Klamath River Compact

Commission Klamath, Oregon

October 24, 2019

KRCC Present

Chrysten Lambert, Chair
Curtis Anderson, California
Tom Byler, Oregon

Others Present

Natalie Reed, Assistant County Counsel, Siskiyou County
Clayton Creager, CA Regional Water Quality Control Board
Robert Rice, Siskiyou County Water Users Association
Richard Marshall, Siskiyou County Water Users Association Brandon Criss, Siskiyou County
Rex Cozzalio, Siskiyou County Water Users Association Jerry Bacigalupi, SCWUA
Susan Miller, Siskiyou County Water Users Association Dr. Richard Gierak, Citizens United
Chrissie Reynolds, SCWUA
Scott Swanson, Deputy Director, USBR Laura Williams, Bureau of Reclamation David Sandino, CDWR
Joe Watkins, SCWUA
Holly Dillemuth, Herald and News Mike Hiatt, ODEQ
Kyle Gorman, OWRD

Welcome and Introductions

Chair Lambert called the meeting to order and offered introductions.

Administrative Topics

Approval of draft minutes. Directors reviewed and recommend approval. Commissioner Byler moves to approve June minutes. Commissioner Anderson seconded. Voting in Favor: Anderson, Byler. Motion passed.

Chair Lambert went through the financials. No comments or questions.
Commissioner Anderson makes a motion to approve. Seconded by Commissioner Byler. Voting in Favor: Anderson, Byler. Motion passed.

Approval of Meeting $295.00 expense. Chair Lambert made copies costing between $48 to $49 dollars.
Commissioner Byler motioned to approve the expenses for approval. Seconded by Commissioner Anderson. Voting in Favor: Anderson, Byler. Motion passed.

Commissioner Byler motioned to approve incurring expenses for future meetings with accounting of expenses. Seconded by Commissioner Anderson. Voting in Favor: Anderson, Byler. Motion passed.

Commissioner Anderson provided an update from the last meeting on the letter from the City of Yreka from Dohn Henion. Mr. Henion expressed concerns about the City's water rights and how to maintain those rights after the dams are removed. Commissioner Anderson and CDWR attorney David Sandino had a discussion of the issues with Mr. Henion after the last meeting. Our recommendations were for Mr. Henion to raise his concerns with the CA State Water Board and with the Klamath River Renewal Corporation. KRCC may have a role in the future, but not at that point.

Records retention and public access to those records were topics that were brought up last meeting. Chair Lambert made efforts to catalog those documents available at the USBR. Most were from the 1950's and 1960's and a map case of USGS quad maps. Maps of adjudication.

Commissioner Byler reported that staff reviewed documents in the Salem office. 1980's and 1990's minutes, agendas from that time. There is information about handouts and small box about 1 cubic foot of space.

Commissioner Anderson – After searching CDWR's documents, he found about 10 linear feet of documents. Six draft versions of the original compact and various financial records, scanned meeting notes, 50's, 60's, 70's and 80's. Whole box of notes from the 1990's when the commission reaffirmed itself. And many of these files are stored electronically on CD as well. Dwight Russell is still around and was involved in the commission long ago and he participated in the 2001 shut off and the well drilling activity. Bill Bennett is still available in Sacramento but Linton Brown passed away recently. Wayne Gentry is also still around to pose questions to, if needed.

Chair Lambert – Public availability of records is an objective for the Commission. States are working on it. Made contact with national archives, USBR could possibly scan documents for the Commission.

Commissioner Anderson – investigated with CDWR and found out CDWR can create a simple webpage that could easily supply main page, meeting notes, agendas, hasn't got final word on the format.

Commissioner Byler – webpage is a cost-effective way and practical. Would be a good way to cover all the documents. Hasn't reached out to WRD technical staff to get their take on it. Some unknowns with cost. Thinks adopting a standard for maintaining the documents.

Commissioner Anderson - Recommends using optical character recognition (OCR) if documents are scanned as a PDF to make them word searchable.

OWRD has a web presence for posting meeting agendas and minutes but is in the beginning development.

Chair Lambert – possible to create a list serve for automation of dispersing information. Chair Lambert will contact national archives. Chair Lambert will search for the potential of a web page with outside help. USBR does not extend help on this subject.

Commissioner Anderson – outside private entity that could set up a webpage for $5k that would get it going. Maybe $1,000 dollars per year. Thinks it is important to get this

information out and available.

Mr. Marshall - Museum in town has a lot of documents, U of California Davis, There are quite a few places where the documents have been stored.

Bob Rice has an extensive library of Compact commission.

Chrissie Reynolds brought up the costs of the meetings and that the costs are paid for by taxes. Commissioner Anderson – if CA handles it and hosts the webpage they would cover the costs.

Both Commissioners thought that it is important that the information be made available and accessible by the public.

Chair Lambert recommends that the discussion continue to look into this subject. Commissioner Anderson proposes an agenda item next meeting to discuss this further and make a decision on that. Commissioner Byler agreed that this is good goal. Need some leg work with experts.

The Commission recessed for a break at 11:39am

Chair Lambert called the meeting back to order at 11:44am

Tom Schlosser with Hoopa Valley tribe joined on the phone.

Klamath Basis TMDL presentation from Clayton Creager and Mike Hiatt.

Clayton Creager and Mike Hiatt provided a presentation on water quality conditions in the Klamath Basin, including an overview of the various TMDLs across the basin and details on how the states of Oregon and California are collaborating to improve water quality.

Water Quality In The Klamath Basin

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- Klamath Basin TMDLs
- Watershed Stewardship Approach
- Water Quality Improvement Techniques
- Example Initiatives & Projects
- Next Steps & Recommendations

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Water Quality Perspective

- Water quality in the Klamath Basin has degraded over time.
- Water quality can be improved.
- Improved water quality is essential to fish health and abundance
- Physical habitat restoration and water quality improvement measures often overlap
- Restoration measures can benefit agricultural operations

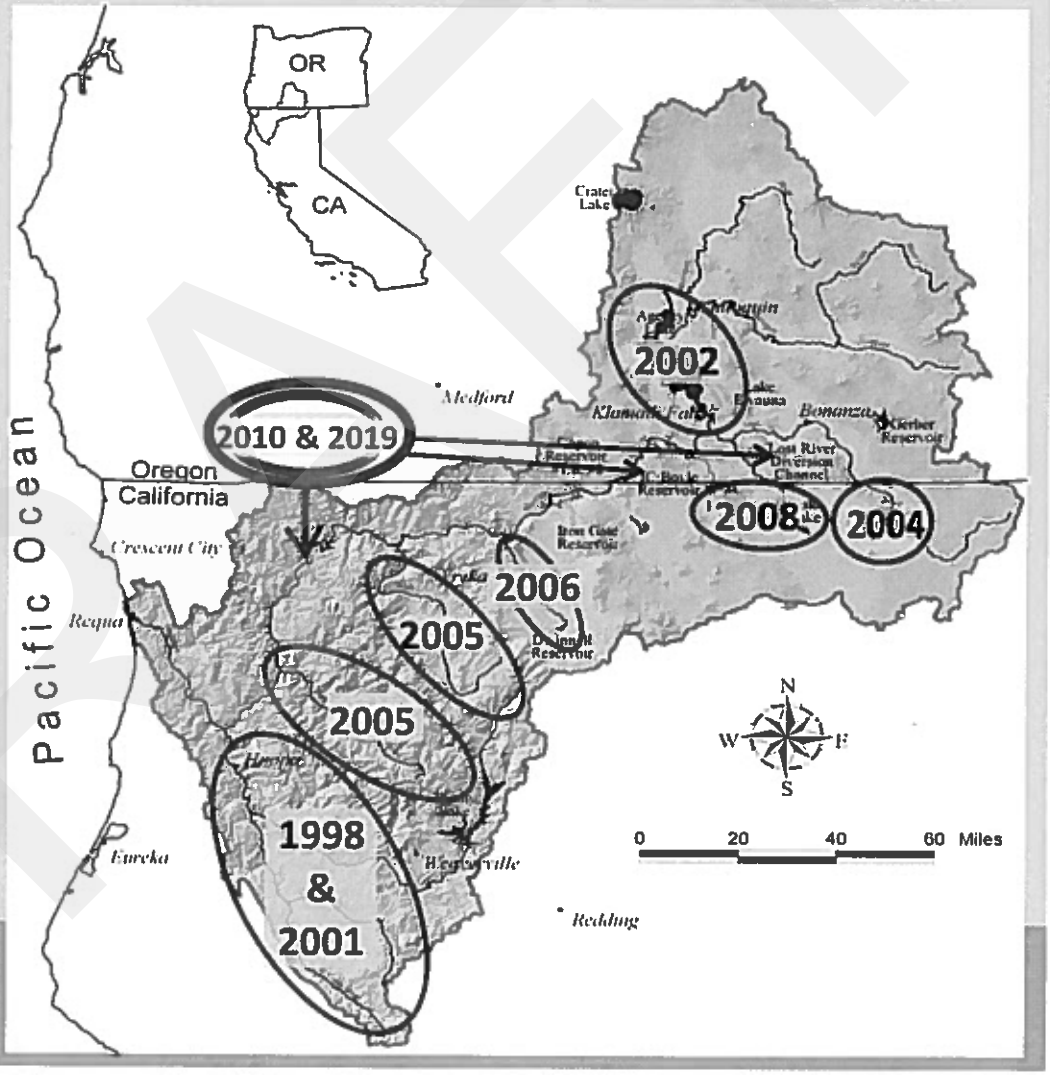
Klamath Basin TMDLs

Oregon

- Upper Klamath Lake, 2002
- Lost River, 2019
- Klamath, 2010 & 2019

California

- Trinity S. Fork, 1998
- Trinity, 2001
- Salmon, 2005
- Scott, 2005
- Shasta, 2006
- Lost, 2008
- Klamath, 2010



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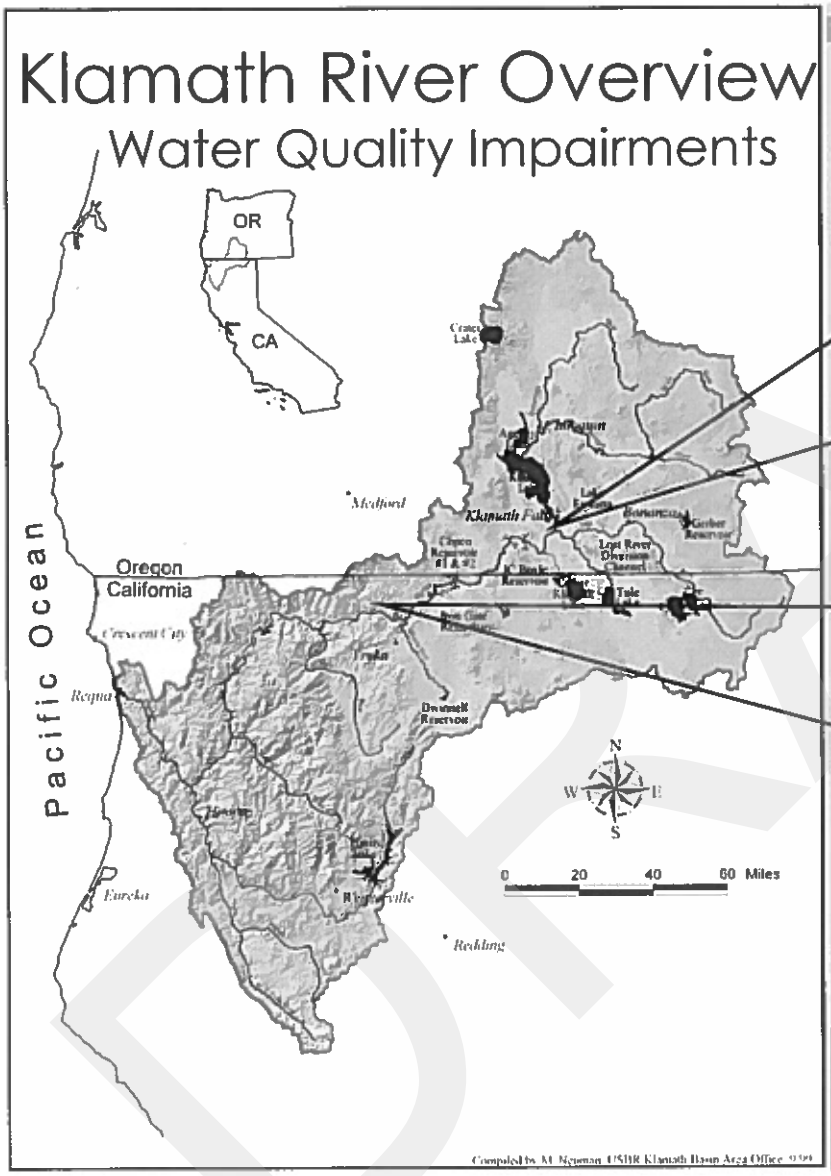
Klamath River Overview

