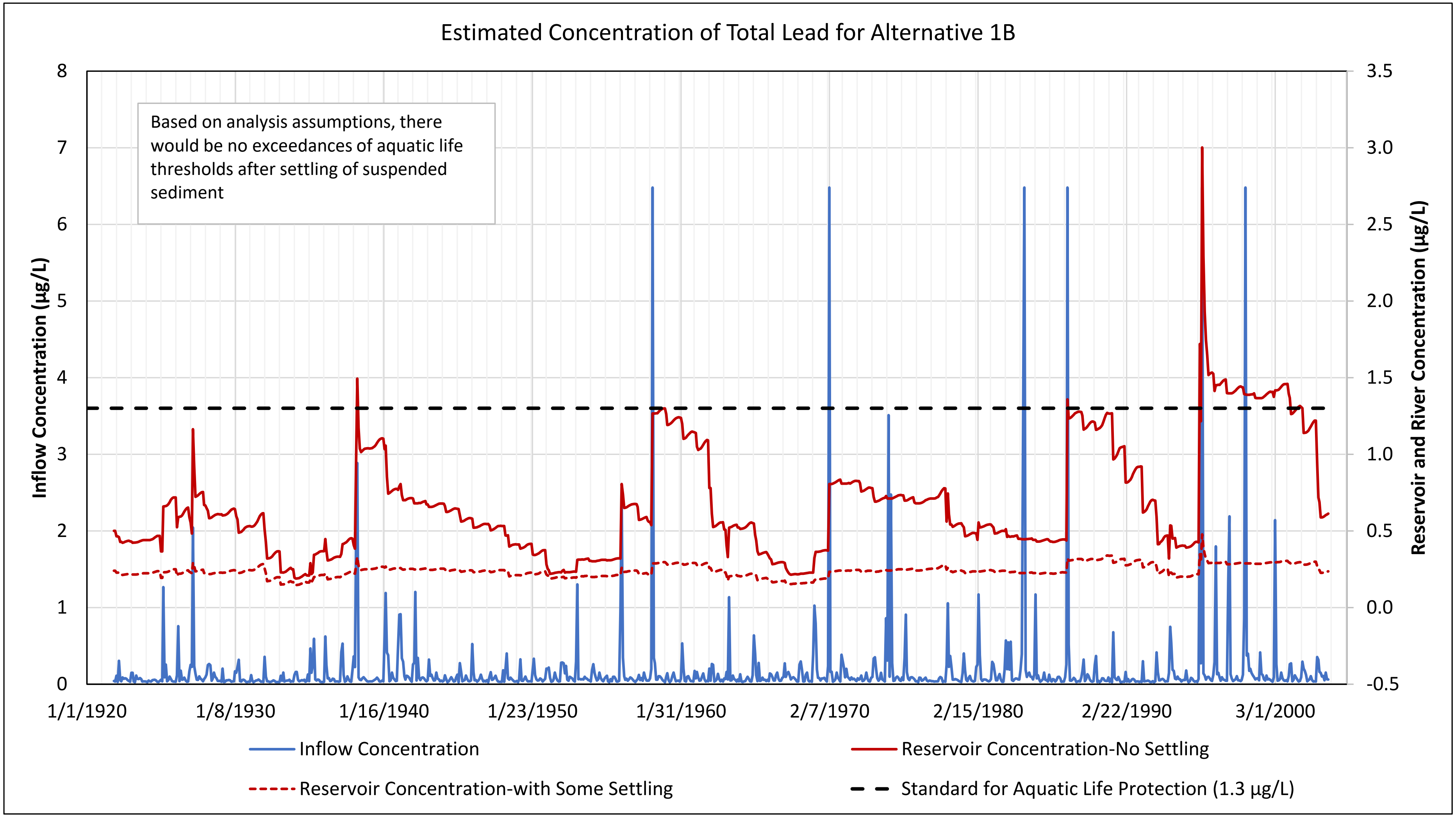
Estimated Concentration of Total Copper for Alternative 1B
Based on analysis assumptions, there would be few exceedances of aquatic life thresholds after settling of suspended sediment
Inflow Concentration (µg/L)
Reservoir and River Concentration (µg/L)
28
24
20
16
12
8
4
0
7
6
5
4
3
2
1
0
1/1/1920
1/8/1930
1/16/1940
1/23/1950
1/31/1960
2/7/1970
2/15/1980
2/22/1990
3/1/2000
Inflow Concentration
Reservoir Concentration-No Settling
Reservoir Concentration-with Some Settling
Standard for Aquatic Life Protection (5 µg/L)

# Metals



Estimated Concentration of Total Iron for Alternative 1B
Based on analysis assumptions, there would be no exceedances of aquatic life thresholds after settling of suspended sediment
Inflow Concentration (µg/L)
Reservoir and River Concentration (µg/L)
20,000
18,000
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
-500
-1,000
1/1/1920
1/8/1930
1/16/1940
1/23/1950
1/31/1960
2/7/1970
2/15/1980
2/22/1990
3/1/2000
Inflow Concentration
Reservoir Concentration-No Settling
Reservoir Concentration-with Some Settling
Standard for Aquatic Life Protection (1,000 µg/L)

# Metals



Estimated Concentration of Total Lead for Alternative 1B
Based on analysis assumptions, there would be no exceedances of aquatic life thresholds after settling of suspended sediment
Inflow Concentration (µg/L)
Reservoir and River Concentration (µg/L)
8
7
6
5
4
3
2
1
0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
-0.5
1/1/1920
1/8/1930
1/16/1940
1/23/1950
1/31/1960
2/7/1970
2/15/1980
2/22/1990
3/1/2000
Inflow Concentration
Reservoir Concentration-No Settling
Reservoir Concentration-with Some Settling
Standard for Aquatic Life Protection (1.3 µg/L)

# HABs

- HABs occur in many reservoirs including Black Butte
- Sufficient nutrients and higher water temperatures (≥66 °F) in Sites Reservoir in May through September could create conditions conducive to formation and maintenance of HABs
- Reservoir Management Plan
  - Monitor for presence of HABs and, if found, cyanotoxins. Add warning signage if warranted
  - Coordinate with Water Board
  - Operate inlet/outlet tower to reduce likelihood of cyanotoxins in release

# Other Topics: Salt Pond

- Salt Pond Information
  - August 1997 – dry
  - September 1997 EC = 194,100 µS/cm
  - January 1998 EC = 7,200 µS/cm
  - Estimated flow = 0.1 cfs based on pond size and evaporation rate for region

# Other Topics: Salt Pond

- Salt Pond Evaluation:
  - Not expected to have substantial water quality effects
  - Conservatively assumed no decrease in spring discharge
  - Fate of spring discharge:
    - Full mixing of 0.1 cfs for a year into a volume of 200 TAF would represent 0.04 percent of the total volume (EC increase from 130 µS/cm to between 133 – 208 µS/cm)
    - Accumulation at bottom of reservoir due to higher density (74 years to reach low-level intake)
- Reservoir Management Plan
  - Measure EC in springs before construction
  - Measure EC in reservoir after inundation

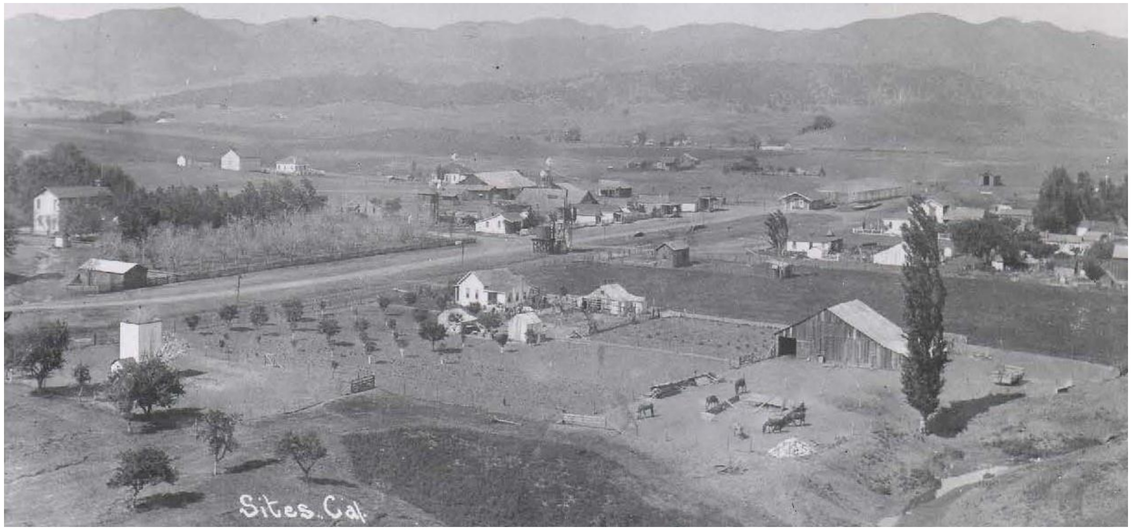
# Other Topics Metals and Erosion

- Metal Leaching from Groundwater
  - Reservoir water expected to seep into ground
  - Groundwater does not have elevated metal concentrations
- Reservoir Bank Erosion
  - Temporary increase in turbidity common to many waterbodies
  - Activities in the reservoir footprint (ranching) unlikely to contaminate soil

# Action Items and Future Topics

# Additional Topics and Action Items

- Any additional questions, thoughts or topics for the next meeting?
- Action item review



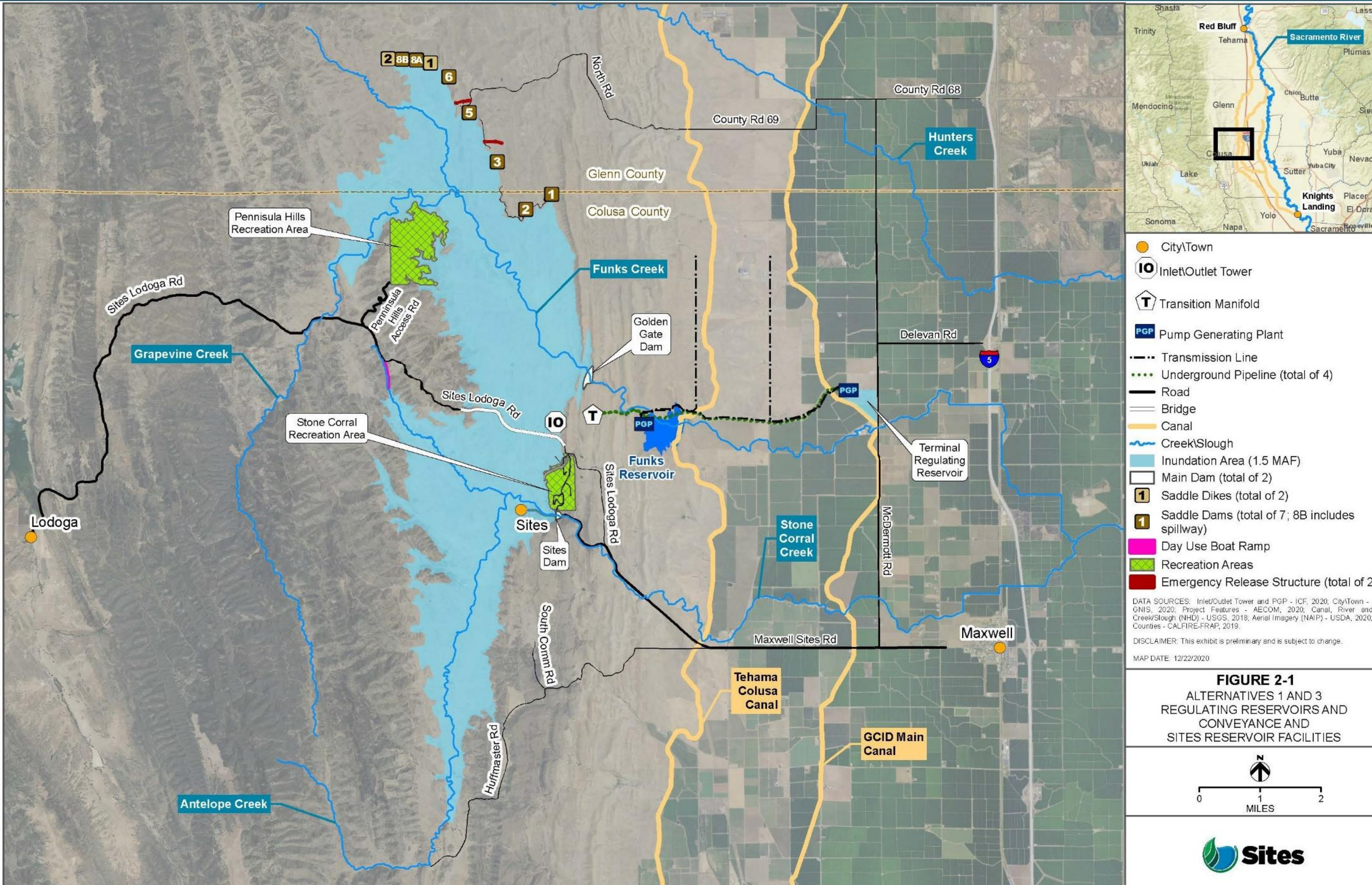
# Thank you!

