

# RECLAMATION

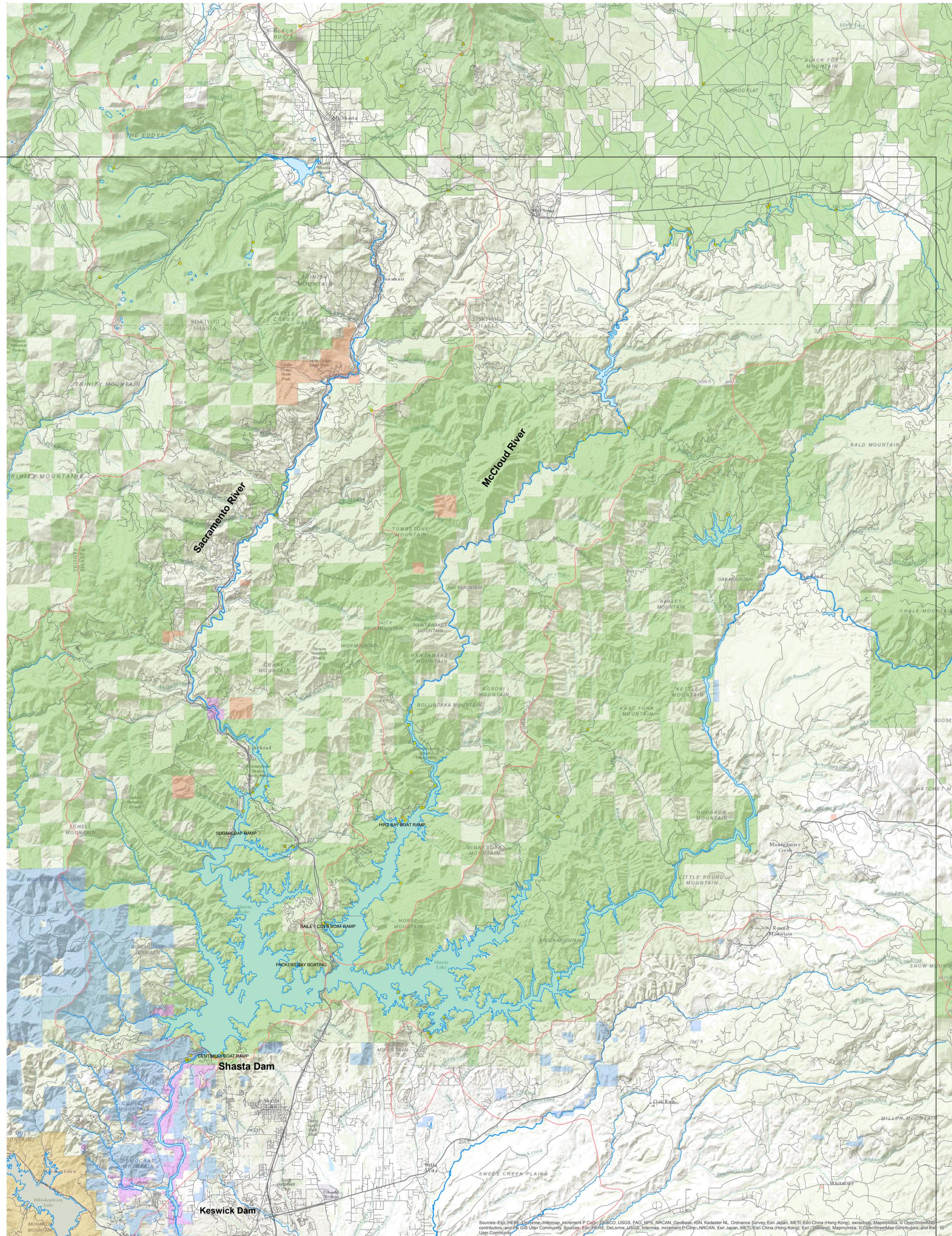
*Managing Water in the West*

**Attachment B, Scoping Meeting Materials**

## **Shasta Dam Fish Passage Evaluation**



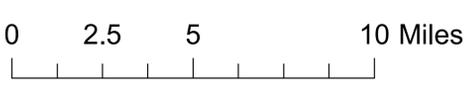
Bureau of Reclamation  
Mid-Pacific Region



Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), Swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community. Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), MapmyIndia, © OpenStreetMap contributors, and the GIS User Community.

### Shasta Dam Fish Passage Evaluation Project Area

- Roads
- Shasta Lake Recreation Sites (Points)
- ▭ Watershed Boundary
- ▭ Bureau of Land Management
- ▭ Bureau of Reclamation
- ▭ Local Government
- ▭ National Park Service
- ▭ Other Federal
- ▭ Private
- ▭ State
- ▭ US Forest Service
- ▭ Unclassified

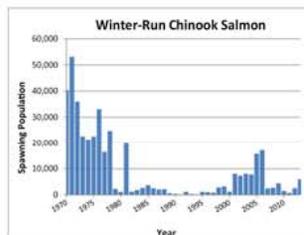


## Reintroduction of Anadromous Salmonids above Shasta Dam

### ABSTRACT

The Shasta Dam Fish Passage Evaluation is an effort to evaluate the feasibility of reintroducing Chinook salmon and steelhead to tributaries above Shasta Lake. The Evaluation is being developed by representatives from Reclamation, National Marine Fisheries Service, U.S. Fish and Wildlife Service, U.S. Forest Service, California Department of Water Resources, California Department of Fish and Wildlife, and the California State Water Resources Control Board.

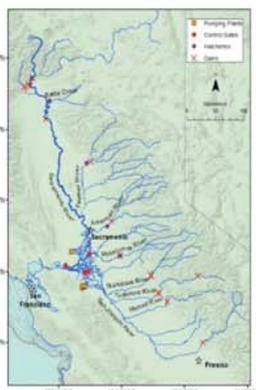
### Limitations to Anadromous Fish Migration



Winter-Run Chinook Salmon Historic Spawning Populations in the Sacramento River

The Central Valley supports steelhead and 4 runs of Chinook salmon. Winter-run Chinook salmon were listed as endangered in 1993. Spring-run Chinook salmon were listed as threatened in 1999. Steelhead were listed as threatened in 2006.

Anadromous salmonids have been blocked from approximately 80 percent of their historic habitat in California's Central Valley rivers and have not accessed the habitat above Shasta Dam for over 70 years.



Barriers to Chinook Salmon and Steelhead Passage in the Central Valley.



CVP and SWP Service Areas

Shasta Dam is a principal feature of Reclamation's Central Valley Project (CVP). The CVP plays a key role in California's economy and is one of the Nation's largest water storage projects, delivering water throughout California for agriculture, municipal and industrial uses.



