

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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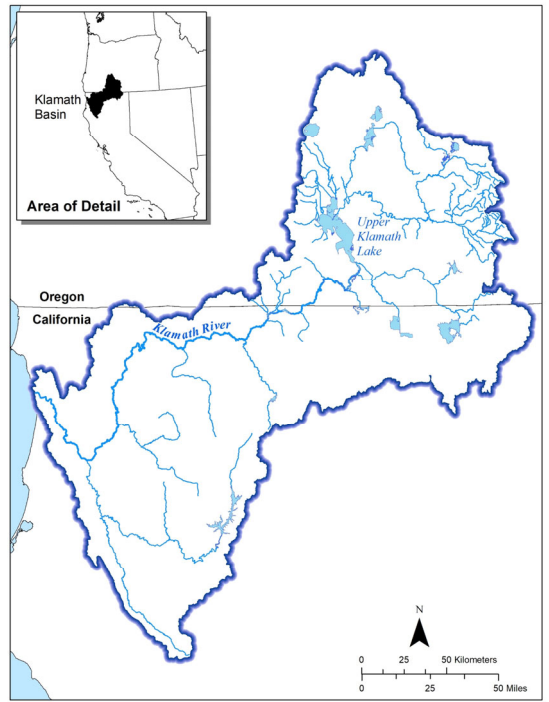
Background

- 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



Photo courtesy of the Klamath County Historical Society

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



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Background

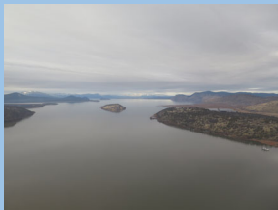
Upper basin aquatic habitat characteristics



Spring Creek, ~ 280 cfs groundwater



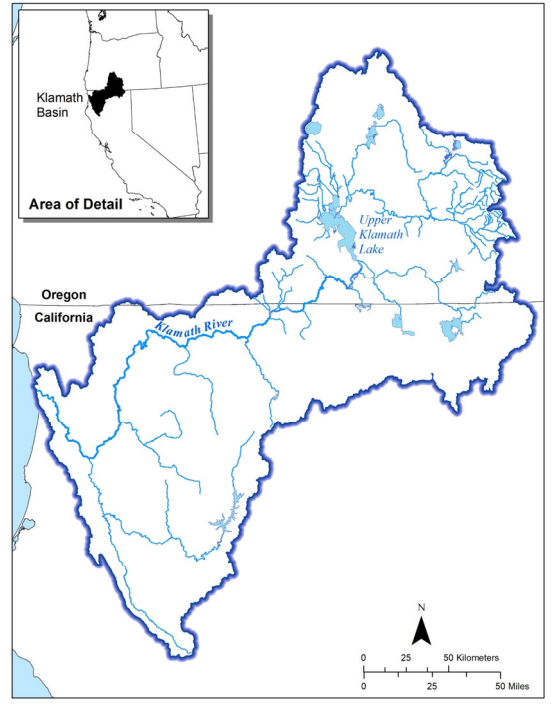
Wood River, ~ 450 cfs groundwater



Upper Klamath Lake, shallow and hypereutrophic



Klamath River Canyon, ~225 cfs groundwater



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Background

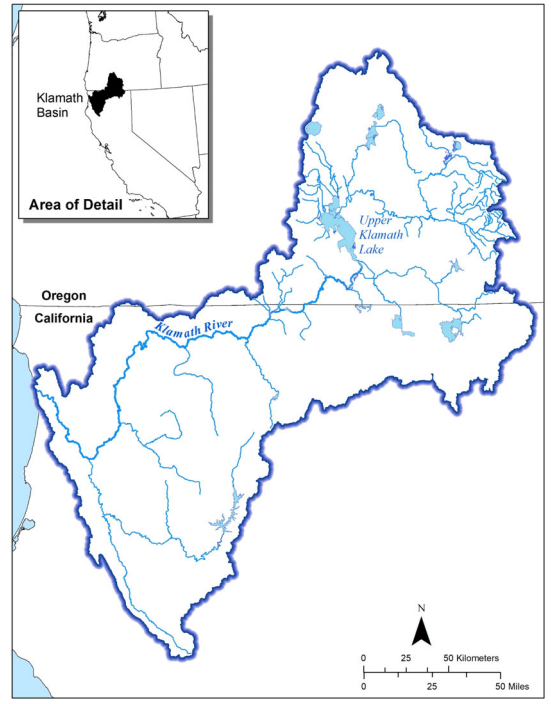
Lower basin aquatic habitat characteristics