Sites

# Method Analysis Overview

| Mechanisms by which Sites Reservoir Operations Could Affect Water Quality | Main Constituents Considered | Qualitative | Quantitative | Model Results Considered |
|---|---|---|---|---|
| Temporal Shift | Metals<br>Pesticides<br>Salinity | X | X | CalSim |
| Evapoconcentration | Metals<br>Salinity | | X | CalSim |
| In-Reservoir Processes | Mercury<br>HABs<br>Nutrients/OC/DO<br>Temperature | X | X | Reservoir temperature modeling (CE QUAL W2) |
| Change in System Reservoir Operations | Temperature<br>HABs<br>Mercury | X | X | CalSim, HEC5Q and Reclamation temperature model |
| Change in Delta Operations | Salinity<br>Chloride | X | X | CalSim and DSM2 QUAL |
| Redirection of CBD Flow to Yolo Bypass | Pesticides<br>Nutrients/OC/DO<br>HABs<br>Mercury<br>Temperature | X | X | CalSim |

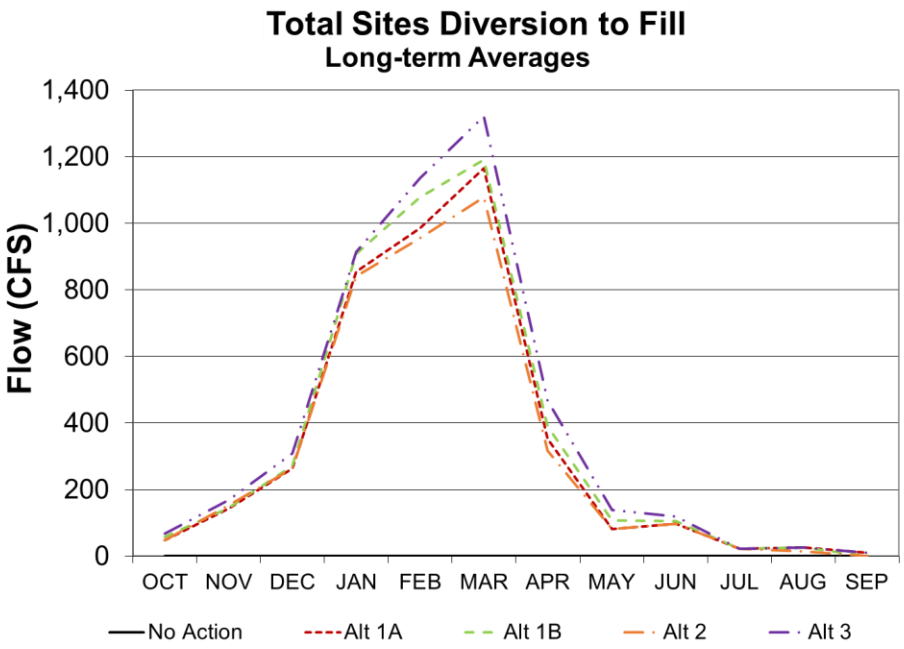
# Alt 1 – Preferred Project

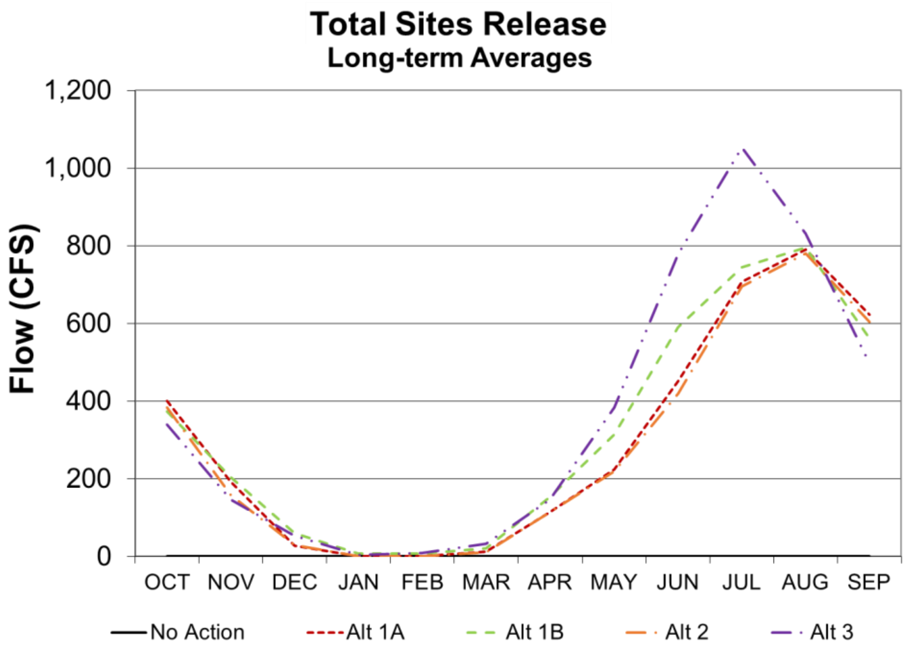


# Total Mercury Concentrations (ug/L)

| Location | Station | n | Mean Concentration | Maximum Concentration | 75th Percentile | Data Range (years) | Source |
|---|---|---|---|---|---|---|---|
| Funks Creek | Golden Gate | 2 | 0.35 | 1.2 | 0.93 | 2006-2007 | DWR Data Library |
| Stone Coral Creek | - | 3 | 0.85 | 2.3 | 1.61 | 2007 | DWR Data Library |
| Colusa Basin Drain | Knights Landing | 26 | 8.6 | 19.3 | 10.8 | 1996-1998 | USGS 2000 |
| Colusa Basin Drain | Knights Landing | 66 | 4.5 | 75 | 5.9 | 1999-2007 | CEDEN |
| Sacramento River | Red Bluff | 66 | 1.3 | 14.4 | 1.6 | 1999-2007 | CEDEN |
| Sacramento River | Hamilton City | 66 | 2.2 | 54 | 2.6 | 1999-2016 | CEDEN |
| Sacramento River | Freeport | 217 | 4.5 | 89 | 8.8 | 1994-2015 | CEDEN |
| Yolo Bypass | Prospect Slough | 28 | 73.2 | 696 | - | 1995-2003 | Central Valley RWQCB 2010 |

