

State Water Project (SWP) Environmental Compliance Overview



Lenny Grimaldo
SWP Environmental Director

Background-State Water Project Operations

- DWR operates the Harvey O. Banks Pumping Facility and other delta facilities (e.g., Barker Slough Pumping Plant) under state and federal endangered species act authorizations
 - Take of state-listed species is covered under an Incidental Take Permit (ITP) issued by the California Department of Fish and Wildlife (CDFW; longfin smelt, delta smelt, winter-run salmon and spring-run salmon)
 - Take of federally-listed species are covered under Biological Opinions issued by the U.S. Fish and Wildlife Service (USFWS; delta smelt) and National Marine Fisheries Service (NMFS; winter-run salmon, spring-run salmon, steelhead and green sturgeon)
- DWR is undergoing consultation for new state and federal permits
 - ***ITP application was submitted to CDFW on November 1st, 2023***
 - Biological Assessment (BA) submitted to USFWS and NMFS on November 9th, 2023
- Operational rules, conservation measures and science actions for the Delta in the BA and ITP application are proposed to be in (almost) complete alignment
 - Developed in coordination with CDFW, FWS and NMFS
- SWP \water rights are authorized under the State Water Resources Control Board (D-1641) Bay Delta Plan



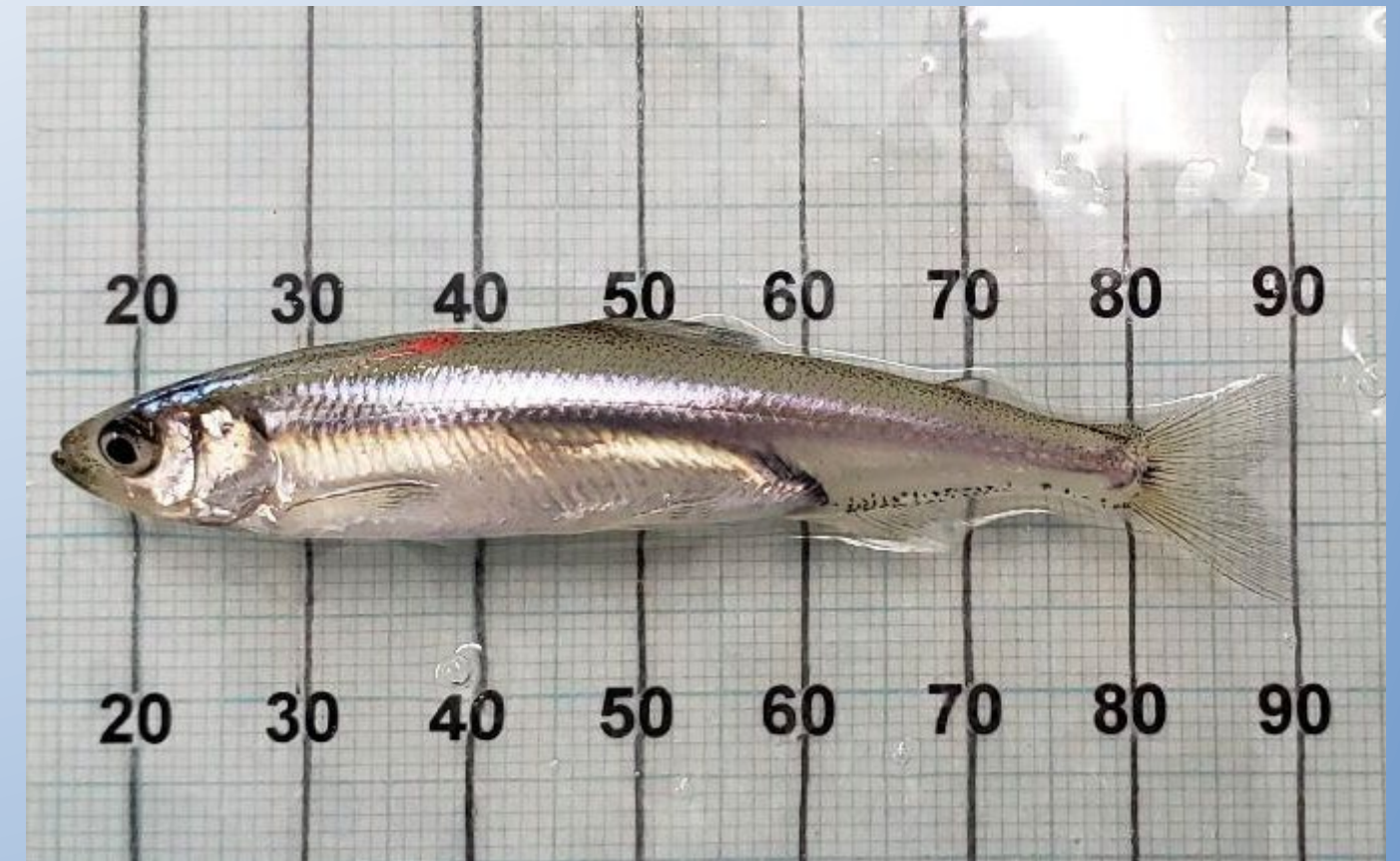
Overview of Operational Rules- Old and Middle River Management

