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Managing Water in the West

Welcome

Public Scoping Meeting

and Open House

for the

Long-Term Plan for Protecting

Late Summer Adult Salmon in the

Lower Klamath River

Purpose

- **Solicit early input from the public regarding the development of alternatives for the long-term plan and environmental impact statement**
- **Things to Consider:**
  - **Are there any impacts or resources that we need to be aware of?**
  - **What alternatives or mitigation measure do you think would help to lessen or avoid impacts?**
  - **Can you recommend any additional sources of information?**
  - **Are there other individuals or organizations that we should be working with?**
- ***This Plan is separate from the Environmental Assessment currently underway for a potential flow augmentation action for 2015.***

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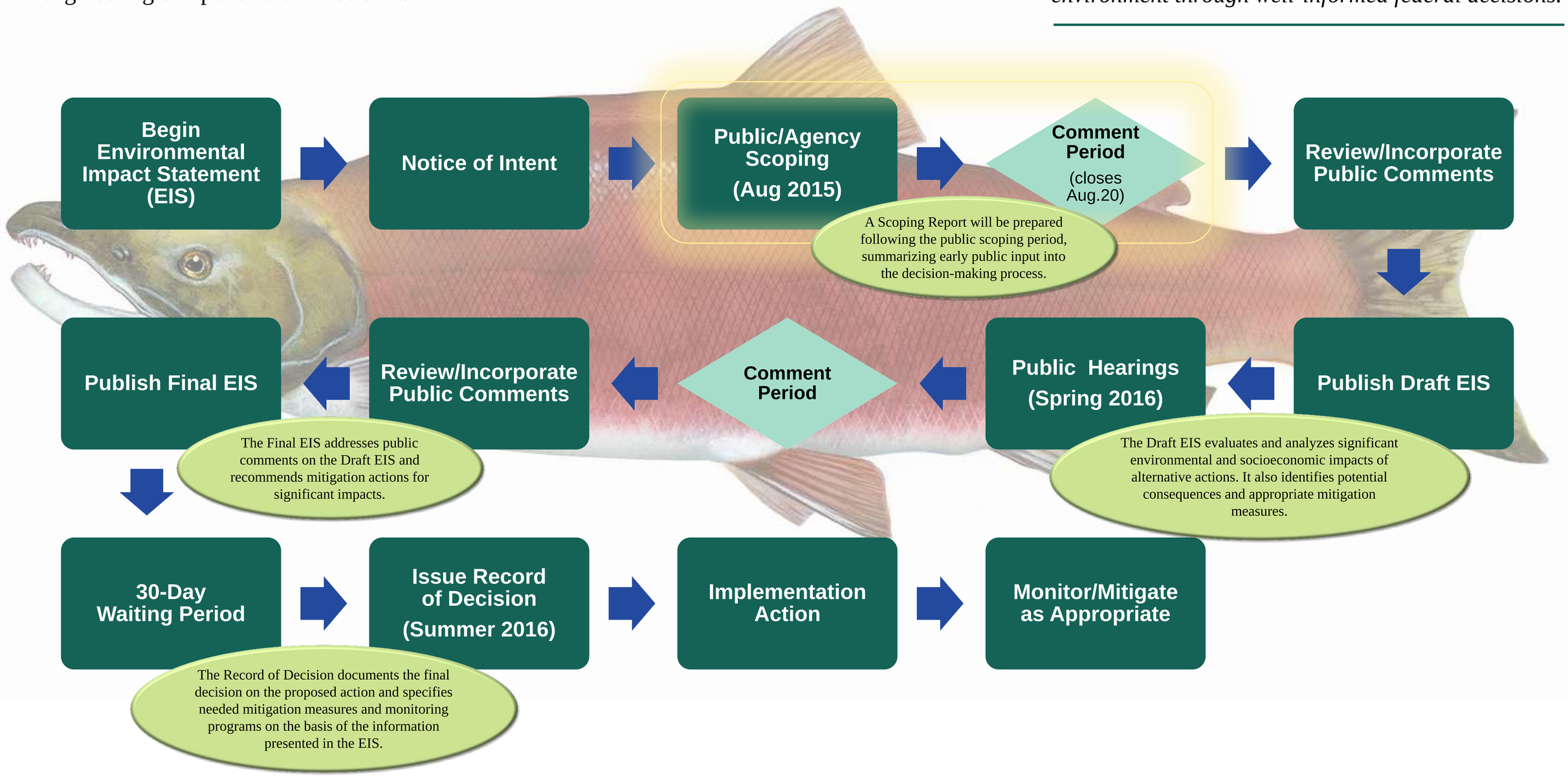
The National Environmental Policy Act

The National Environmental Policy Act (NEPA) requires the identification and analysis of potential environmental effects of major proposed federal actions and alternatives before those actions take place, and ensures that environmental factors are considered equally with the technical and engineering components of a decision.

Public involvement is integral to the federal decision-making process, and is required by NEPA. The Act's intent is to protect, restore, or enhance the environment through well-informed federal decisions.