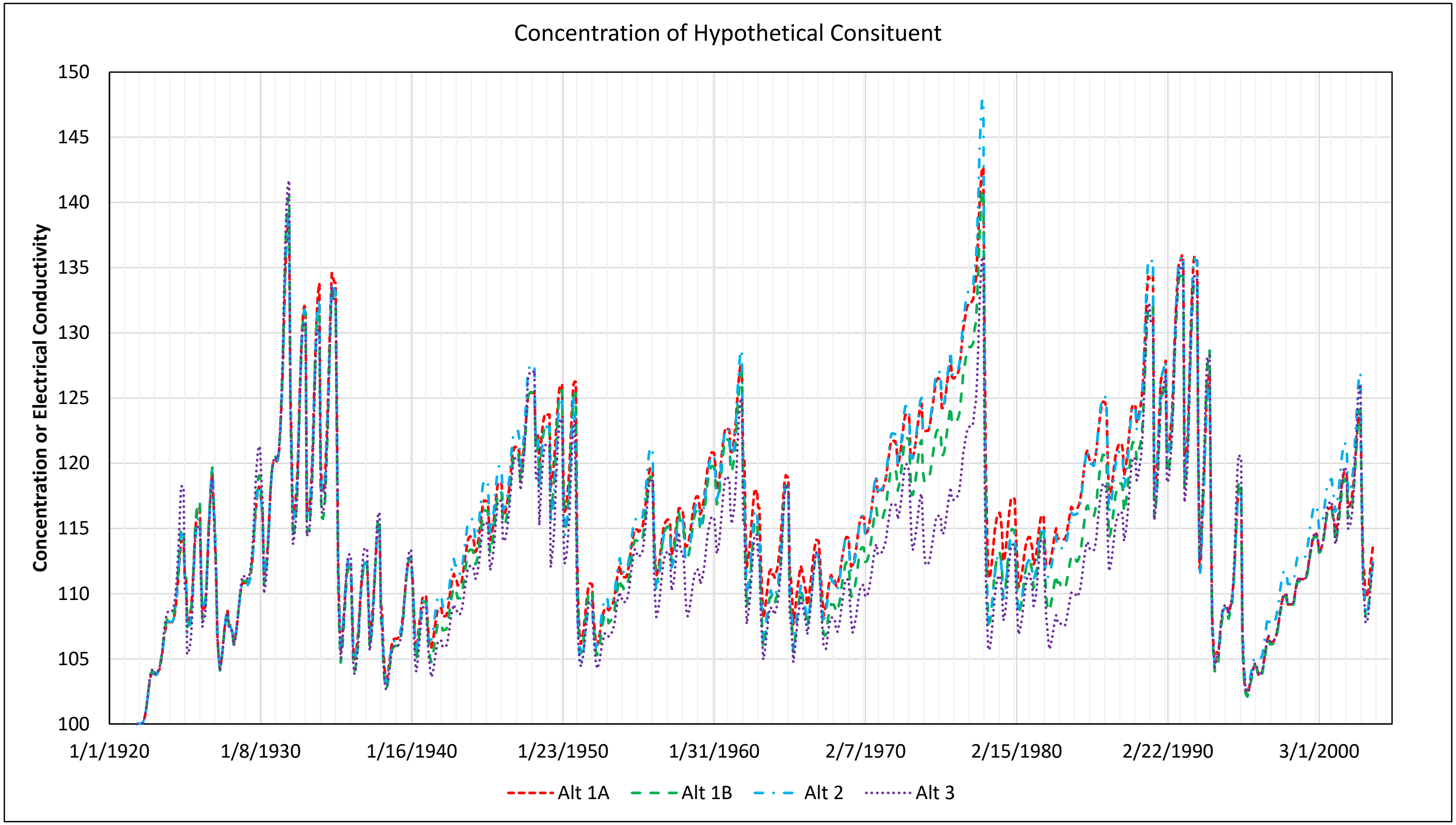
# Diversions and Releases



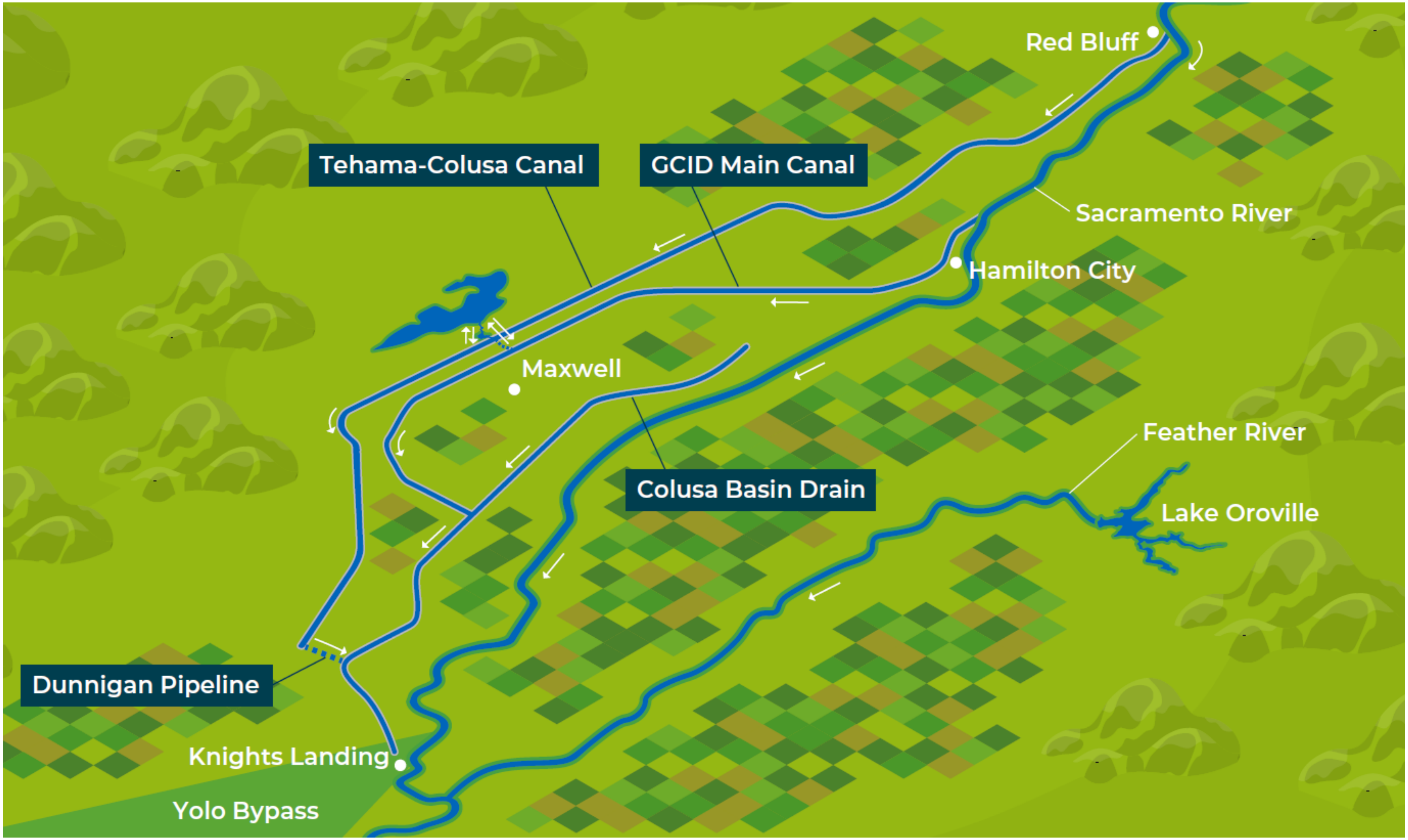



# Evapoconcentration

- Calculations using water balance information from CALSIM



# Project Water Operations



# Main Data Sources

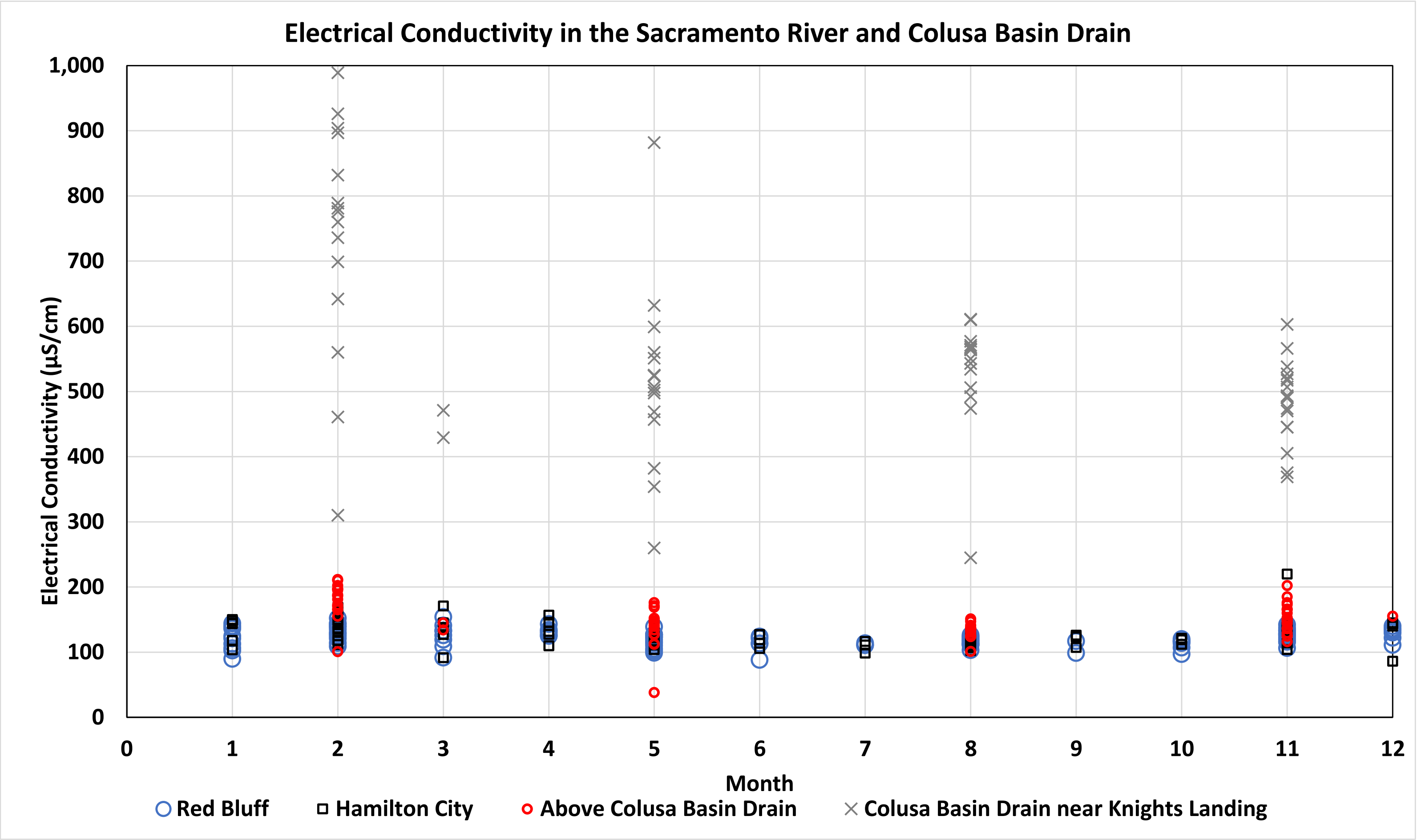
| Constituent Group | Data Source | Location |
|---|---|---|
| Metals<br>Electrical Conductivity<br>Nutrients | DWR Water Data Library (WDL) | Sacramento River below Red Bluff<br>Sacramento River at Hamilton City<br>Sacramento River above CBD<br>CBD near Knights Landing<br>Stone Corral Creek near Sites |
| Flow | USGS<br>WDL<br>CA Data Exchange Center | Sacramento River at Keswick<br>Sacramento River above Bend Bridge |
| Pesticides | CA Dept of Pesticide Regulation Surface Water Database (CDPR SURF) | Sacramento River near Hamilton City<br>Sacramento River at Colusa<br>CBD above Knights Landing<br>Yolo Bypass Toe Drain near Babel Slough |

# Average Metal/Metalloid Concentrations

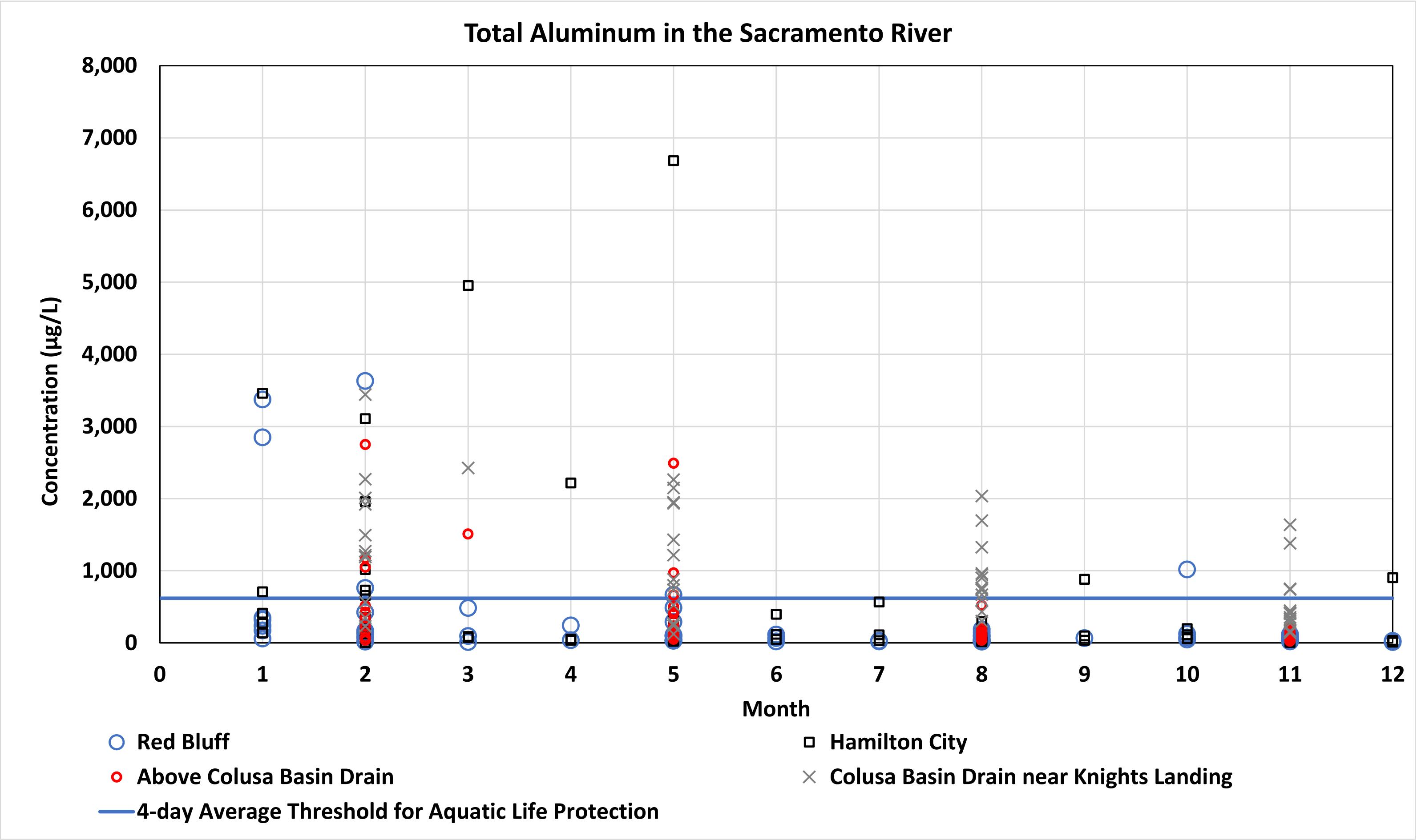
- Units are in micrograms per liter
- No available data for Funks Creek
- Source for Stone Corral Creek and Sacramento River = DWR Water Data Library. See Slide 14
- Source for groundwater is DWR NODOS study (2007)