Water Quality Impairments



Oregon:

- Temperature
- DO
- pH
- Ammonia
- Chlorophyll-a

California:

- Temperature
- Organic / DO
- Nutrients
- Sediment
- Microcystin

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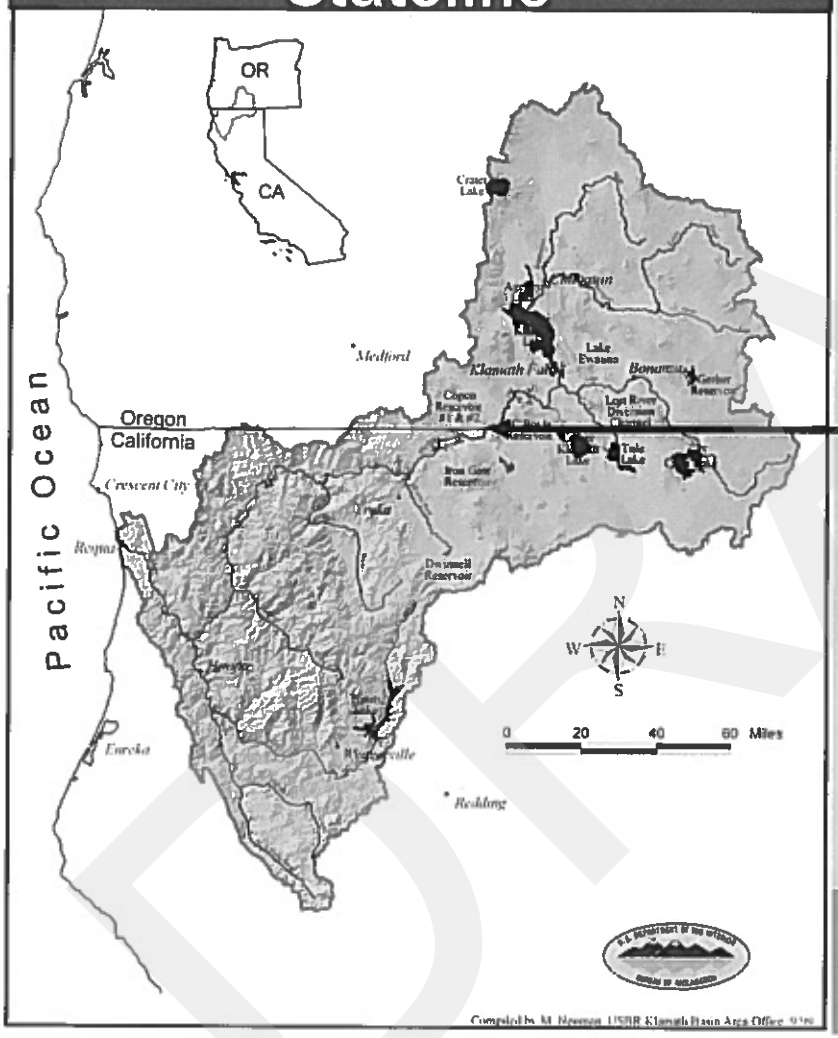
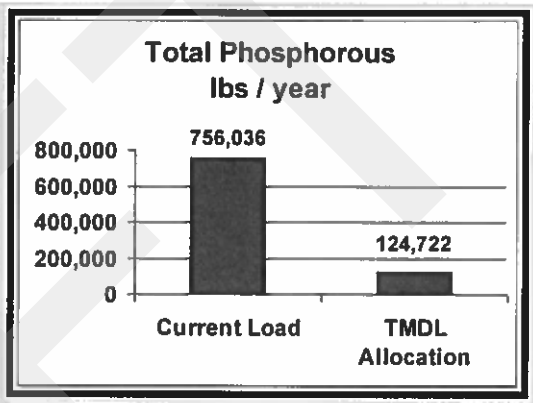
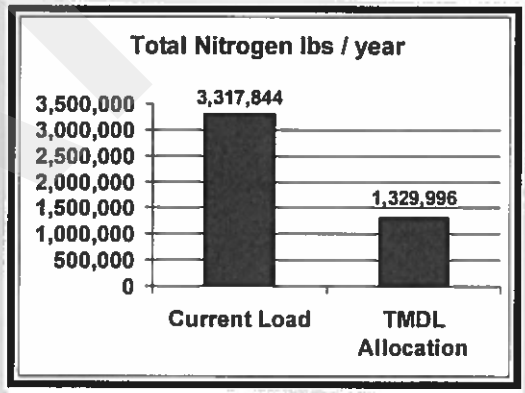
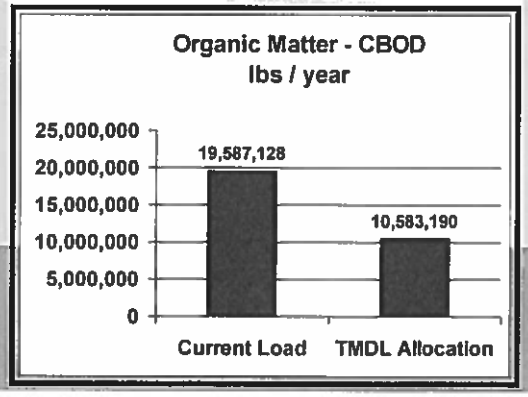
TMDL Allocations at Stateline