Delta Smelt

- Proposed rules for delta smelt will no longer be based on actual observed take (aka “salvage) of delta smelt. Instead, proposed rules are based on surrogate habitat conditions informed from ***modeling studies***

Key outstanding questions:

- Do hatchery delta smelt behave like wild delta smelt? Will entrainment risk predictors change with hatchery fish?
- What role can ***eDNA play*** in helping with operational rules?
- Will climate change shift timing or magnitude of conditions that currently influence high entrainment risk conditions?
- Can we check the box complete for answering the question about how ***SWP and CVP exports affect the delta smelt population?***



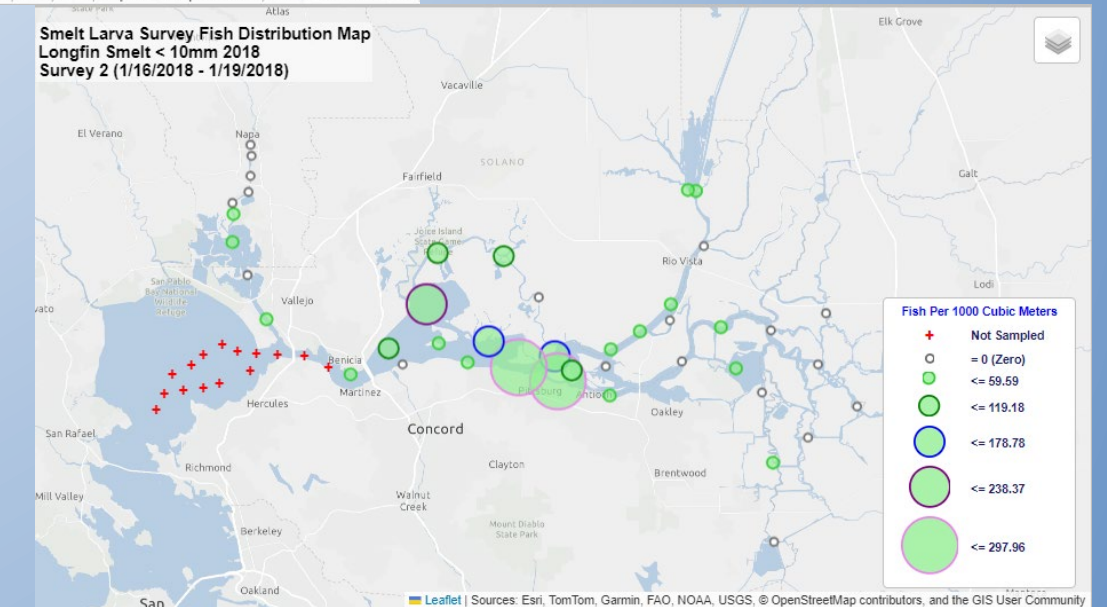
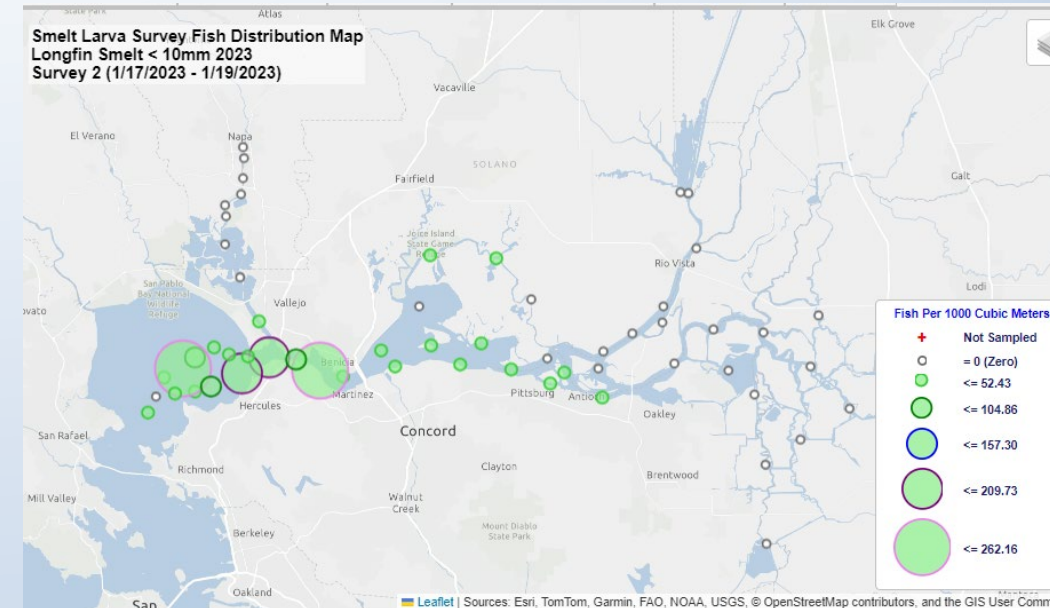
Overview of Operational Rules- Old and Middle River Management