| Metal/Metalloid | Stone Corral Creek | Groundwater in Sites Reservoir Footprint | Sacramento River at Intake Locations |
|---|---|---|---|
| Dissolved Aluminum | 149 | 3 | 94 |
| Total Aluminum | 562 | 12 | 359 |
| Dissolved Arsenic | 2.8 | 0.7 | 1.5 |
| Total Arsenic | 3.1 | 0.8 | 1.6 |
| Dissolved Cadmium | 0.05 | 0.02 | 0.04 |
| Total Cadmium | 0.06 | 0.05 | 0.04 |
| Dissolved Chromium | 2.9 | 2.6 | 0.7 |
| Total Chromium | 4.0 | 3.3 | 1.4 |
| Dissolved Copper | 2.8 | 2.7 | 1.3 |
| Total Copper | 3.9 | 3.4 | 2.3 |
| Dissolved Iron | 123 | 7 | 67 |
| Total Iron | 512 | 81 | 424 |
| Dissolved Lead | 0.08 | 0.12 | 0.03 |
| Total Lead | 0.31 | 0.27 | 0.20 |
| Dissolved Manganese | 12 | 18 | 2 |
| Total Manganese | 37 | 21 | 15 |
| Dissolved Nickel | 2.8 | 1.0 | 1.2 |
| Total Nickel | 4.0 | 1.3 | 2.2 |
| Dissolved Selenium | 6.1 | 4.6 | 1.2 |
| Total Selenium | 6.7 | 5.0 | 0.2 |
| Dissolved Silver | 0.03 | 0.00 | 0.01 |
| Total Silver | 0.05 | 0.01 | 0.03 |
| Dissolved Zinc | 1.4 | 112.5 | 0.9 |
| Total Zinc | 3.7 | 115.2 | 3.8 |