Lower Klamath River, precipitation dominated



Klamath River estuary



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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



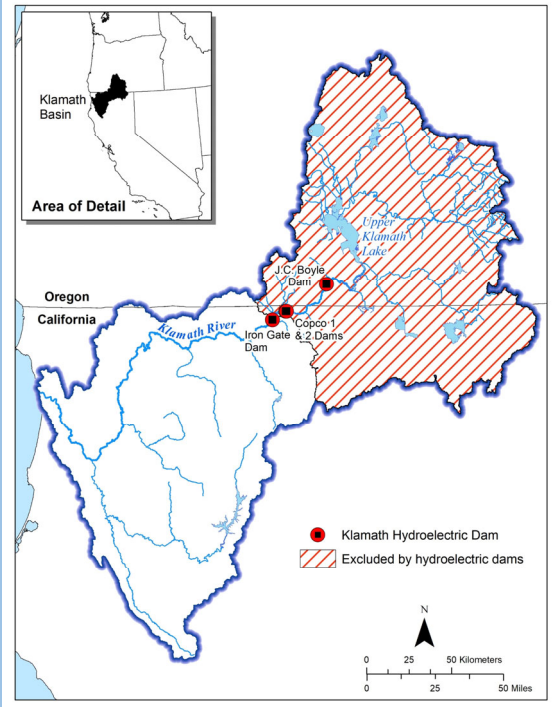
Copco 1 Dam, CA



Iron Gate Dam, CA



J.C. Boyle Dam, OR



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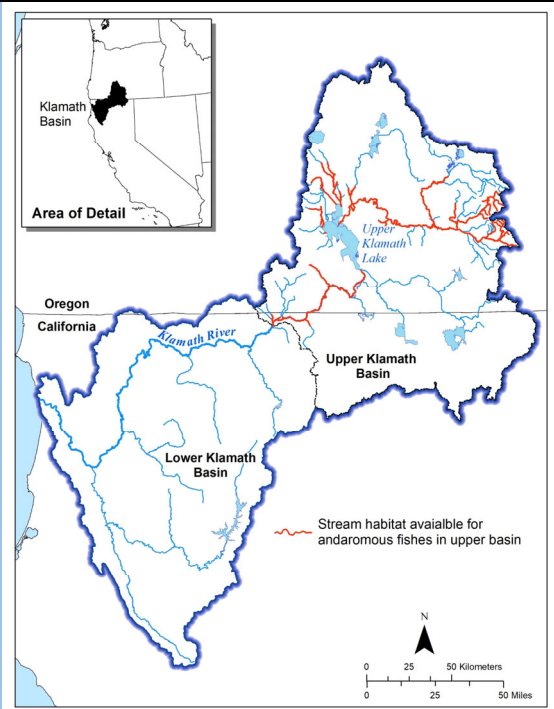
Background

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

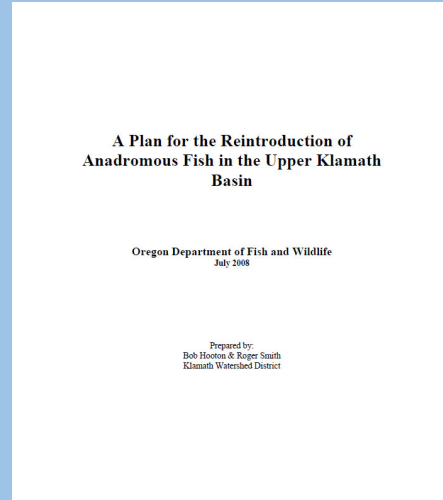


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2008 ODFW Anadromous Fish Reintroduction Plan