Longfin smelt

- Larval and juvenile longfin smelt entrainment risk increases under low flow conditions; protections trigger when larvae are observed in the interior delta (i.e., closer to SWP and CVP pumping facilities)
- Adult longfin smelt rules based on take of individuals at the SWP and CVP and assessment of risk. Since 2009, take of adult longfin smelt has been low
- **Entrainment losses** of longfin smelt larvae during the spring do not compromise juvenile abundance later in the year

Key outstanding question(s):

- How can monitoring inform entrainment risk of larval and juvenile longfin smelt for management application?
- What role can eDNA play in helping with operational rules?
- Will climate change shift timing or magnitude of conditions that currently influence high entrainment risk conditions?



CALIFORNIA DEPARTMENT OF
WATER RESOURCES

Overview of Operational Rules- Old and Middle River Management

Winter-run Chinook salmon

- Rules based on entrainment risk and take relative to the ***Juvenile Production Estimate (JPE)***
- DWR and Reclamation proposed that new rules rely on ***genetic confirmed approaches rather than length-at-date methods***
- Cohort replacement models will be contemplated in new permits

Key outstanding question(s):

- How can real-time survival data be integrated into SWP and CVP operation rules?
- How does climate change and project operations affect winter-run viability in the Central Valley watershed?
- How much will the Georgiana Slough Barrier reduce entrainment risk? How can results get incorporated into real-time protection rules?



