

# RECLAMATION

*Managing Water in the West*

## **NMFS – Reclamation Stakeholder Conference Call Shasta RPA Draft Proposed Amendment September 21, 2017**



U.S. Department of the Interior  
Bureau of Reclamation

# Conference Call Objectives

Provide status updates on:

1. Coordinated Modeling Update
2. Science Plan Update

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# Science Plan

- Purpose of the Plan
  - Inform adaptive management related NMFS RPA Action Suite I.2
  - Identify monitoring, modeling, analysis, and synthesis needs to reduce uncertainty on how actions may achieve fish and water management goals
  - Coordinate activities from agencies, stakeholders, and other interested parties
- Purpose of Today
  - Solicit feedback on a proposed framework (What's missing?)
  - Request management questions (What are the interests?)

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# Proposed Science Plan Outline

- Purpose
- Background
- Conceptual Models and Frameworks
- Management Questions
- “What We’re Doing Now”
- Technical Approach
  - Related Project and Program
  - Coordination Forums
  - Data Access and Availability
  - Methods and Study Design
- Activities
- References

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**Conceptual Model Example: Winter-Run Chinook Salmon Management (Windell et al 2017)**

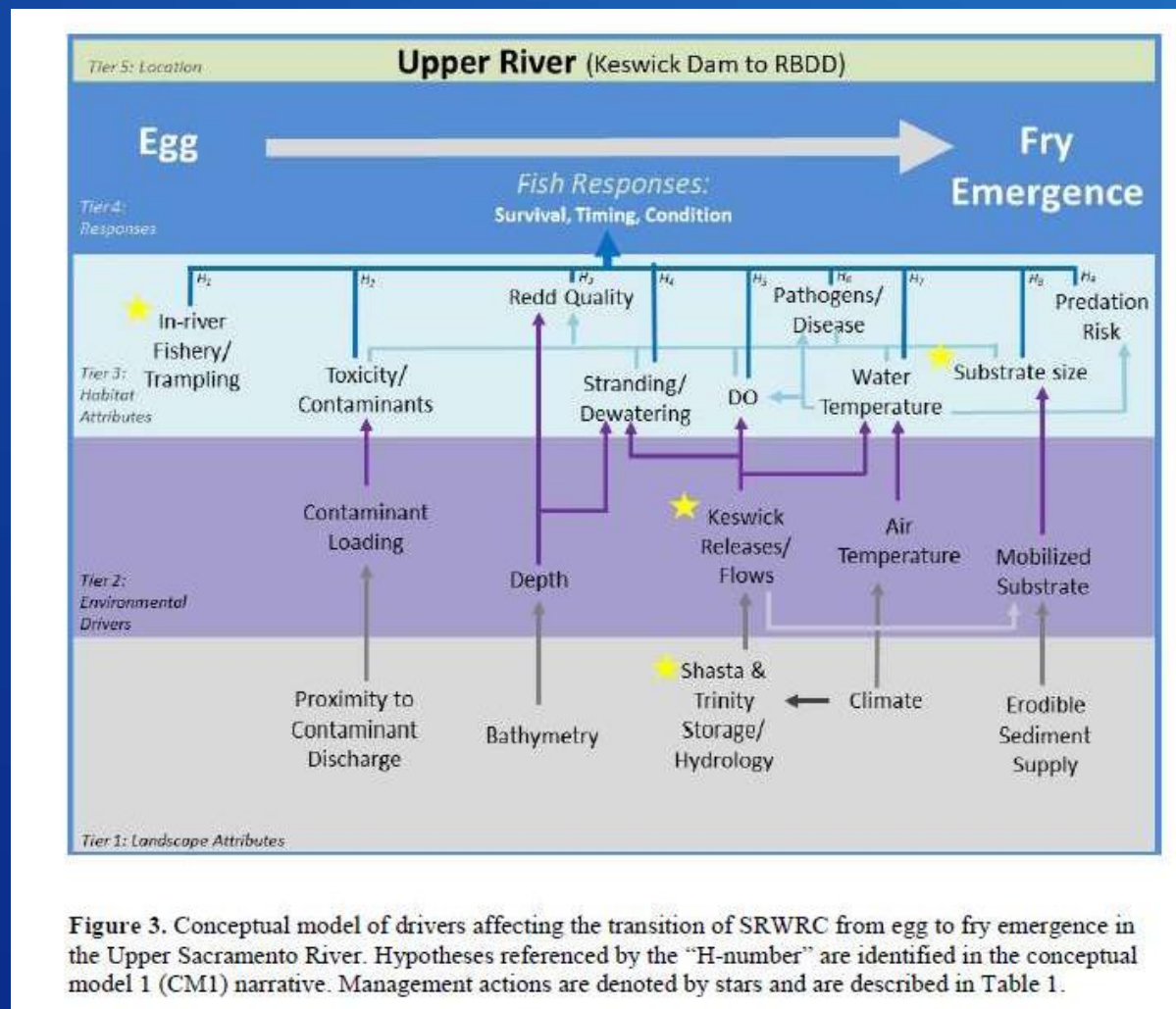


Figure 3. Conceptual model of drivers affecting the transition of SRWRC from egg to fry emergence in the Upper Sacramento River. Hypotheses referenced by the "H-number" are identified in the conceptual model 1 (CM1) narrative. Management actions are denoted by stars and are described in Table 1.

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# Environmental Water Framework

Maintain

- Sustain populations
- Activities stabilize the natural population

Restore

- Improve juvenile productivity
- Activities increase survival and carrying capacity through flow and non-flow actions

Protect

- Avoid extinction
- Activities are off-the-shelf contingencies due to predicted stressors

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# Egg Mortality Conceptual Models

- **Critical Temperature Curves**
- **Dissolved Oxygen Limits**
- **Background Mortality**
- **EPA 7 DADM**

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# Management Question Introduction

- Management questions provide a top down approach to direct resources to activities.
- A tiered approach can help organize questions.
- What do we do about fish?
  - What do we do about fish above Red Bluff Diversion Dam?
    - What do we do about temperature management?
- Think about the actions we may take.
- Think about why we might take them.
- Try to trace those back to a fundamental need for fish or a water supply operation.

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# Example Draft Tiered Questions #1

- **What are the bounds of feasibility (storage, climate, etc.) driving availability of cold water volumes?**
  - **What are reasonable biological objectives for temperature dependent mortality?**
    - To sustain a population in drier years?
    - To restore a population in wetter years?
