EBMUD

Fisheries & Wildlife

EBMUD Fisheries & Wildlife Programs

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Fisheries Management, Science and Monitoring, Habitat Restoration, Fish Hatchery Programs

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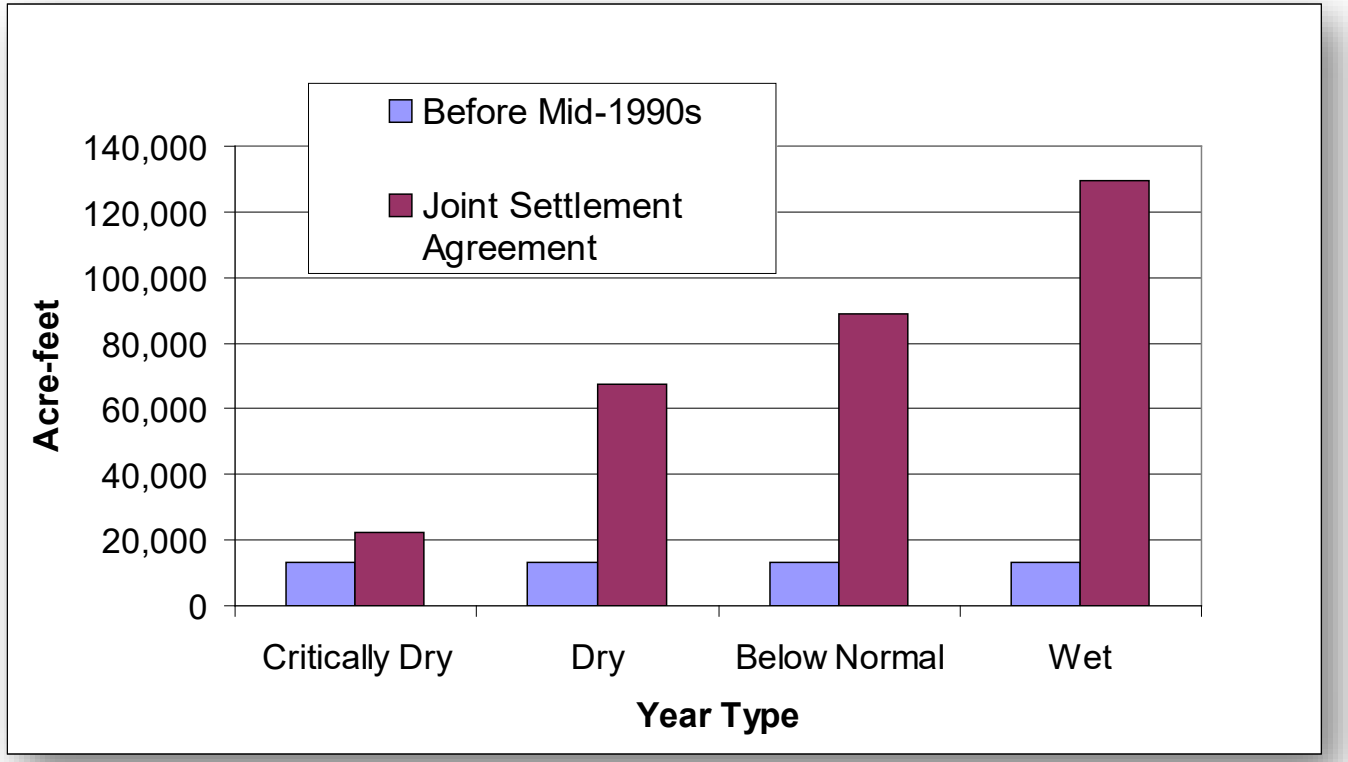
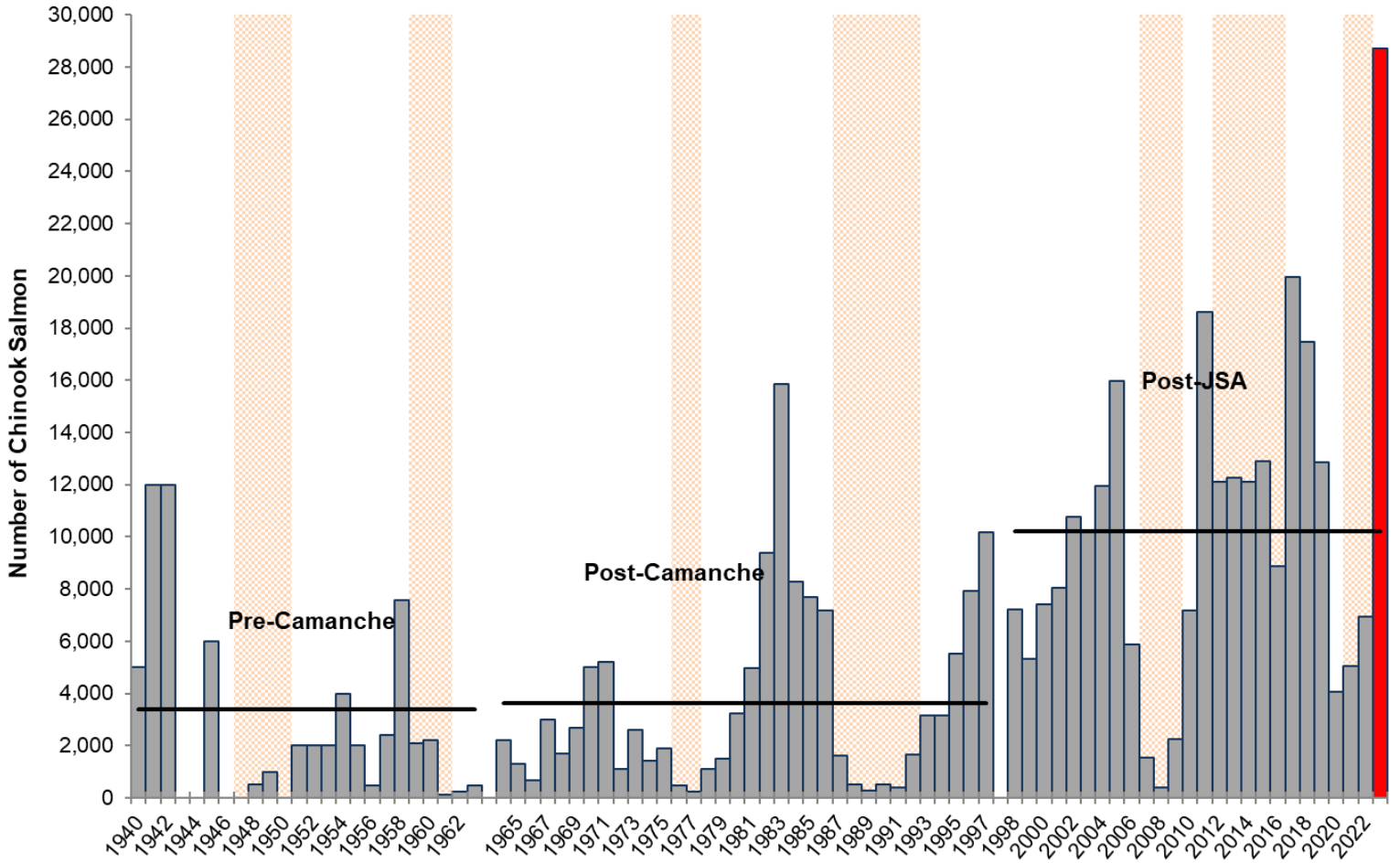
EBMUD's Mokelumne River Fish Restoration Program

- Integrated approach to ecosystem management
- Codified in 1998 Joint Settlement Agreement
- 10-fold increase in dry-year flows from early 1990s
- A portion of newly acquired supplies provided to further increase Mokelumne flows
- Formal collaboration with resource agencies and stakeholders to optimize river management
- $2 million endowment for habitat improvements
- $12.5 million in improvements to upgrade hatchery



Chinook Salmon Returns 1940-2023



Horizontal lines indicate pre-Camanche, post-Camanche, and post-JSA periods, respectively.