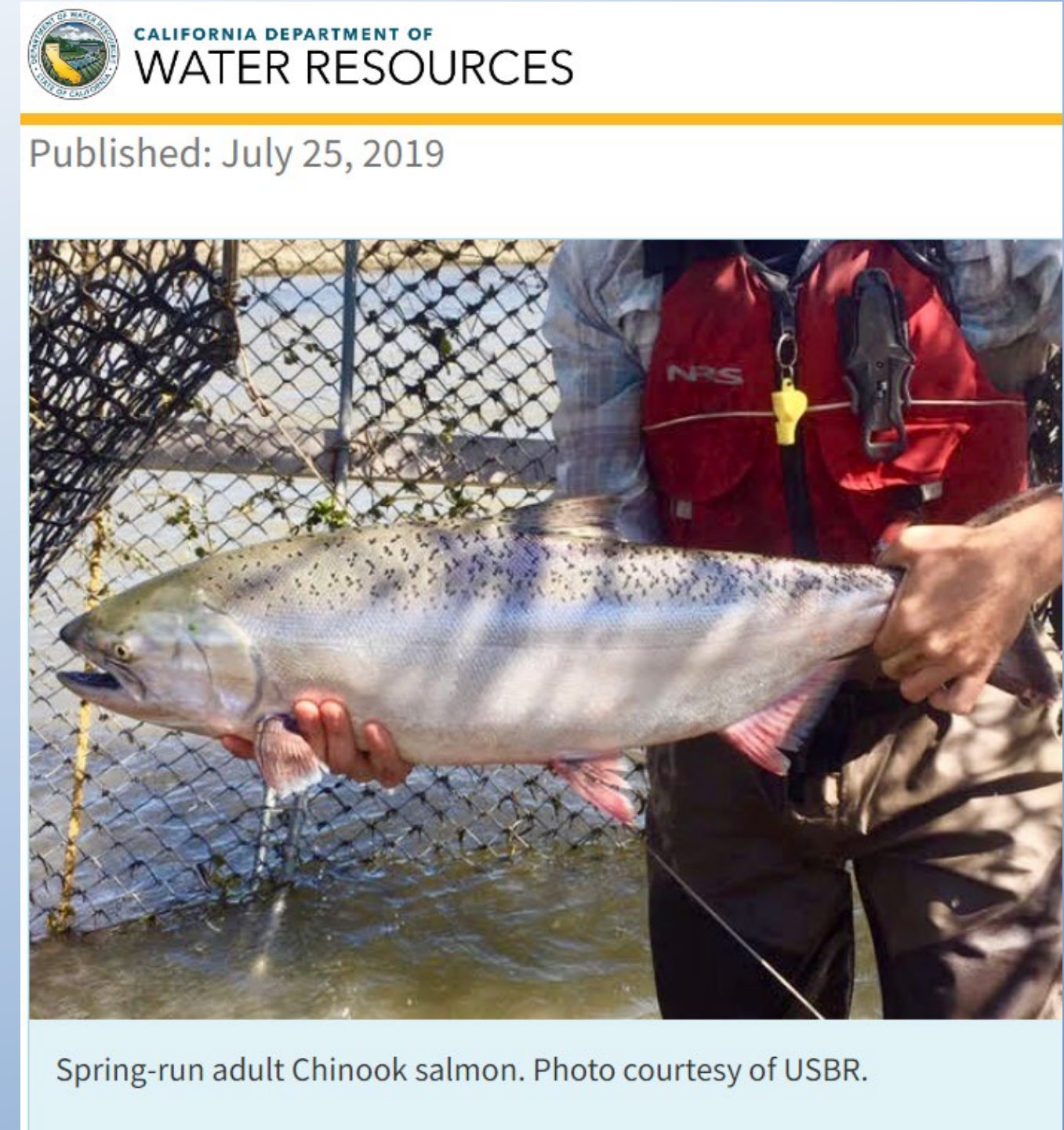
Overview of Operational Rules- Old and Middle River Management

Spring-run Chinook salmon

- Operational rules are currently based on take of surrogate releases of fall-run salmon intended to mimic spring-run salmon emigration timing
- Operational rules will be re-assessed when ***spring-run JPE monitoring program*** is up and running (~2026)
- DWR is planning an independent peer review of the Spring run JPE methods

Key outstanding question(s):

- How do SWP and CVP operations affect spring-run salmon populations?
- How will climate change threaten different life stages of spring run in the Central Valley watershed?
- How much will the Georgiana Slough Barrier reduce entrainment risk? How can results get incorporated into real-time protection rules?



Spring-run adult Chinook salmon. Photo courtesy of USBR.