Shasta Dam and Shasta Lake

### STUDY NEED

In 2009, NMFS issued a jeopardy decision in the Biological Opinion for the long-term operations of the CVP and State Water Project. The Biological Opinion and the Draft Recovery Plan for Sacramento River winter-run Chinook salmon, Central Valley spring-run Chinook salmon, and Central Valley steelhead, identified the need to reintroduce winter-run and spring-run Chinook salmon and steelhead into their historic habitat above the CVP dams. The ultimate goal is to increase the number of viable populations.

### NMFS Biological Opinion Reasonable and Prudent Alternative Action V:

Fish Passage at Shasta, Folsom and New Melones Dams



Action V: Fish Passage Evaluation Watersheds

#### ● Near-term fish passage actions:

Develop and implement a fish passage pilot plan and associated pilot studies that would result in recommendations for the implementation of a long-term reintroduction of the target species.

#### ● Long-term goal:

Increase abundance, productivity, and spatial distribution, and to improve the life history, health, and genetic diversity of the target species.

### NEXT STEPS, SHASTA PILOT STUDY



The McCloud and Upper-Sacramento River are the target watersheds

### McCloud River Habitat



Moderate gradient



Moderate gradient



Spawning habitat patch



Adult holding habitat

### Upper Sacramento River Habitat



Spawning habitat near Box Canyon Dam



Sacramento River, potential adult holding



Half-mile reach with springs entering



Railroads and highways parallel stream

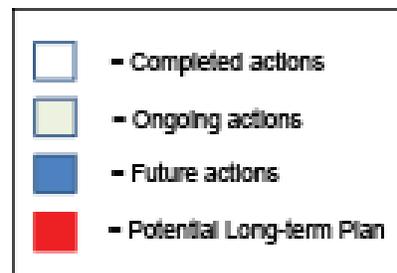
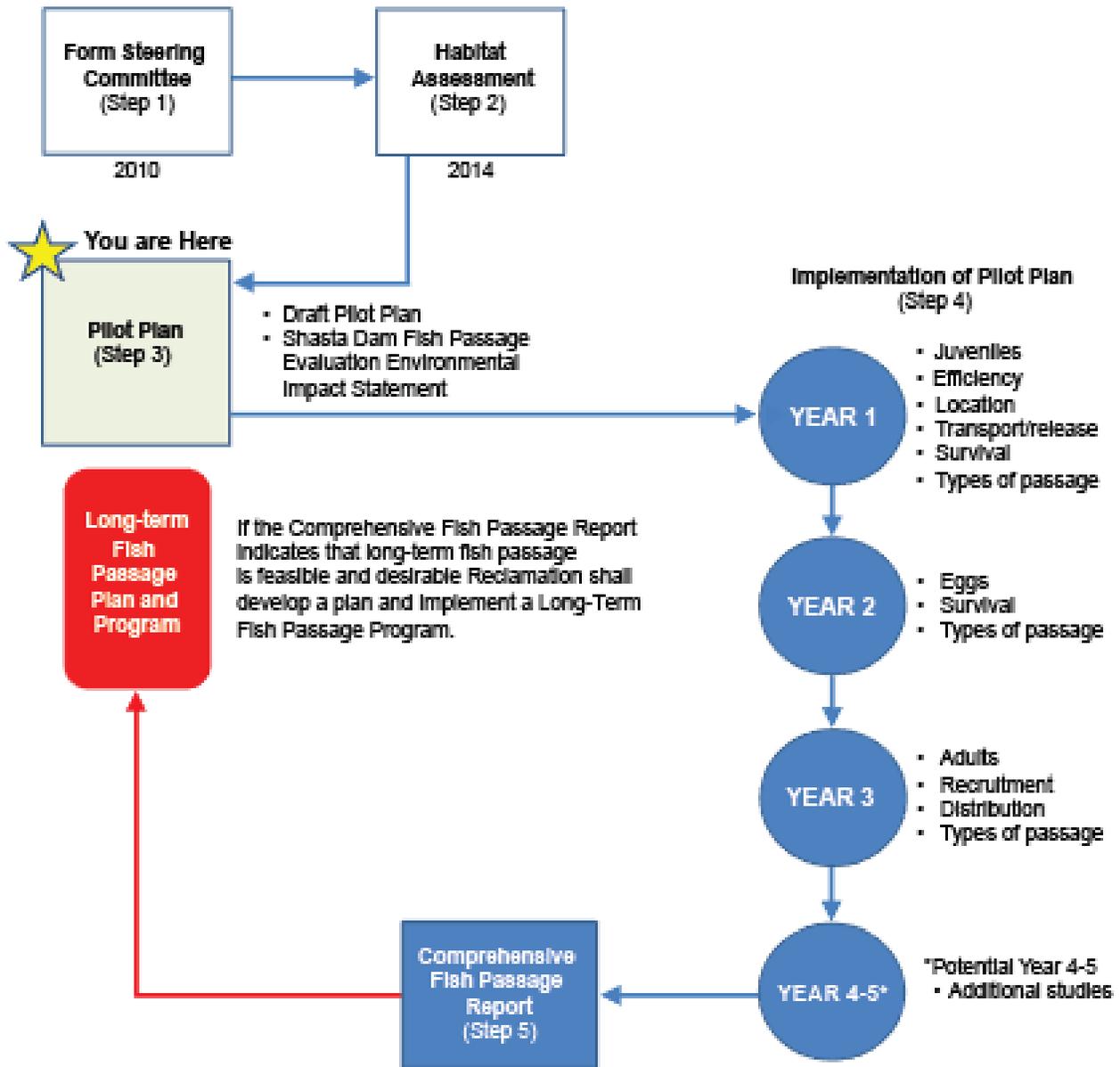
### COMPLETED ACTIVITIES

- Habitat Assessments of the McCloud and Sacramento rivers
- Draft Pilot Study Implementation Plan
- Preliminary Draft Environmental Assessment
- Resident Fish Health Testing
- Hatchery Water Treatment Study
- Captive Broodstock Established

### CONCLUSION

If the Pilot Study results show that Chinook salmon reintroduction is feasible, then a long-term reintroduction of the target species will be established.

# 2009 Biological Opinion on Long Term Operation of the Central Valley Project and State Water Project Shasta Fish Passage Evaluation



# **Shasta Dam Fish Passage Pilot Program Cultural Resources Compliance**

## **National Historic Preservation Act (NHPA) Section 106 (Title 54 U.S.C. §306108) 36 C.F.R. Part 800 Protection of Historic Properties**

Federal agencies must take into account the effect of their undertakings on historic properties, in consultation with the Advisory Council on Historic Preservation, the State Historic Preservation Officer, Indian tribes, and interested parties.