1. "Pre-Camanche" escapement (3,374) is the average estimate at Woodbridge Dam for the period from 1940 through 1963 (excluding years when no data were recorded: 1943, 1944, 1946, 1947, and 1950).
2. "Post-Camanche" escapement (3,636) is the average estimate at Woodbridge Dam for the period 1964 through 1997.
3. "Post-JSA" escapement (10,230) is the average estimate at Woodbridge Dam since implementation of the JSA in 1998.
4. Dithered shaded areas are periods of drought in California (California Department of Water Resources, California's Drought Update. January 1, 2024)

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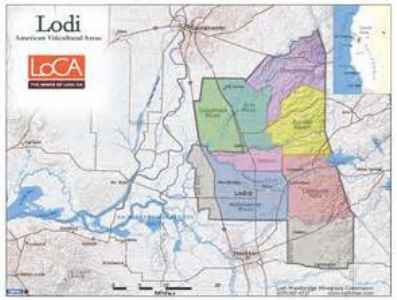
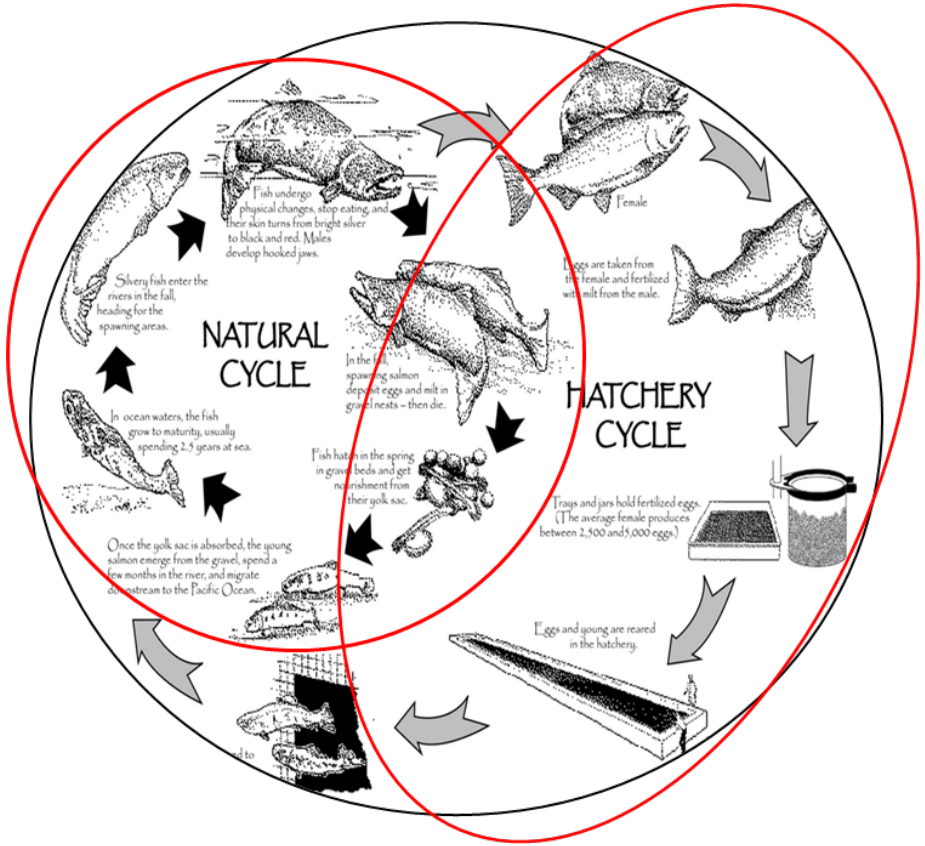
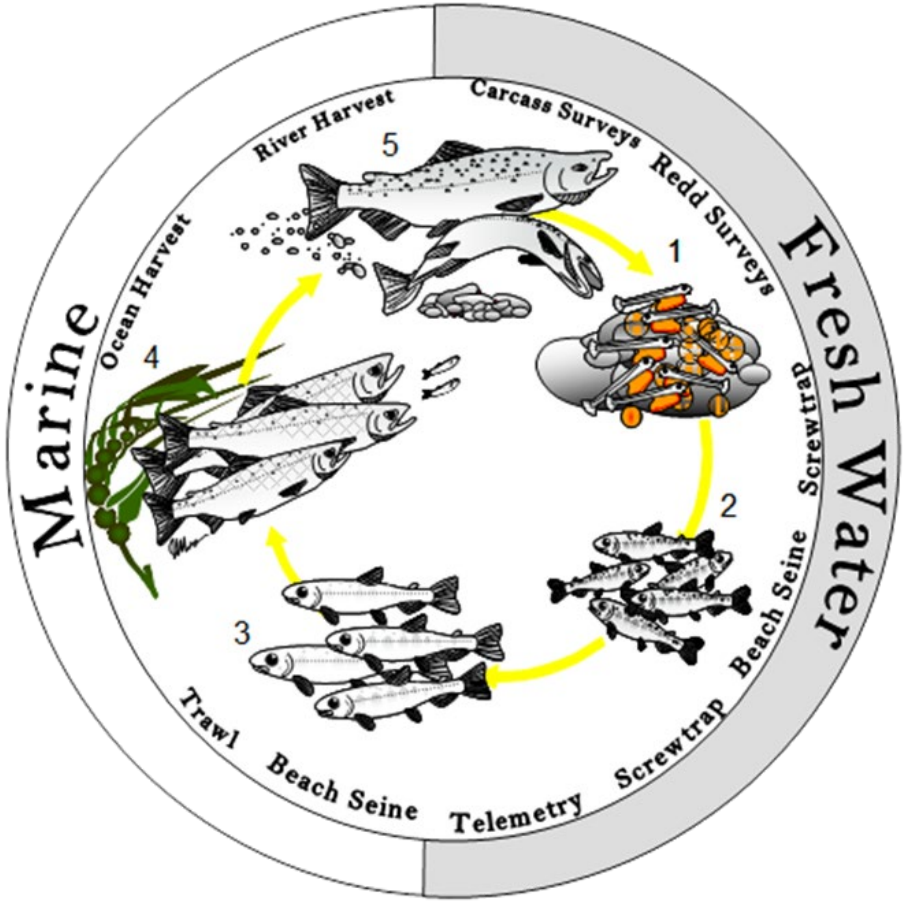
Collaboration & Coordination

Woodbridge Irrigation District
CDFW
USFWS AFRP
NMFS
USBR
Many Landowners Along Mokelumne
UC Davis
UC Santa Cruz
Golden Gate Salmon Association
California Sportfish Protection Alliance
Foothill Conservancy
Delta Fly Fishers
Cal Fire
Upper Mokelumne River Watershed Authority
Amador Calaveras Consensus Group