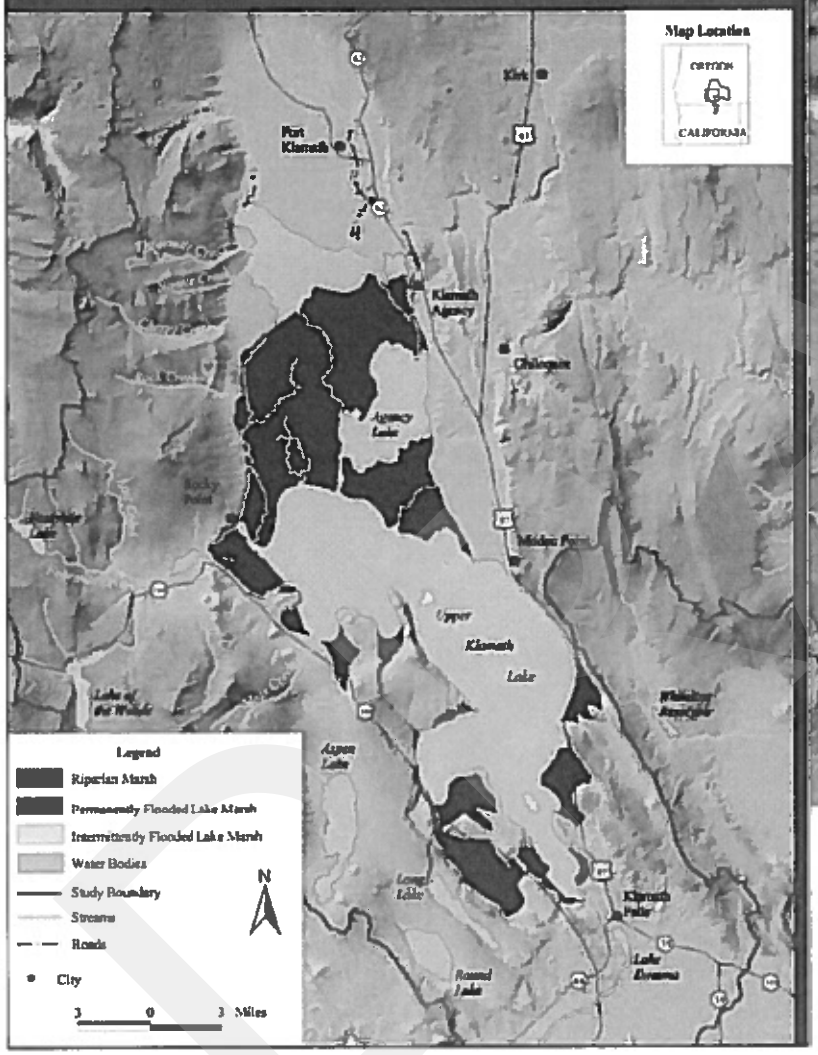




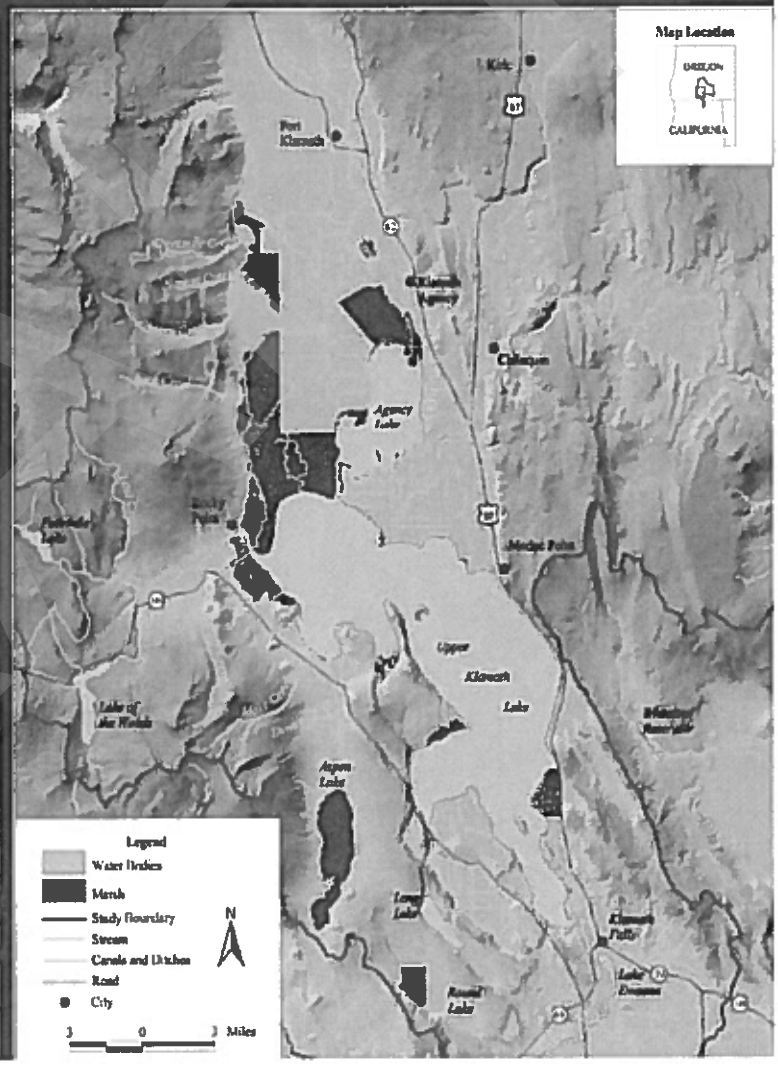




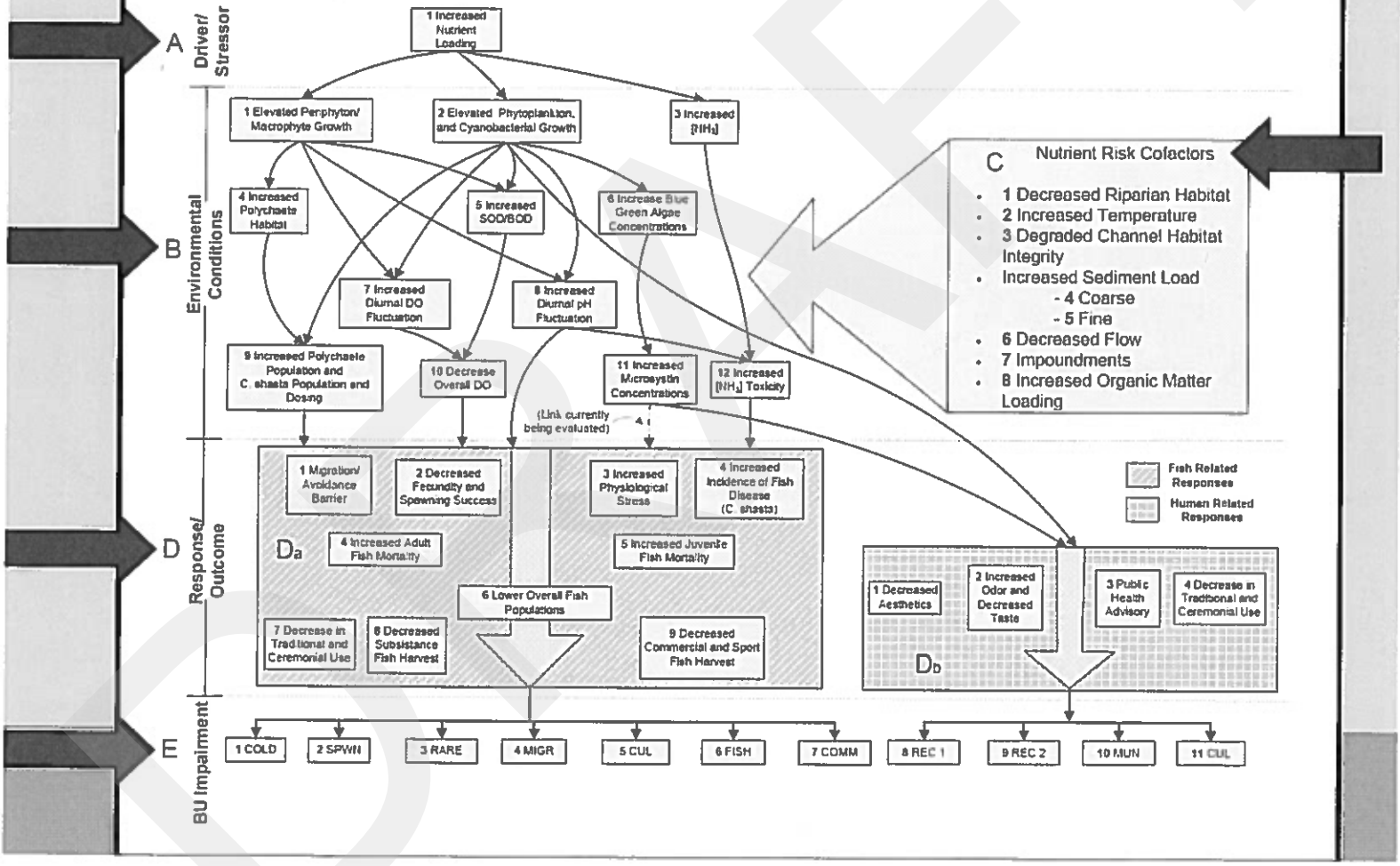
Natural Lake & Marsh Areas of UKL



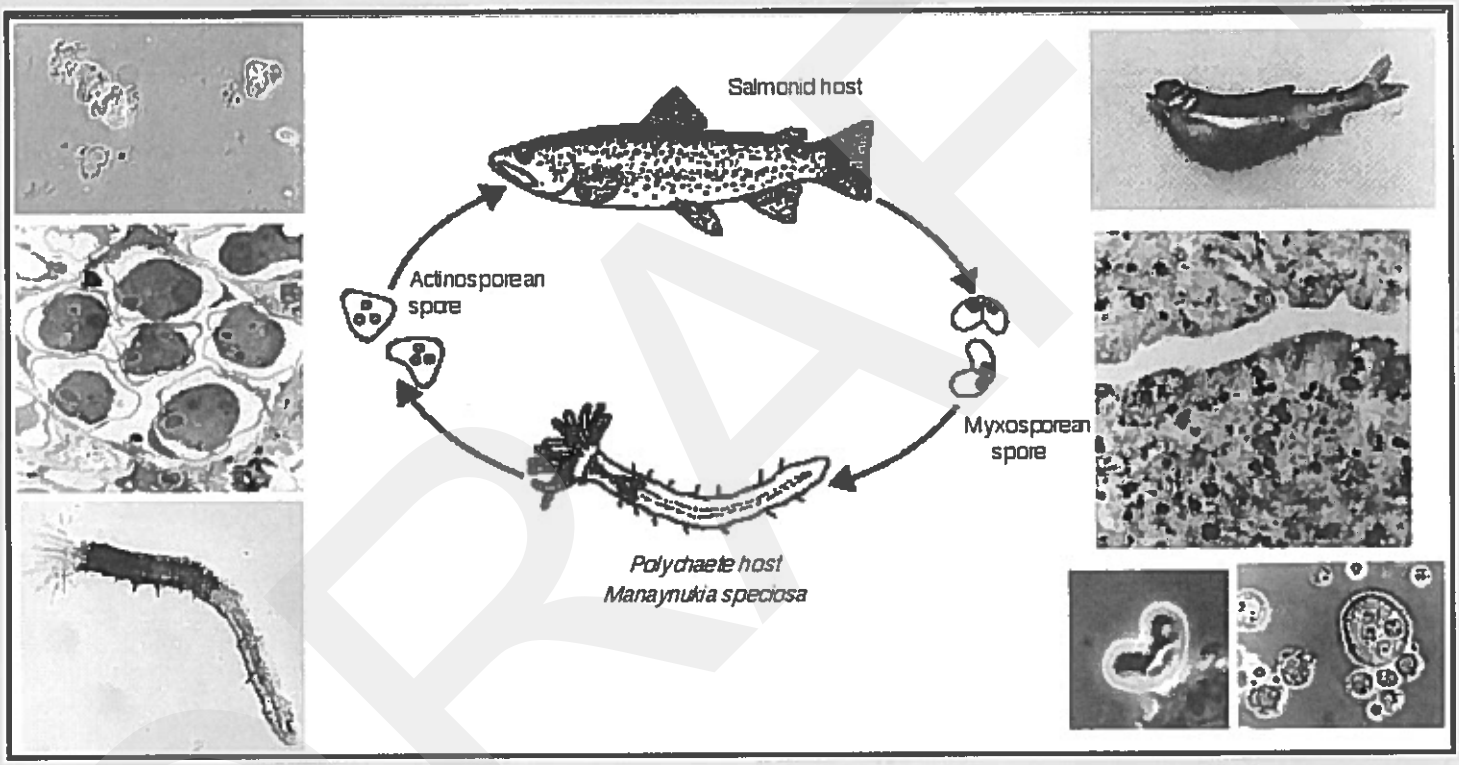
Current Lake & Marsh Areas of UKL



Klamath River NNE Conceptual Model



Klamath River – Fish disease



Life cycle of the parasite Ceratomyxa shasta

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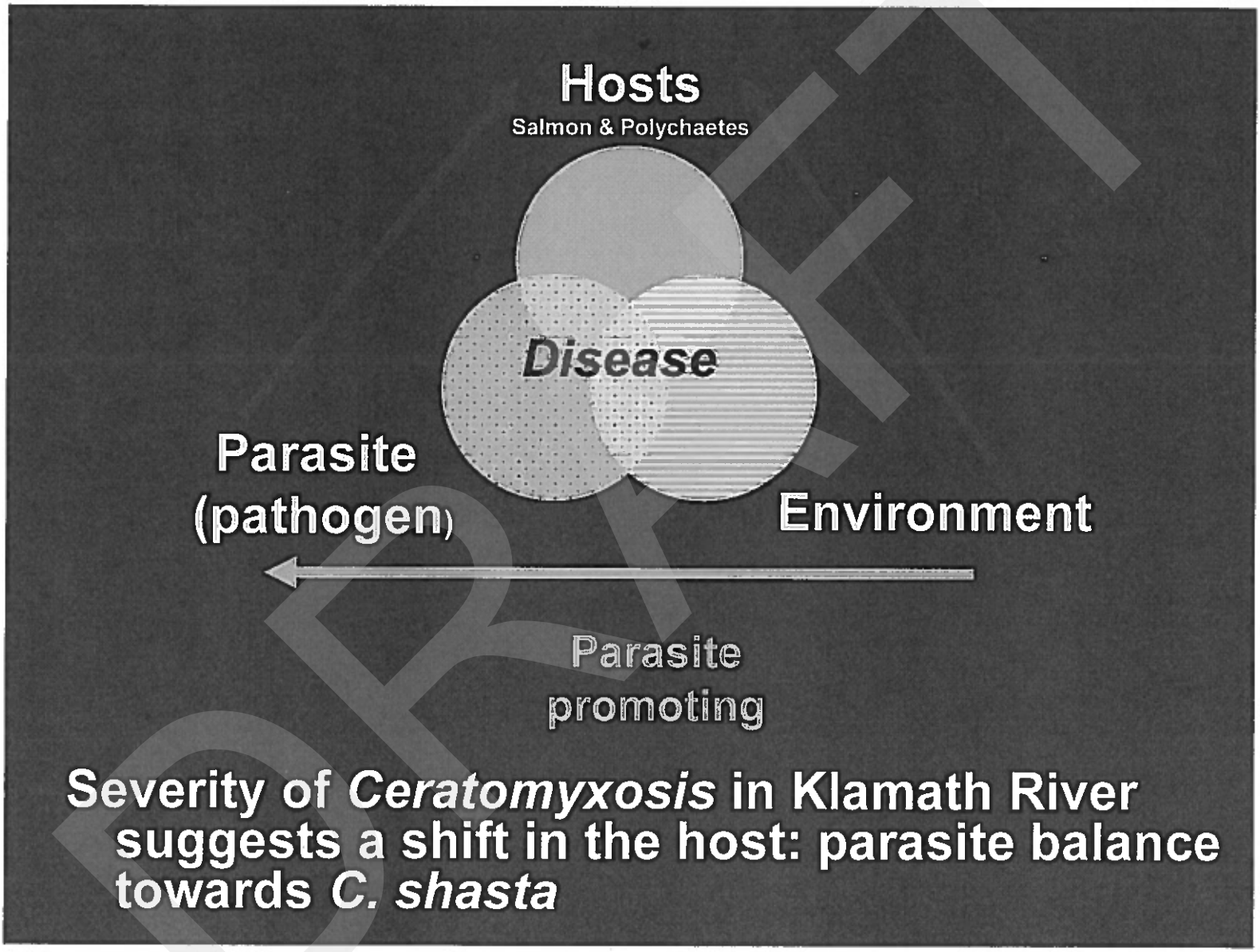
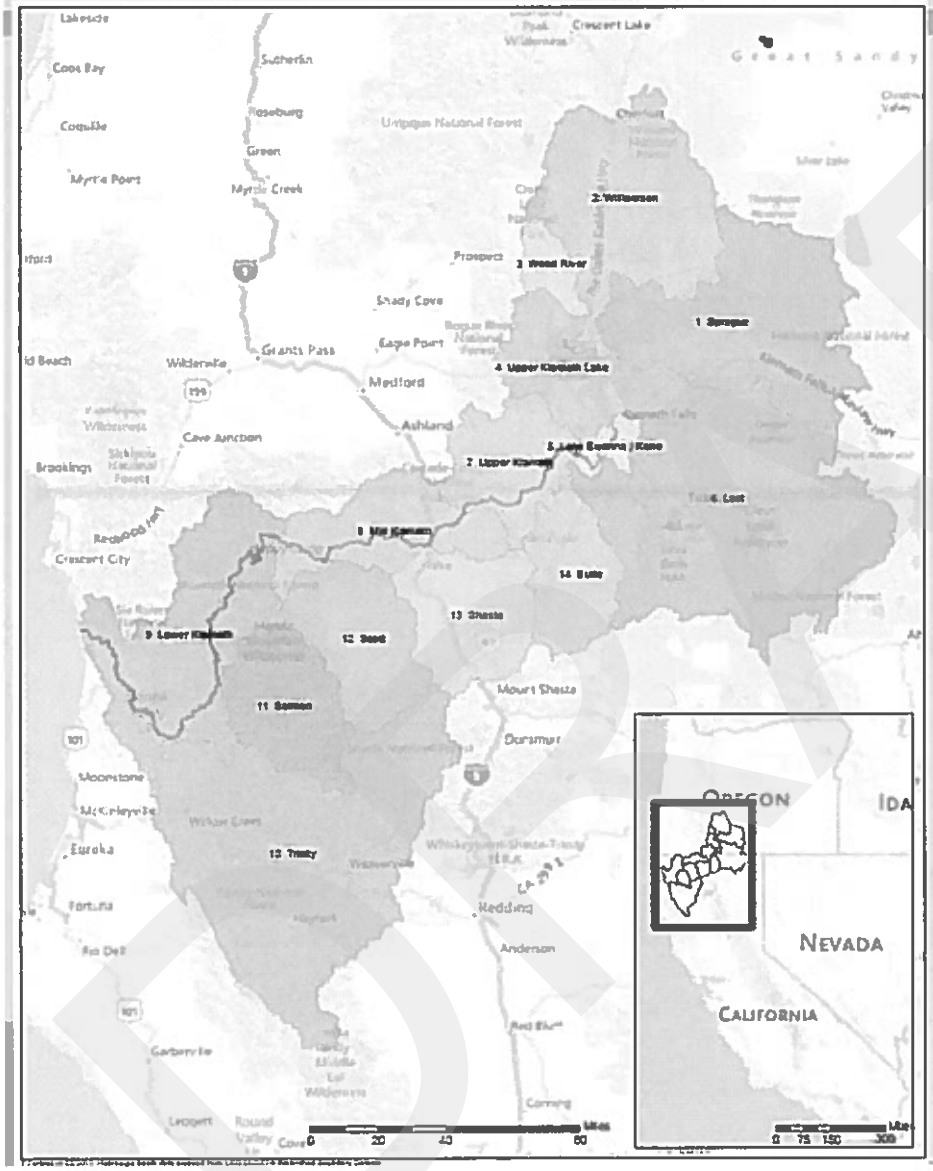