- 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



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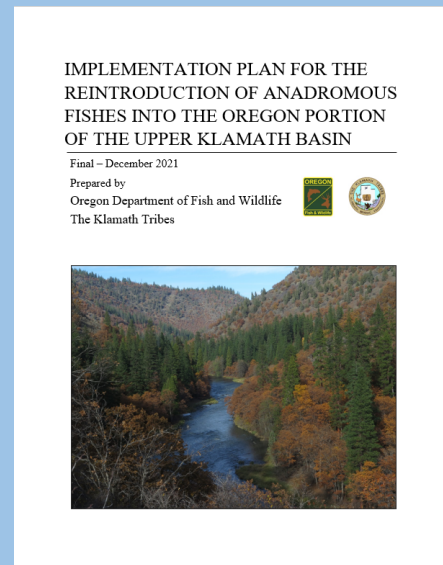
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Implementation Plan

- 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



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Implementation Plan Reintroduction Approaches

Natural Repopulation – Hands off approach

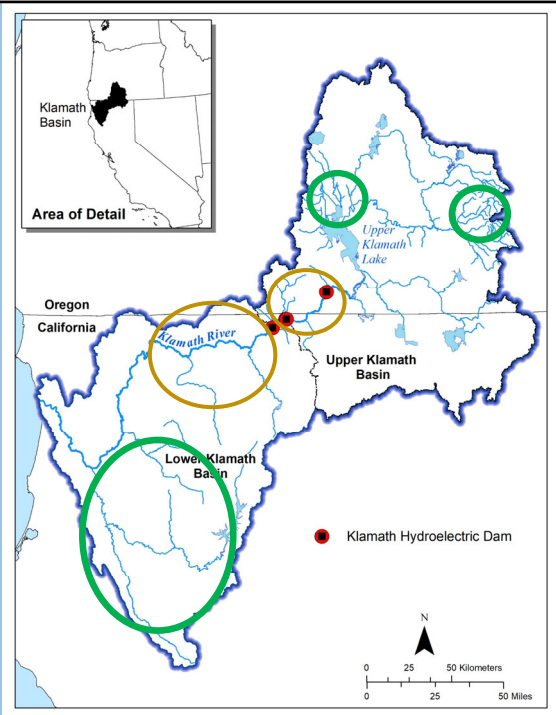
- Fall-run Chinook Salmon
 - Coho Salmon
 - Steelhead Trout
 - Pacific Lamprey
- Currently exist immediately below Iron Gate Dam
- Habitat immediately above dams

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



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Monitoring Natural Repopulation

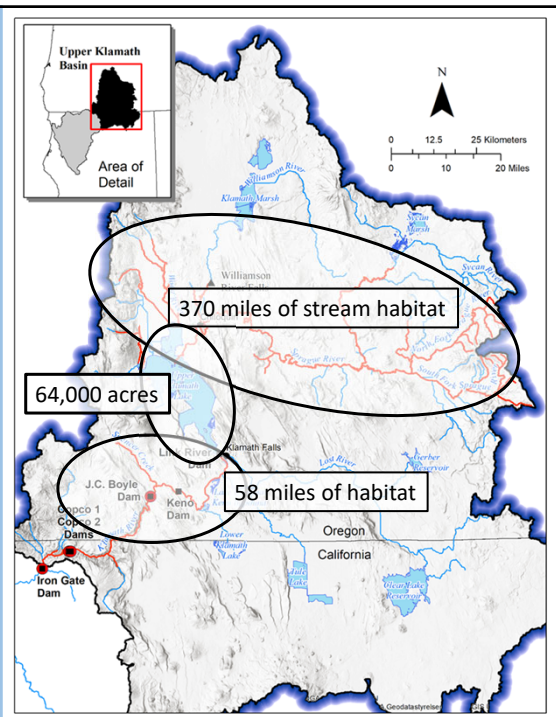
- Determine if anadromous fishes are migrating upstream of the removed dams
 - If so, what species and how many?
- Large amount of habitat to monitor
- Initially focused on habitat immediately above the dam sites
- Monitoring effort in streams above Upper Klamath Lake when fish are known to be present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



Adult salmon carcass surveys



Link River Dam fish ladder



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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



Quantifying habitat in Spencer Creek, a tributary to the Klamath River, OR

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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



Klamath River near Klamath Falls, below Upper Klamath Lake



Williamson River entering Upper Klamath Lake

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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



Tagged juvenile Chinook Salmon



Groundwater sourced tributaries



Outlet of Upper Klamath Lake/Link River Dam



Upper Klamath Lake

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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



Klamath River downstream of J.C. Boyle Powerhouse, OR

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