  - **How do we prioritize storage and the available cold water pool?**
    - **What are the appropriate egg to fry biological mechanisms to model?**
      - Are there thresholds that optimize temperature dependent mortality?
      - Do we manage for dissolved oxygen demand?
        - » Are the fish oxygen deprived?
        - » What else can we do to meet oxygen?
      - Have we appropriately characterized background mortality?
    - **What facility improvements might improve volumes of cold water?**
  - **How might additional populations above Shasta or in Battle Creek change requirements below Keswick Dam?**

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## Example Draft Tiered Questions #2

- **Are there unanticipated effects to fish from temperature management?**
  - Do we encourage spawning in higher risk locations?
  - Does colder incubation impact survival after emergence?
- **What are the non-temperature factors that may relieve pressures on cold water management?**
  - Does improving spawning habitat reduce sensitivity to temperatures?
  - Can improving rearing and migration habitat improve survival enough to reduce pressures on egg to emergence?
  - Does trading cold water for out-migration cues provide a benefit to populations?
  - Are there disease or predation factors?

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# Example Draft Tiered Questions #3

- **What operations tools are required for cold water management?**
  - What models are required to represent water temperatures?
  - Do we adequately count fish at Red Bluff Diversion Dam?
  - How do we account for potential air temperatures?
  - What metrics and targets are meaningful for operating to achieving biological objectives?
    - Are there spring metrics that can estimate stratification?
    - What is the relationship between carryover storage and cold water availability in a subsequent year?

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# Example Activities

- **Updating Temperature Modeling Tools**
- **Red Bluff Rotary Screw Trap Monitoring**
- **Genetic Signatures of Drought Conditions and Disease in Central Valley Salmonids**

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# Management Questions Next Steps

- **Email Management Questions to:**
  - Josh: [JAlIsrael@usbr.gov](mailto:JAlIsrael@usbr.gov); and
  - Garwin: [Garwin.Yip@noaa.gov](mailto:Garwin.Yip@noaa.gov)
- **Reclamation and NMFS can compile and organize management questions into tiers.**
- **Please feel free to setup a time for discussion.**

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# Science Plan Next Steps

Steps to Success	Target Dates
Collect input on management questions and Science Plan	September-October 2017
Final version of Science Plan	November-December 2017
Study prioritization and planning	January- June 2018-2020
Study funding and implementation	October 2018- September 2021
Study Status Reporting	Semiannually WY 2019-2021
Monitoring Status Reporting	Open data approach
Biological Review Panel (Independent review of final findings and monitoring)	September 2019, 2021, 2023

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