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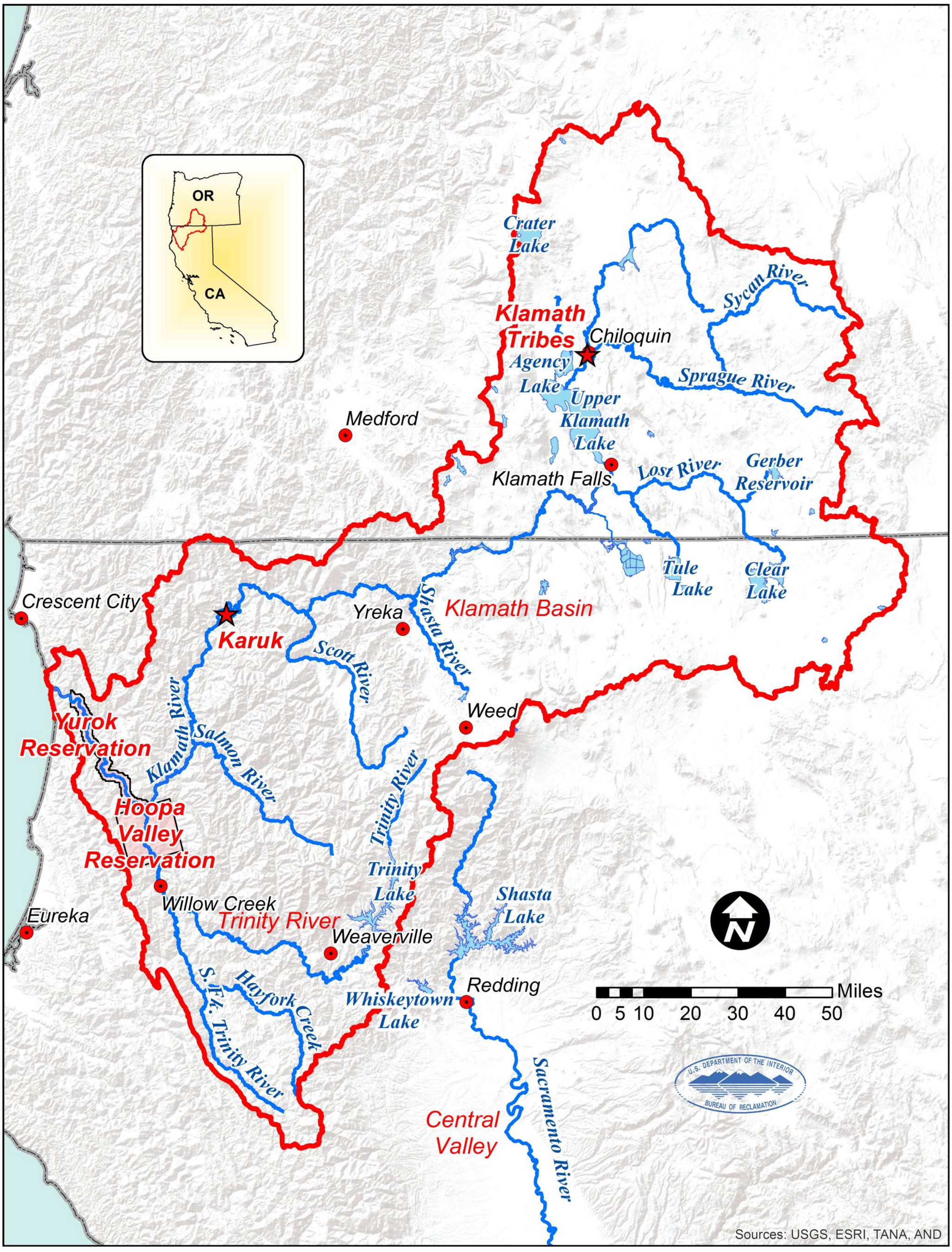
Klamath River Basin



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Klamath River
Flow Augmentation Timeline

1955
Congress authorizes Trinity River Division of Central Valley Project

1963
Trinity/Lewiston Dams completed

1981
Sec. of Interior increases flows/ initiates Trinity River Flow Study

1984
Congress enacts Trinity River Fish & Wildlife Mgmt. Act to implement salmon restoration

1992
Congress enacts Central Valley Project Improvement Act, making 340,000 AF available to Trinity River

1999
Trinity River Flow Evaluation Study completed, used as Preferred Alternative in the EIS/EIR

2000
Record of Decision signed

Sep. 2002
Approx. 34,000 salmonids die off over 2-week span

2003 Klamath River post-run estimate: 192,000 adults

2004 Klamath River post-run estimate: >79,000 adults

2008 Klamath River post-run estimate: 70,698 adults

2009 Klamath River post-run estimate: 100,644 adults

March 2012
PFMC run projection: 384,000 adults

Dry hydrologic conditions lead to low Klamath River accretion forecasts prompting concerns of disease outbreak

May 31, 2012
TMC recommends:
- Klamath River flows augmented to 3,200 cfs Aug 15-Sep 21
- Enhanced fish monitoring

Aug 10, 2012
Reclamation signs FONSI for release of up to 44,800 AF for emergency purposes

2012 Klamath River Post-run estimate: 292,000 adults. No substantial disease outbreak

March 2013
PFMC run projection: 272,000 adults

NOAA forecasts very low flow accretions in August & September

May 2013
Suggested alternatives fail to pass. Following input from basin partners, decision to augment flows to 2,800 cfs Aug 15-Sep 1

Aug 6, 2013
NCAO signs FONSI for release of up to 62,000 AF from Trinity Reservoir for preventative purposes

2013 Klamath River post-run estimate: 165,100 adults. No substantial disease outbreak

August 12, 2013 Joint Memorandum (NOAA Fisheries/U.S. Fish & Wildlife Service):

Preventative Flow Augmentation
- Initiate preventative flow augmentation in lower Klamath River to min. 2,800 cfs when cumulative Chinook harvest in Yurok Tribal fishery in the estuary area meets or exceeds 7,000 fish.
- Initiate preventative flow augmentation by Aug 22 if fish metric not triggered.
- Continue augmentation until Sep 21 unless mean daily water temp. in lower Klamath River is projected to be greater than or equal to 23º C, in which case continue until temp is projected to be less than 23º C.
- Implement real-time flow-temp management using existing water temp models.
- Implement fish pathology monitoring to determine the need for a fish pathology/mortality emergency release.
- Monitor conditions to inform need and timing of emergency flow releases based on real-time environmental conditions.

Emergency Flow Augmentation
- If diagnosis of severe *Ich* infection of gills in 5% or greater of a desired sample of 60 adult salmonids, or
- Observed mortality of greater than 50 dead adult salmonids in a 20-kilometer reach in 24 hours combined with a confirmed presence of *Ich*, then
- Immediately double pre-existing flows in the lower Klamath River for a period of 7 days.

March 2014
PFMC run projection: 92,800 adults

NOAA forecasts very low flow accretions in August & September

June 20, 2014
Hoopa Valley Tribe issues letter to Sec. of Interior urging flows be augmented

Yurok Tribe, PFMC, and other entities formally request that Reclamation augment flows

Reclamation receives letters from Central Valley Project water and power users questioning the biological basis for augmented flows and expressing concern about impact to water supplies and power generation

July 29, 2014
Reclamation announces it will not provide augmentation flows on preventative basis, but will implement fish pathology/mortality component of the emergency fall flow release recommendation, as described in 2013 Joint Memorandum

August 2014
Hydrologic conditions and observed fish health worsens; Fish Health Assessment Team reports a significant fish die-off likely imminent

Reclamation determines an emergency release from Trinity Reservoir necessary; announces increased releases to achieve flow rate of ~2,500 cfs in lower Klamath River

September 15, 2014
Fish Health Center confirms presence of Ich parasites. Reclamation increases releases from Lewiston Dam to ~3,400 cfs in lower Klamath River

Formal post-season fishery reviews not yet available; anecdotal reports indicate that fish health did not decline following flow doubling

2014 Klamath River Post-run estimate: 160,000 adults; documented reports of severely infected fish but no significant die-off