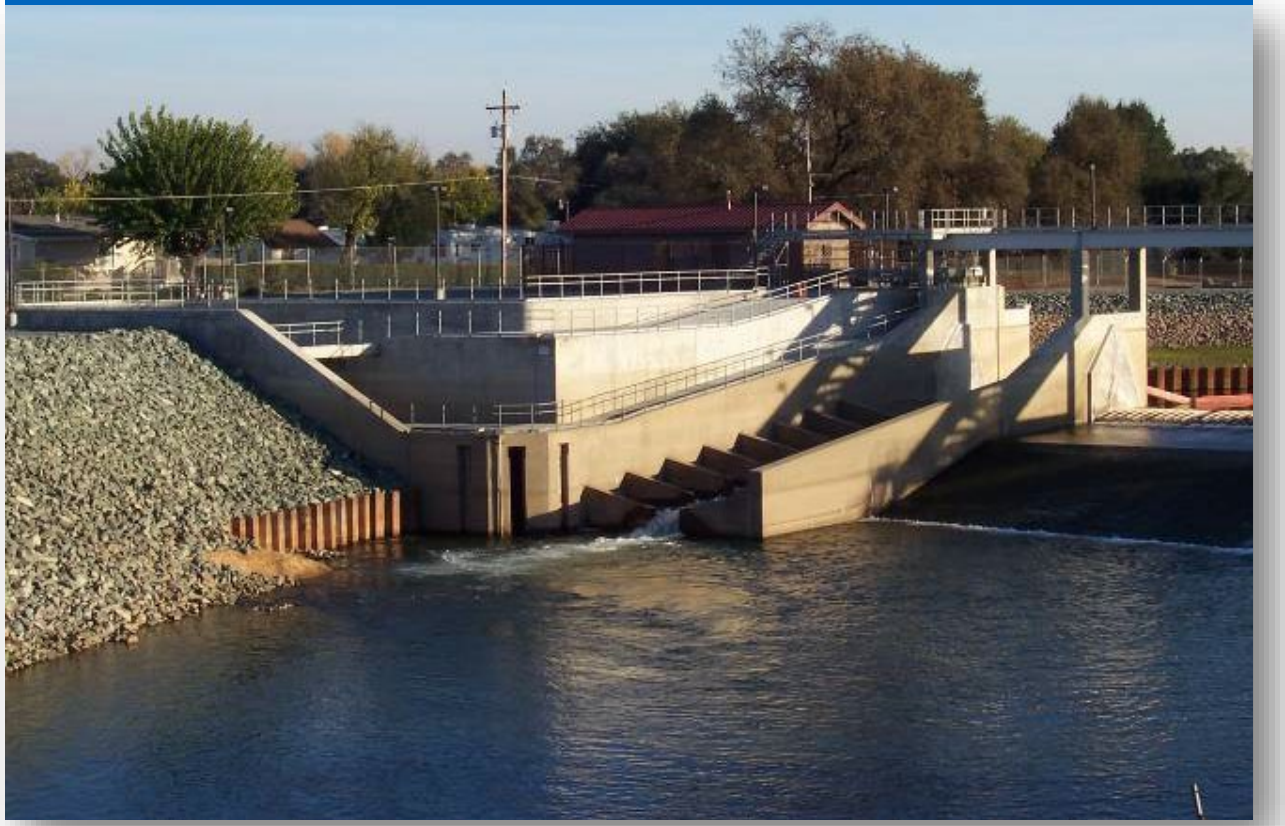
Monitoring and Management to meet Salmon Lifecycle Stages





Fish Passage and Video Monitoring at Woodbridge Irrigation District Dam

Since fall 1990, EBMUD has been monitoring fall-run Chinook salmon escapement at WIDD.



Escapement Monitoring

Redd Surveys

- Count salmon redds (nests)
- Distribution
- Habitat use and preferences
- In-river escapement estimate when needed

Carcass Surveys

- CWT recovery
- Pre-spawn mortality
- Collect biological samples
- In-river escapement estimate when needed

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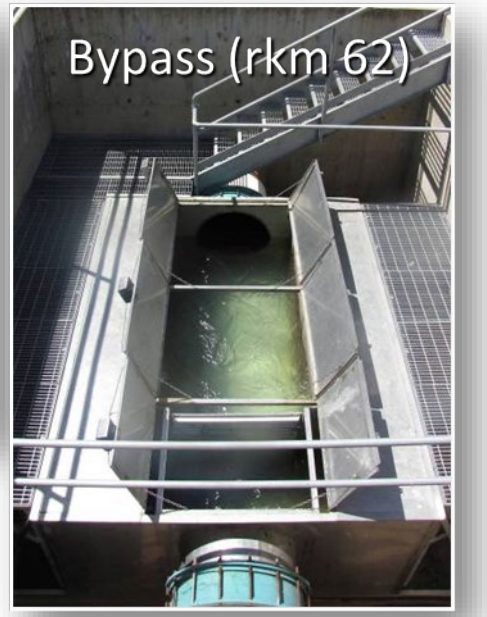
Juvenile Salmon Outmigration