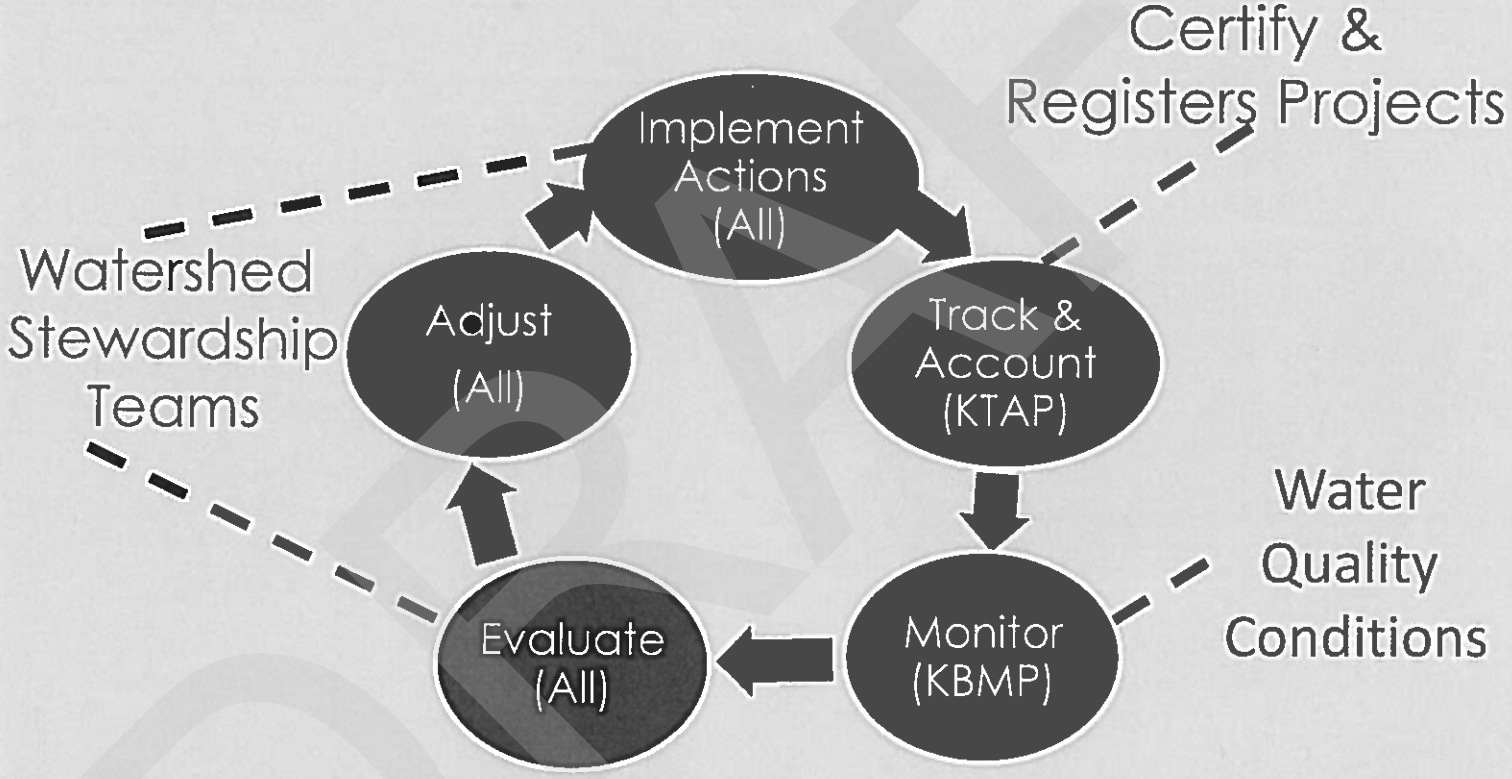
Severity of *Ceratomyxosis* in Klamath River suggests a shift in the host: parasite balance towards *C. shasta*



Klamath Basin Water Quality Strategy

- Integrated aquatic ecosystem
- Address legacy impacts
- Develop voluntary Watershed Stewardship groups in sub-basins

Klamath Watershed Stewardship Adaptive Management Framework



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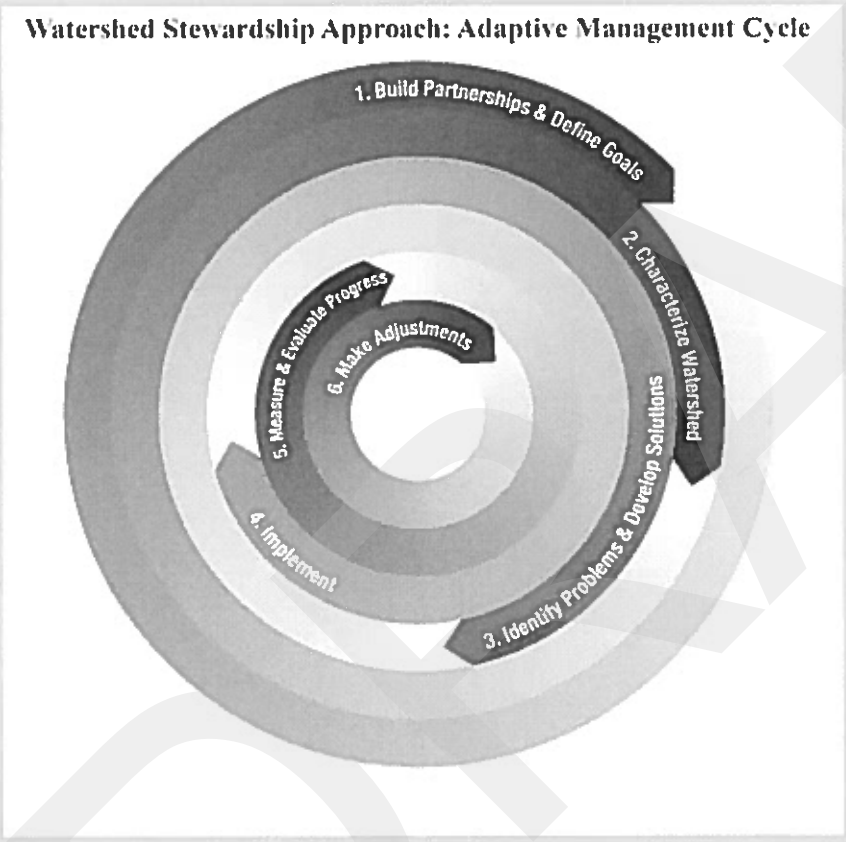
Watershed Stewardship Framework



An approach that supports collaborative outcomes

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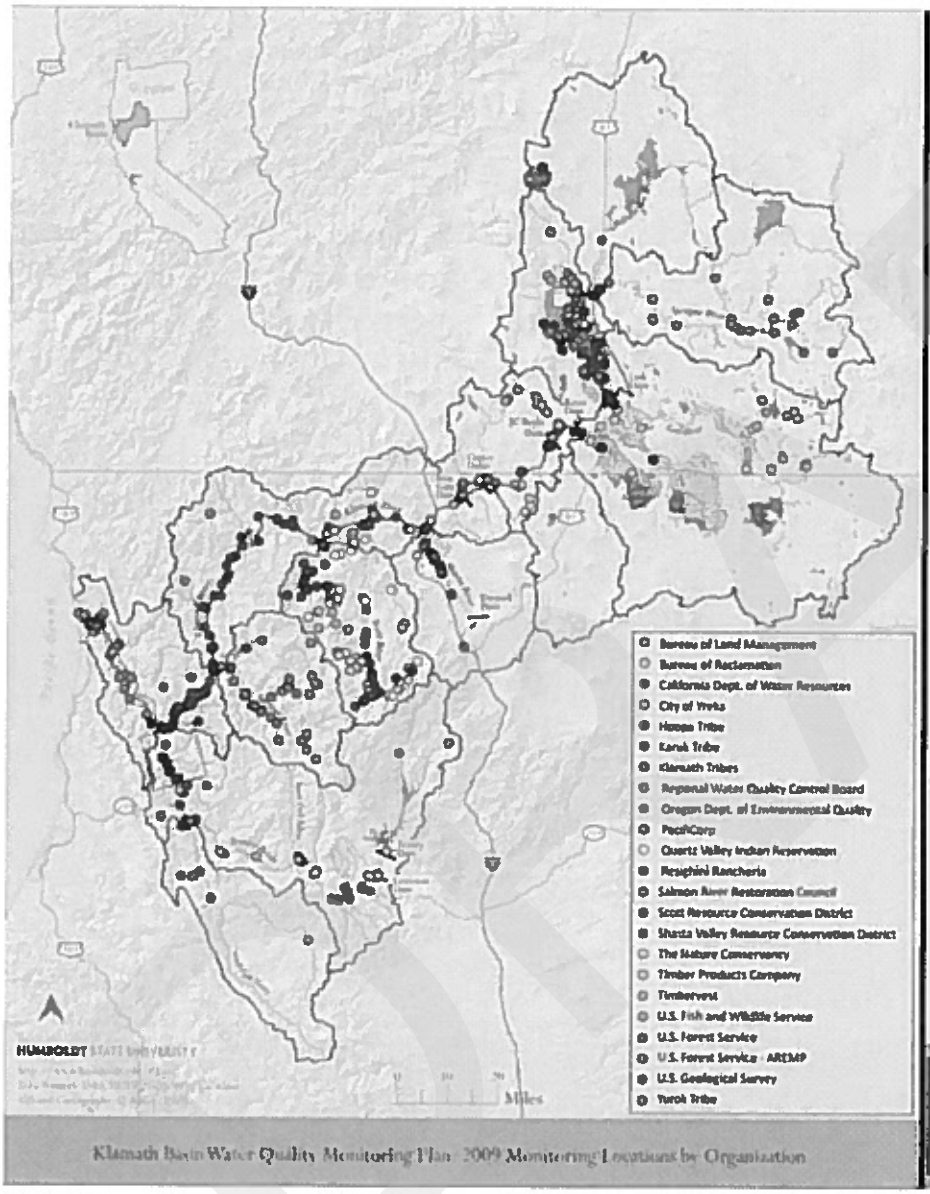

Klamath Basin Water Quality Monitoring Plan - 2009 Monitoring Locations by Organization

Klamath Basin Monitoring Program

- Monitoring coordination
- Common analytical methods and sampling protocols
- Unified data management
- Membership meetings
- Watershed stewardship assessment reports
- Web Information Portal (Blue-green Algae Tracker)
- www.kbmp.net