2015
NEPA Environmental Assessment for potential flow augmentation action for fall 2015

2015
NEPA EIS for Long-Term Plan to protect the returning adult salmon population in the lower Klamath River

1955-2001 | **2002-2011** | **2012** | **2013** | **2014** | **2015**

2003
38,000 AF released

2004
36,313 AF released

2012
39,000 AF released

2013
17,500 AF released

2014
64,000 AF released

Acronyms/abbreviations

AF	acre-feet
cfs	cubic feet per second
EIS	Environmental Impact Statement
EIR	Environmental Impact Report
FONSI	Finding Of No Significant Impact
Ich	*Ichthyophthirius multifilis*
NCAO	Northern California Area Office of the Bureau of Reclamation
NEPA	The National Environmental Policy Act
NOAA	National Oceanic and Atmospheric Administration
PFMC	Pacific Fishery Management Council
TMC	Trinity Management Council

Agency Actions
Fish Statistics
Water Releases
Joint Memorandum

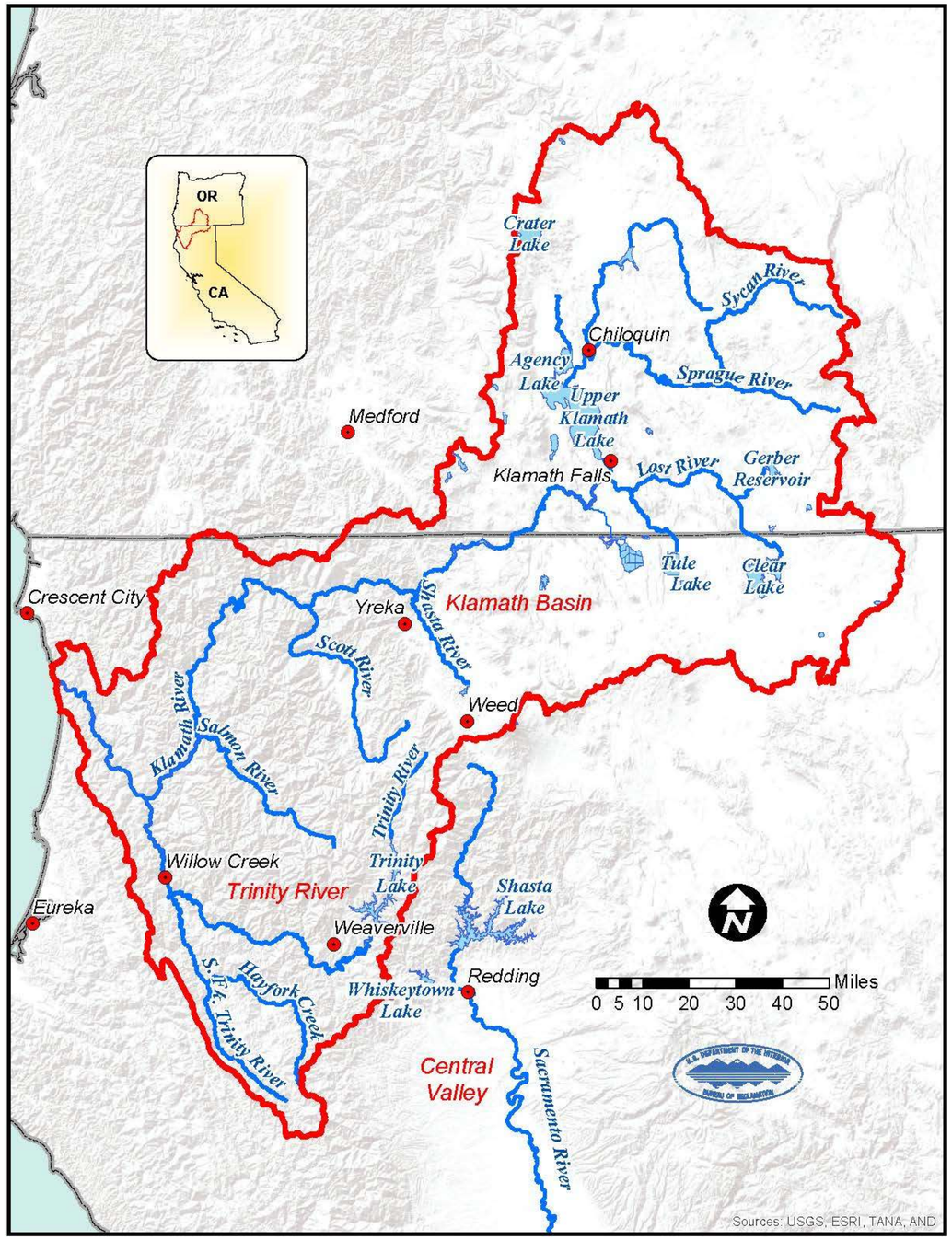
Hydrology
Klamath River Basin

Trinity River and Lower Klamath River

Hydrology of the Klamath River Basin is derived from controlled sources, including Iron Gate Dam on the Klamath River and Lewiston Dam on the Trinity River.

Releases from deep portions of the reservoir ensure release of suitably cold water throughout the year in support of Trinity River Restoration Program goals.

Water was released from the Trinity Reservoir to augment flows in the lower Klamath River in 2003, 2004, 2012, 2013, and 2014 when risk of a potential die-off of adult salmon could occur during late summer. Supplemental flows used during these years were preventative or emergency scheduled quantities that ranged up to 80,000 acre-feet.