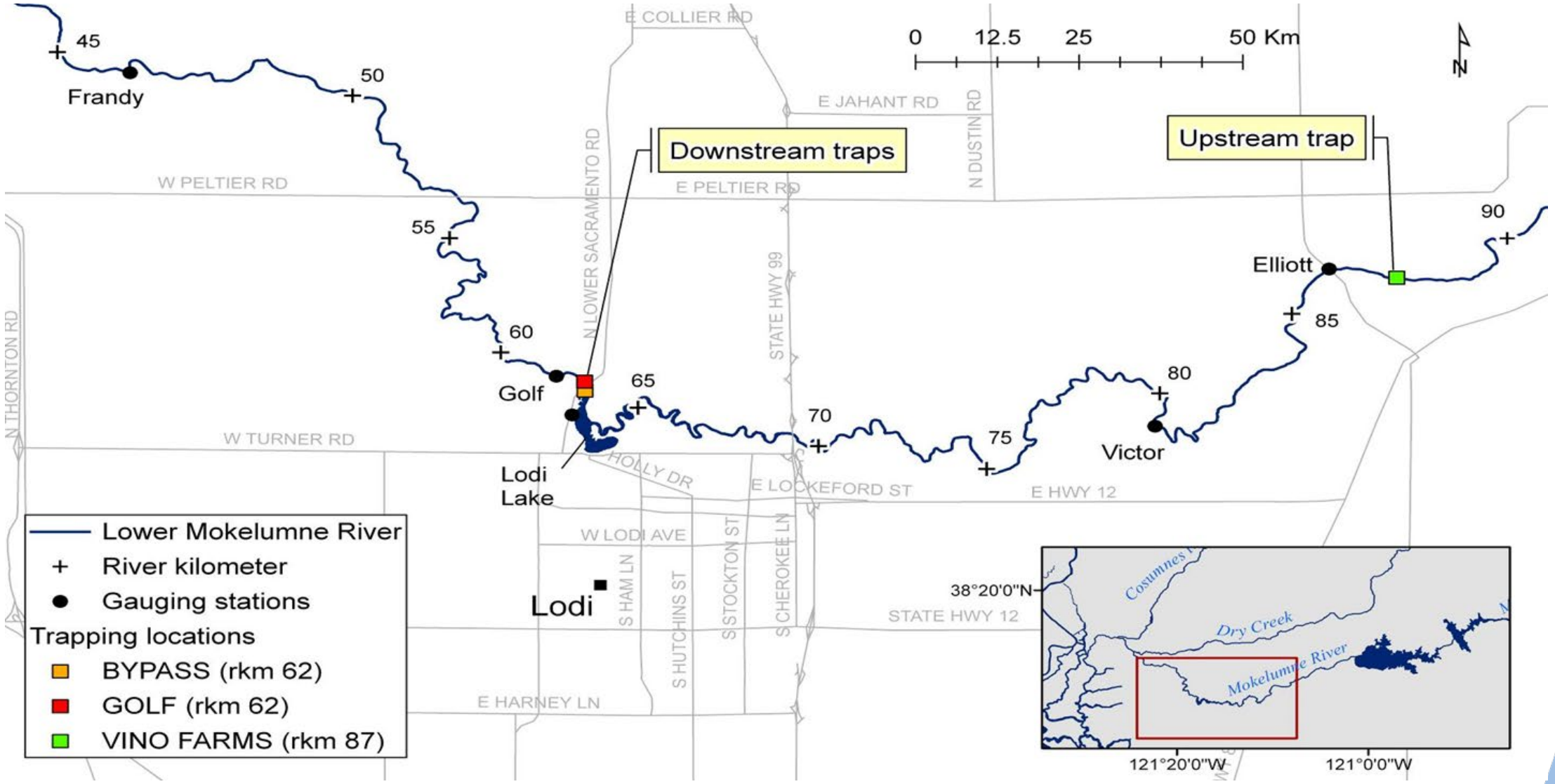
8 ft RST

8 ft and 5ft RST



Screened Smolt Trap

Outmigration Survey Locations

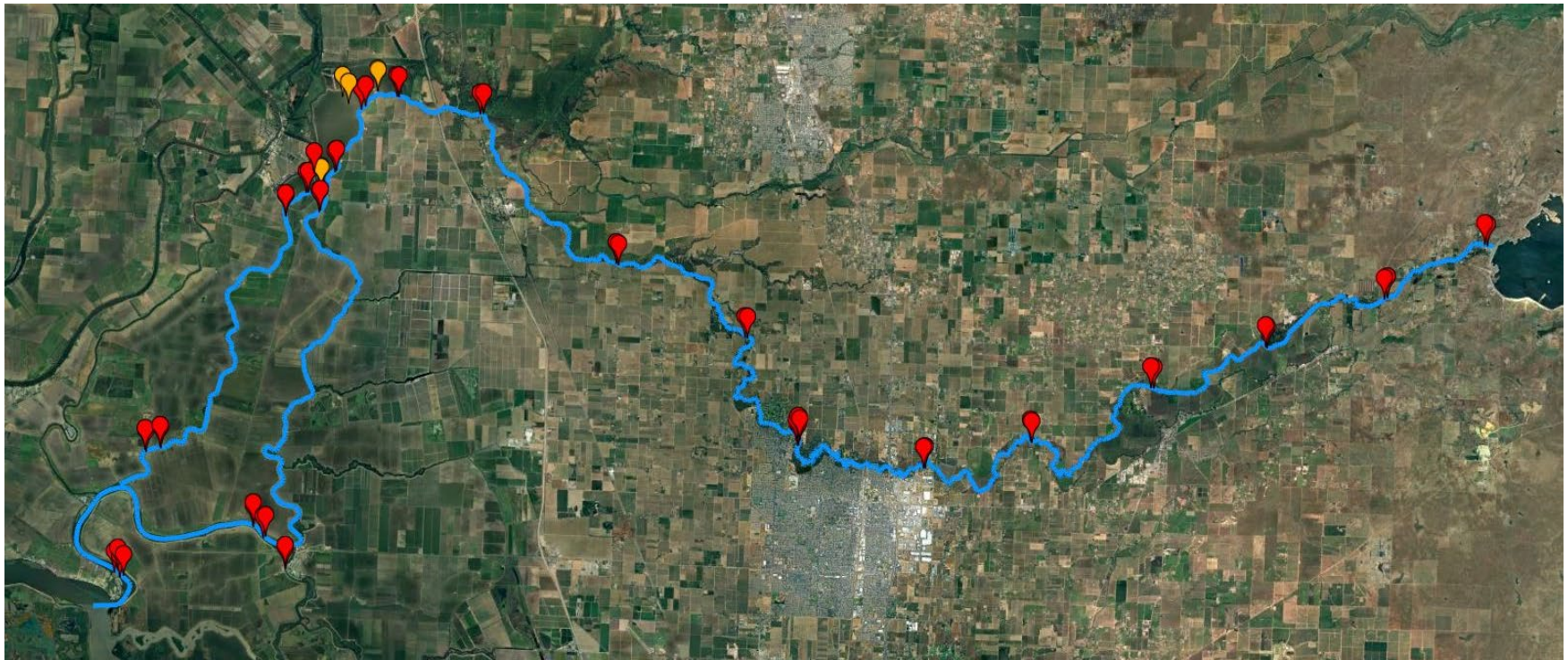


Acoustic Telemetry

Telemetry Tag

85 mm Chinook salmon smolt tagged

2024 Mokelumne River Telemetry Receiver Array: 56 Receivers Deployed



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Evolution of Habitat Restoration Program

- 1990-2000 Annual site-specific spawning gravel restoration projects
- 2001-present- Reach scale spawning habitat restoration design and implementation
- 2005 Side Channel Construction for juvenile chinook and steelhead rearing
- 2015-2022 Shift focus to improve floodplain habitat while continuing to maintain spawning habitat
- Total placed gravel = 56,537 cubic yards since 1990

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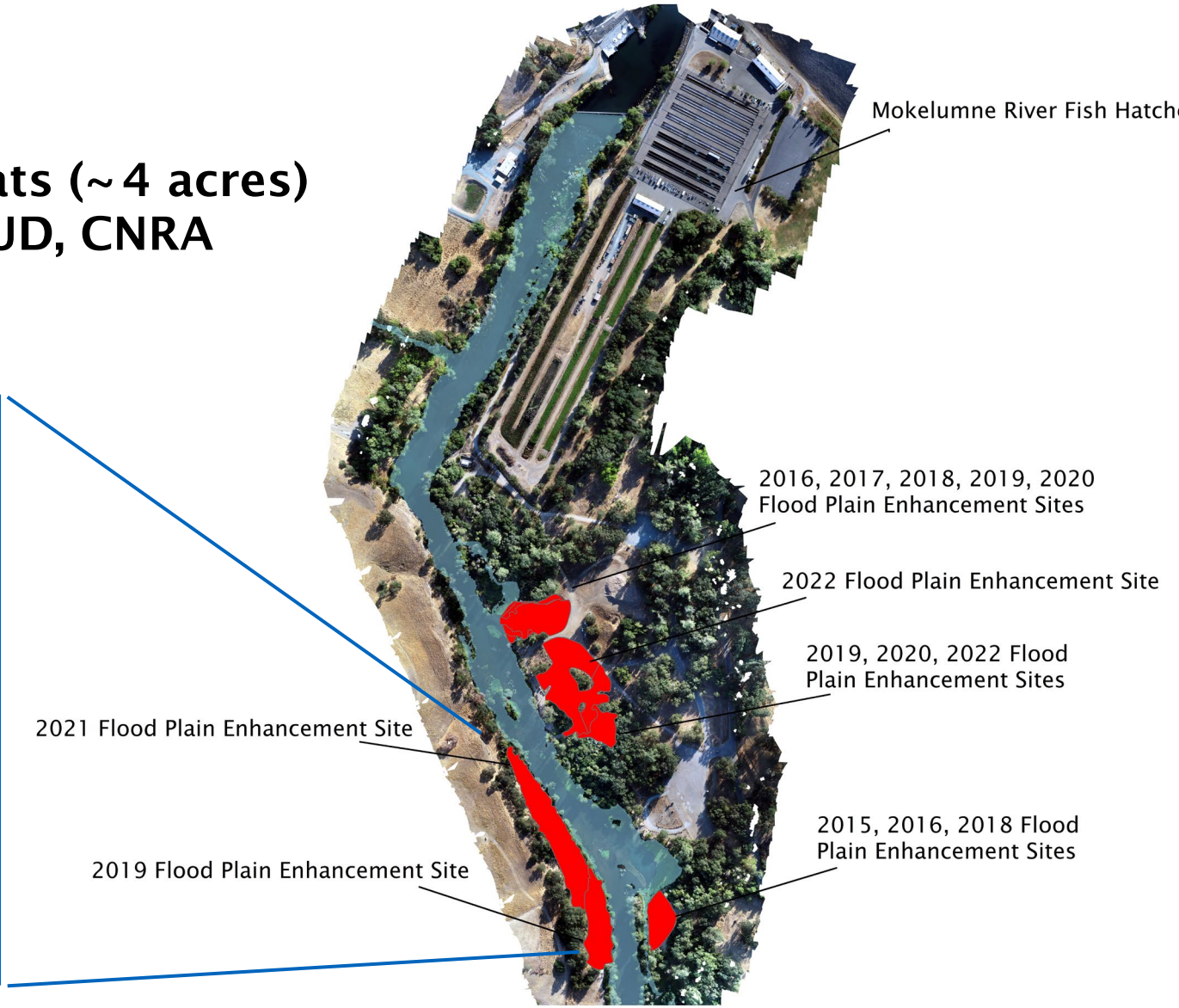
Floodplain Restoration