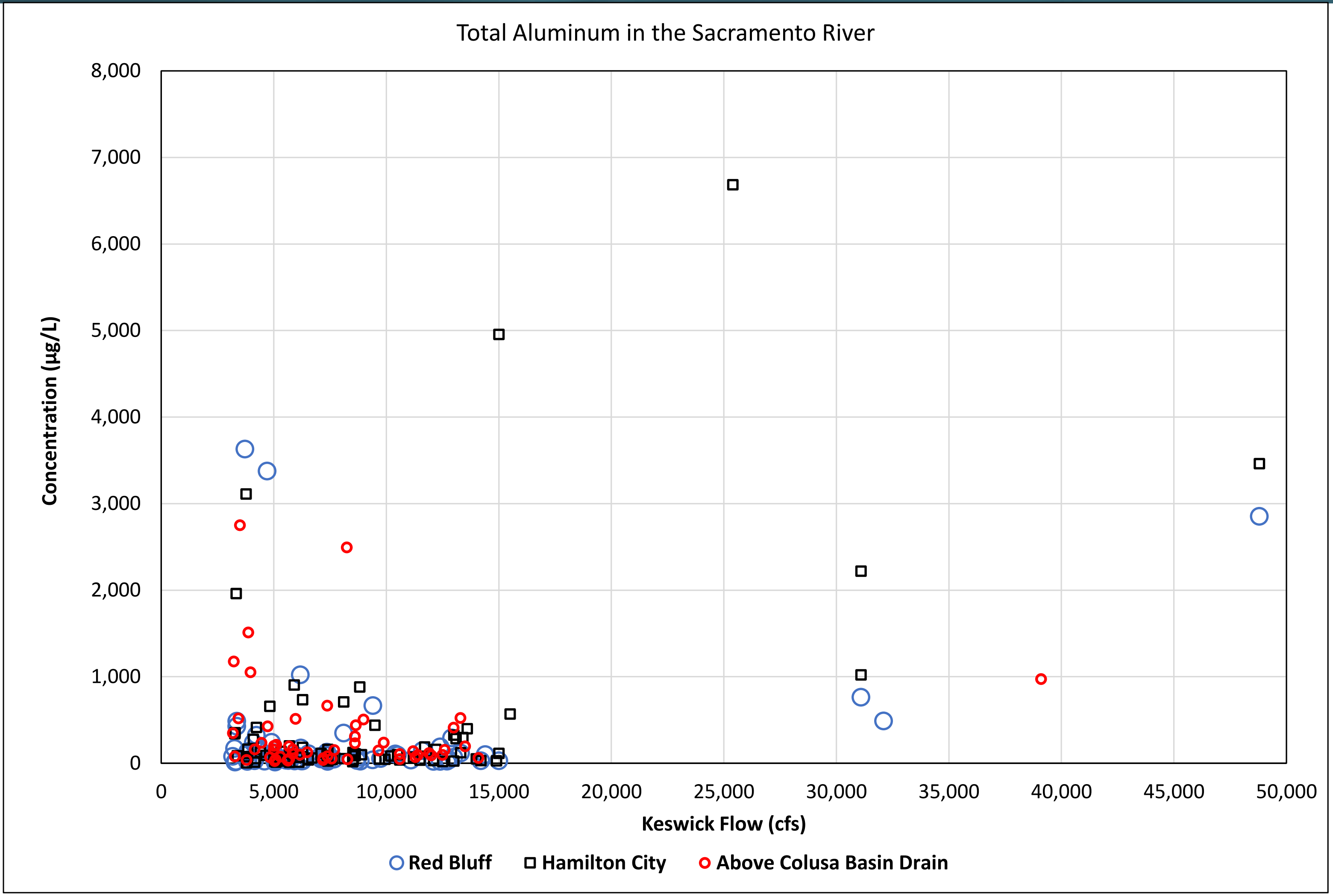
# Electrical Conductivity



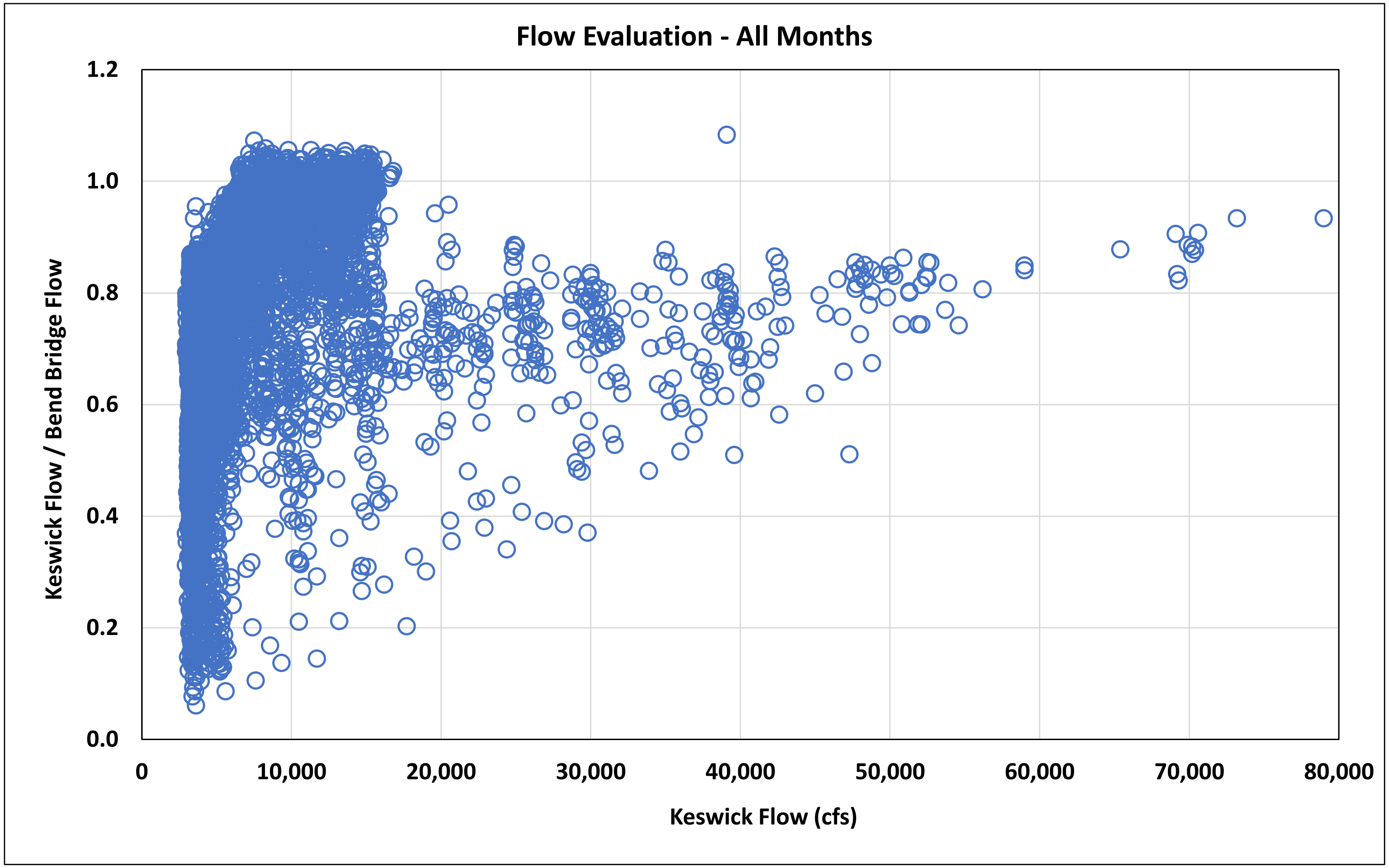
# Metals – Aluminum Example



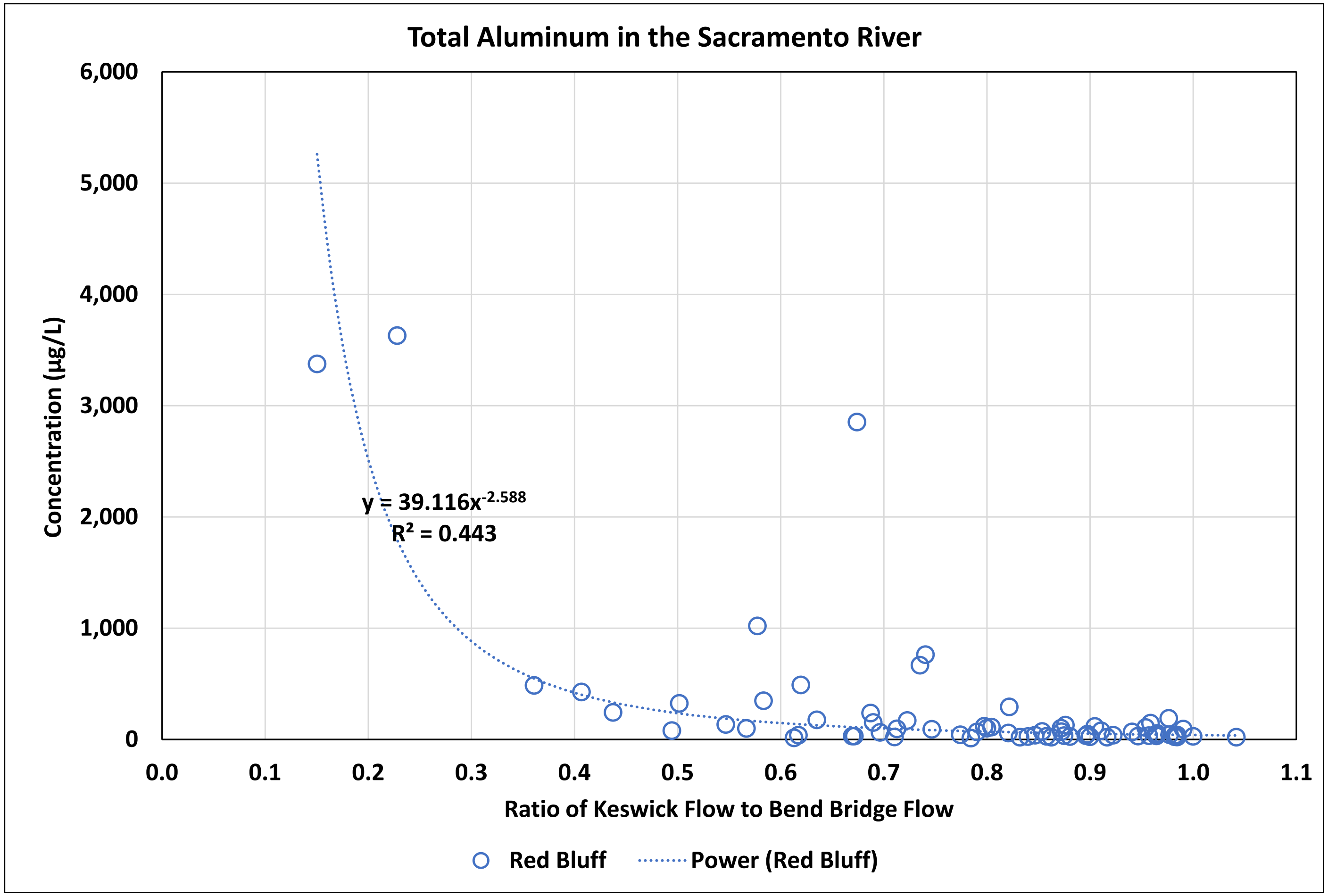
# Compared to Flow



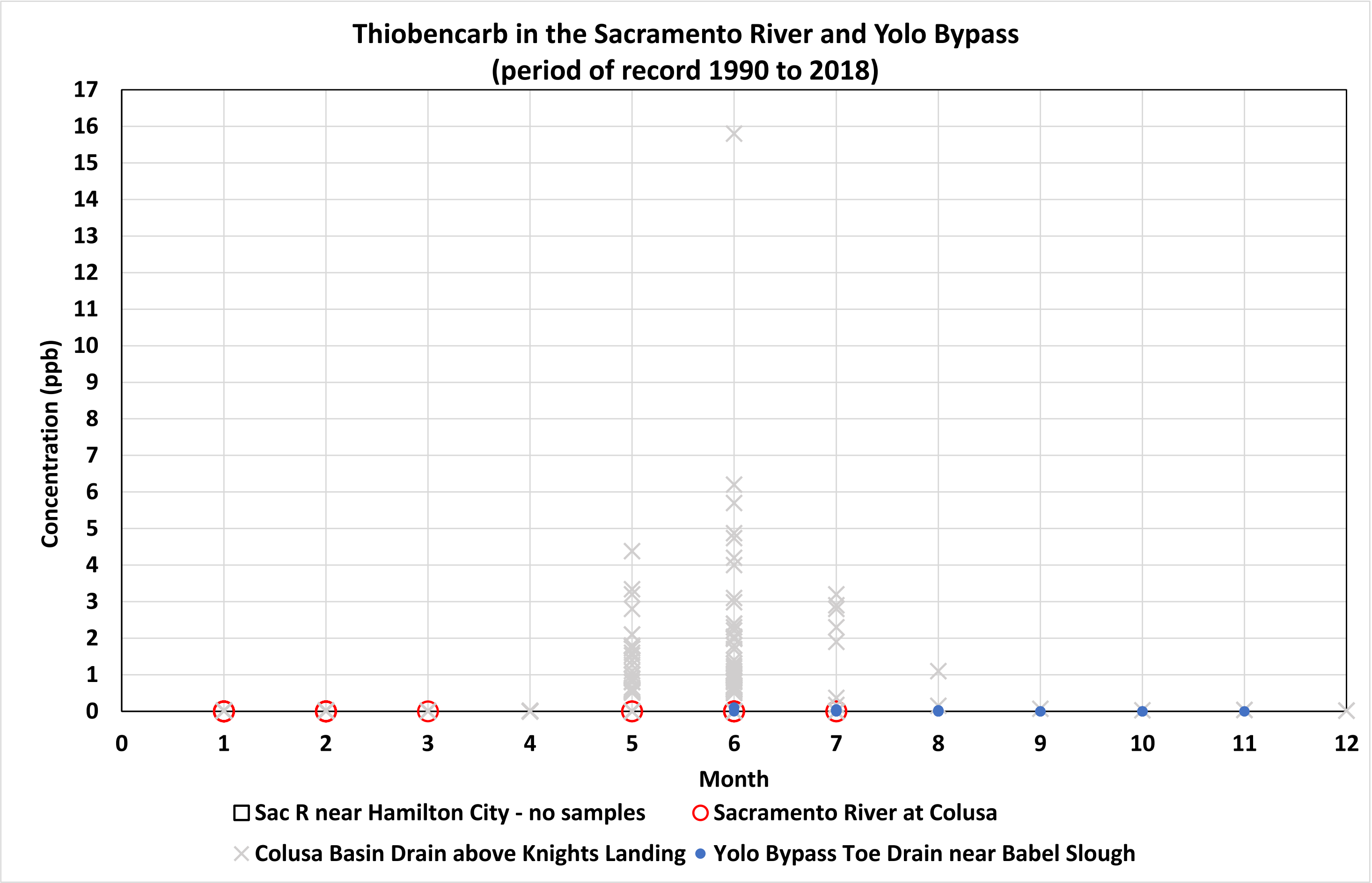
# Sacramento River Indicator of Local Runoff vs Flow



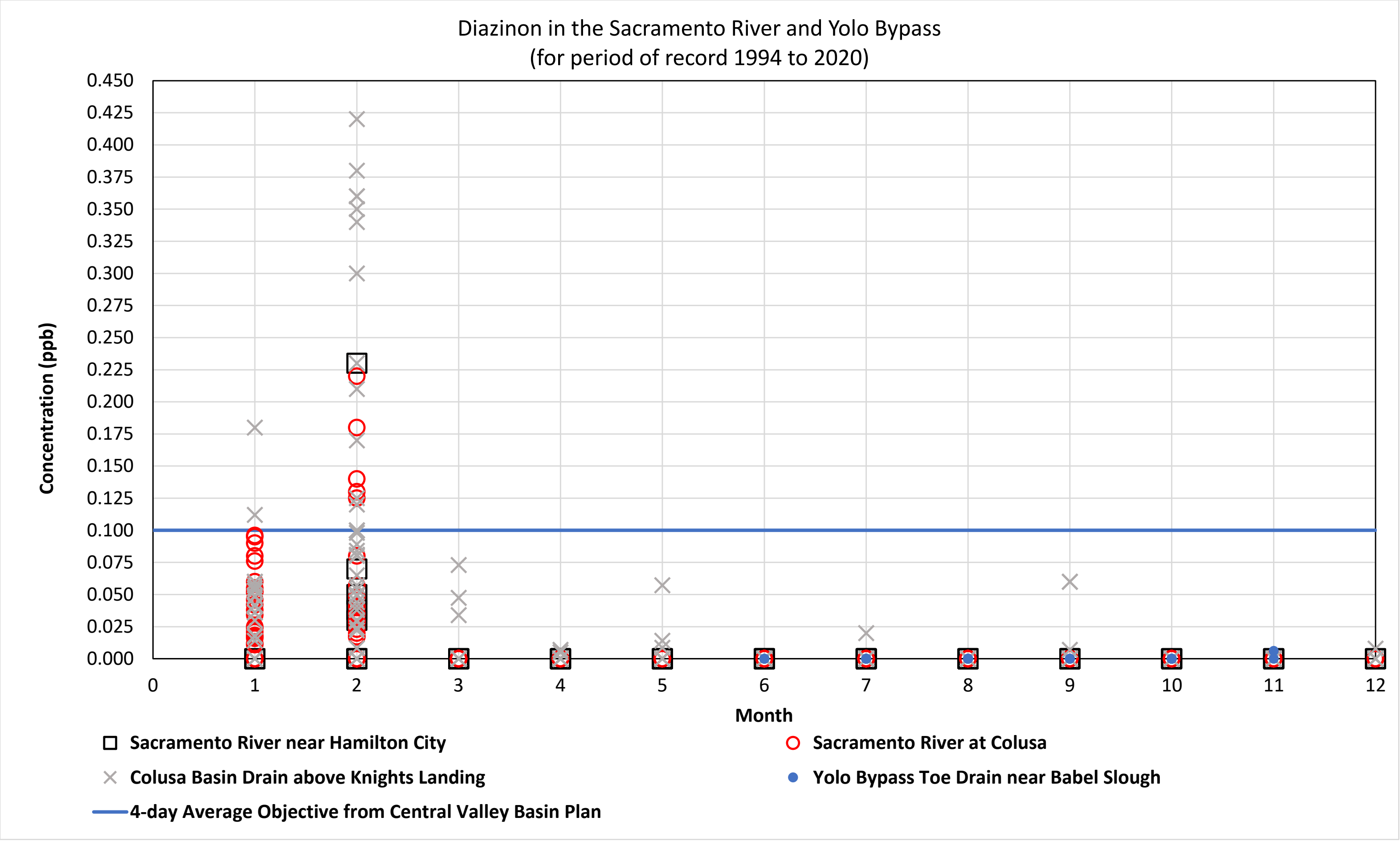
# Example Quantitative Approach



# Thiobencarb – typical pesticide pattern



# Diazinon – atypical pesticide pattern



# Other Topics: Salt Pond

- Salt Pond Evaluation:

**Estimated Electrical Conductivity (EC in µS/cm) of reservoir release assuming 0.1 cfs salt spring flow is continually mixed with reservoir release and that Sacramento River EC is 130 µS/cm.**

| **Spring EC** | **Reservoir Release (cfs)** | |
|---|---|---|
| (µS/cm)[a] | 10 cfs | 1,200 cfs |
| 7,200 | 201 | 131 |
| 194,100 | 2,070 | 146 |

[a] Spring EC between these two values.