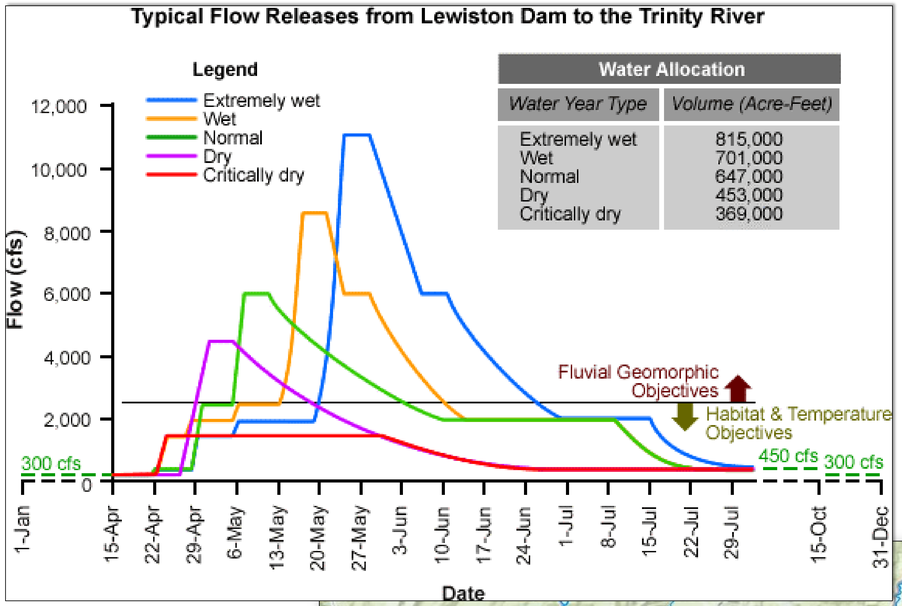


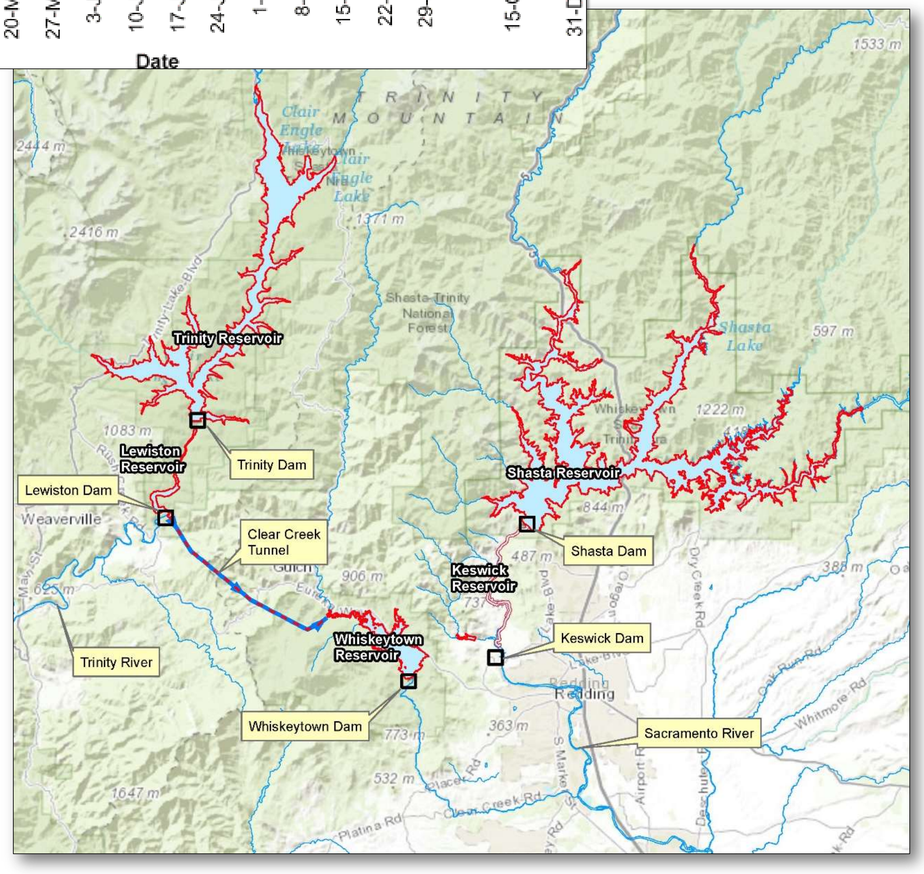
Hydrology
Trinity River Basin

Trinity Reservoir is the primary water storage facility in the Trinity River Division of the Central Valley Project. At capacity, it stores 2.448 million acre-feet, and receives an average annual inflow volume of approximately 1.2 million acre-feet. Water released from Trinity Reservoir flows to Lewiston Reservoir, a re-regulating reservoir formed by Lewiston Dam. From Lewiston Reservoir, water can be diverted for use in the Sacramento River Basin via the Clear Creek Tunnel, or pass through Lewiston Dam to flow 112 miles to the Klamath River, which then flows approximately 43 miles before entering the Pacific Ocean. The Trinity River Hatchery, located at the base of Lewiston Dam, also diverts a small quantity of water in support of fish hatchery operations.

Hydropower Generation

The Trinity River Division has the capacity to generate substantial hydroelectric power per acre foot of water diverted because the elevational difference between Trinity and Keswick Reservoirs provides the gravitational flow to generate hydropower at a higher than average rate. In addition to generating power at Trinity and Lewiston Dams in the Trinity Basin, hydropower is also generated at Judge Francis Carr and Spring Creek Powerplants, then at Keswick Powerplant (part of the Sacramento River Division). In total, operations of the Trinity River Division alone can account for as much as 30 percent of the total power generation capability of the Central Valley Project.





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Hydrology
Central Valley

In addition to generating hydropower at several power plants, Trinity Reservoir water released from Keswick Dam is used to support the environmental, irrigation, and municipal and industrial needs of the Sacramento River Valley, extending through the Sacramento – San Joaquin Delta. Relative to environmental conditions, the cold water that is diverted via the Clear Creek Tunnel is important for meeting the water temperature requirements in Clear Creek, assisting in meeting the water temperature requirements in the mainstem Sacramento River below Keswick Dam, and managing the cold water pool behind Shasta Dam. The period of greatest temperature reduction need in the Sacramento River Basin occurs during the warmer months when irrigation, municipal, and industrial demands are highest and water temperature concerns of the mainstem Sacramento River exist for several fish species listed under the Endangered Species Act.

Management of the river includes a variable flow regime based on five water year types ranging from critically dry to extremely wet to mimic more natural spring peak flows.

