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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?)

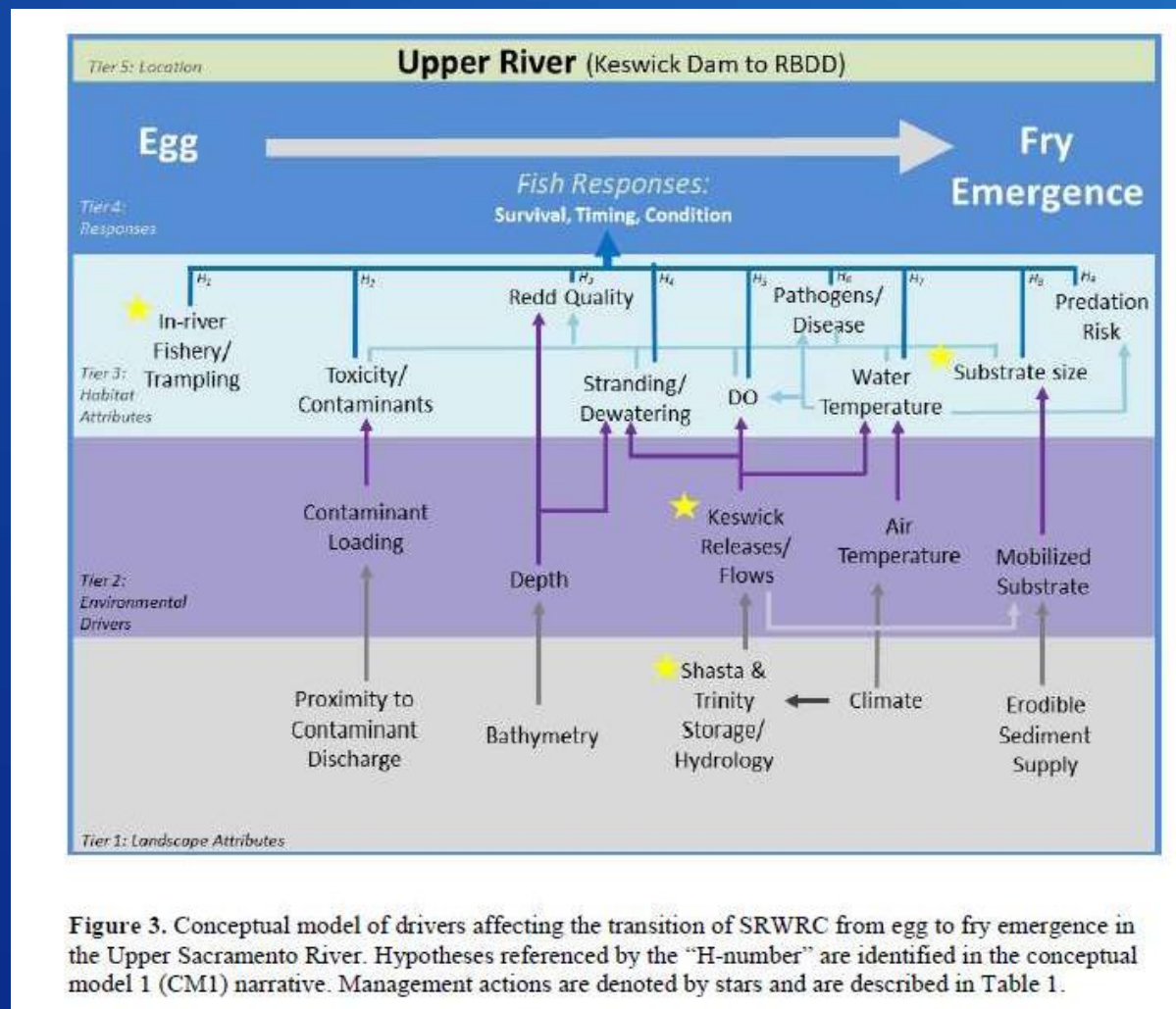
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Proposed Science Plan Outline

- 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)



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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: JAIsrael@usbr.gov; and
 - Garwin: 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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