2015- 2022: 5 floodplain habitats (~4 acres)
Funding from: USFWS, EBMUD, CNRA

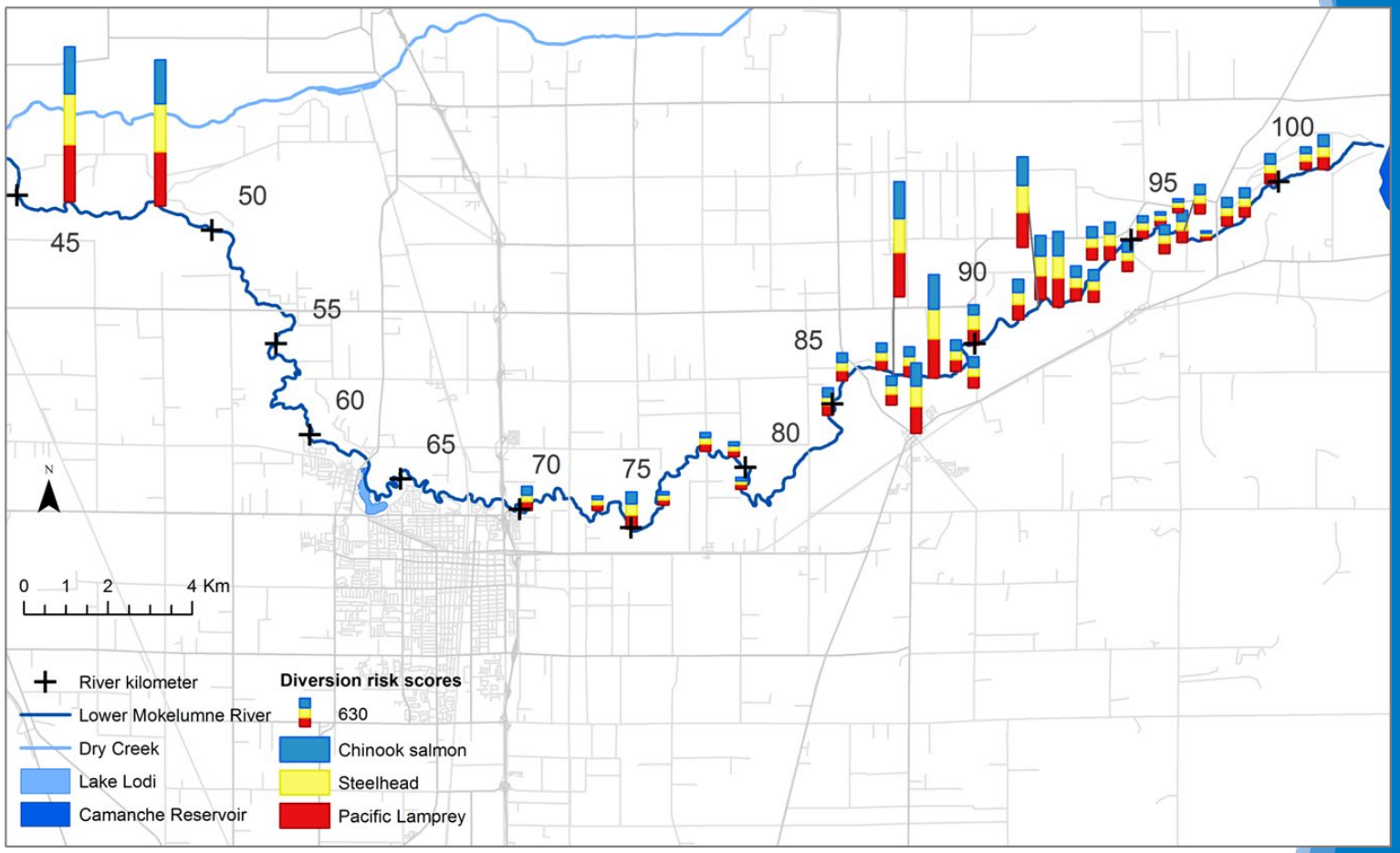


Rearing – Screening Private Riparian Diversions

- 2019 Relative Risk Model of Surface Water Diversions
- 270 water diversions along the LMR
- 3 screened in 2021
  - RRM rank: 3rd, 4th, and unranked
- 3 screened in 2024
  - RRM rank: 1st, 2nd, and unranked

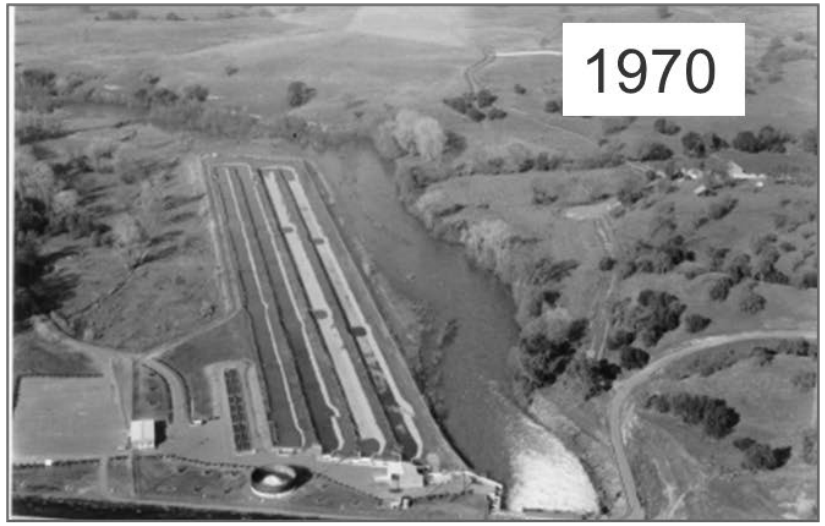
Unscreened Diversion

Screened Diversion



Predicted risk at surface water diversions on LMR for CS, STH, and PLAM.