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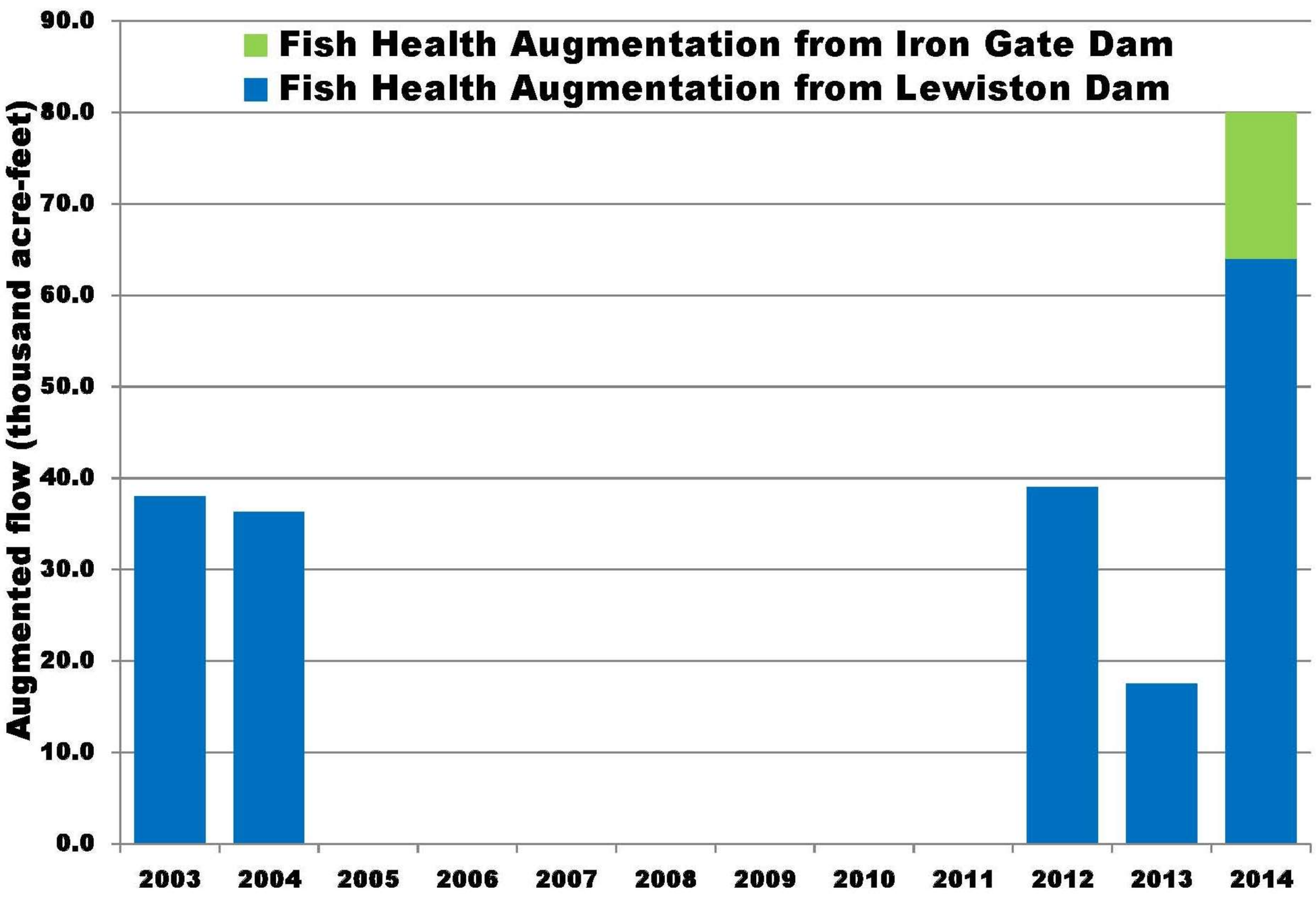
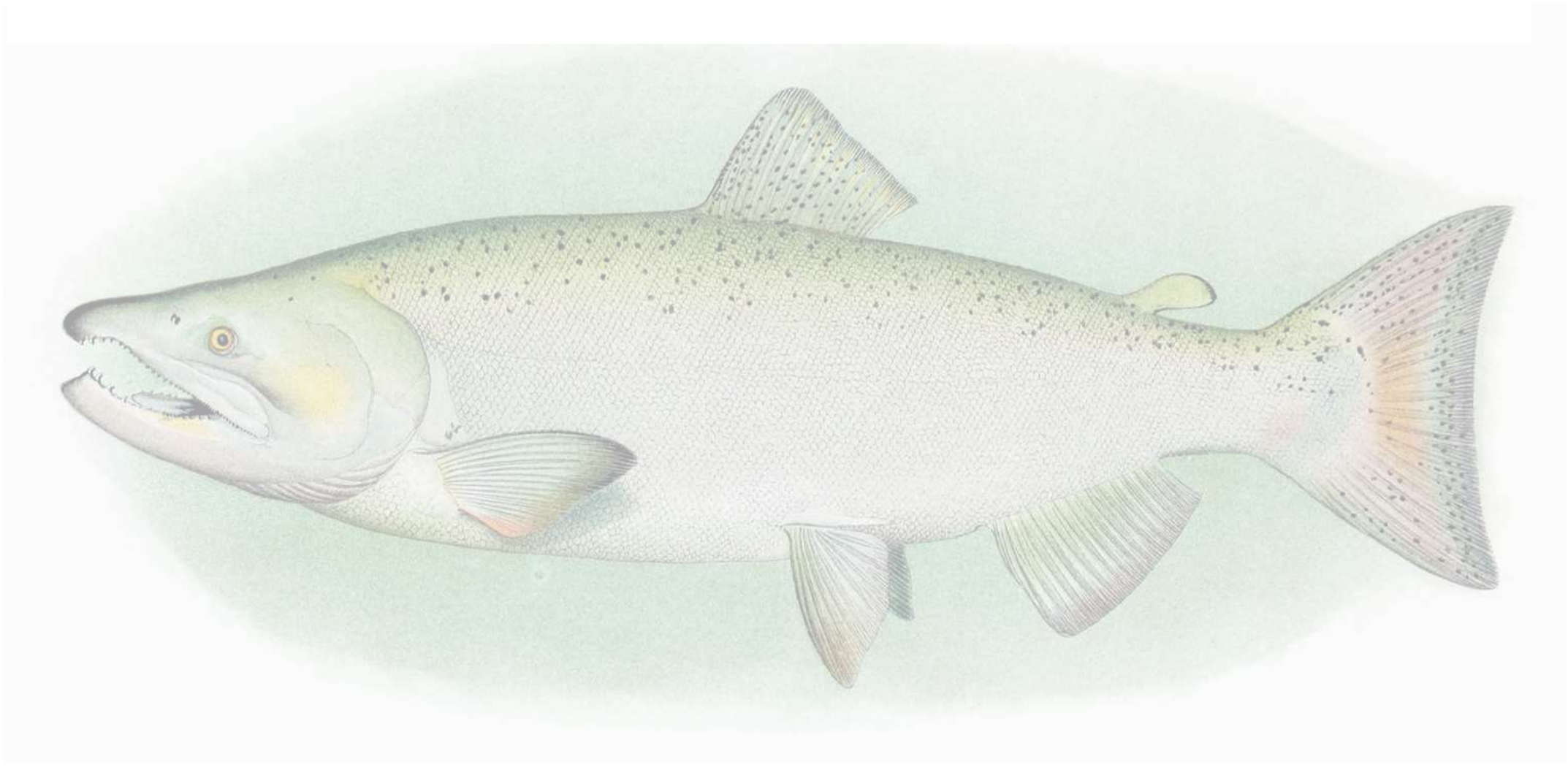
Years of Flow Augmentation to Avert Fish Die-Off