# Fishery Group Discussion #3 – Project Effects
# Agenda

Affordable Water, Sustainably Managed

***Our Core Values – Safety, Trust and Integrity, Respect for Local Communities, Environmental Stewardship, Shared Responsibility and Shared Benefits, Accountability and Transparency, Proactive Innovation, Diversity and Inclusivity***
***Our Commitment – To live up to these values in everything we do***

## Meeting Information:

| | | | |
|---|---|---|---|
| **Date:** | October 29, 2021 | **Location:** | Microsoft Teams<br>Or call in (audio only)<br>(833) 255-2803,,335745359# |
| **Start Time:** | 2:00 p.m. | **Finish Time:** | 3:00 p.m. |
| **Purpose:** | Overview and discussion of the updated Sites Project's aquatic modeling and EIR/S analysis | | |

## Meeting Invitees:

| | | |
|---|---|---|
| André Sanchez | Rebecca Wu | Laurie Warner Herson |
| Dave Zelinski | Regina Chichizola | Jason Hassrick |
| Debra Lucero | Ron Stork | Jim Lecky |
| Doug Obegi | Stephanie Gordon | Marin Greenwood |
| Greg Reis | Suzanne Manugian | Melissa Dekar |
| Jerry Boles | Tom Stokely | Mike Hendrick |
| Jim Brobeck | Ali Forsythe | Natalie Wolder |
| Joe Morgan | Dan Deeds | Nicole Williams |
| Rachel Zwillinger | Erin Heydinger | Steve Micko |
| | John Spranza | Vanessa King |

## Agenda:

| Discussion Topic | Topic Leader | Time Allotted |
|---|---|---|
| 1. Meeting Goals and Objectives | John S | 5 mins |
| 2. Meeting Norms | John S | 5 mins |
| 3. Updated Diversion Criteria in Draft REIR/SEIS | John S/Steve | 15 min |
| 4. Updated Salmonid Effects | Mike H | 10 min |
| 5. Updated Smelt Effects | Mike H | 10 mins |
| 6. Updated Schedule | John S | 5 mins |
| 7. Open Topics | Group | 10 min |
| 8. Adjourn | | |

# Sites Project Fishery Group Discussion No. 3

October 29, 2021

# Agenda

1. Goals and Objectives
2. Group Norms
3. Update Diversion Criteria
4. Updated Salmonid Effects
5. Updated Smelt Effects
6. Updated Schedule
7. Adjourn

# Group Norms

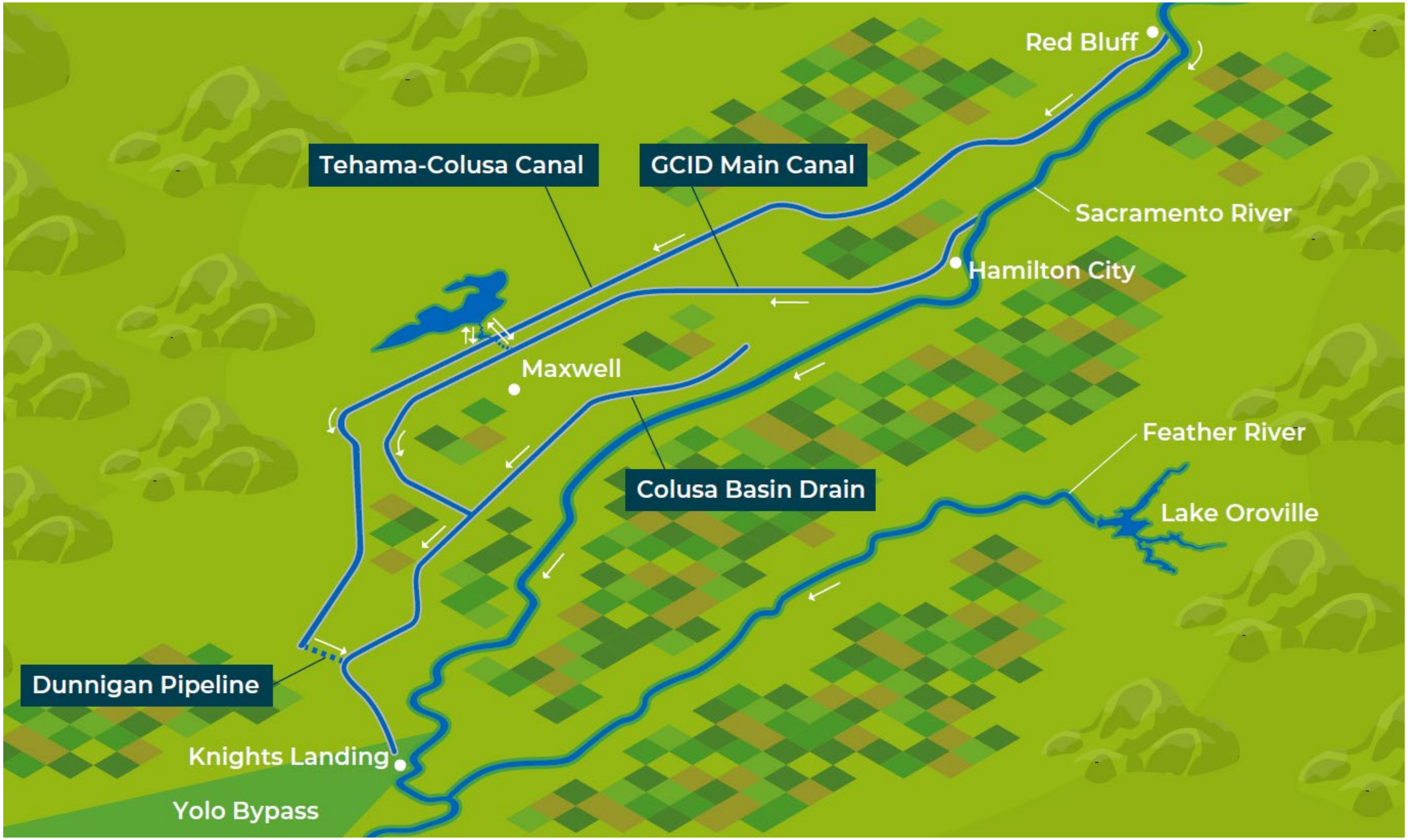
- Encourage everyone to be on video
- Mute yourself when others are speaking
- Respectful, professional dialogue
- Ask questions throughout, lets have a dialogue
  - Let the speaker finish their point
  - Use the raise your hand function in Teams if needed

# Updated Diversion Criteria

John Spranza, Jim Lecky and Steve Micko

Sites

# Project Water Operations



# Operations Project Description

- Operational Criteria
  - Junior diverter – Diverting after all senior water rights and water quality and flow requirement are met
  - Diverting during “excess conditions” (as determined by Reclamation and DWR)
  - Diversion locations in priority:
    1. Red Bluff Pumping Plant into the Tehama-Colusa Canal
       - Up to 2,100 cfs diversion for Sites (plus losses), subject to other uses
    2. Hamilton City Pump Station into the GCID Main Canal
       - Up to 1,800 cfs diversion for Sites (plus losses), subject to other uses
  - Diversions when Sacramento River not fully appropriated (September 1 to June 15)

# Project Diversion Criteria – Pre-October

| Criteria | Purpose | Description |
|---|---|---|
| Bend Bridge Pulse Protection | Survival of emigrating juvenile salmon | • Each pulse protected<br>• "Reset" to differentiate between pulses |
| Scaled Diversions | Ensure proper screen function | • Rate of diversion controlled by screen design |
| Wilkins Slough Bypass Flow | Facilitate salmonid smolt outmigration | • 8,000 cfs in April and May;<br>• 5,000 cfs all other times |
| Fremont Weir Notch Criteria | Protect project objectives | • First 600 cfs held to 1% change<br>• 600 – 6,000 cfs held within 10%<br>• No restriction above 6,000 cfs |
| Net Delta Outflow Index (NDOI) | Comply with existing regulations | • Operations consistent with 2019 BO, CA SWP ITP |
| Delta Water Quality | Comply with existing regulations | • Operations consistent with Delta water quality requirements |

*Diversions when Sacramento River not fully appropriated (September 1 to June 15)

# Post-October Changes

- Continuing evolution of our understanding in the flow survival relationship in salmonids
- There isn't a good understanding that relates flow to survival through the rearing phase of the life cycle
    - Many are based on a comparison of smolt survival in wet years and dry years
    - Fish survive better in wet years, however, the application of these studies to within year operational decisions is limited
- Recent literature on the importance of variability in the hydrograph, particularly in drier year, in survival of emigrating smolts (Michel et al. 2021, Hassrick et al. in prep)
    - Combined with Agency discussions prompted a refinement of our analysis with a diversion criteria mitigation measure for seasonal bypass flows at Wilkins Slough

# Updated Diversion Criteria in 2021 RDEIR/SDEIS

- Sacramento River at Wilkins Slough bypass flow requirements have been updated *AS A MITIGATION MEASURE*:

| Prior Requirement | Revised Requirement |
|---|---|
| • 8,000 cfs in April – May<br>• 5,000 cfs in all other months | • 8,000 cfs in April – May<br>• Mitigation Measure = 10,700 cfs in March – May<br>• 5,000 cfs in all other months |

- Modeling framework and baseline model are same as prior meetings
  - Baseline: 2020 Benchmark CalSim II Model
  - Modeling framework: CalSim II results inform secondary models (e.g. water temperature)

# Updated 2021 EIR/EIS Salmonid Effects Overview

Mike Hendrick

Sites

# Aquatic Biological Resources – Overview

- Evaluates 20 Impacts
  - Impact FISH-1: Construction Effects
  - Impact FISH-2 through -19: Operation effects on listed species and special status species of concern, including Killer Whales
  - Impact FISH-20: Maintenance Effects
- Impact assessments rely primarily on modeled hydrologic changes in SWP and CVP operations that would occur as a result of Project operations. Depending on the species and location, the specifics of the assessment methodologies differ.
- Today’s presentation will focus on changes / revisions since our last discussion

# Salmon Operations and Construction Effects Summary

- Impact FISH-1: Construction Effects on Special Status Fish
- Impact FISH-2: Operations Effects on Winter-Run
- Impact FISH-3: Operations Effects on Spring-Run
- Impact FISH-4: Operations Effects on Fall-Run and Late Fall-Run
- Impact FISH-5: Operations Effects on Steelhead

# Impact FISH-1: Construction Effects on Special Status Fish

- Construction would result in:
  - Ground-disturbance activities
  - Use of heavy equipment and hazardous materials
  - In-water construction (including pile driving)
  - Stream diversion and dewatering
  - Removal of riparian and stream-side vegetation (including vegetation supporting SRA cover)
  - Filling of Sites Reservoir.
  - Alt 2 includes construction of the energy dissipation structure for the Sacramento River discharge
- These activities would result in temporary impacts on special-status fish during construction activities. However, these temporary and permanent impacts would not affect any ESA-listed fish species. Exception is Alternative 2 and the construction of the energy dissipation structure for the Sacramento River discharge.

# Impact FISH-1: Construction Effects on Special Status Fish (Continued)

- Construction of Alternative 1, 2 or 3 would be less than significant with mitigation and the inclusion of BMPs.
- Mitigation Measures:
  - Will compensate for the temporary and permanent loss of riparian habitat, including SRA cover.
  - Will compensate for permanent impacts on wetlands, including riparian and freshwater marsh.
  - Will compensate for temporary and permanent impacts on state or federally protected non-wetland waters by creating or acquiring and permanently protecting suitable open-water habitat
  - Conduct Surveys for Sensitive Natural Communities and Oak Woodlands in the Project Area Prior to Construction Activities
- Best Management Practices (BMPs) would be implemented during construction.  Examples include Stormwater Pollution Prevention Plan (SWPPP), and Requirements of Central Valley Regional Water Quality Control Board

# Impact FISH-2: Operations Effects on Winter-Run, Analysis Completed

- Fish Screen Entrainment and Impingement
- Stranding Behind Screens
- Predation at Intakes
- Temperature Effects
- Redd Dewatering and Redd Scour Entombment
- Habitat Weighted Usable Area (spawning, rearing)
- Juvenile Stranding
- Salmon Mortality and Production (via SALMOD)
- Floodplain Inundation and Access
- Delta Effects (Through Delta Survival, Juvenile Rearing, South Delta Entrainment)
- **NOTE: THE ABOVE ARE RELEVANT TO ALL SALMONIDS ANALYZED**

# Impact FISH-2: Operations Effects on Winter-Run, Impact Conclusion and Mitigation

- With the inclusion of Mitigation Measure FISH-2.1, operation impacts would be less than significant with mitigation.
- **Mitigation Measure FISH-2.1: Wilkins Slough Flow Protection Criteria:** The Authority will not divert water from the Sacramento River for Project purposes during March through May of all water year types if the flows in the Sacramento River are below 10,700 cfs as measured at Wilkins Slough or if Project diversions would result in flows in the Sacramento River below 10,700 cfs as measured at Wilkins Slough.

# Impact FISH-3: Operations Effects on Spring-Run, Impact Conclusion and Mitigation

- With the inclusion of Mitigation Measure FISH-2.1 below, operation impacts would be less than significant with mitigation.
- **Mitigation Measure FISH-2.1: Wilkins Slough Flow Protection Criteria:** The Authority will not divert water from the Sacramento River for Project purposes during March through May of all water year types if the flows in the Sacramento River are below 10,700 cfs as measured at Wilkins Slough or if Project diversions would result in flows in the Sacramento River below 10,700 cfs as measured at Wilkins Slough.