- Identify participants in the Section 106 process
- Identify historic properties
- Assess effects of the undertaking on historic properties
- Resolution of adverse effects

### **Other Federal Laws**

- Archaeological Resources Protection Act
- Native American Graves Protection and Repatriation Act
- Executive Order 13007 Indian Sacred Sites

**Cultural Resources**



View on the Sacramento River. 1882. Courtesy of UC Berkeley, Bancroft Library:  
<http://www.oac.cdlib.org/ark:/13030/tf6w100976/?order=1>.



U.S. Gov. Fishery, McCloud River. 1882. Courtesy of UC Berkeley, Bancroft Library:  
<http://www.oac.cdlib.org/ark:/13030/tf3v19p0fc/?order=1>



Houses, drying racks; McCloud River, Shasta Co. July 1903. Courtesy of UC Berkeley, Bancroft Library: <http://www.oac.cdlib.org/ark:/13030/tf3199p2c2/?order=1>.



Southern Pacific Trestle at the confluence of the McCloud River and the Pit River, c. 1887.  
Source: <http://www.mtshasta.com/history-of-the-mccloud-river-rainbow/>.

# Shasta Dam Fish Passage Evaluation - Pilot Study Environmental Compliance Proposed Timeline

National Environmental Policy Act  
National Historic Preservation Act Section 106 (NHPA)



NOTE: If long-term reintroduction moves forward, additional environmental analysis and compliance will be conducted.

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## **Shasta Dam Fish Passage Evaluation – RPA Action V**

**Near Term Actions  
June 2017**



U.S. Department of the Interior  
Bureau of Reclamation

# Agenda

- **Introduction and Meeting Guidelines**
- **Overview, Objectives, and Purpose**
- **Project Background**
- **Environmental Compliance**
- **Public and Stakeholder Engagement**
- **Action V Near-term Activities**
- **Pilot Plan Studies**
- **ESA 10(j) Experimental Population**
- **Cultural Resources**
- **Schedule and Next Steps**

# Overview

- In 2009, NMFS issued a BO on the Long-Term Operation of the CVP and SWP
- The BO includes RPA actions that would allow the CVP and SWP to operate the projects in compliance with the ESA
- RPA Action V includes an evaluation of the potential reintroduction of Federally-listed Chinook salmon and steelhead to historical habitats

# Overview Continued

- **Action V is separated into near-term and long-term actions**
- **The near-term of Action V is to increase the geographic distribution and abundance of listed fish**
- **The near-term actions of Action V includes development of a Shasta Fish Passage Pilot Plan and associated Pilot Studies to determine the feasibility of reintroducing winter-run Chinook salmon above Shasta Dam to historical habitats**
- **This EIS is an effort to analyze and disclose impacts associated with implementing the Shasta Fish Passage Pilot Plan – Pilot Studies**

# EIS Pilot Studies Purpose and Need

## NEED

- Construction of Keswick and Shasta dams limited winter-run Chinook salmon to the mainstem downstream of the dams and has resulted in the decline of coldwater habitat below the dams.
- Projections of further incidences of temperature related impacts and reduction of coldwater habitat is expected to further exacerbate the imperiled status of winter-run and spring-run Chinook salmon.

## PURPOSE

- Evaluate the feasibility of establishing self-sustaining populations of listed anadromous fish above Shasta Lake to make a well-informed decision about initiating a long-term fish passage program

# Meeting Purpose

- **Gather information to support the preparation of an EIS on the implementation of Pilot Studies**
- **Obtain suggestions on the scope of alternatives and issues to be addressed in the EIS**
- **Identify important issues raised by the public related to the development and implementation of the proposed action**

# Environmental Compliance

- **Habitat Assessment – 2014**
  - **Description of habitat availability and conditions**
- **Draft Pilot Implementation Plan - 2016**
  - **Framework and guide for evaluating potential reintroduction**
- **Draft Preliminary EA - 2017**
  - **Analysis of three alternatives**
    - **No Action**
    - **reintroduction in McCloud River and Sacramento River at the same time**
    - **reintroduction in those locations in different years**
- **Preparation of an EIS on implementing Pilot Studies included in the Draft Pilot Plan- 2017**
  - **Initial EA analysis conducted indicated uncertainties associated with the resources analyzed**

# Background

- **Public and Stakeholder Engagement**
- **Action V Near-term Activities**
- **Pilot Plan Studies**

# Participating Agencies

- **Bureau of Reclamation**
- **National Marine Fisheries Service**
- **CA Department of Water Resources**
- **CA Department of Fish and Wildlife**
- **Fish and Wildlife Service**
- **CA State Water Board**
- **US Forest Service**
- **US Geological Survey**

# Public and Stakeholder Engagement

- Public Meetings
- Stakeholder Questionnaire
- Project Update Webinars
- Habitat Assessment Webinar
- McCloud River CRMP
- Siskiyou Co. Board of Supervisors
- CalTrout Water Talk
- Local timber managers
- Winnemem Wintu
- Sweetbriar Cabin Owners
- California Board of Forestry
- Fishing Groups