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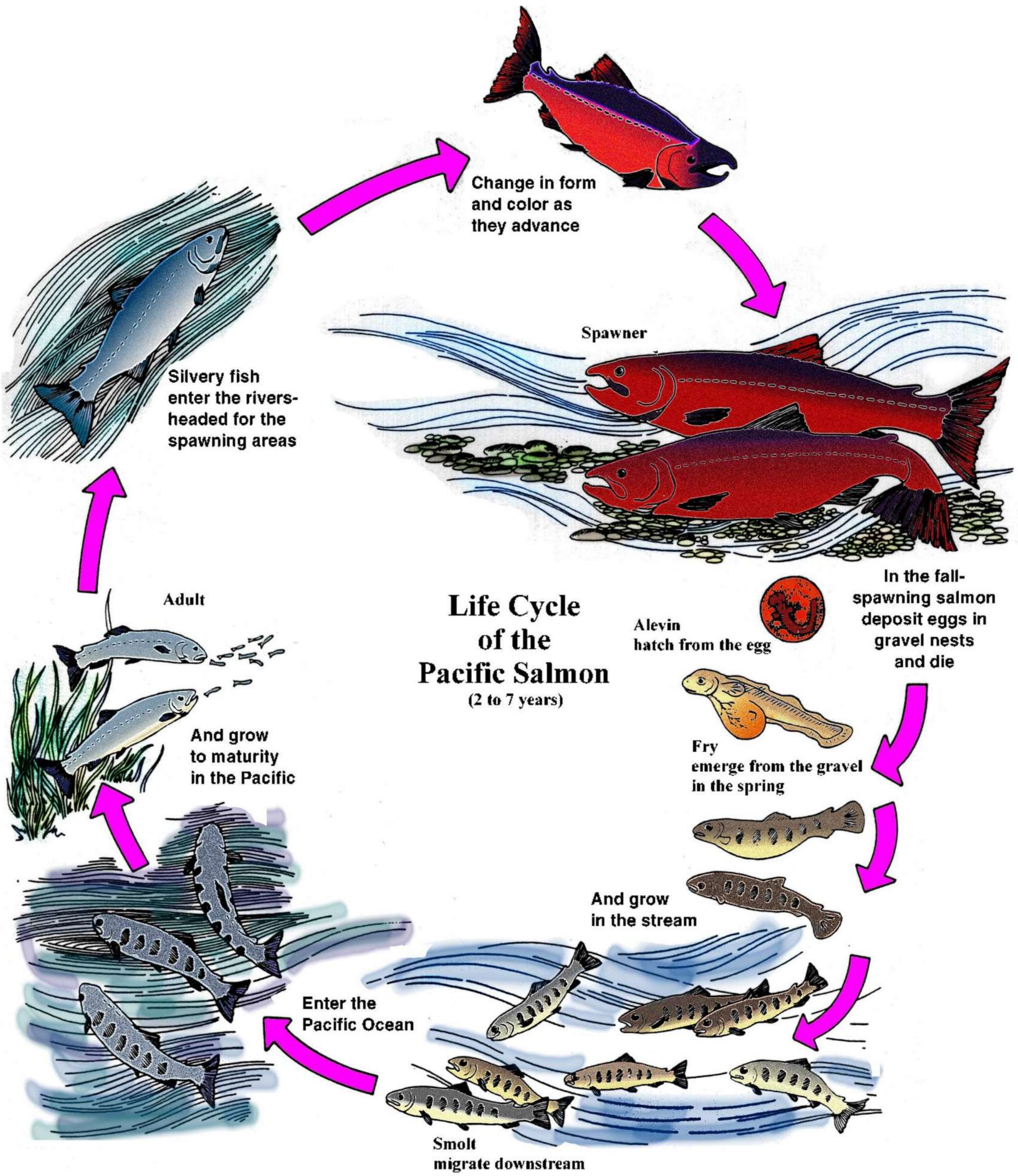
Life Cycle of the Pacific Salmon



Length of life cycle varies with species and conditions

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Biology

Life-history timing of anadromous fish in the Klamath River Basin downstream

Peak activity indicated by black (Stillwater Sciences, 2009).

Spring-run Chinook salmon

Life Stage	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Type I												
Incubation												
Emergence												
Rearing												
Juvenile outmigration												
Adult migration in mainstem 1												
Adult entrance into tributaries												
Spawning												
Type II												
Rearing												
Juvenile outmigration												
Type III												
Rearing												
Juvenile outmigration												

Fall-run Chinook salmon

Life Stage	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Type I												
Incubation												
Emergence												
Rearing												
Juvenile outmigration												
Adult migration												
Spawning												
Type II												
Rearing												
Juvenile outmigration												
Type III												
Rearing												
Juvenile outmigration												

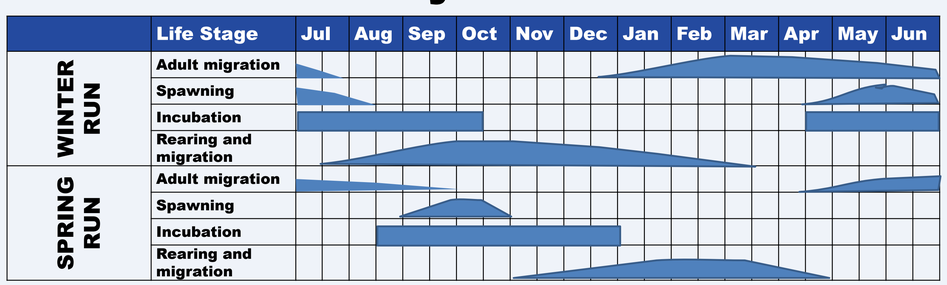
Coho salmon

Life Stage	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Incubation												
Emergence												
Rearing												
Juvenile redistribution												
Juvenile outmigration												
Adult migration												
Spawning												

Green sturgeon

Life Stage	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Incubation/ emergence												
Rearing												
Juvenile outmigration												
Adult migration												
Spawning												
Post-spawning adult holding												

Sacramento Basin Central Valley Chinook salmon



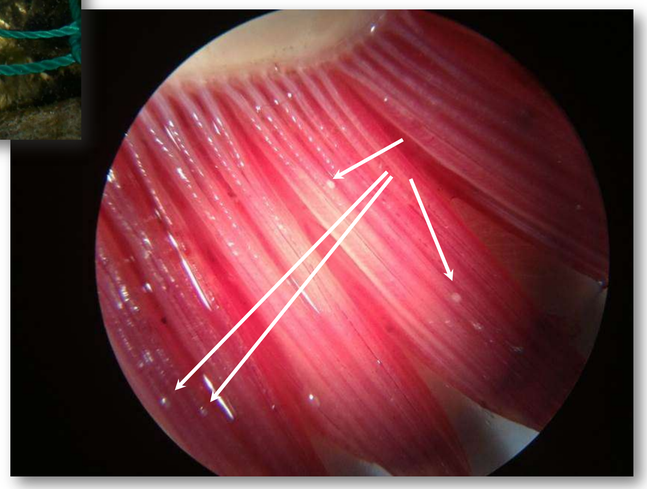
Denotes presence and relative magnitude

Denotes only presence

Biology: 2002 Die-Off

In September 2002, a substantial number of returning adult fall-run Chinook salmon died prematurely in the lower Klamath River. Biologists studying the die-off concluded that:

- Pathogens *Ichthyophthirius multifiliis* (*Ich*) and *Flavobacterium columnare* (*Columnaris*) were the primary causes of death to fish
- Warm water temperatures, low water velocities and volumes, high fish density, and long fish residence times likely contributed to the disease outbreaks and subsequent mortalities
- During the first half of August 2002, flows in the lower Klamath River were approximately 2,500 cubic feet per second (cfs), decreasing to approximately 2,000 cfs by September
- Approximately 33,000 Chinook salmon, 630 steelhead, and 345 Coho salmon perished



Left: *Columnaris* and *Ich* infected steelhead

Below: *Ich* on Chinook salmon gill from Klamath River, 2014. Arrows point toward individual *Ich* organisms. Approx. size of *Ich* organisms is 0.5 mm (visible to the naked eye).