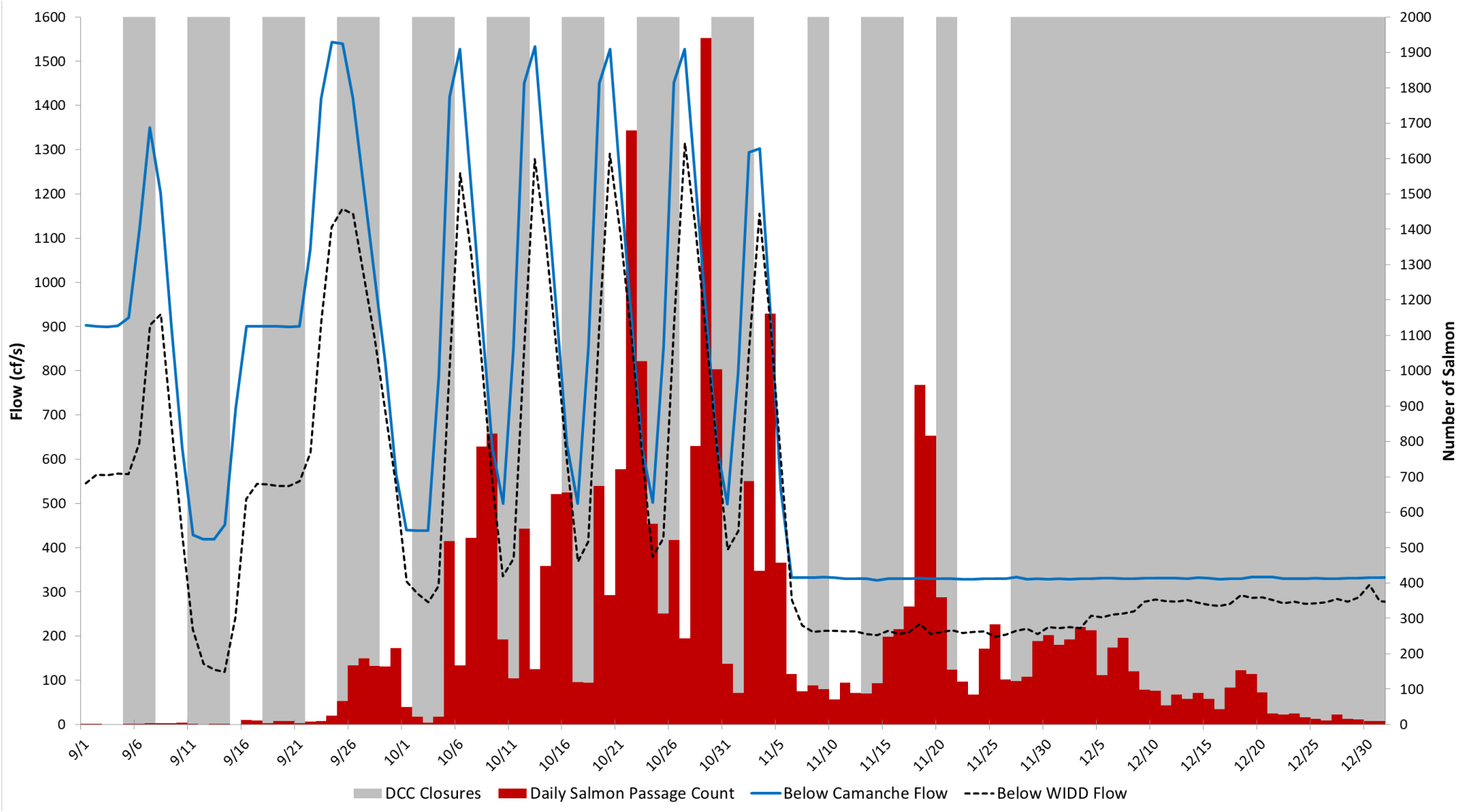
Mokelumne River Fish Hatchery



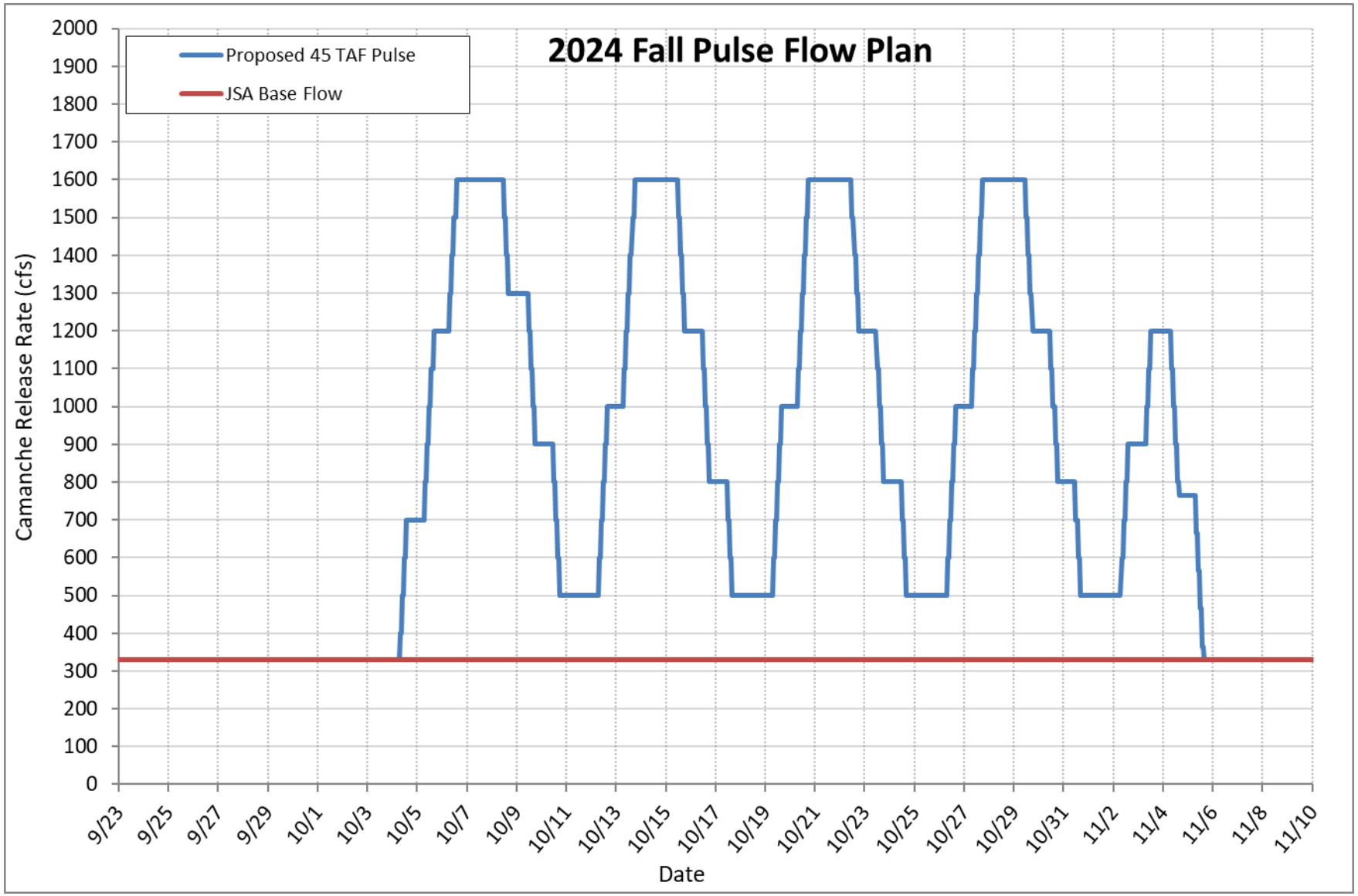
Hatchery Improvements

- Chillers for the Hatchery water supply cool water up to 8°C
- Sand filters to remove unwanted particulate matter
- Ultraviolet light water treatment system to eliminate pathogenic organisms
- Hypolimnetic Oxygenation System (HOS) system in response to hydrogen sulfide problem
- These improvements have resulted in a 92% to 95% egg to trucked fish survival rate, which is extremely high for hatchery production.
- We've also improved management practices to balance natural and hatchery production