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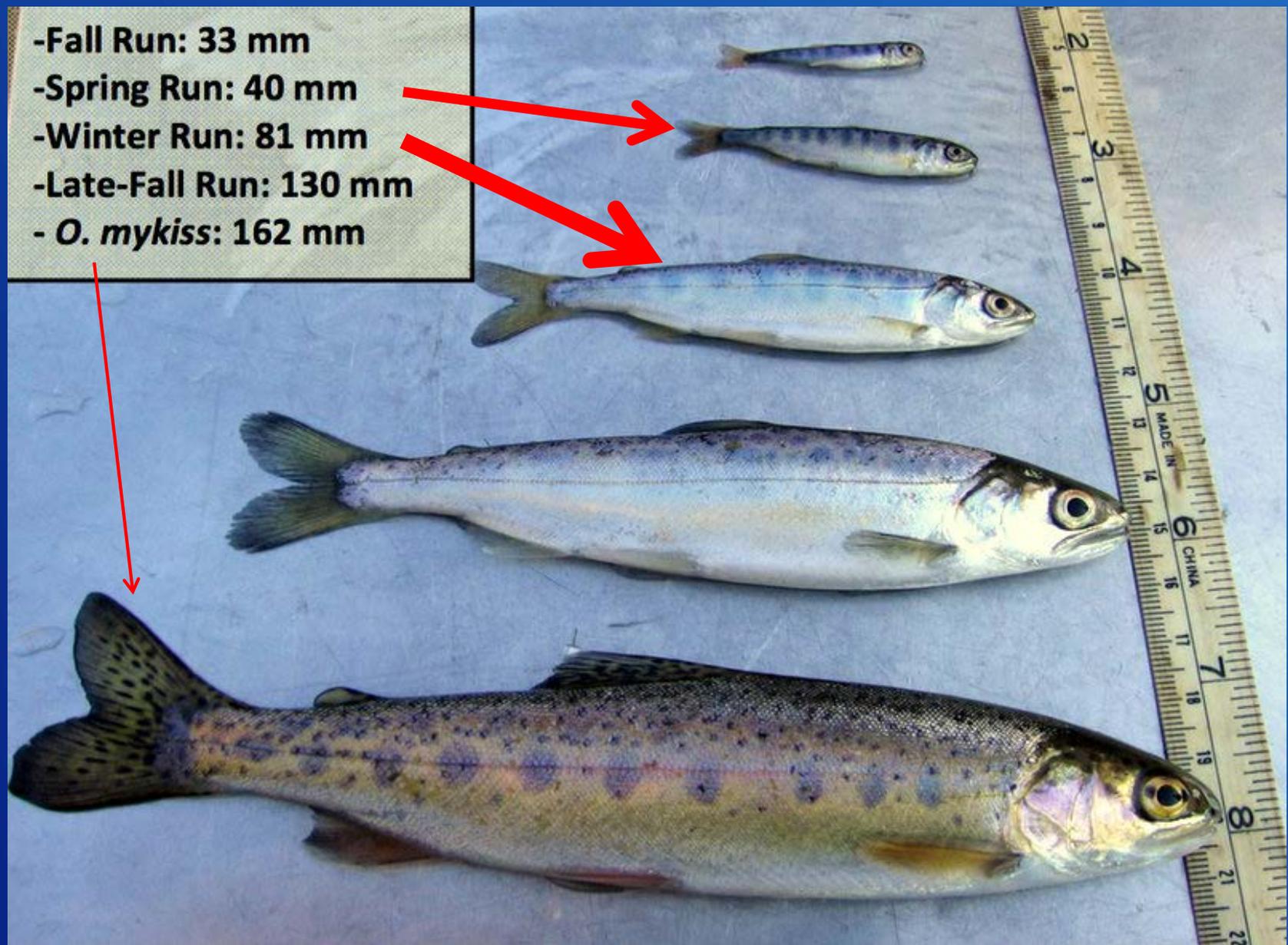
# Near-term Pilot Fish Passage (Action V)

- **Habitat Assessment**
  - Completed August 2014
- **Biological Productivity**
- **Technical Feasibility of Pilot Juvenile Collectors**
  - Head of Reservoir
  - In-River
- **Feasibility Determination**



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- Fall Run: 33 mm
- Spring Run: 40 mm
- Winter Run: 81 mm
- Late-Fall Run: 130 mm
- *O. mykiss*: 162 mm



USFWS Photo

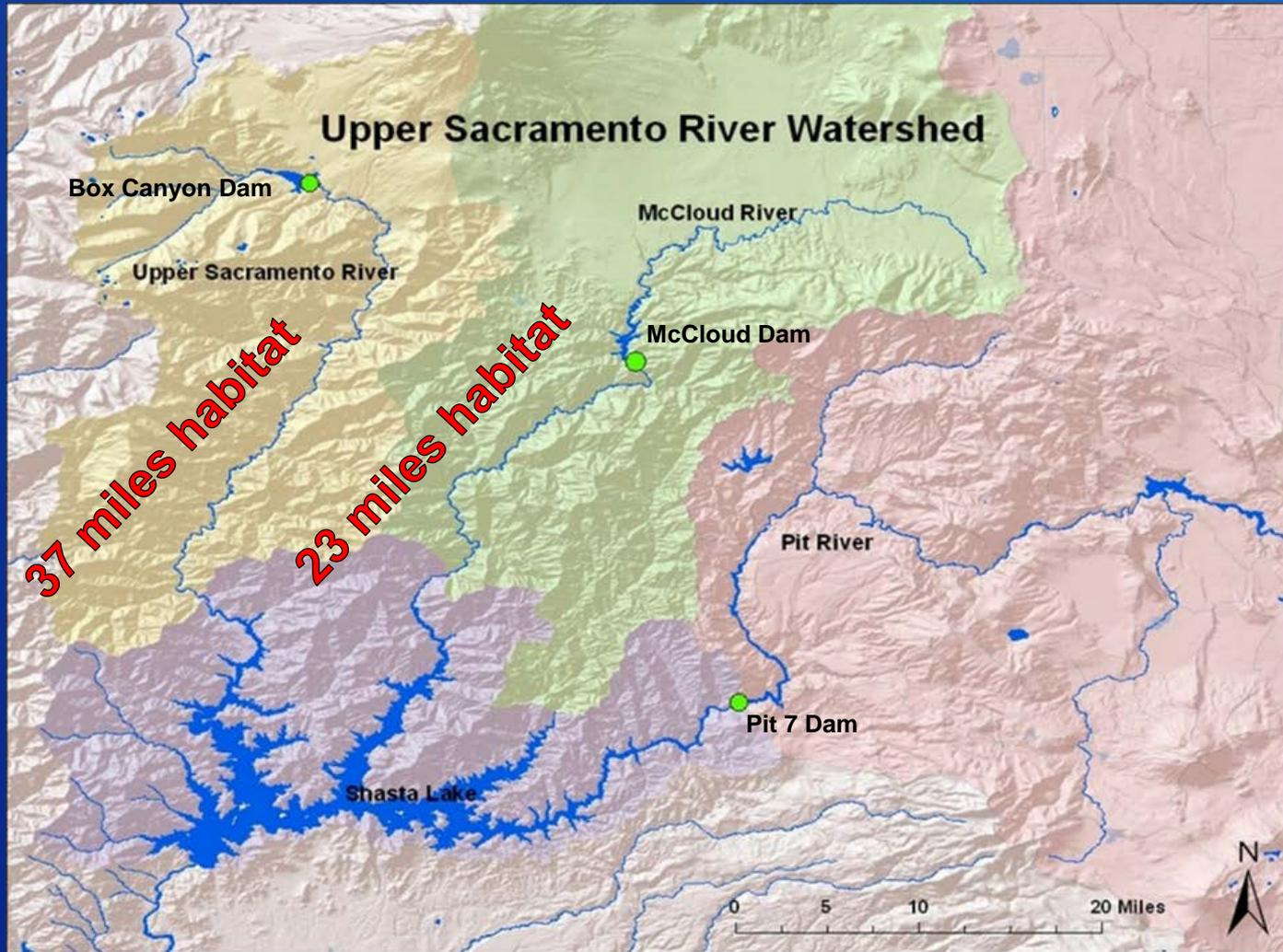
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# Springs provide year round cold water needed by salmon