Ichthyophthirius multifiliis (Ich) *is a protozoan naturally present in low concentrations during much of the year in many rivers and streams. In its free-swimming life stage, Ich is opportunistic, and spreads more rapidly among fish that are in close proximity in slow-moving water.*

Indian Trust Assets

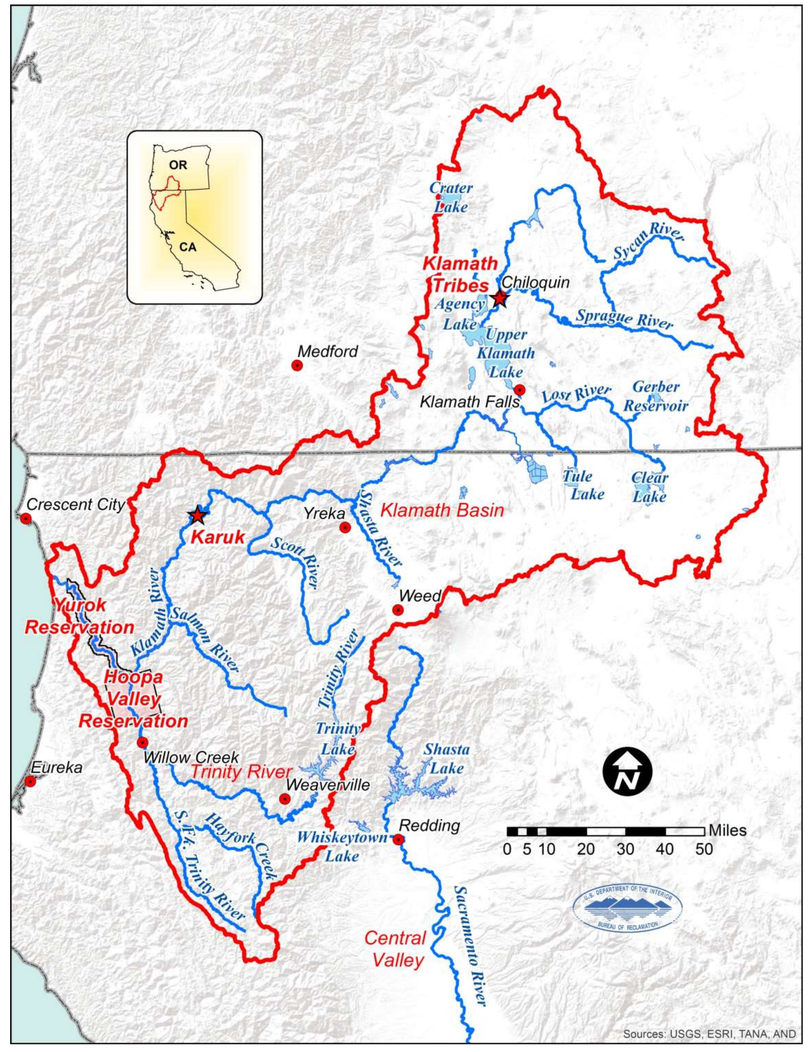
The Environmental Impact Statement will evaluate impacts to Indian Trust Assets, which are legal interests in assets that are held in trust by the United States Government for federally recognized Indian tribes or individuals. Trust assets may include lands, minerals, and natural resources, as well as hunting, fishing, and water rights. In some cases, Indian Trust Assets may be located off trust land.

If a large-scale fish die-off similar to 2002 were to occur…, regardless of apparent causes, it would be devastating for the tribal trust fisheries in the Klamath and Trinity Rivers.

2013 Environmental Assessment

Flow augmentation to the lower Klamath River is expected to decrease the risk of disease vulnerability to fall Chinook salmon, therefore decreasing the risk to the tribal trust fishery.