Overview of Operational Rules- Spring Outflow

Spring outflow

- SWP reduces exports during the spring to allow for increased outflow, Increased outflow is expected to improve rearing conditions for listed species
- DWR and Reclamation proposed to implement ***Voluntary Agreement (aka Healthy River and Landscapes)*** flows to support longfin smelt abundance and juvenile salmon survival

Key outstanding question(s):

- What are the mechanisms underlying the ***longfin smelt spring outflow-fall abundance relationship?***
- How much variation in longfin smelt abundance is explained by ***San Francisco Bay area tributary rearing*** during extreme high flows?
- Will climate change alter how longfin smelt respond to spring outflow?



Overview of Operational Rules- Summer/Fall Habitat Actions for Delta Smelt

Fall X2

- Maintain low salinity habitat in fall of wetter years in Suisun Bay

Suisun Marsh Salinity Control Gates (SMSCG)

- Operate DWR's SMSCG to maximize low salinity habitat in Suisun Marsh

Monitoring and science

- Support and fund a robust ***Suisun Marsh science and monitoring plan***

Key outstanding question(s):

- Given that wild delta smelt are rare in monitoring surveys, what *surrogate measures* effectively inform a species response?
- Will hatchery delta smelt rear in low salinity habitat similar to wild delta smelt?



Suisun Marsh Salinity Control Gates (SMSCG)



Non-operational Measures and Science Actions

Tidal Marsh Habitat Restoration

- Restore 8,396 acres for delta smelt per 2008 USWFS Biological Opinion and 2020 ITP
- Restore 1,196 acres for longfin smelt per 2009 and 2020 CDFW ITPs
- Support and fund a ***robust tidal marsh monitoring program***

Key outstanding question(s):

- What's the best timeline (every 10 years? 20 years?) for defining restoration success? Or for implementing adaptive management modifications to restored sites?
- How can ***life cycle models*** utilize tidal marsh monitoring data?
- What are we learning from the ***tidal monitoring program*** to inform new restoration projects?
- What are appropriate measures for management with respect to land use and invasive species control?



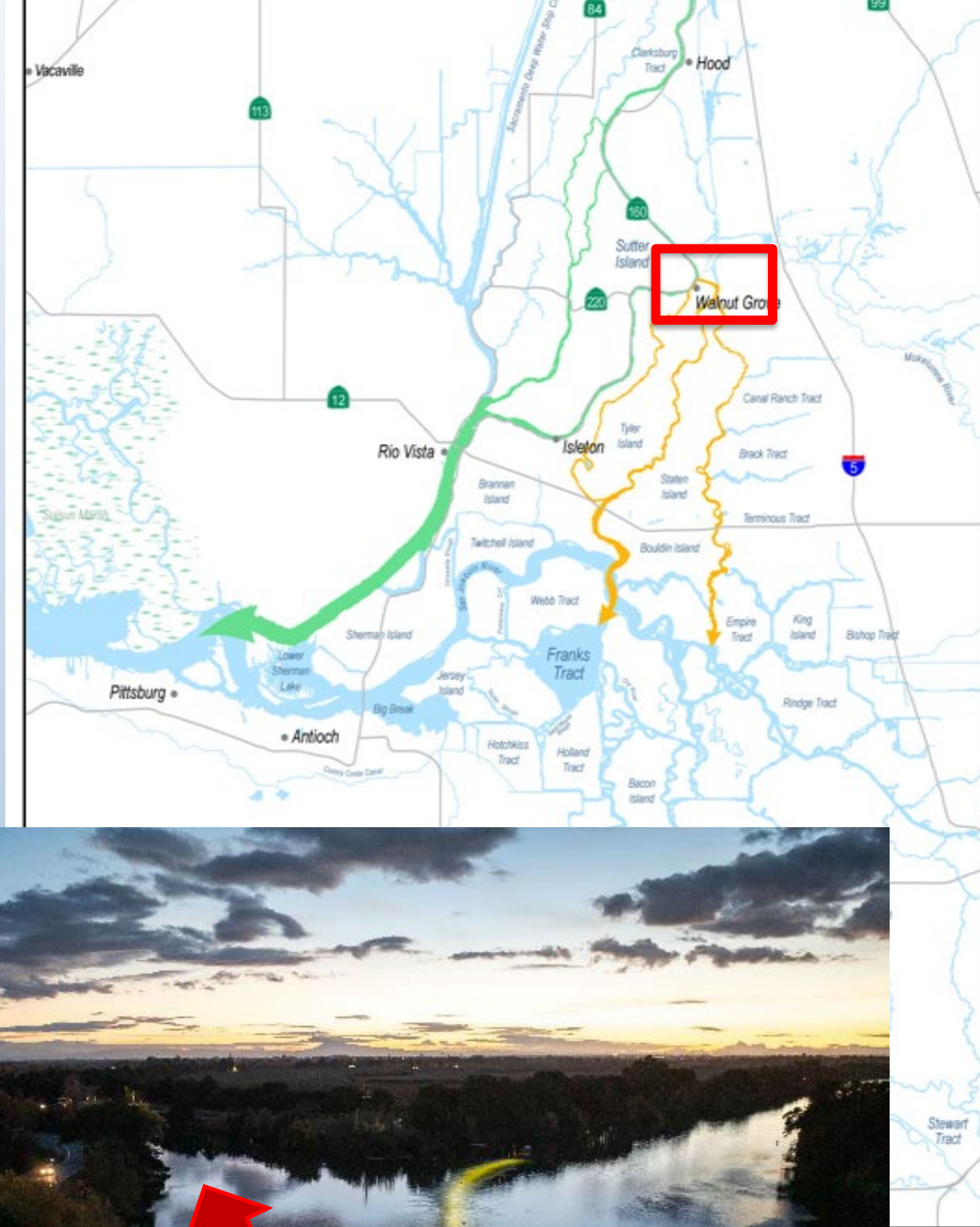
Non-operataional Measures and Science Actions