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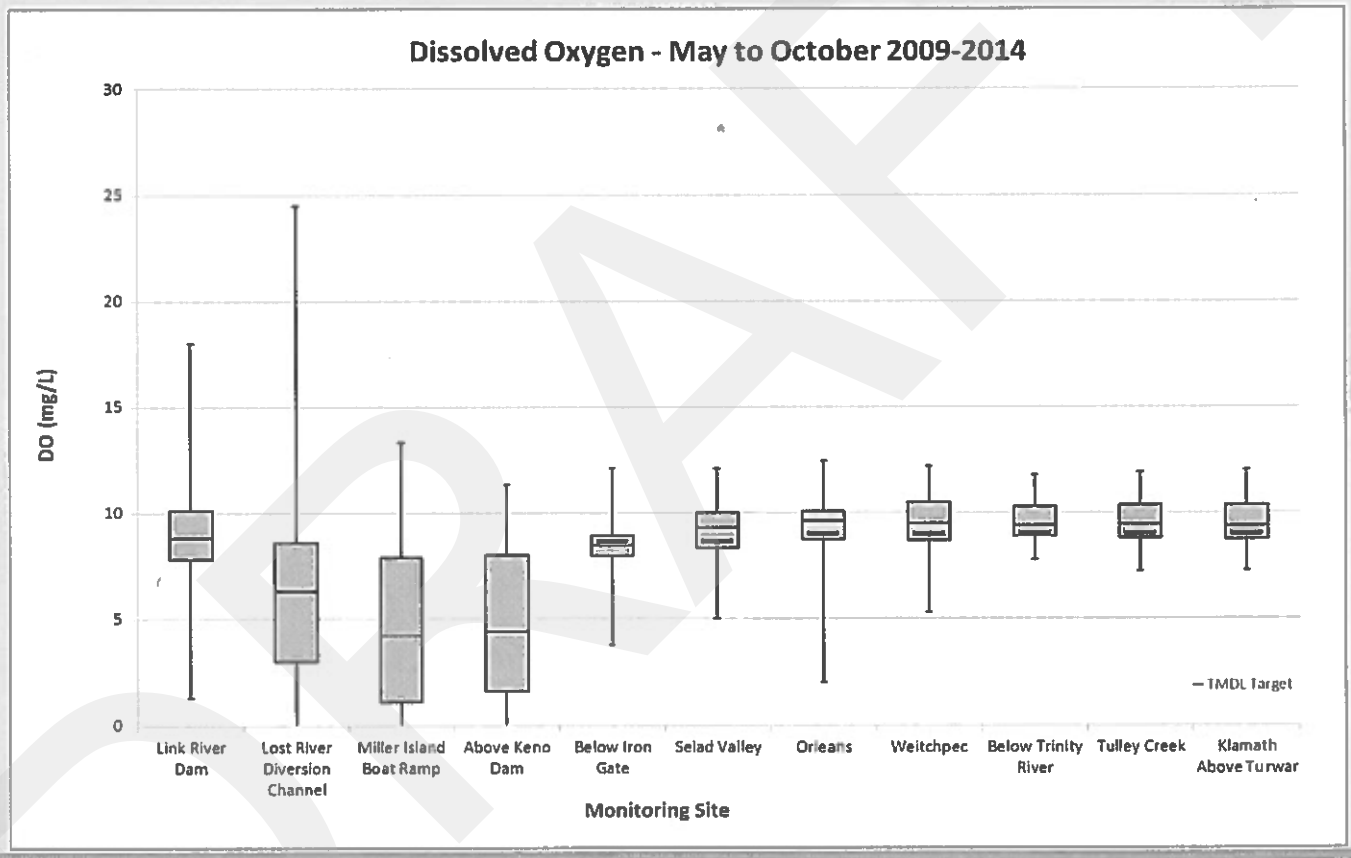
Sonde Data – Dissolved Oxygen

Data source: USGS, USBR, Karuk Tribe, Yurok Tribe



Adaptive Management

KLAMATH TRACKING & ACCOUNTING PROGRAM

Quantification Methods

Consistent protocols

Tracking/ Registration

Select Site → Calculate Credit → Verify Conditions → Register & Issue → Track & Transfer → Procurement Strategy → Credit Demand

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Klamath Tracking and Accounting Program

Working Group Participants

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Example Initiatives & Projects

Apologies to all landowners, agencies, Tribes, and non-profit organizations who have participated in an initiative or undertaken a project for not acknowledging your work here today. The projects depicted are meant as examples of types of efforts underway throughout the Klamath Basin and in no way reflect the total effort.

TECHNICAL MEMORANDUM • JULY 2012

Klamath River Pollutant Reduction Feasibility Study: KHSA Interim Measure 10

PREPARED FOR

California State Coastal Conservancy
PacifiCorp

PREPARED BY

Stillwater Sciences
Riverbend Sciences
Aquatic Ecosystem Sciences
Atkins
Tetra Tech
NSI/Biohabitats
Jones & Trimlew Design

Stillwater Sciences

KHSA Interim Measure 10 Klamath Water Quality Improvement Projects

Conceptual Feasibility Analysis

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Klamath Water Quality Improvement Projects

Conceptual Feasibility Analysis:

- Diffuse Source Treatment systems
- Treatment Wetlands
- Wetland Restoration
- Algal Biomass Removal from Water Column via Filtration
- Sediment Sequestration
- Sediment Dredging
- Project Network Design

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Diffuse Source Treatment Systems

Pros

- Medium to high nutrient removal over project life - 50 years
- On-site TSS removal medium to high
- Affordable to individual landowners
- Engineering challenges low
- Low energy use; no CO_2

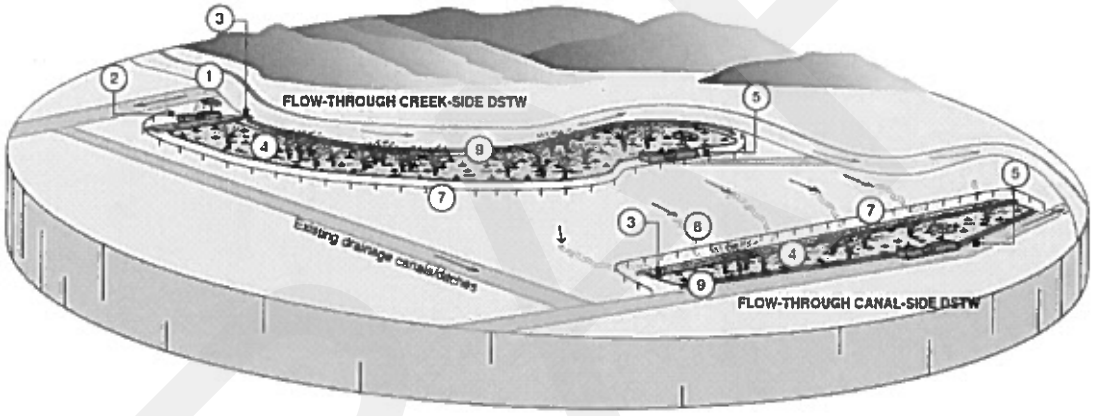
Cons

- Internal cycling not addressed
- Nutrient removal in an individual wetland is low; requires installation throughout watershed
- TP removal cost relatively high

Trout Unlimited:

Diffuse Source Treatment Wetlands Pilot: Wood River

Fig. 3 7 Concept designs for flow-through creek-side and flow-through canal-side DSTWs.



1. **EXISTING POINT OF DIVERSION** - Water is diverted from the creek by way of existing drainage canals/ditches adjacent to or near the proposed site.
2. **OVERFLOW WEIR AND DIVERSION BOX** - Water flows over the weir and into the diversion box to control inflow. The diversion box can be shut off completely if necessary.
3. **DISTRIBUTION TRENCH** - Constructed at the head of the wetland, the distribution trench ensures the water is 4 feet deep and at right angles to the direction of flow.
4. **VEGETATION** - DSTW is planted with primary species such as cattail (*Typha spp.*), bulrush (*Scirpus spp.*), bur-reed (*Sparganium eurycarpum*), and spike rush (*Eleocharis spp.*) for water treatment; secondary species such as pond lilies (*Nuphar lutea* ssp. *polysepala*) for food and habitat.
5. **ADJUSTABLE DISCHARGE WEIR** - Maintains water levels in the vegetated area at 2 feet or less for a system with a designated discharge.
6. **LEVEL CONTROL STRUCTURE** - Maintains water levels in the vegetated area at 2 feet or less for a terminal system.
7. **EXCLUSION FENCING** - Keeps grazing animals out of the wetlands.
8. **VEGETATED SWALE** - Diverts run-off from higher elevations on the parcel.
9. **EARTHEN BERMS** - Generally to be avoided, since the site is likely to be wet and difficult to work with using typical earth moving equipment. If required, berms should have two feet of freeboard and should be higher at the discharge end of the wetlands.

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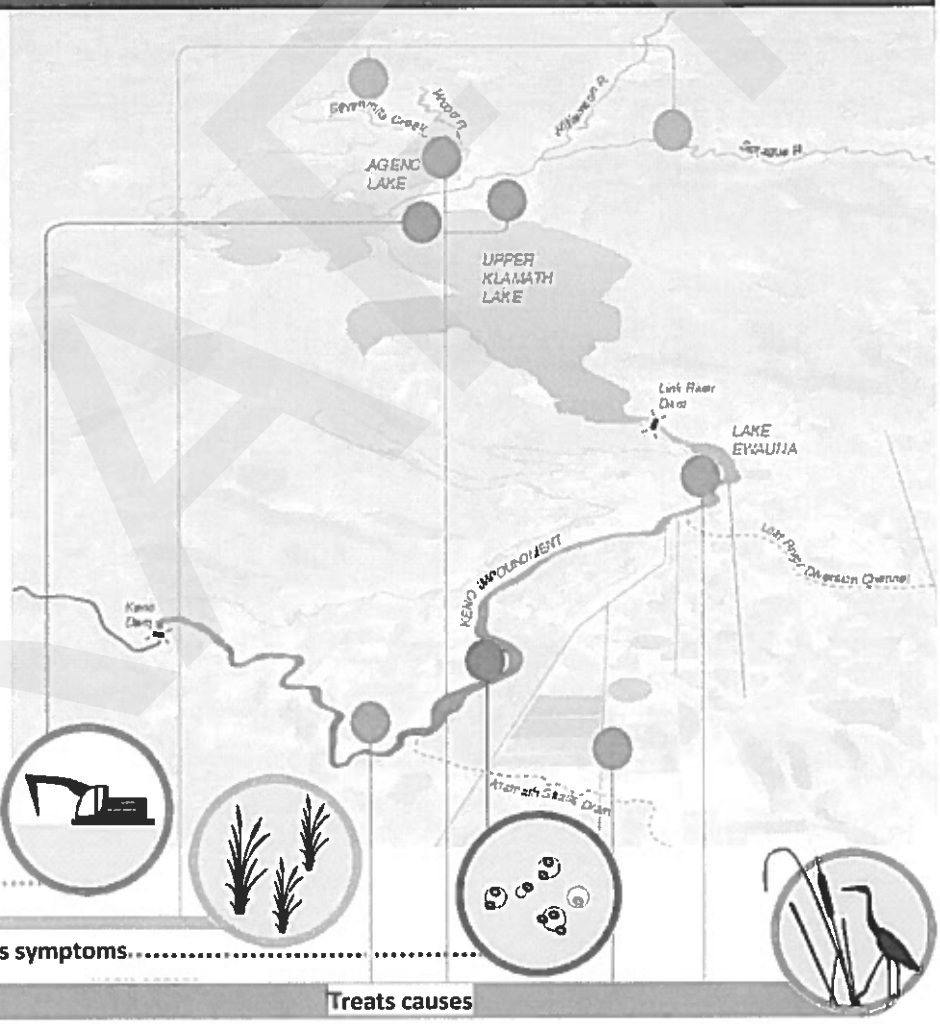
Klamath Landscape-Scale Restoration

REHABILITATED WETLANDS ALONG UPPER KLAMATH LAKE, AGENCY LAKE, LAKE EWAUNA, KENO IMPOUNDMENT

SEDIMENT P SEQUESTRATION USING ALUM MICRO-FLOC W/AERATION/OXYGENATION

DSTWs IN WOOD AND SPRAGUE RIVER VALLEYS

TARGETED DREDGING IN UKL & AGENCY LAKE COMBINED W/IN-BASIN SEDIMENT RE-USE



Years to effective treatment: 3-5

Treatment is immediate

Years to effective treatment: 1-2

Treatment is immediate

Years of effective treatment: 5-10 years | 15-20 years | 20-30 years | 30-50 years