Management Actions to Support Fisheries

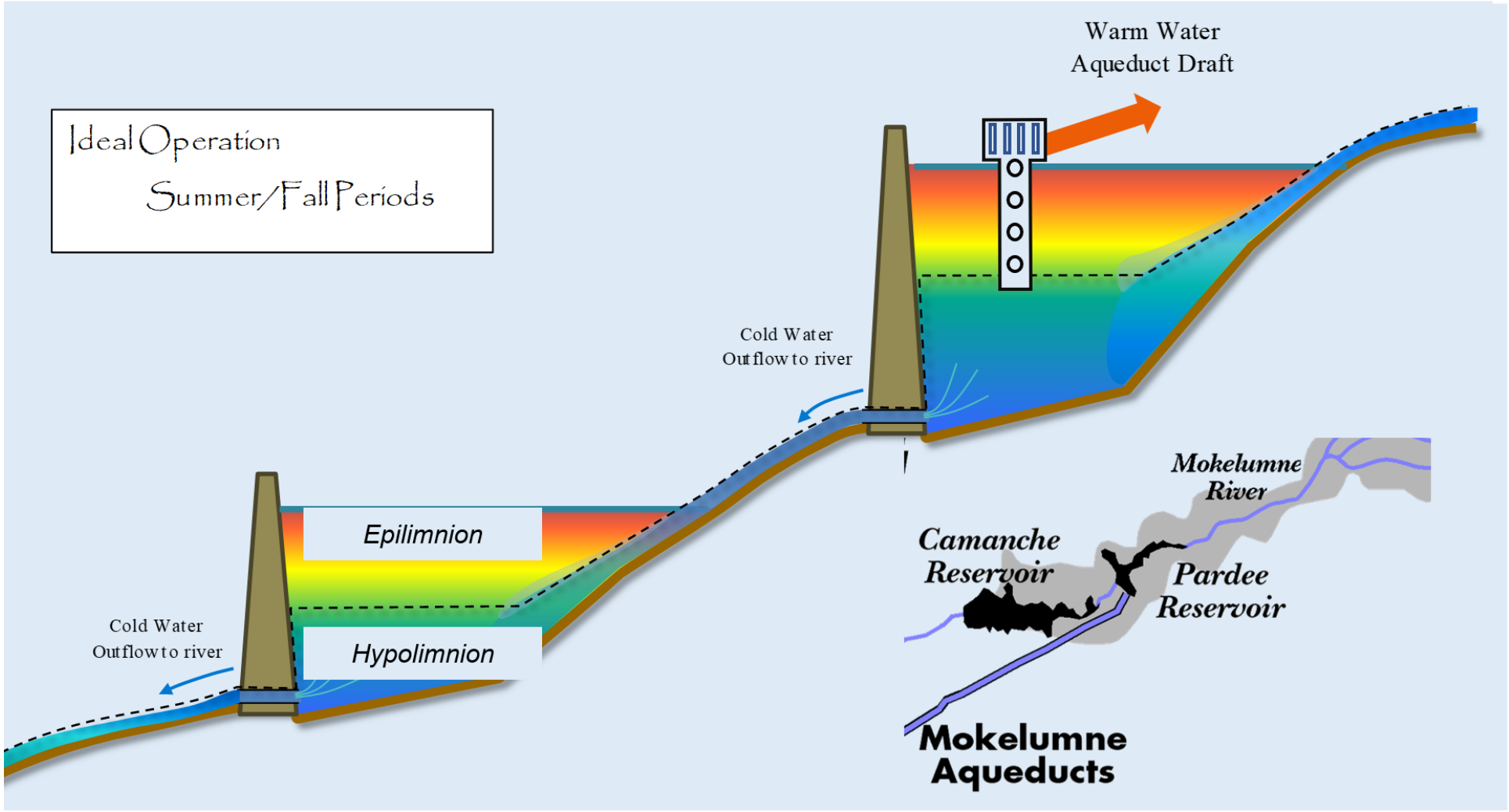


Adaptive Management: Pulse Flows

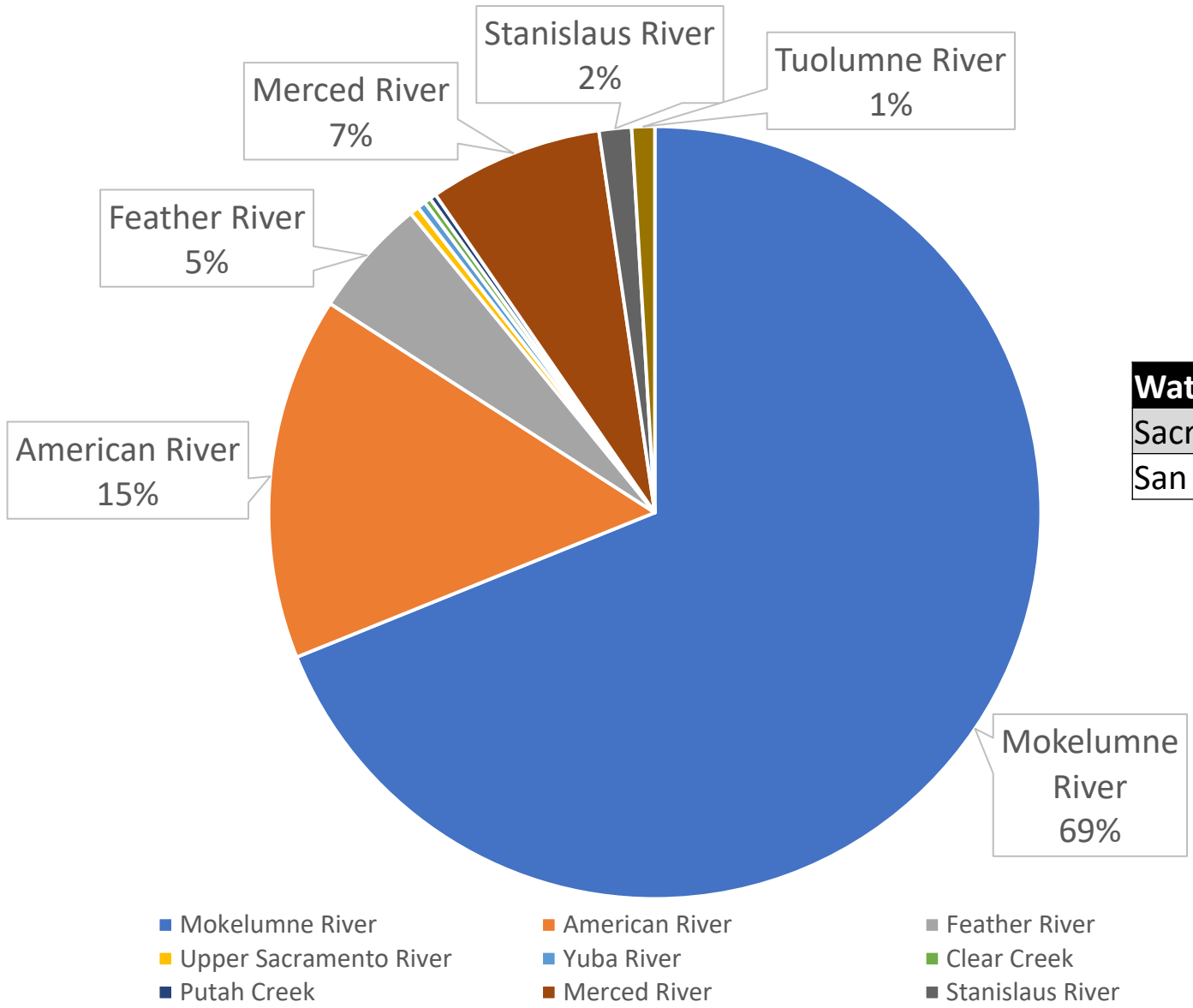


Temperature Management for Fisheries

Operate Pardee and Camanche to deliver cold water to Mokelumne River Downstream



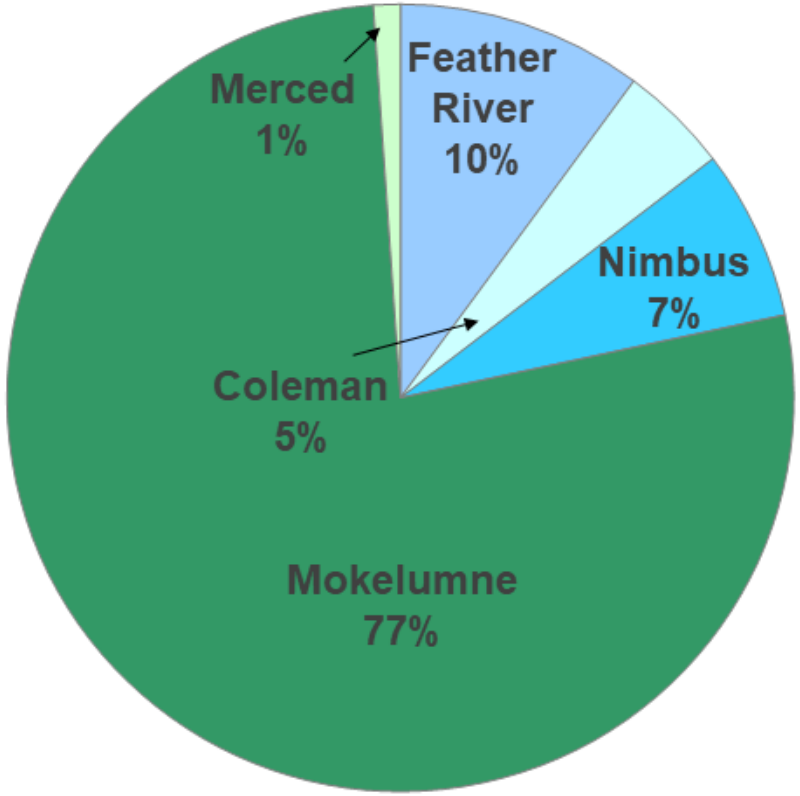
2023-2024 Straying Rates (Preliminary)



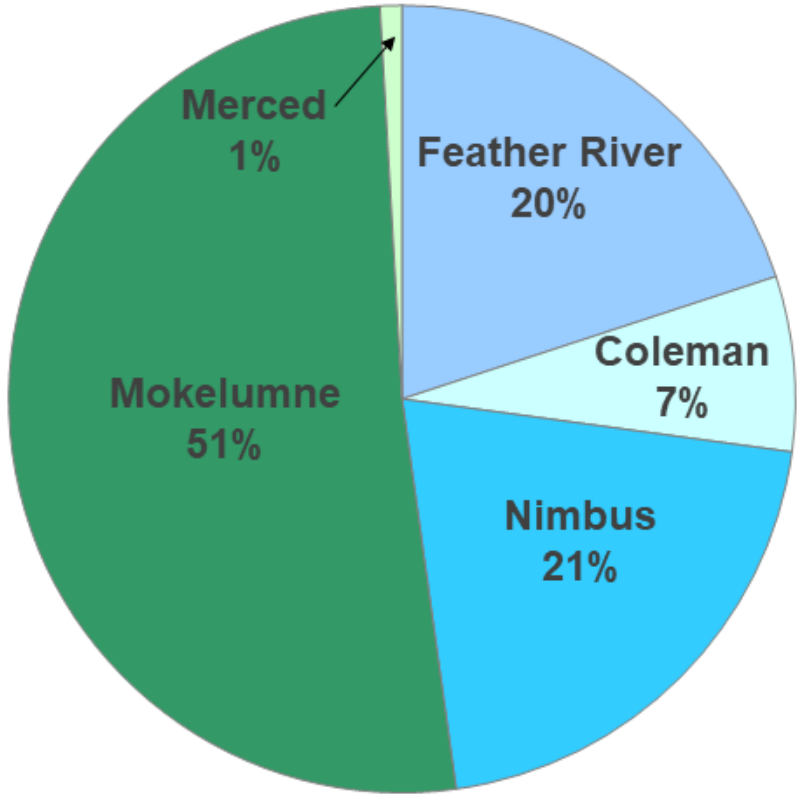
Watershed	Straying Rate
Sacramento River	21.49%
San Joaquin River	9.61%

Hatchery Contribution to 2022 CA Ocean Fisheries

Recreational
Central Valley fall Chinook



Commercial
Central Valley fall Chinook



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Summary

- EBMUD manages the lower Mokelumne River in partnership with CA Department of Fish and Wildlife, US Fish and Wildlife Services, National Marine Fisheries Service, and other river partners
- EBMUD provides flows and habitat to create a hospitable natural environment for native fishes
- Science, monitoring, adaptive management are key to successful outcomes
- Leverage long-term datasets to refine and improve management of the LMR

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Wildlife Management and Conservation Agreements

Safe Harbor Agreement

Between EBMUD and USFWS

Purpose:

- to promote the enhancement and management of habitat for CTS, CRLF and VELB on EBMUD watershed lands.
- to provide certain regulatory assurances to EBMUD.