Georgiana Slough Barrier

- Install a non-physical barrier to keep emigrating Chinook salmon in the Sacramento mainstem to improve survival and reduce entrainment risk
- Fund and support a ***robust winter-run survival science plan***

Key Outstanding question(s):

- How effective is the barrier in reducing entrainment into the interior delta? And increasing overall survival?



Non-operational Measures and Science Actions

Delta Smelt supplementation

- Transition from experimental hatchery releases to a full scale supplementation program

Longfin smelt pilot culture program

- Continue to learn how to culture longfin smelt in captivity

Longfin Science Plan

- Support development of *longfin smelt life cycle model*
- Investigate mechanisms *underlying spring outflow abundance* relationships

Key outstanding question(s):

- Can supplementation increase resiliency in the delta smelt population?



Captively raised Delta smelt are being released into the Sacramento-San Joaquin Delta for the first time ever. (Source: U.S. Fish & Wildlife Service)



Adaptive Management- Addressing Scientific Uncertainty

- **Purpose**

- Promote collaborative and participatory science
- Guide (by identifying, prioritizing, and funding) the development and implementation of scientific investigations and monitoring for CVP and SWP management actions, and
- Incorporate new information into decision support tools to gain insights to management decisions, actions, and constraints
- Maximize the effectiveness of actions toward achieving clearly defined management objectives and balancing potential tradeoffs,
- Provide transparent documentation of the decision process.



Adaptive Management- Addressing Scientific Uncertainty

- **Purpose**

- Promote collaborative and participatory science
- Guide (by identifying, prioritizing, and funding) the development and implementation of scientific investigations and monitoring for CVP and SWP management actions, and
- Incorporate new information into decision support tools to gain insights to management decisions, actions, and constraints
- Maximize the effectiveness of actions toward achieving clearly defined management objectives and balancing potential tradeoffs,
- Provide transparent documentation of the decision process.

Evaluated within the ITP consultation period (some examples)

Winter-run Chinook Salmon OMR Management
Spring-run Chinook Salmon OMR Management
Longfin Smelt OMR management
Delta Smelt Supplementation release strategies
Alternative Salmonid loss pilot studies
Winter-run Chinook Salmon through-delta survival
Georgiana Slough Migratory Barrier Effectiveness

Evaluated over a longer timescale (some examples)

Restoration effectiveness
Delta smelt summer-fall habitat response
Delta smelt supplementation success



Thank you



**CALIFORNIA DEPARTMENT OF
WATER RESOURCES**