IMPLEMENTATION PLAN FOR THE REINTRODUCTION OF ANADROMOUS FISHES INTO THE OREGON PORTION OF THE UPPER KLAMATH BASIN

An update for the Oregon Fish and Wildlife Commission
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Background
- Historically the Klamath River Basin was one of the top salmon producers on the west coast
- Anadromous Fishes
  - Chinook Salmon (fall and spring-run)
  - Coho Salmon
  - Steelhead Trout
  - Pacific Lamprey

Fisherman with their catch of Chinook Salmon on the Link River, OR 1891
Background

Upper basin aquatic habitat characteristics

Spring Creek, ~ 280 cfs groundwater
Wood River, ~ 450 cfs groundwater
Upper Klamath Lake, shallow and hypereutrophic
Klamath River Canyon, ~225 cfs groundwater

Background

Lower basin aquatic habitat characteristics

Lower Klamath River, precipitation dominated
Klamath River estuary
Background

- Construction of the first Klamath Hydroelectric Dam blocked anadromous fishes from Oregon in 1912
- Additional dams further blocked migration
- Anadromous fish have been extirpated from Oregon for over 100 years

![Copco 1 Dam, CA](image1)

![Iron Gate Dam, CA](image2)

![J.C. Boyle Dam, OR](image3)

Background

**Dam removal Process**

- The License to operate dams expired in 2006
- In 2016 parties signed an agreement to provide for removal of the dams through the FERC approval process
- In 2021 FERC approved the transfer of license to the Klamath River Renewal Corporation and the States of Oregon and California

**Benefits of Dam Removal**

- Will open over 400 miles of stream habitat
- Would improve ecosystem resilience to climate change
- Returning the Klamath River to a more natural temperature regime would decrease late summer/early fall water temperatures
- Access thermally diverse habitat that includes the largest groundwater inputs in the basin will improve conditions and allow fish a better chance to adapt and tolerate a changing climate
2008 ODFW Anadromous Fish Reintroduction Plan

- In 2008 ODFW wrote *A plan for the reintroduction of anadromous fish in the Upper Klamath Basin*
  - Commission adopted plan
  - **Goal of Reintroduction**: Re-establish naturally reproducing populations of anadromous fishes that were historically present into suitable habitat in the Oregon portion of the Upper Klamath Basin
  - Identified species-specific approaches
  - Amended the Klamath Fish Management Plan to include efforts to re-establish anadromous fish
  - Established OAR’s that specifically address anadromous fish reintroduction
  - Calls for an **Implementation Plan** to be written to guide reintroduction efforts

Implementation Plan

- Co-authored with The Klamath Tribes
- Collaboration with basin fish management groups (Tribal, State, and Federal)
  - Multiple meetings
  - Reviews of the document

**Purpose of Implementation Plan**

- Guide efforts to monitor the natural repopulation of anadromous fish
- Recommend a strategy for any active efforts to repopulate habitat
Implementation Plan
Reintroduction Approaches

Natural Repopulation – Hands off approach

- Fall-run Chinook Salmon
- Coho Salmon
- Steelhead Trout
- Pacific Lamprey

Timeframe = 3 fish generations
- 9 years for Coho Salmon
- 12 years – fall-run Chinook Salmon
- 15 years – Steelhead and Pacific Lamprey

Active Repopulation – actively transporting fish

- Spring-run Chinook Salmon
- Juveniles from an in-basin source

Monitoring Natural Repopulation

- Determine if anadromous fishes are migrating upstream of the removed dams
  - If so, what species and how many?
- Large amount of habitat to monitor
- Initially focused on habitat immediately above the dam sites
- Monitoring effort in streams above Upper Klamath Lake when fish are known to be present
- This Implementation Plan recommends monitoring activities and facilities.

Adult salmon carcass surveys
Link River Dam fish ladder
Monitoring Natural Repopulation

Incorporating Climate and Ocean Change considerations

- Incorporate water temperature, flow, and other physical parameters track any changes in key habitat features
- Monitor fishes in conjunction with habitat data to determine if and how climate change is impacting the repopulation effort
- Prioritize protection and restoration of climate change resilient habitats while maintaining a diverse assemblage of habitat types

Spring-run Chinook Salmon Active Repopulation

Phased Approach

- **Phase 1** – investigations involving the release of a small number of tagged juveniles into suitable tributaries above Upper Klamath Lake
  - Track fish as they migrate through the upper basin
  - Identify any potential limiting factors
- **Phase 2** – Apply lessons learned from Phase 1, but with increased abundance in numbers released to achieve returning adults

- Active repopulation efforts will be focused on streams have suitable habitat and are more buffered to the immediate impacts of climate change
Pre-dam Removal Activities

• Coordination with CDFW, NMFS, USFWS, and Tribes to ensure post dam removal monitoring elements are in place and compatible
• Basin-wide genetic assessment of Redband/Rainbow Trout/Steelhead (*O. mykiss*)
• Water temperature monitoring in the Klamath River and tributaries
• Baseline fish health studies
• Juvenile spring-run Chinook Salmon release study
  - Release tagged hatchery reared juvenile Chinook Salmon
  - Track fish as they migrate through the upper basin
  - Obtain a better understanding how juvenile Chinook might navigate and survive outmigration in the current landscape

Next steps

• We have updated Klamath Basin stakeholders, such as the Klamath Water Users Association, and will continue to engage with them throughout this process
• Continue spring-run Chinook Salmon release study for at least another year
• Conduct other baseline studies that will help inform reintroduction efforts
• Continue to coordinate with partners to ensure monitoring efforts are compatible and effective
• Once fish populations are re-established in the upper Klamath Basin, a Conservation Plan will be developed