EBMUD: maintain baseline habitat, implement and maintain specific conservation management activities

USFWS: authorizes incidental take through a 30 year enhancement of survival permit (TE-213311-0)

USFWS Safe Harbor Agreement

Conservation Management Actions:

- Restore and maintain healthy, contiguous native plant communities that include elderberry bushes for VELB
- Restore and maintain suitable breeding ponds, moist refuge habitat, and upland dispersal habitat for CTS and CRLF
- Manage vegetation and grazing appropriate to the conservation needs of the covered species, consistent with water quality protection and fire management
- Control non-native predators
- Implement related protection and conservation measures

California Tiger Salamander

California Red-Legged Frog

Valley Elderberry Longhorn Beetle

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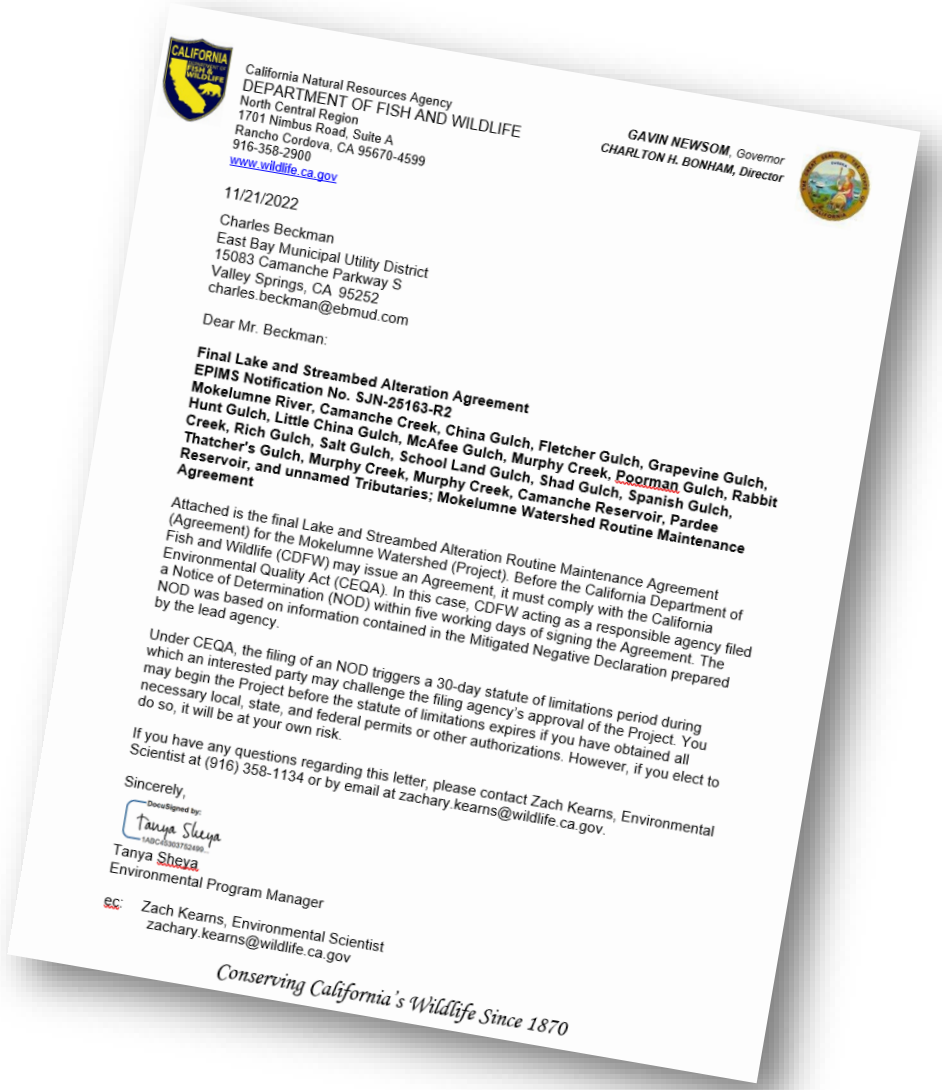
Upcountry Watershed RMA

- Agreement with the California Department of Fish and Wildlife
- Required because our routine maintenance could substantially impact fisheries and wildlife resources on District lands
- Protects fish and wildlife resources by incorporating reasonable measures (BMPs) to protect these resources
- Signed November 21, 2022



California Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
North Central Region
1701 Nimbus Road, Suite A
Rancho Cordova, CA 95670-4599
916-358-2900
www.wildlife.ca.gov

GAVIN NEWSOM, Governor
CHARLTON H. BONHAM, Director

11/21/2022

Charles Beckman
East Bay Municipal Utility District
15083 Camanche Parkway S
Valley Springs, CA 95252
charles.beckman@ebmud.com

Dear Mr. Beckman:

Final Lake and Streambed Alteration Agreement
EPIMS Notification No. SJN-25163-R2
Mokelumne River, Camanche Creek, China Gulch, Fletcher Gulch, Grapevine Gulch, Hunt Gulch, Little China Gulch, McAfee Gulch, Murphy Creek, Poorman Gulch, Rabbit Creek, Rich Gulch, Salt Gulch, School Land Gulch, Shad Gulch, Spanish Gulch, Thatcher's Gulch, Murphy Creek, Murphy Creek, Camanche Reservoir, Pardee Reservoir, and unnamed Tributaries; Mokelumne Watershed Routine Maintenance Agreement

Attached is the final Lake and Streambed Alteration Routine Maintenance Agreement (Agreement) for the Mokelumne Watershed (Project). Before the California Department of Fish and Wildlife (CDFW) may issue an Agreement, it must comply with the California Environmental Quality Act (CEQA). In this case, CDFW acting as a responsible agency filed a Notice of Determination (NOD) within five working days of signing the Agreement. The NOD was based on information contained in the Mitigated Negative Declaration prepared by the lead agency.

Under CEQA, the filing of an NOD triggers a 30-day statute of limitations period during which an interested party may challenge the filing agency's approval of the Project. You may begin the Project before the statute of limitations expires if you have obtained all necessary local, state, and federal permits or other authorizations. However, if you elect to do so, it will be at your own risk.

If you have any questions regarding this letter, please contact Zach Kearns, Environmental Scientist at (916) 358-1134 or by email at zachary.kearns@wildlife.ca.gov.

Sincerely,

DocuSigned by:
Tanya Sheya
1ABC4B3037524B9...

Tanya Sheya
Environmental Program Manager

ec: Zach Kearns, Environmental Scientist
zachary.kearns@wildlife.ca.gov

Conserving California's Wildlife Since 1870

Stewards of the Source

Mokelumne River : Wild & Scenic Designation

- Signed into law June 27, 2018
- State Wild and Scenic Designation
- Protects 37 miles upstream of Pardee Reservoir
- Preserves the wild and scenic values of the Upper Mokelumne River
- Supported by broad group of environmental and water agency stakeholders

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Overview *Recap*

- Water Temperature Projections Follow Water Supply Projections
- Flexible Management Approach Leads to Positive Fisheries Outcomes
- Monitoring Program Allows Understanding & Guides adaptation