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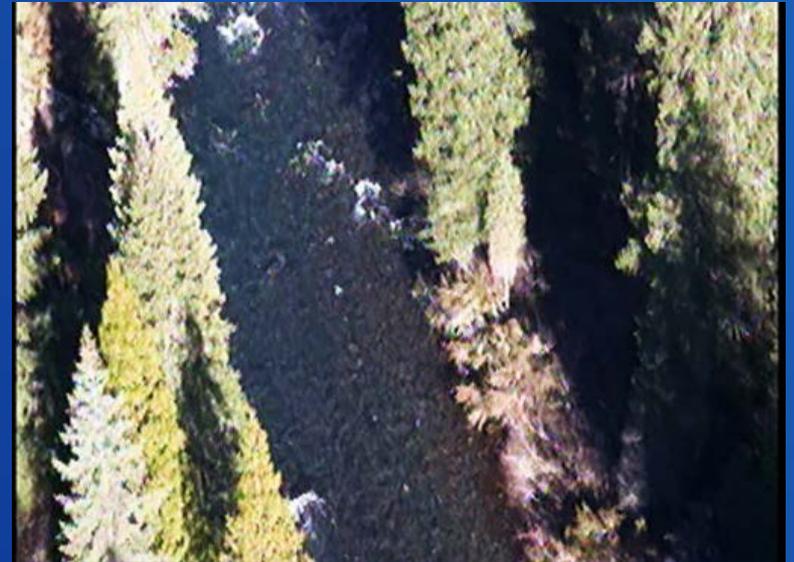
# Upper Sacramento River Watershed



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# Habitat Assessment

- Inform locations to focus initial pilot studies
- **Estimated**
  - Spawner Capacity
  - Rearing Habitat Quality



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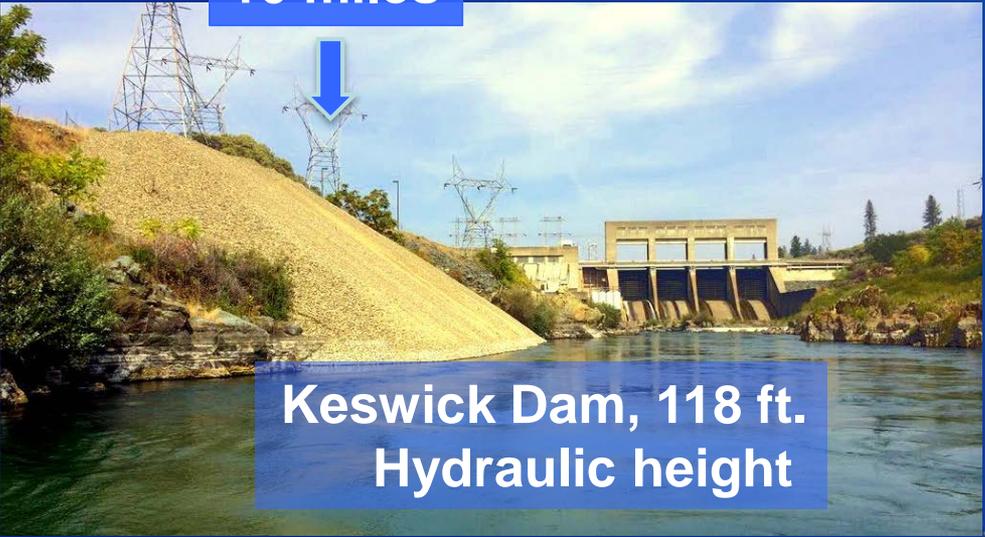
**Shasta Dam, 523 ft.  
Hydraulic height**

**Hatchery**

**10 miles**

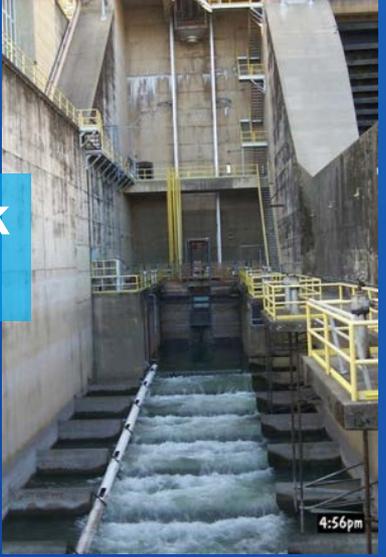


**Shasta Temperature  
Control Device**



**Keswick Dam, 118 ft.  
Hydraulic height**

**Keswick  
Trap**

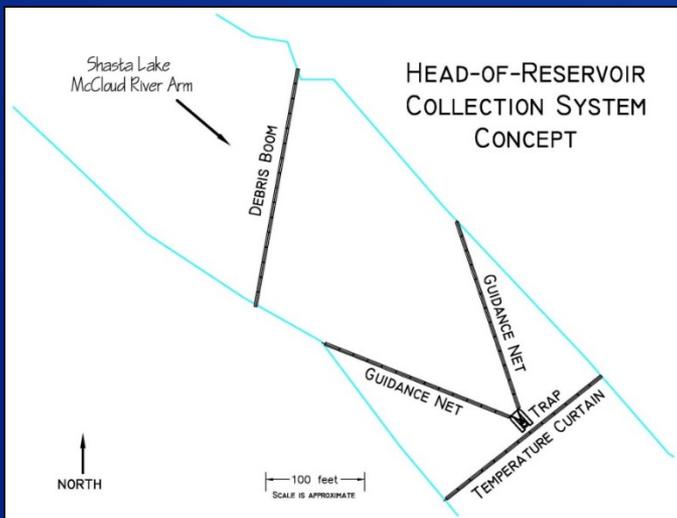


# Pilot Plan - Year 1: Fry/Juveniles



## Key questions focused on:

- Migration within lake
- Survival rates
- Juvenile collection efficiency
- Collection location and method
- Transport method/release location
- Timing of migration
- Size and distribution (growth rates)
- Differences in productivity between the tributaries
- Competition/predation with trout



# Juvenile/Fry Introduction



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# Year 2: Fry/Juveniles and Instream/ Streamside Egg Incubation

## Questions from Year 1 plus:

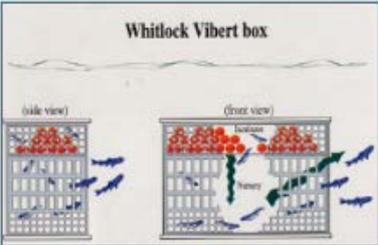
- Survival of swim-up fry to emigrant reaching lake
- Method for egg transplant
- Location for egg incubation/planting



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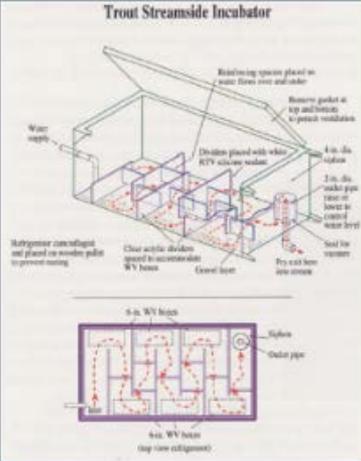
# Egg Introduction