# Impact FISH-4, FISH-5, FISH-6: Operations Effects on Spring-Run, Fall-Run/Late Fall-Run, Steelhead, Impact Conclusion and Mitigation

- Similar analysis, impact conclusion, and Mitigation Measure result in operation impacts of less than significant with mitigation with the inclusion of **Mitigation Measure FISH-2.1.**
- **Mitigation Measure FISH-2.1: Wilkins Slough Flow Protection Criteria:** The Authority will not divert water from the Sacramento River for Project purposes during March through May of all water year types if the flows in the Sacramento River are below 10,700 cfs as measured at Wilkins Slough or if Project diversions would result in flows in the Sacramento River below 10,700 cfs as measured at Wilkins Slough.

# Updated 2021 EIR/EIS Smelt Effects Overview

Mike Hendrick

Sites

# Smelt Operations Effects Summary

- Impact FISH-8: Operations Effects on Delta Smelt
- Impact FISH-9: Operations Effects on Longfin Smelt

# Impact FISH-8: Operations Effects on Delta Smelt, Conclusion Excerpts

- No increase in south Delta entrainment risk because south Delta exports of Sites Reservoir water do not occur during times of the year when delta smelt are susceptible to entrainment.
- Small reductions in suspended sediment to the Delta. These are addressed by the Sediment Technical Studies Plan and Adaptive Management for Sacramento River
- The analyses of flow-related effects (differences in Delta outflow/X2) suggested the potential for small negative effects under the Alternatives
- Impacts on delta smelt would **be significant due** to uncertainty associated with Dissolved Oxygen (DO) and temperature effects from Sites Reservoir releases. **HOWEVER…**

# Impact FISH-8: Operations Effects on Delta Smelt, Mitigation Measures

- **Mitigation Measure FISH-8.1** will reduce this significant impact by preventing detrimental DO and water temperature effects associated with moving Colusa Basin Drain (CBD) water through the Yolo Bypass.
- Existing DO and temperature levels suitable to delta smelt would be maintained and would not exceed recognized critical physiological thresholds through implementation of Mitigation Measure FISH-8.1; **therefore, impacts would be reduced to less than significant**.
- There is uncertainty in the potential for negative effects from Sites habitat flows redirecting CBD water relatively high in pesticides downstream to the lower Yolo Bypass where delta smelt occur. This potential effect would be addressed by **Mitigation Measure WQ-2.2**.

# Impact FISH-9: Operations Effects on Longfin Smelt, Conclusion Excerpts

- No change from previous EIR/EIS version, however as a reminder ---
- Implementation of **Mitigation Measure FISH-9.1** would provide tidal habitat restoration mitigation. Tidal habitat restoration would expand the diversity, quantity, and quality of longfin smelt rearing and refuge habitat consistent with recent tidal habitat mitigation required for outflow impacts to the species. The mitigation requirement for each alternative varies between 11 and 15 acres.

# Updated Schedule

John Spranza

# Permitting Schedule Milestones

- NEPA / CEQA
  - 60-day Public Review Period
  - CEQA Revised EIR release November 5, 2021
  - NEPA Subsequential EIS release November 12, 2021
  - Comment Period ends January 11, 2022
    - Analyses related to today's agenda are in Chapter 11 of the REIR/SEIS
- CDFW ITP
  - Submit construction in Dec 2021 and operations Mar 2022
- Revised Biological Assessment
  - Submittal to Reclamation late February/early March
- Water Right
  - Application complete in late January/early February

# Open Topic Discussion

Sites

# Thank you!

Sites

# Fishery Group Discussion #4 Agenda

Affordable Water, Sustainably Managed

***Our Core Values – Safety, Trust and Integrity, Respect for Local Communities, Environmental Stewardship, Shared Responsibility and Shared Benefits, Accountability and Transparency, Proactive Innovation, Diversity and Inclusivity***
***Our Commitment – To live up to these values in everything we do***

**Meeting Information:**

| | | | |
|---|---|---|---|
| **Date:** | September 1, 2022 | **Location:** | Microsoft Teams<br>Or call in (audio only)<br>(833) 255-2803,,335745359# |
| **Start Time:** | 12:00 p.m. | **Finish Time:** | 1:00 p.m. |
| **Purpose:** | Overview and discussion of the changes to the diversion criteria and fisheries analysis since the release of the 2021 Revised Draft EIR/Supplemental Draft EIS | | |

**Meeting Invitees:**

Sites Project staff, key consultants and interested NGO and community members

**Agenda:**

| Discussion Topic | Topic Leader | Time Allotted |
|---|---|---|
| 1. Meeting Norms | John Spranza | 5 mins |
| 2. Updated Diversion Criteria | John Spranza | 15 min |
| 3. Updated Exchanges | Steve Micko | 10 min |
| 4. Updated Modeling | Steve Micko | 15 mins |
| 5. Open Topics | Group | 15 min |
| 6. Adjourn | | |

# Sites Project Fishery Group Discussion No. 4

September 1, 2022

Sites

# Agenda

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

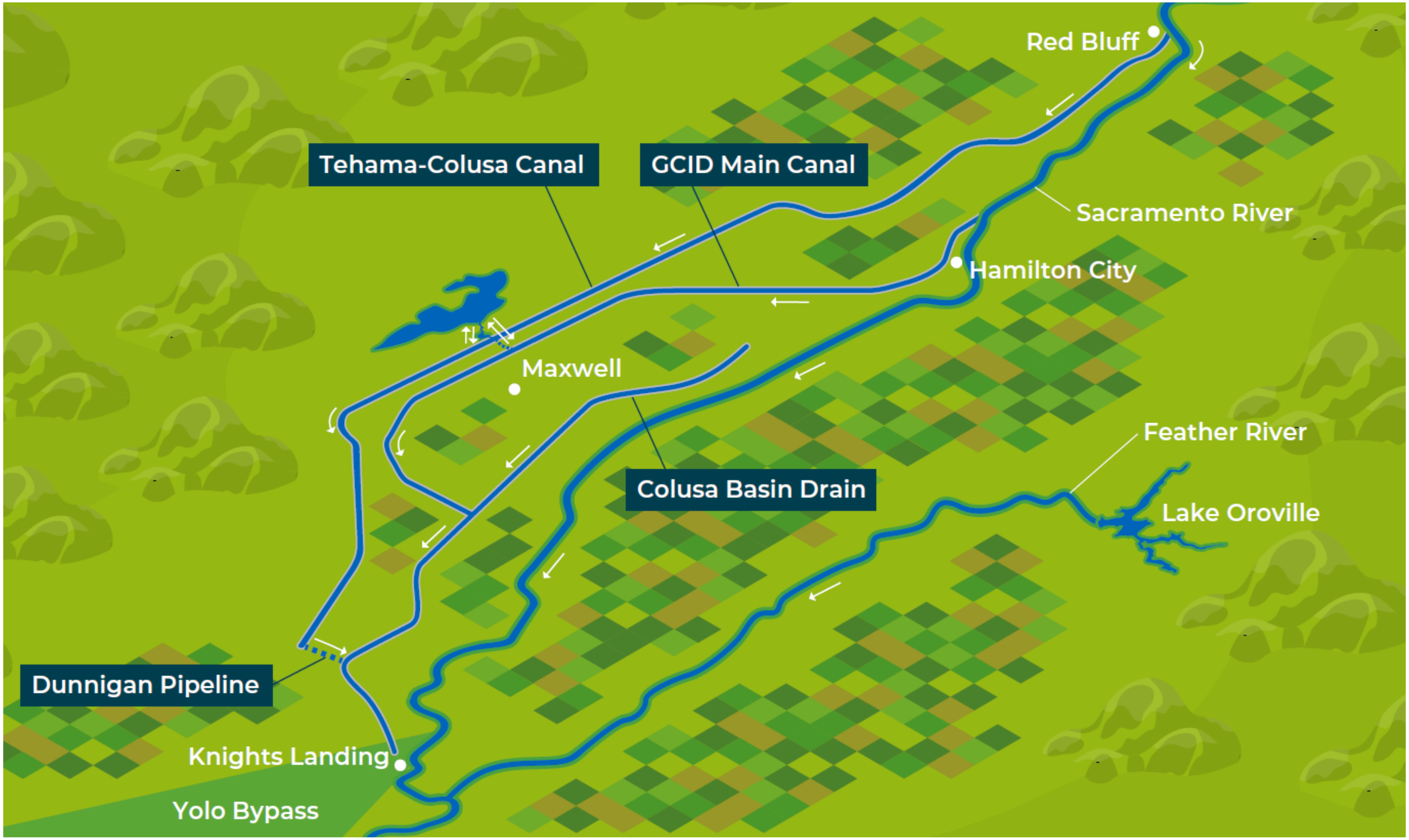
# Group Norms

- 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

# 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<br>2. Operational Exchanges<br>a. Within Year Exchanges<br>b. Real-time Exchanges | Operational Exchanges<br>a. Within Year Exchanges<br>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

# 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

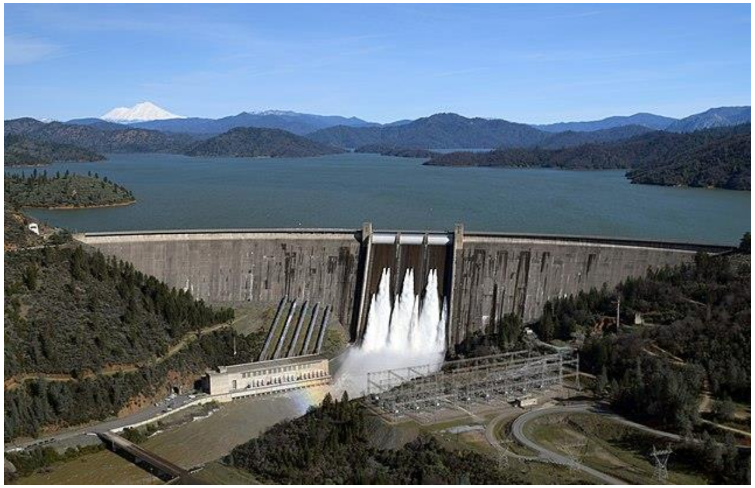
- Previous Modeling Focus:
  - Sites-Shasta exchanges focused on improving Shasta cold water pool management and incidentally improved Fall Flow Stability
- Revised Modeling Focus:
  - Shasta exchanges support Shasta cold water pool management, Fall Flow Stability and Spring Pulse Flow actions

# Shasta Exchanges – Cold Water Pool Modeling Criteria

| Criteria | RDEIR/SDEIS | Final EIR/EIS |
|---|---|---|
| Period | Dry: Apr – Jun<br>Critical: Apr – May | Dry: Apr – Jun<br>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<br>Jun: 10,000 cfs | No criteria |
| Temperature Criteria | Apr – Jun:<br>Tiers 2 and 3: 53.5 deg F<br>Tier 4: 56 deg F | No criteria |
| Sacramento Valley Conditions | Only occurs during Balanced conditions | Only occurs during Balanced conditions |