IM - 11 Preferred List of Projects

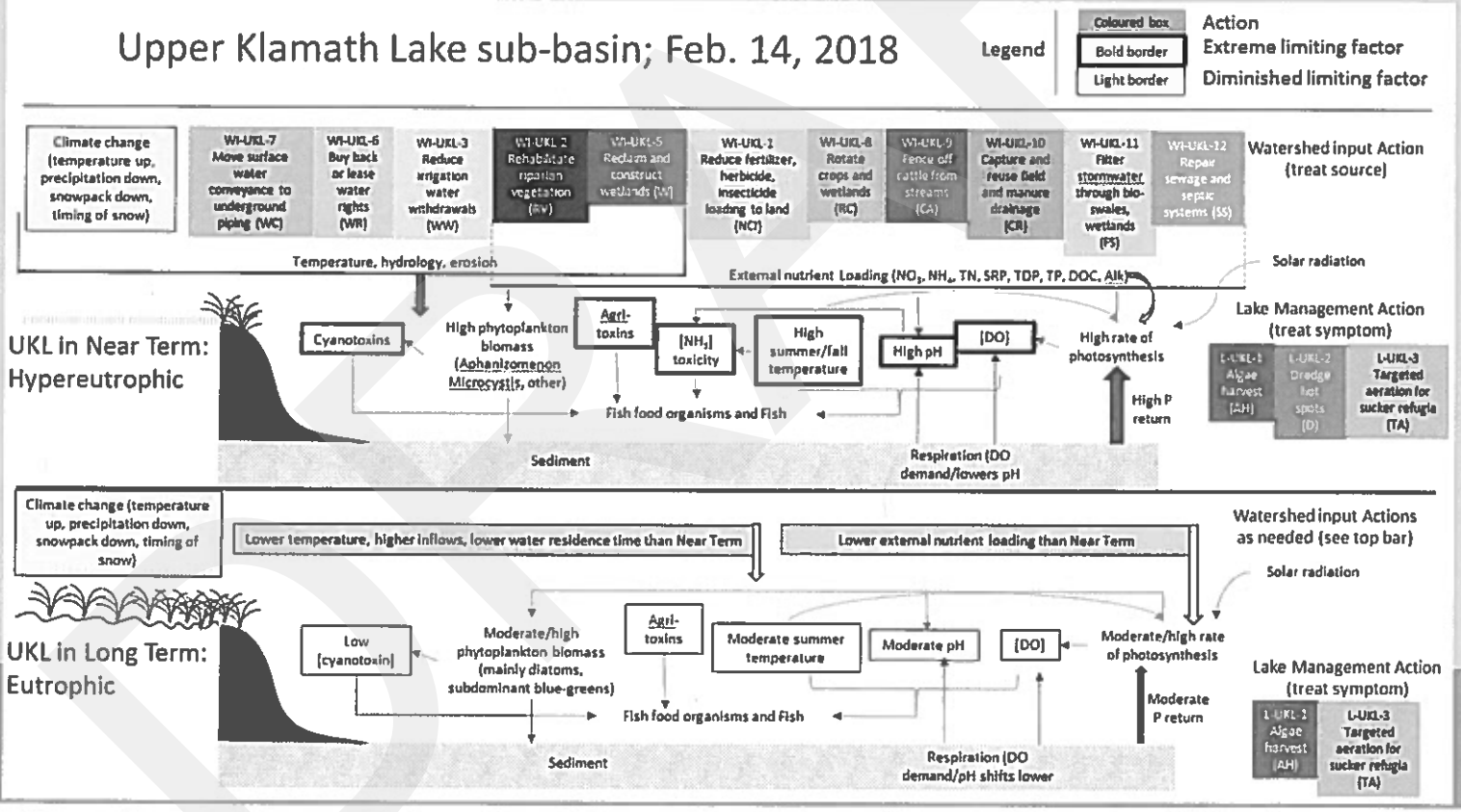
- Klamath Hydroelectric Settlement Agreement – funded by PacifiCorp
- $5,400,000 at license transfer
- Four categories of projects
  - Diffuse Source Treatment Wetlands
  - Riparian Restoration
  - Lake Fringe Wetland Restoration
  - Agriculture Water Conservation Piping
- Governance procedures under development

Integrated Fisheries Restoration and Monitoring Plan

- USFWS led initiative developing comprehensive plan for fisheries in Klamath Basin
- Multi-species, Upper Klamath Lake, Mid-River, and Estuary
- Completion by 2020
- https://essa.com/explore-essa/projects/restoration-planning-in-the-klamath-river-basin/#1512665948945-0b64f385-20c90ae0-cc44

Integrated Fisheries Restoration and Monitoring Plan

Conceptual models for each Reach



Upper Klamath Basin Watershed Action Plan

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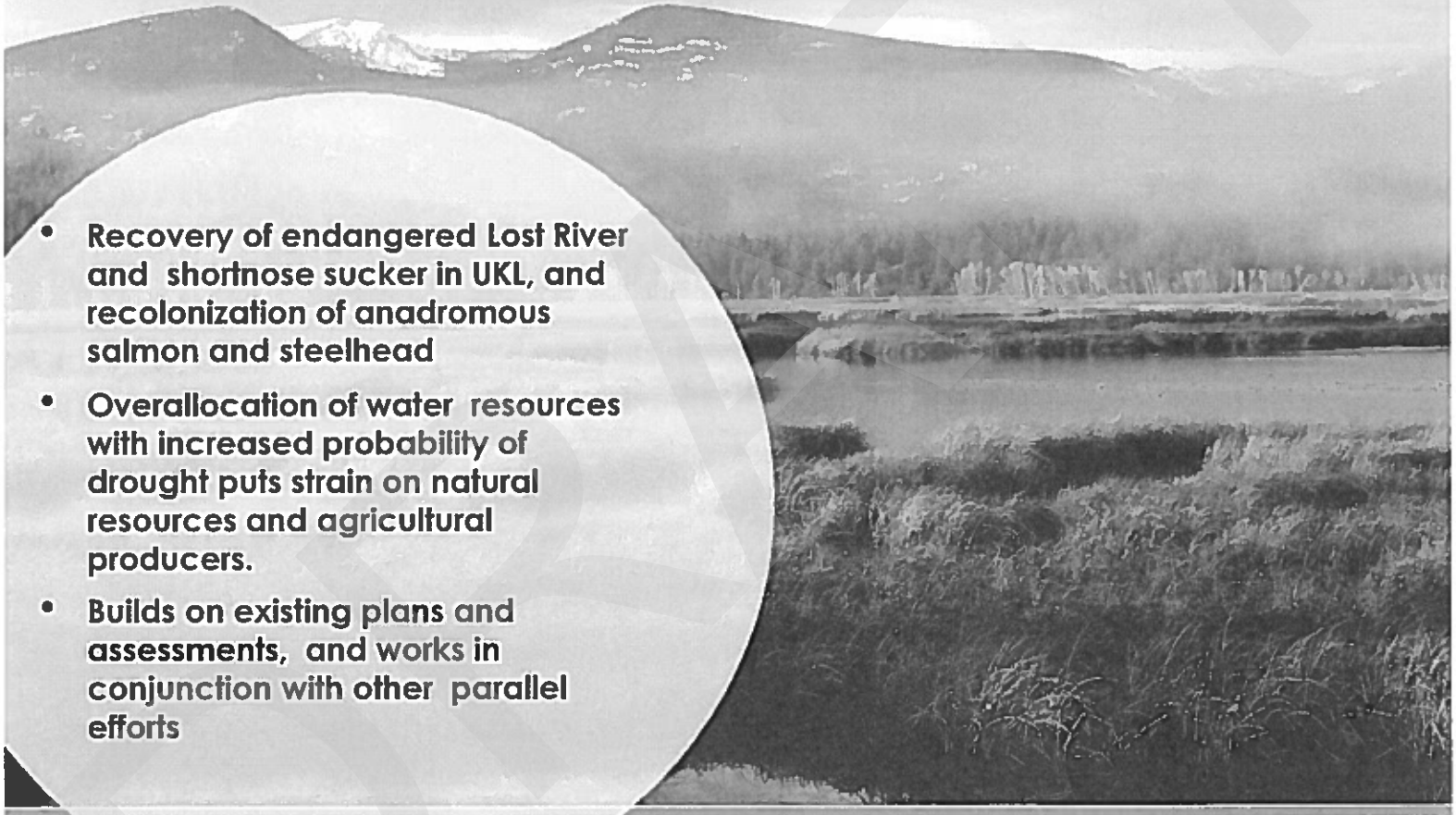
Background & History

- The need for a restoration plan was identified during the community-led effort to build the Upper Klamath Basin Comprehensive Agreement
- Even in the absence of a settlement, the need and funding still existed for a restoration plan
- Non-profit, state, federal, and tribal entities came together to contribute, and a contractor was hired to develop prioritization tools and assemble content

Why is the UKB WAP timely and necessary now?



- **Recovery of endangered Lost River and shortnose sucker in UKL, and recolonization of anadromous salmon and steelhead**
- **Overallocation of water resources with increased probability of drought puts strain on natural resources and agricultural producers.**
- **Builds on existing plans and assessments, and works in conjunction with other parallel efforts**

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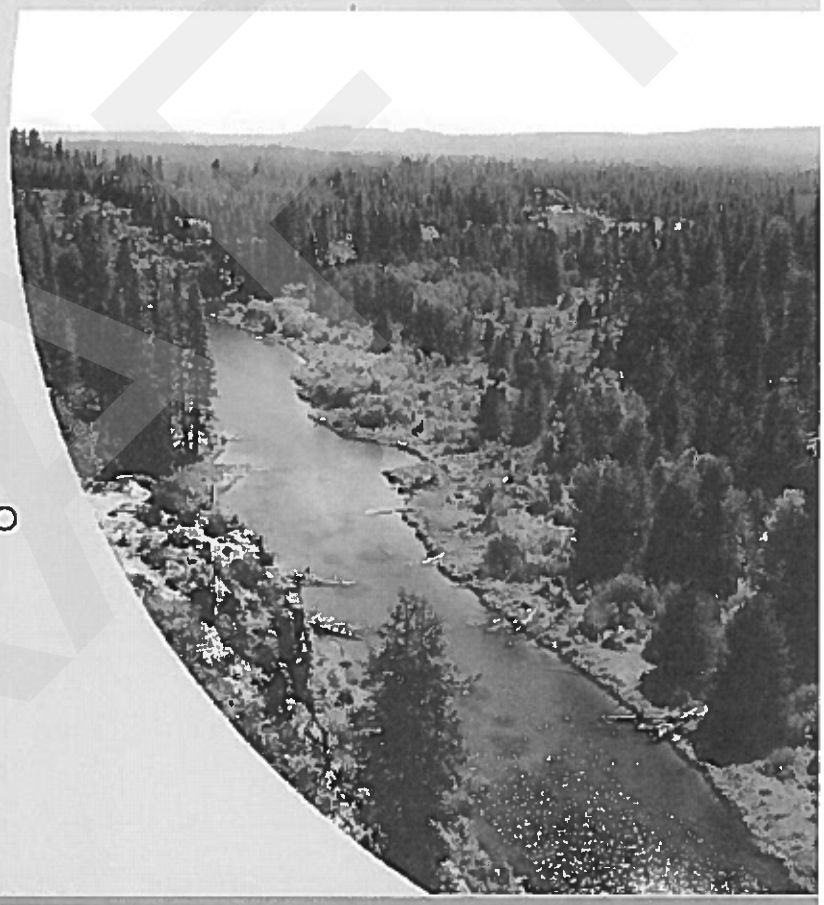
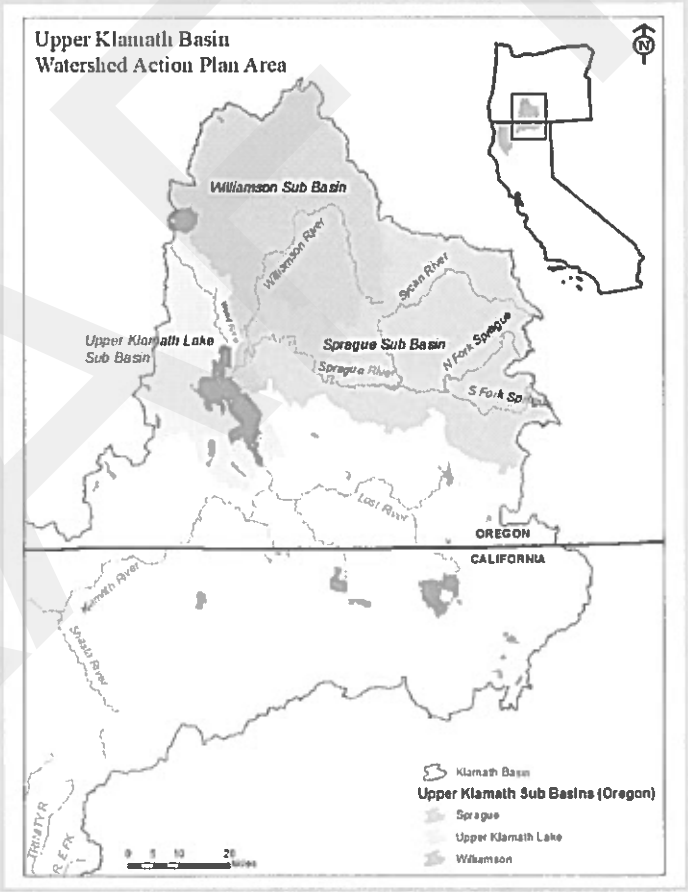
What is the UKB WAP?