**Whitlock Vibert box**



Eggs are placed in top of the Whitlock-Vibert boxes

**Trout Streamside Incubator**

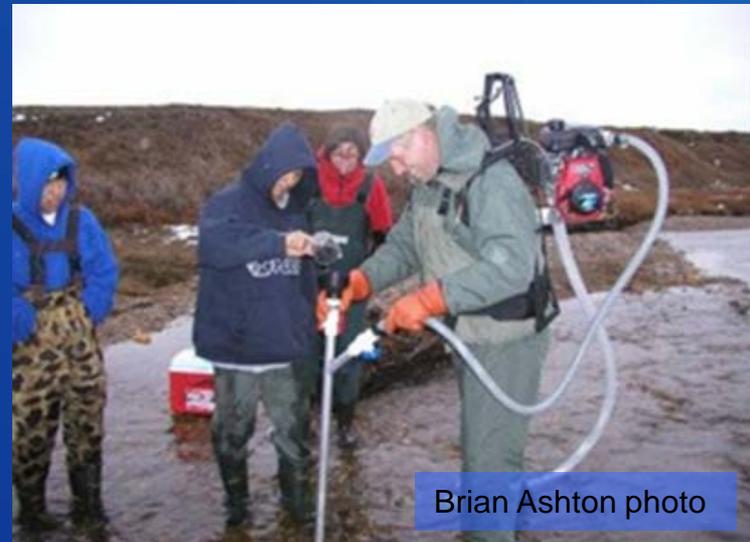


Schematic of the Fridge Streamside Incubator



Eggs are placed in the top compartment

Boxes with eggs are placed within the fridge's 'channels'



Brian Ashton photo

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# Year 3: Fry/Juveniles, Instream/ Streamside Egg Incubation, and Adults

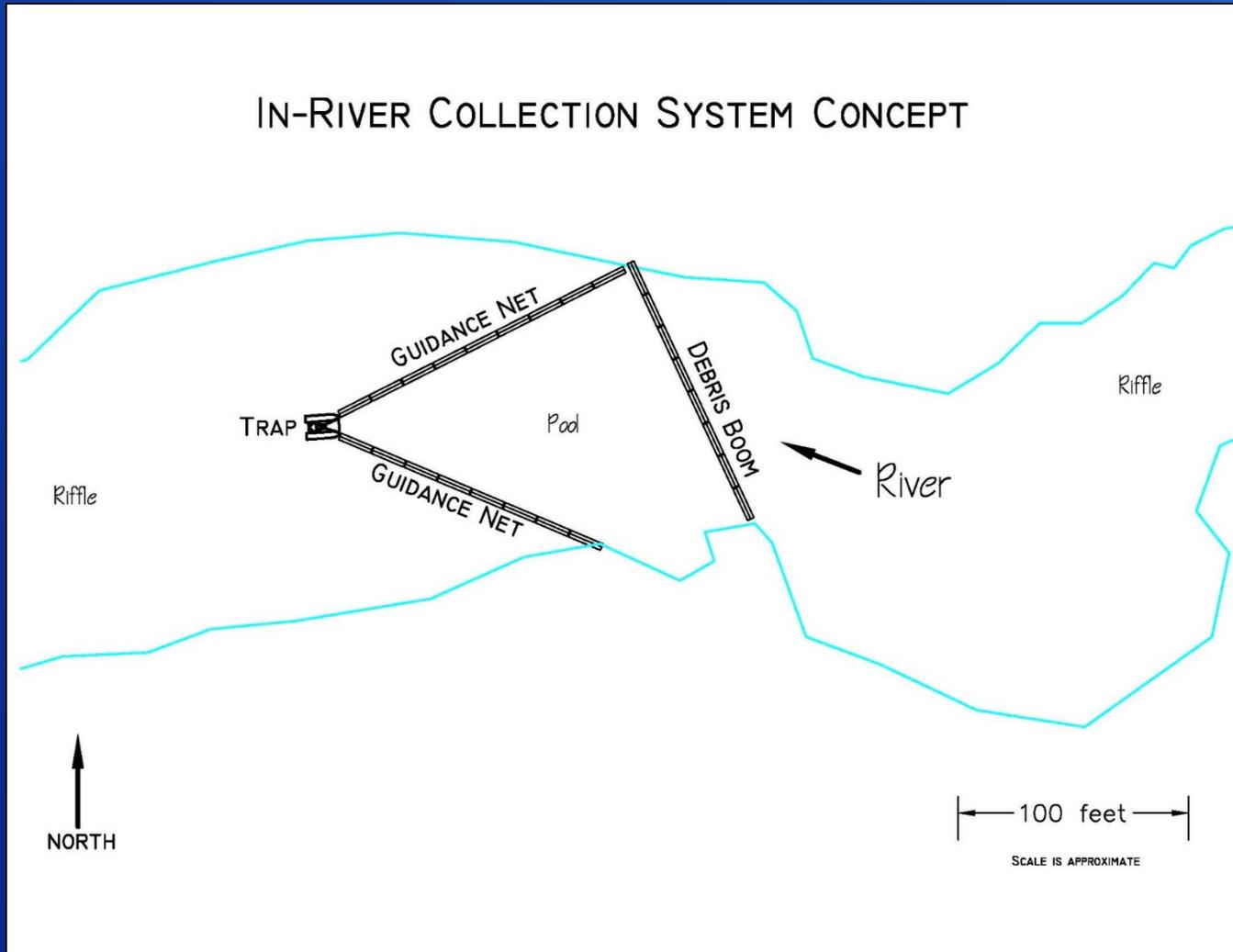


## Questions from Y1 and Y2 plus:

- Prespawn mortality rates
- Release location
- Juveniles reaching lake per adult female
- Sufficient holding and spawning habitat
- Distribution of holding and spawning adults