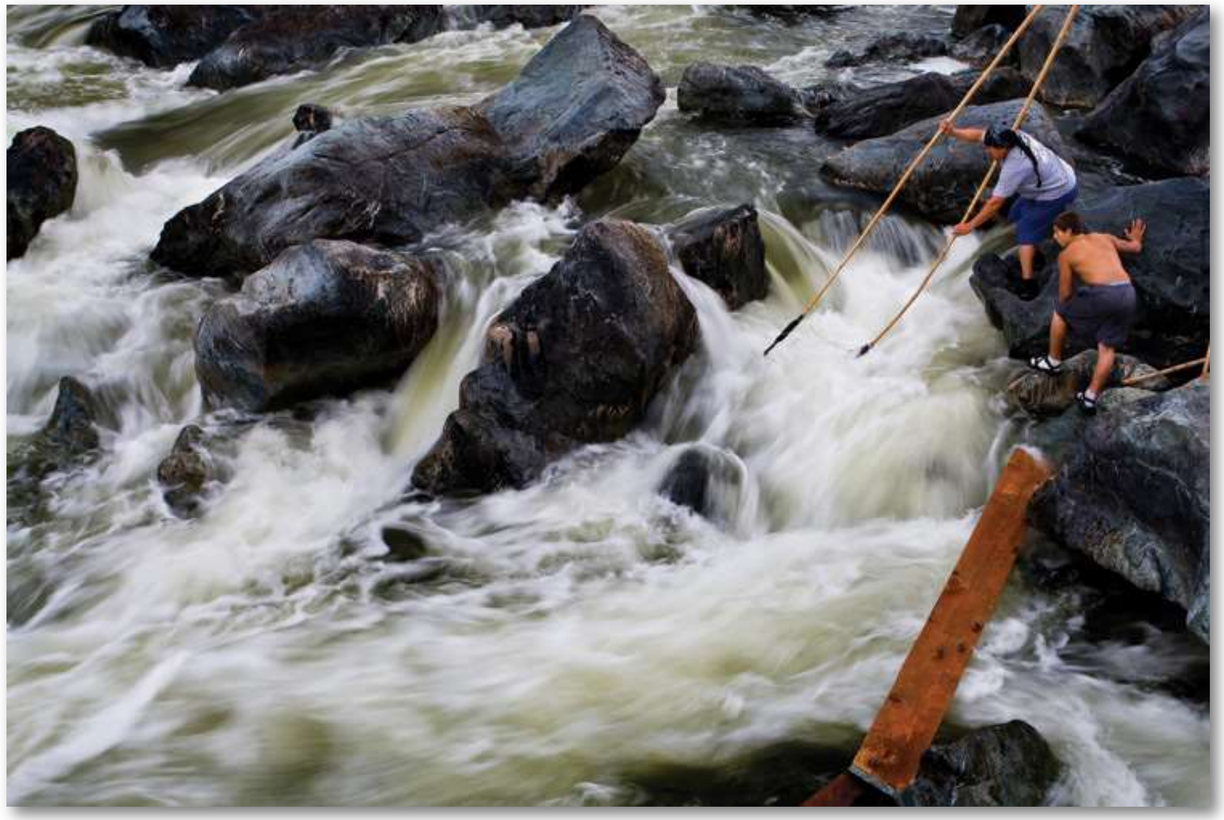
2013 Finding of No Significant Impact



Environmental Justice

Federal agencies are mandated by Executive Order 12898 to identify and address disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and lower-income populations.

The Trinity and Klamath Rivers flow through rural areas. Additionally, these rivers both run through the Hoopa Valley Tribe and Yurok Tribe Reservations, as well as land associated with the Karuk Tribe in California and the Klamath Tribe in Oregon. The Reservations' populations traditionally rely on salmon and steelhead as an important part of their subsistence.



NEPA requires federal agencies to identify all potential environmental effects, any adverse effects that cannot be avoided, and to evaluate alternatives to the proposed action.

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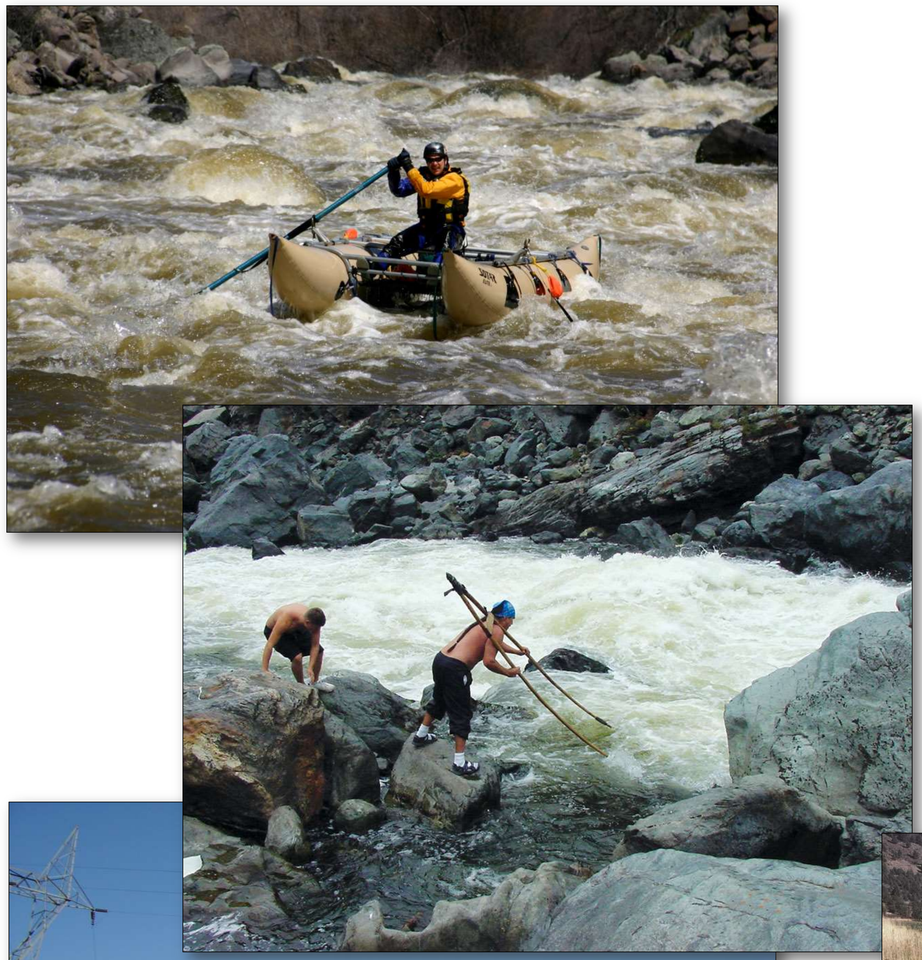
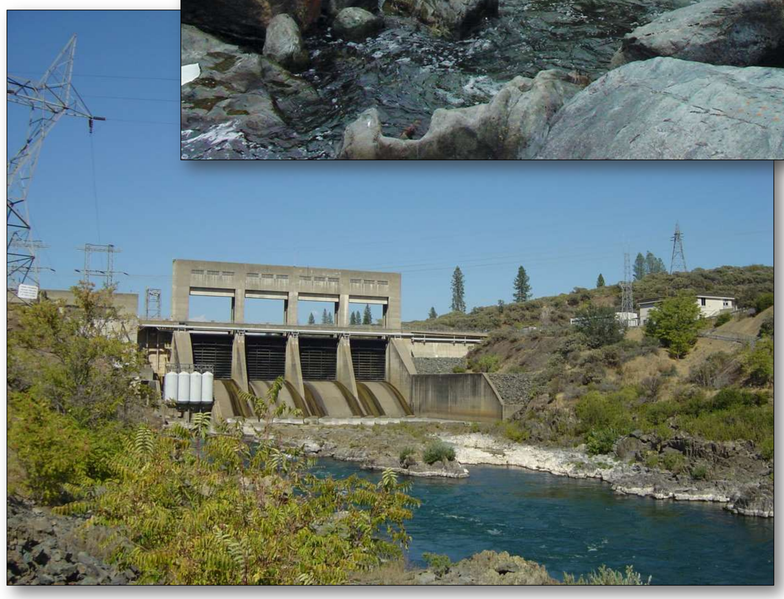


Socioeconomic Impacts

The Environmental Impact Statement will evaluate socioeconomic impacts of the Long-Term Plan to agricultural, recreational, commercial, and Tribal uses in the Trinity River Basin, Central Valley, and Sacramento River Basin.



Environmental Impact Statement

The Environmental Impact Statement will:

- Assess the actions proposed in the "Long-Term Plan for Protecting Late Summer Adult Salmon in the Lower Klamath River," including cumulative impacts
- Use a variety of modeling tools to forecast potential impacts from the proposed action
- Solicit public input about the actions under consideration

Public comments are encouraged and will be accepted until close of business on August 20, 2015.