- An accessible planning and mapping tool to guide future restoration projects
- Voluntary and Non-regulatory
- Adaptive and easy to update
- Harmonious with other regional planning efforts
- Accessible to partners while also sensitive to the needs of landowners to sustain their operations and ways of life.
- Has full buy-in from all WAP organizational partners



WAP Geographic Scope

- Sprague River Basin
- Williamson River Basin
- Wood River Basin
- Westside tributaries of Upper Klamath Lake
- Upper Klamath and Agency Lakes shorelines



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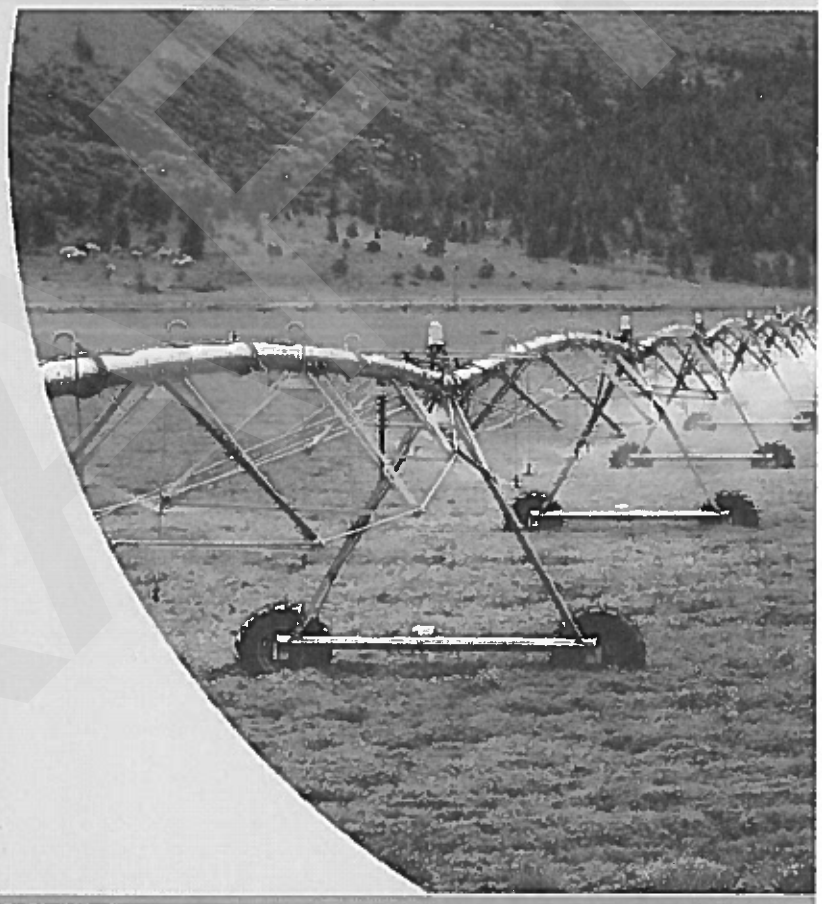
WAP Contributors (partial list)

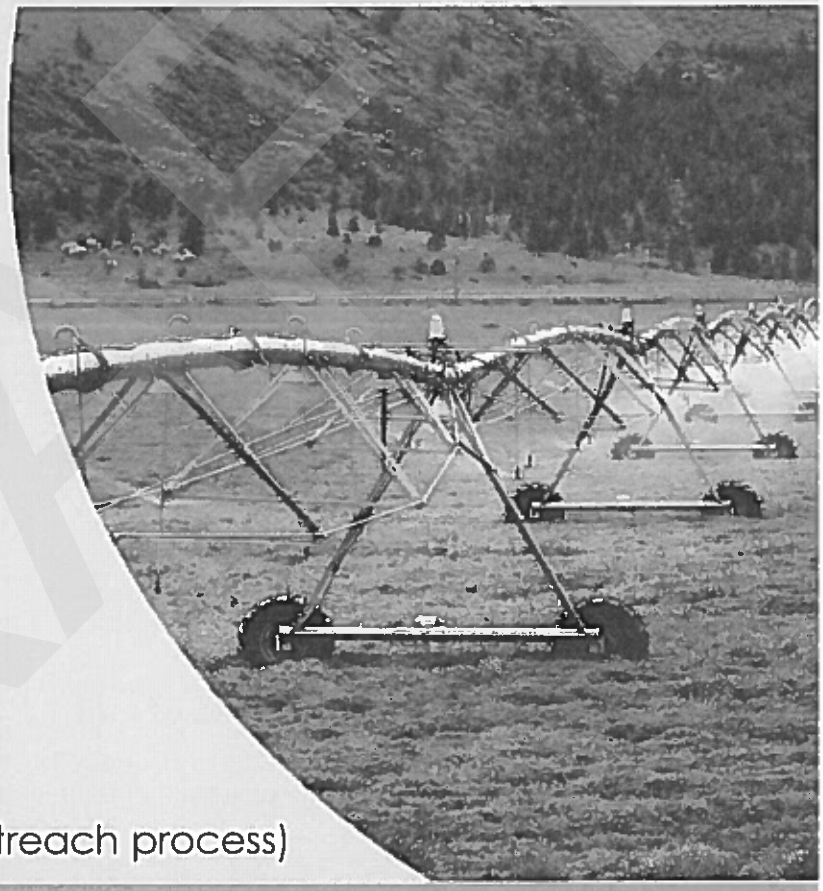
- Klamath Watershed Partnership (KWP, recognized by the state of Oregon as the watershed council for the Upper Klamath Basin),
- North Coast Regional Water Quality Control Board (Regional Water Board) in California,
- Oregon Department of Environmental Quality (ODEQ),
- The Klamath Tribes (TKT),
- The Nature Conservancy (TNC),
- Trout Unlimited (TU), and
- US Fish and Wildlife Service Partners for Fish and Wildlife Program (USFWS)



WAP Contributors (continued)

- Oregon Water Resources Department (OWRD)
- Oregon Dept of Fish and Wildlife (ODFW)
- Bureau of Land Management (BLM)
- U.S. Geological Survey (USGS)
- Engineering/Biological Consultants
- Landowners and Waterusers

(This list continues to grow through outreach process)



WAP Timeline (dates are subject to change)

- **Jun - Sept 2018:** Collection of data, weighting of priorities, and development of WAP mapping tool metrics
- **Jun - Nov 2018:** Development of mapping based tool and restoration prioritization framework
- **Oct 2018 - Feb 2019:** WAP draft internal and external expert review, landowner outreach and feedback
- **Sept - Dec 2018:** Draft of WAP chapters
- **March 2019:** WAP draft available for review to agency partners and landowner representatives
- **May - June 2019:** WAP data tool finalized
- **July 2019:** UKB WAP completed

WAP Application Example: Fish Passage Barriers

WAP

1: Identify all fish passage barriers within geographic scope → 2: Evaluate ecological priority based on multiple metrics → 3: Produce map and list of barriers and reaches, organized by priority

We are here

June 2019

implement

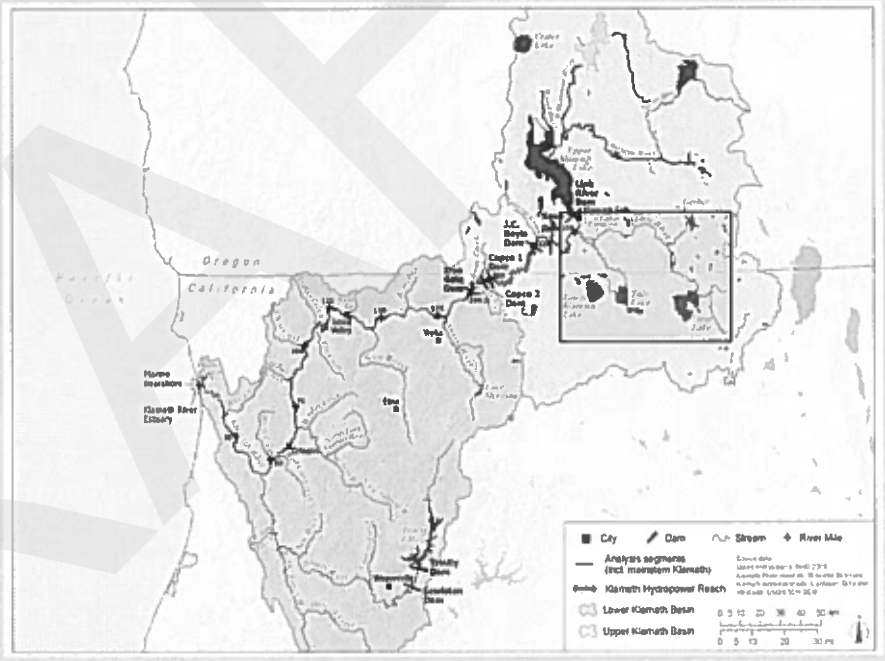
4: Assess feasibility based on non-ecological factors and input from landowners (e.g. cost, permitting complexity, impact to agricultural operations, etc.) → 5: Pursue funding to implement feasible priority projects

WAP
How to get involved

Spread the word about this effort to colleagues and community members with the intention that the UKB WAP and tool will be available for integrating into project based used in mid- 2019. For more information, please contact Nell Scott at nscott@tu.org or Bill Lehman at blehman@klamathpartnership.org

Lower Klamath Lake Watershed Stewardship Partnership

- USBR, USFWS, KWUA, IDs, ODEQ, KWP, Individual Landowners & NCRWQCB
- Water conservation and restoration
- Farmers Conservation Alliance working with Modoc ID and KID on strategic plan
- Initiating Charter Agreement



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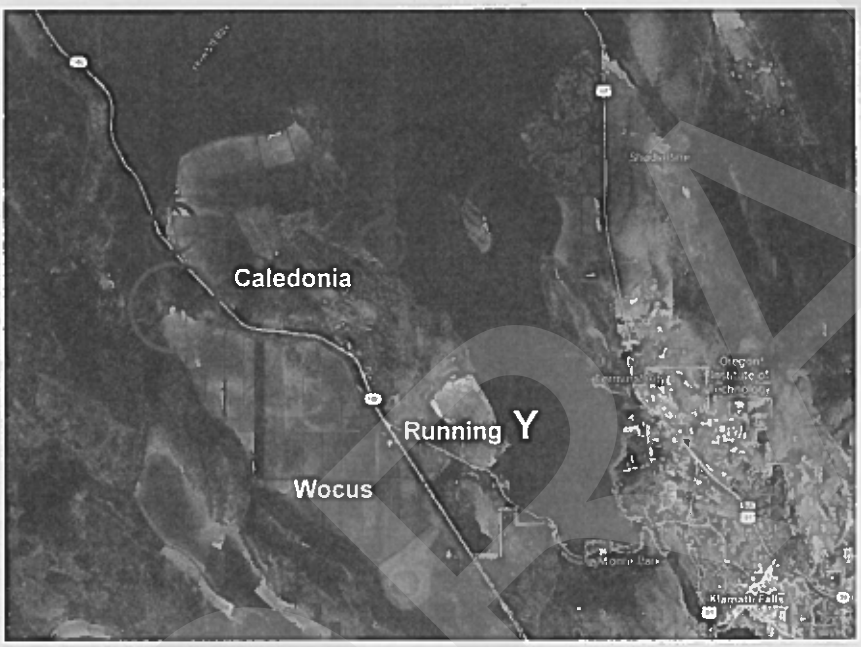
ODEQ and OR Department of Agriculture