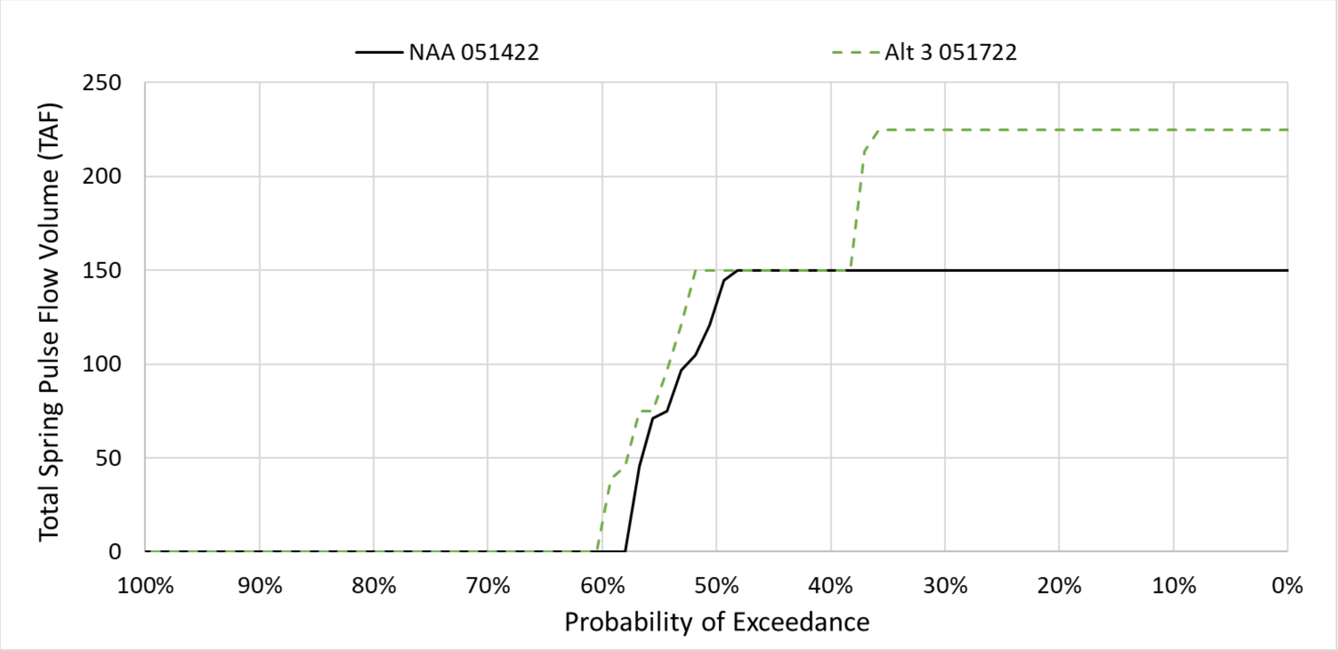
# Shasta Exchanges – Fall Flow Stability Modeling Criteria

- 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

# 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

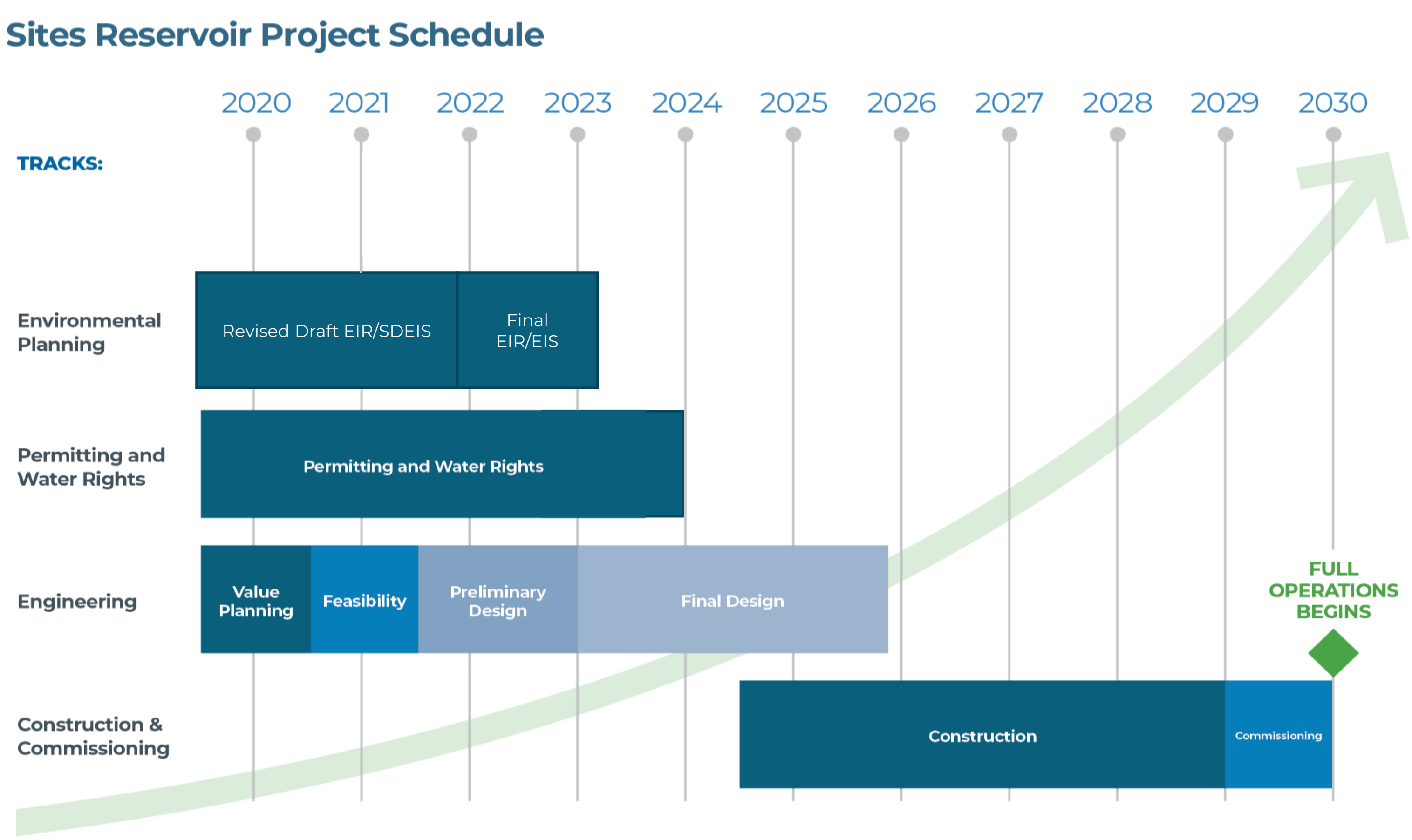
# Winter-run Lifecycle Model

- 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

# Project Schedule



# Permitting Schedule

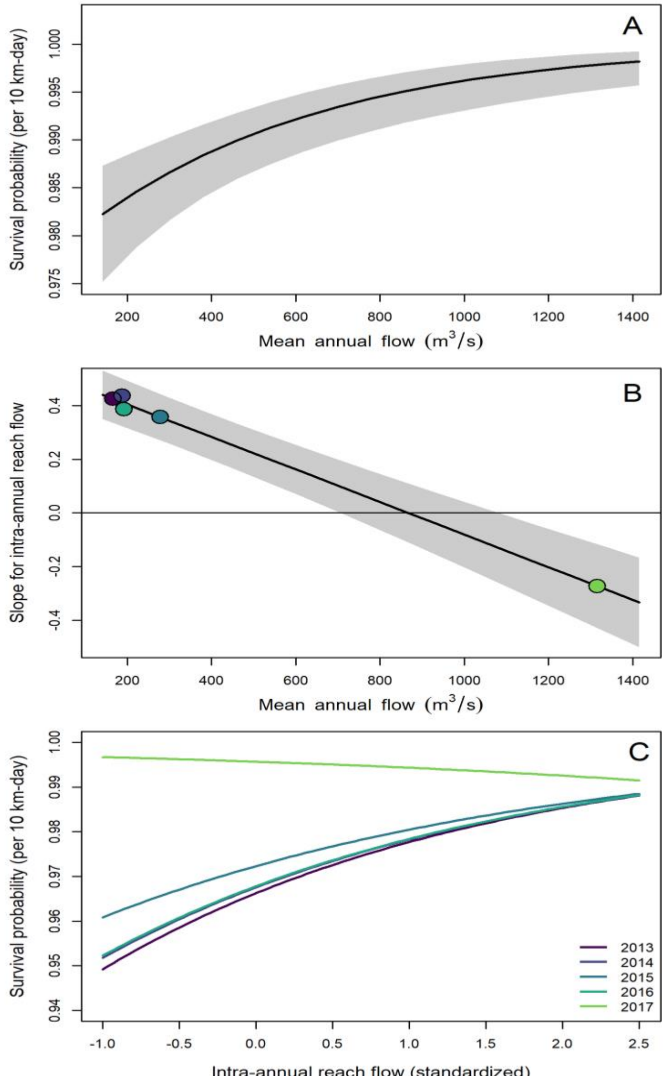
- State ESA Incidental Take Permit (ITP) – Construction
  - Application submitted Jan 2022
- State ESA Incidental Take Permit (ITP) – Operations
  - Application complete Q3 2022
- Biological Assessment
  - Expected to be submitted to agencies in October or November
- Water Right
  - Submitted Application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

# Open Topics and Agenda for Next Meeting

# Thank you!

Sites

# Riverscape Level – Hassrick et al. (2021)



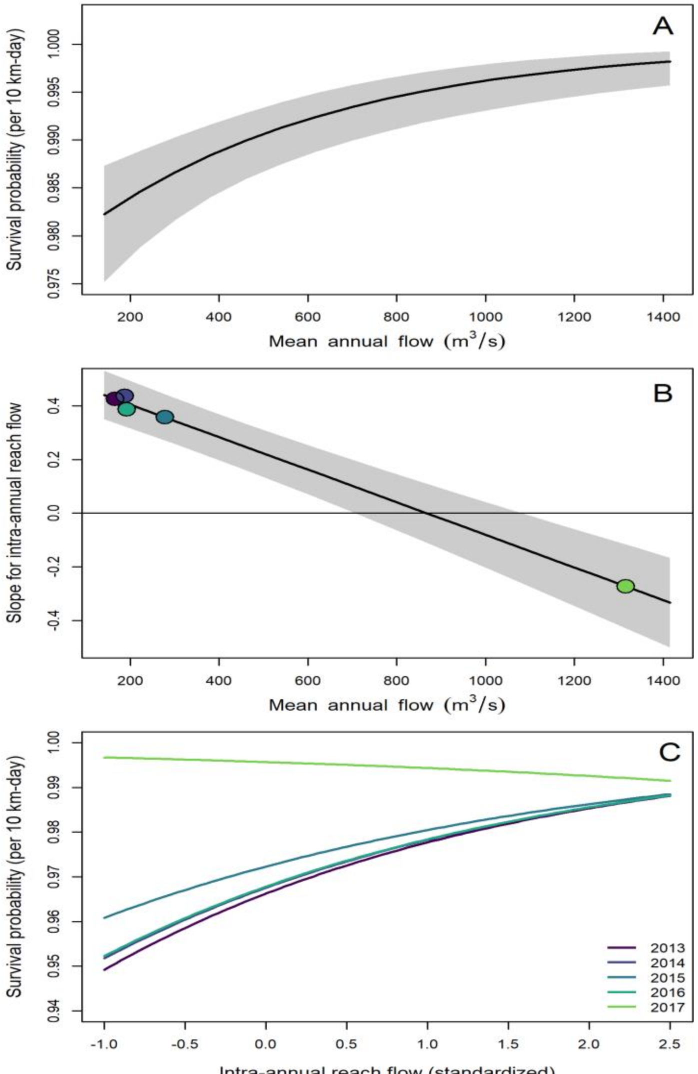

A. Survival as a function of mean annual flow

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

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<br>• “Reset” to differentiate between pulses<br>• **A focus point for Adaptive Management** |
| Wilkins Slough Bypass Flow | Facilitate salmonid smolt outmigration | • **10,700 cfs in Oct – June**<br>• 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**<br>• **A focus point for Adaptive Management considering what is learned through Big Notch Project** |

No changes to other criteria