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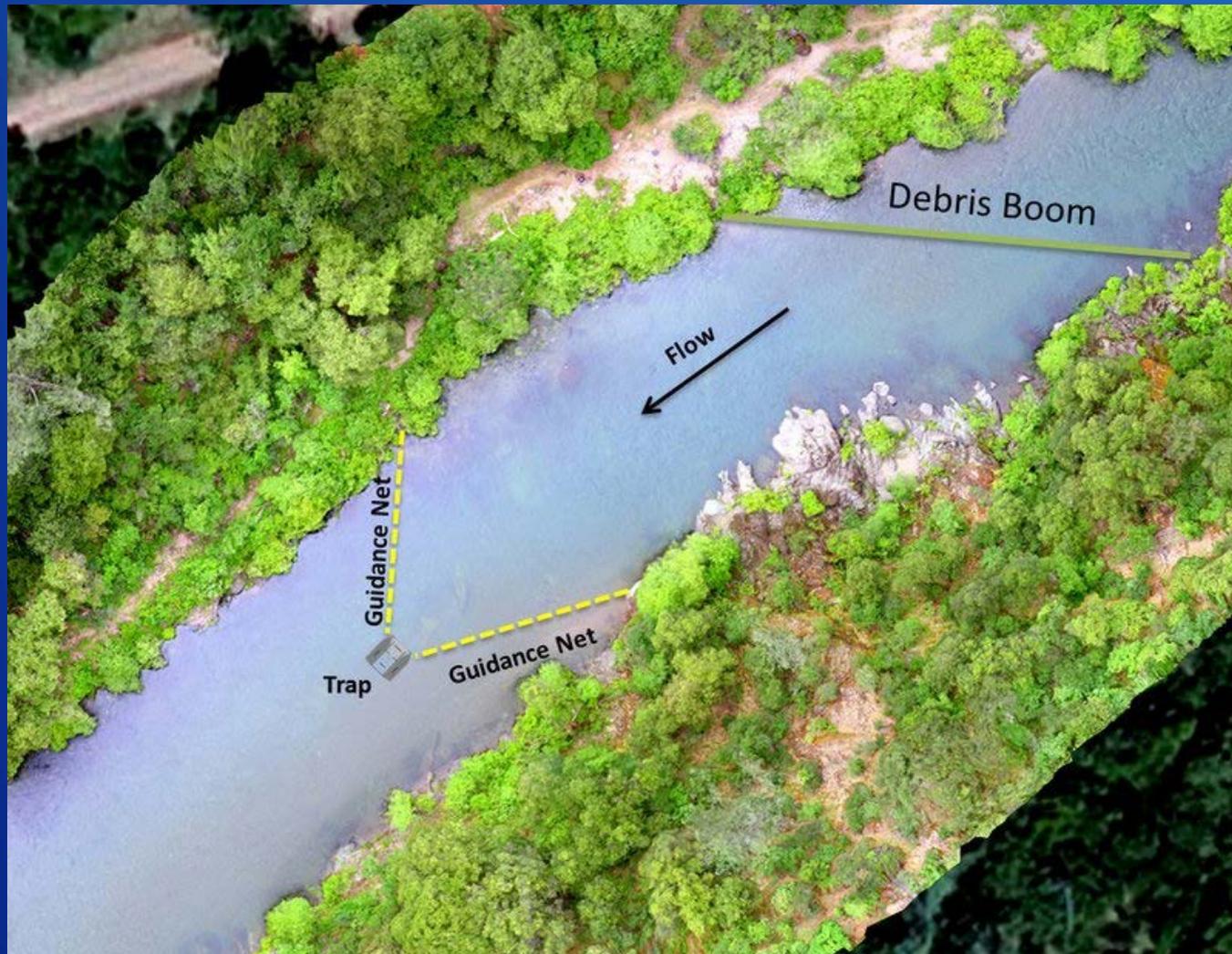
# In-River Juvenile Collection System



Randy Beckwith, DWR

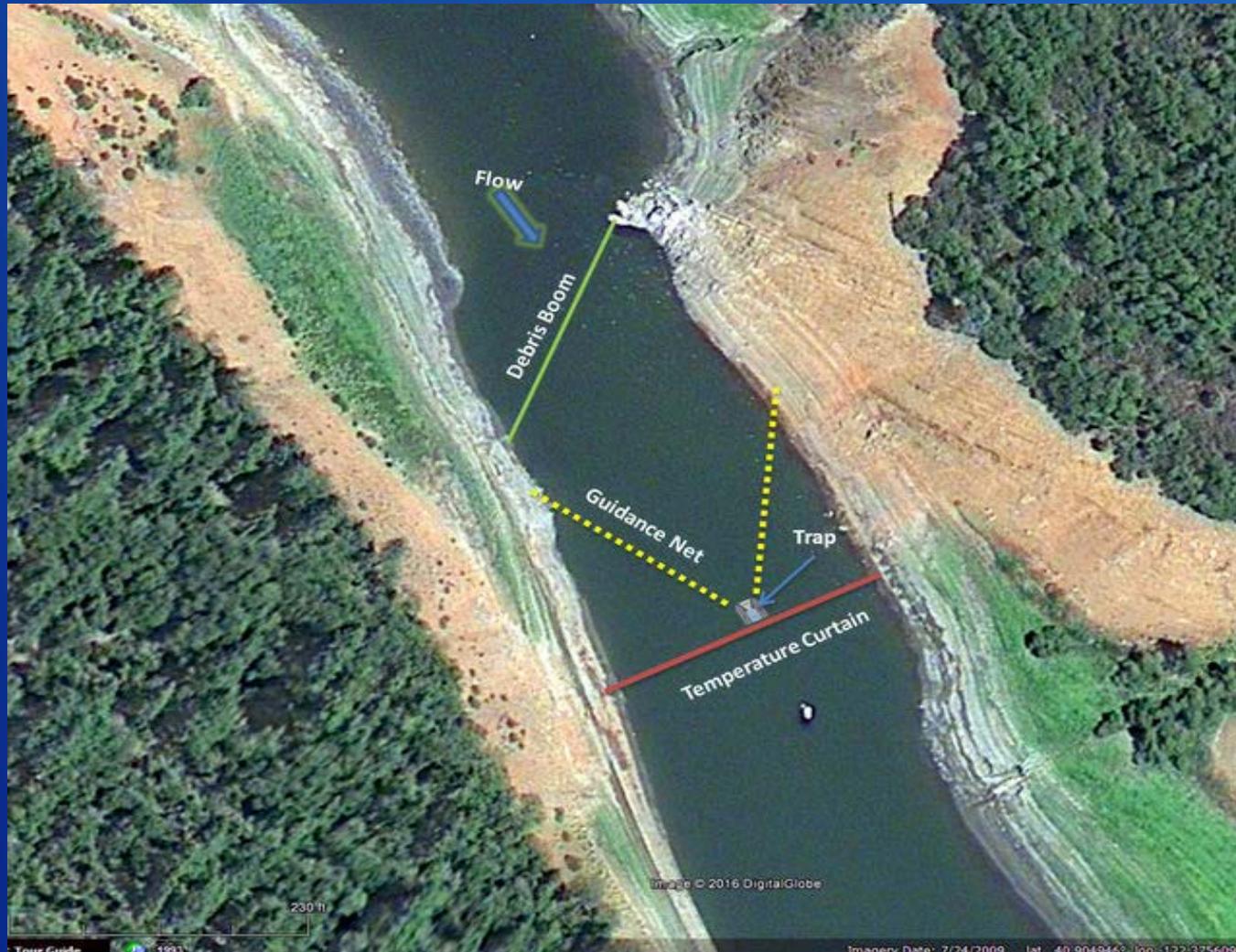
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# In-River Juvenile Collection System



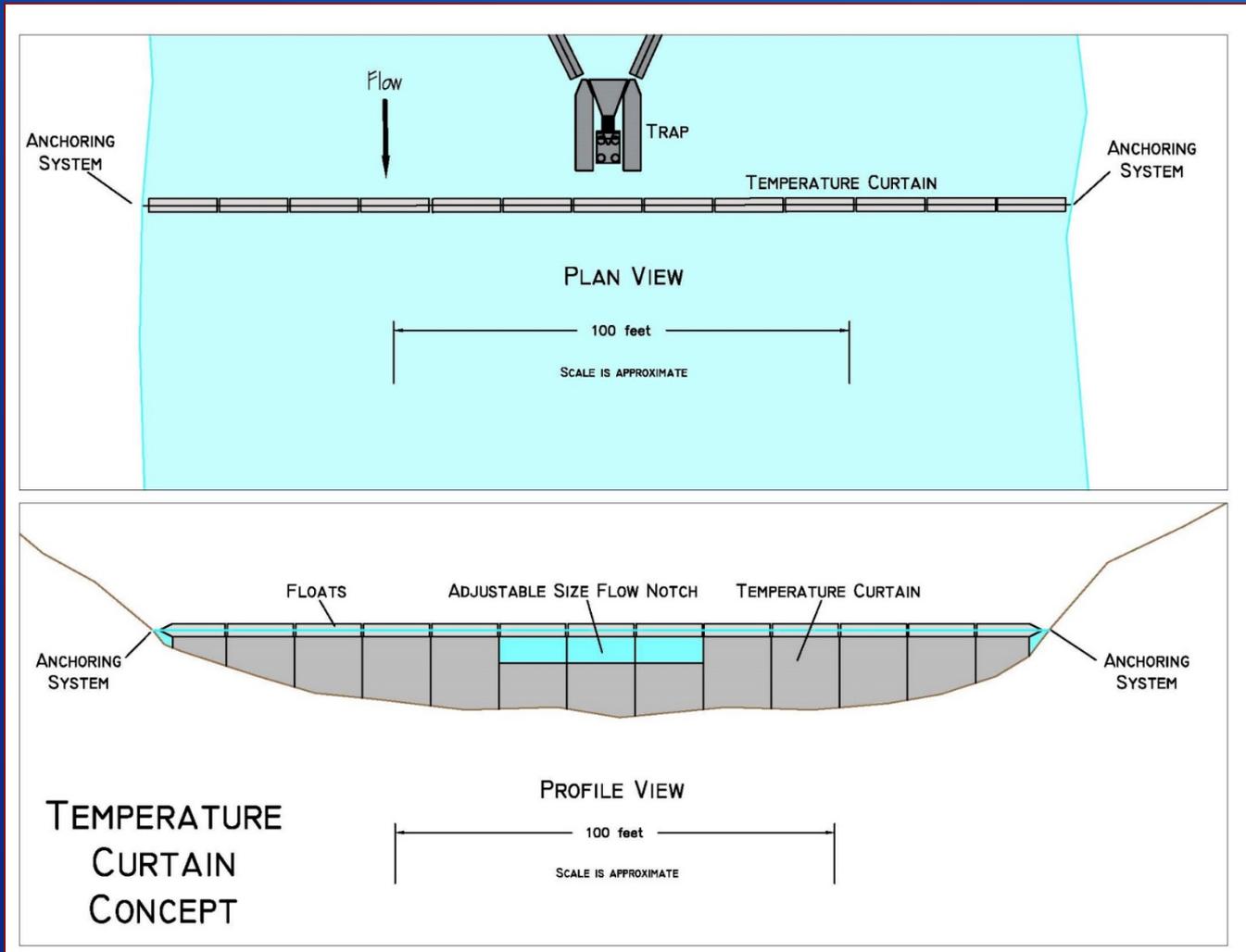
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# Head of Reservoir Juvenile Collection



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# Temperature Curtain Concept



**NMFS ESA 10(j)**

**Experimental Population**

**RECLAMATION**

# ESA Section 10(j) – Experimental Population

- Allows for reintroductions of Threatened & Endangered (T&E) species as “experimental populations” into suitable habitat outside the species current natural range but within probable historic range
- Primary purpose is to promote recovery of T&E species in the face of regulatory concern
- 10(j) actions must:
  - further the conservation of species
  - be determined “essential” or “nonessential”
  - be wholly separate from non-10(j) populations.

# Environmental Compliance

## ESA Section 10(j)

- **Draft EA – Winter 2017**
  - Will include Sacramento winter-run Chinook and Central Valley spring-run Chinook
- **Draft 10(j) rule**
  - The rule is proposed to remain until species are delisted
- **Draft 4(d) rule**
  - Allows regulatory flexibility

# Cultural Resources

**Cultural Resources:** *Prehistoric and historical sites, buildings, structures, objects, districts, cultural landscapes, sacred sites, and traditional cultural properties.*

# Cultural Resources

- **Archaeological Sites**  
Generally Native American
- **Historical Sites**  
Generally post-dating Euro-American arrival to the region
- **Traditional Cultural Properties (TCPs)**  
Places rooted in a community's history and important in maintaining cultural continuity



Houses, drying racks; McCloud River, Shasta Co.; July 1903

Courtesy of UC Berkeley, Bancroft Library  
<http://www.oac.cdlib.org/ark:/13030/tf3199p2c2/?order=1>

# Cultural Resources Compliance

## National Historic Preservation Act Section 106 (Title 54 U.S.C. §306108)

- Federal agencies must take into account the effect of an undertaking on any historic property, in consultation with interested parties.
- Historic Property: a cultural resource that is eligible for listing or listed on the National Register of Historic Places. Resource meets significance criteria at 36 CFR §60.4.



View on the Sacramento river. 1882

Courtesy of UC Berkeley, Bancroft Library  
<http://www.oac.cdlib.org/ark:/13030/tf3199p2c2/?order=1>

# Project Timeline

- Public Scoping Meetings Summer 2017
- Scoping Report August 2017
- Public Draft EIS Winter 2017
- Final EIS Early Spring 2018
- Record of Decision Late Spring 2018
- 10(j) Designation Late Spring 2018
- Permitting 2017-2018
- Pilot Studies Initiated 2018
- Monitoring Studies 2018
- Fish Passage Report 2021

# For Additional Information

- **Program website:**  
[http://www.usbr.gov/mp/BayDeltaOffice/Documents/Shasta\\_Fish\\_Passage/index.html](http://www.usbr.gov/mp/BayDeltaOffice/Documents/Shasta_Fish_Passage/index.html)
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