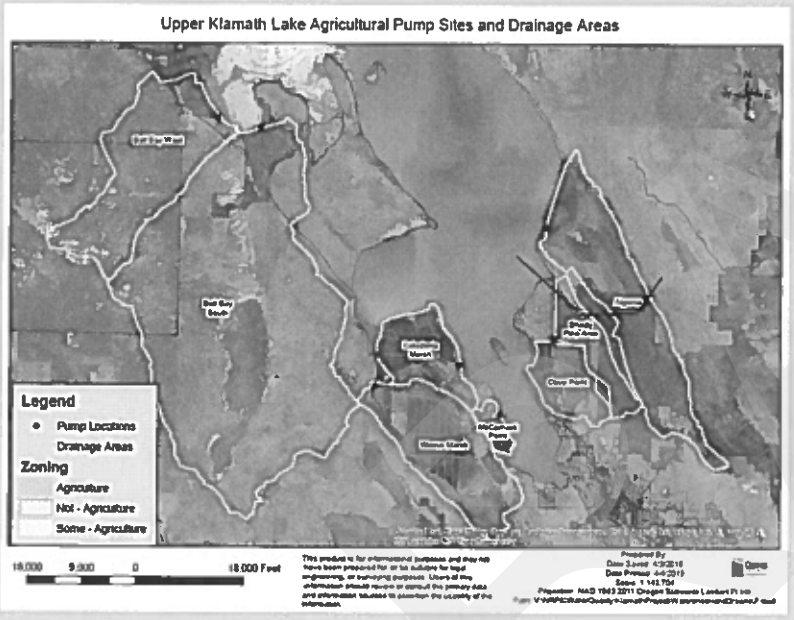
- TMDL Issued in 2002
- TMDL Requires Designated Management Agencies (DMA's) develop implementation plans
- Target pollutant phosphorus
- 40% phosphorus reduction from external sources
- ODA named a DMA in the TMDL
- ODA designated CWA authority for agricultural operations in Oregon
- ODA developed Water Quality Management Plan and Area Specific Rules for UKL

OR Department of Agriculture



- Walker Farms
  - ✓ Caledonia
  - ✓ Wocus
- Blue Circle
  - ✓ Inlet Wocus
  - ✓ Outlet Wocus
  - ✓ Mousefield Wetland
- Red Circles
  - ✓ West Outlet Caledonia
  - ✓ East Outlet Caledonia

OR Department of Agriculture



- Pump Location Map
  - ✓ 8 additional locations
  - ✓ Similar irrigation practices
  - ✓ Historical wetland complexes
  - ✓ Irrigation return / Storm water
- ODA Collaborative
  - ✓ Working with Landowners
  - ✓ Working with Klamath Tribes
  - ✓ Working with other partners

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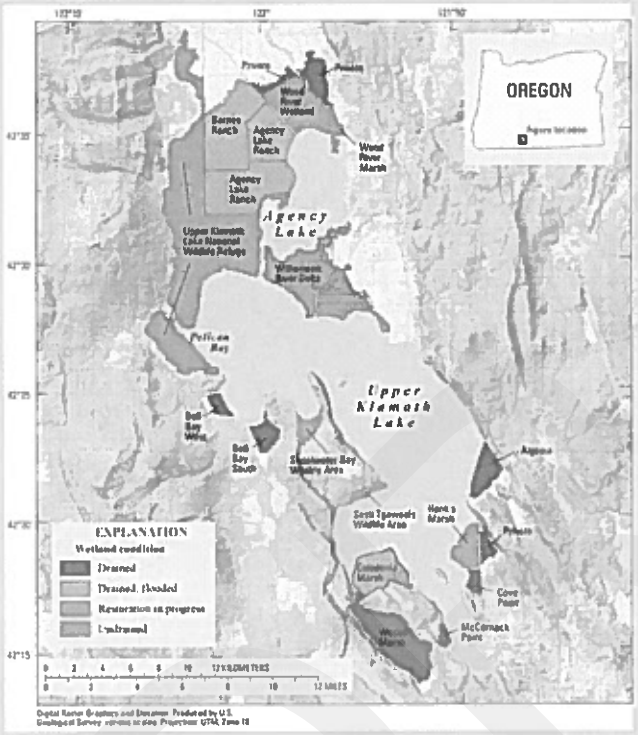
OR Department of Agriculture

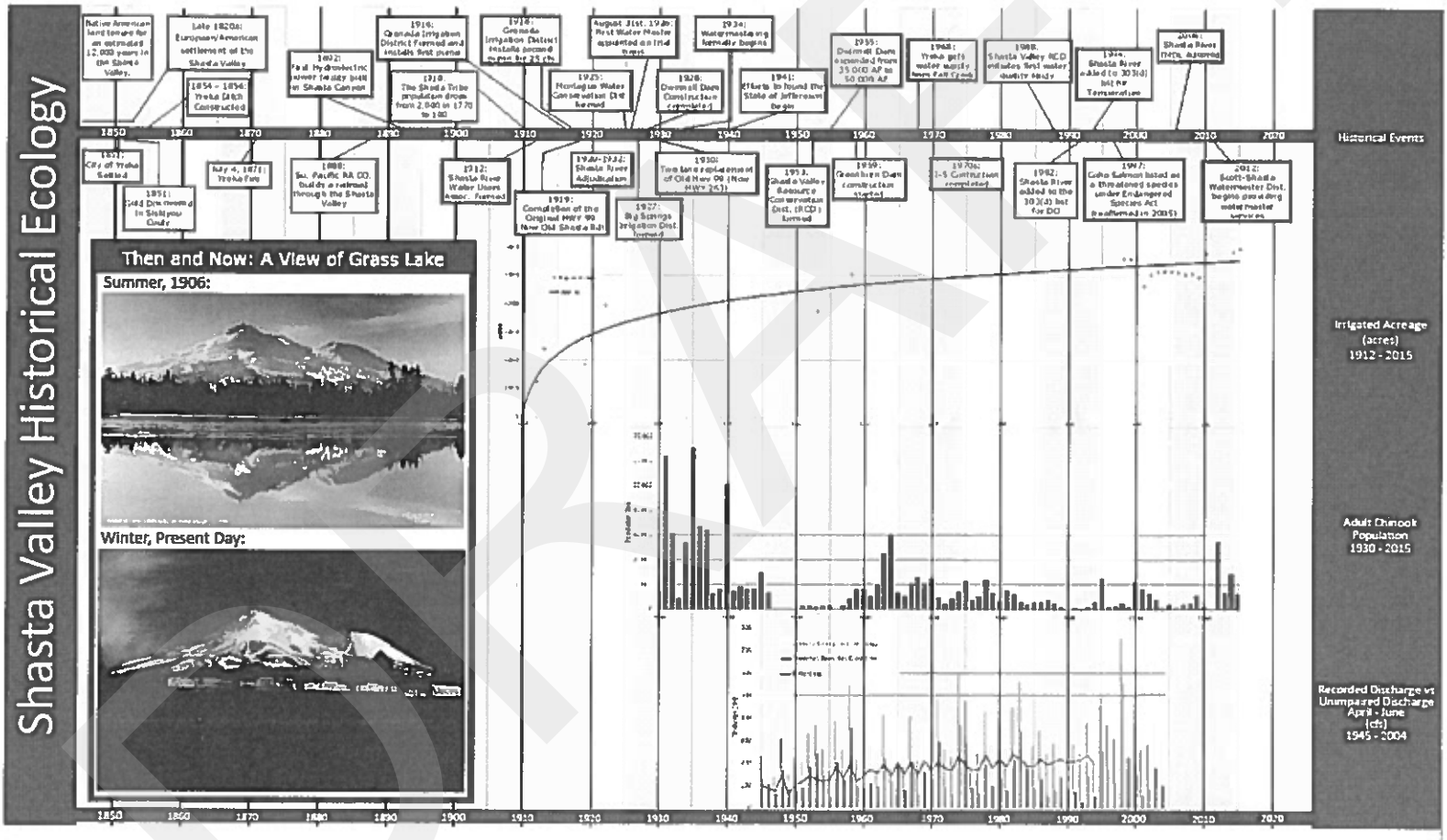


- Upper Klamath Lake Wetlands
  - ✓ Historical wetland locations
  - ✓ Current use agriculture
  - ✓ Williamson River Delta (Restored)
  - ✓ Wood River Wetland (Restored)

October 24, 2019

Klamath River Compact Commission

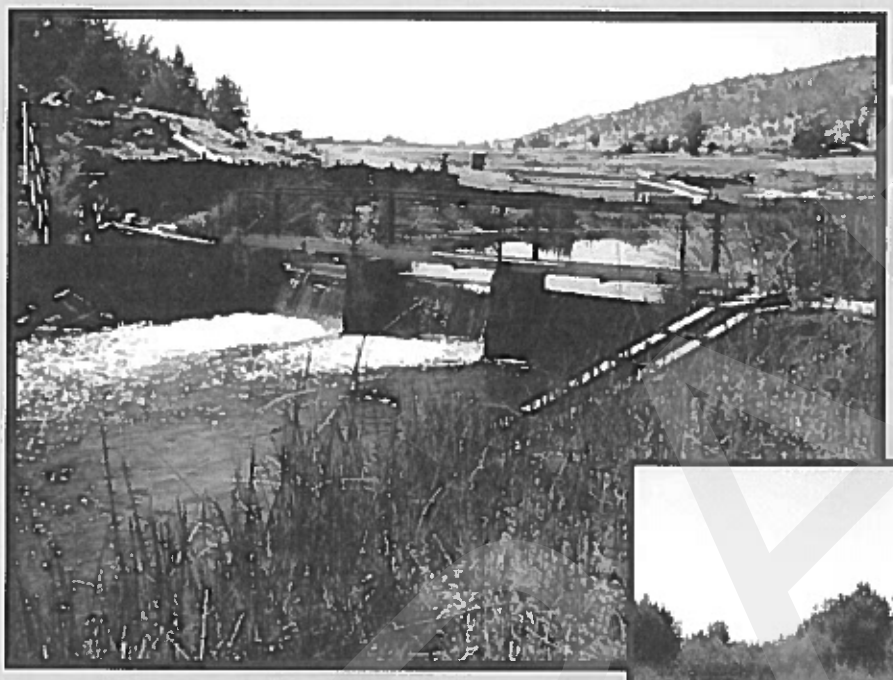
Shasta Watershed Stewardship



Shasta River Example Project

Shasta Valley RCD: Meamber Tailwater Re-use

Will result in 0 ac-ft



Shasta Water Association Pre-project…2008

Post project Spring 2009

February 12, 2019

Klamath National Forest

USFS Waiver Permit: Road Storm & Proofing Stream Crossing Upgrade

- **Increase pipe size**
- **Constructed a dip**
- **Rock fill**

October 24, 2019

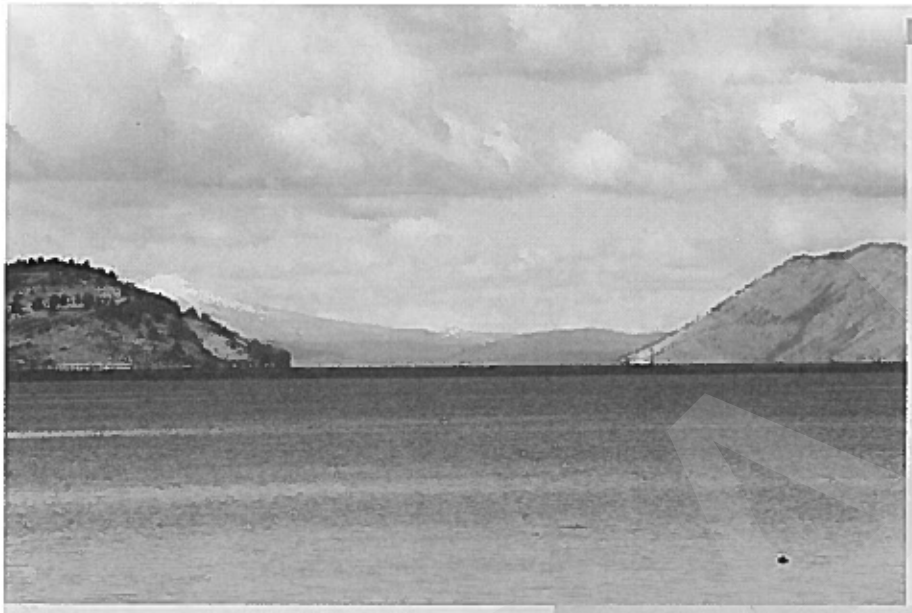
Klamath River Compact Commission

Yurok Tribe:
Watershed and Stream Restoration

Yurok Tribe: Instream & Riparian Habitat Enhancement

Next Steps - Recommendations

- Continue to build collaborative sub-basin watershed stewardship groups
- Use and adapt watershed plans
- Support Klamath Basin adaptive management: KBMP & KTAP



Thank You!

Questions?

Photos by Randy Turner

The meeting opened for comments and questions on the materials presented.

Commissioner Byler stated that he appreciates the approach of collaboration. Takes a lot of work to do these types of things. OWEB brings resources; what does CA bring? How to maintain momentum over time. Mr. Creager responded that tailwater recovery systems are very expensive and they are focusing on the Shasta because it is a stronghold for the Salmon. Dr.
Harder is working on a GW study in the Scott River basin. OWEB and the Pacificorp funds are going to be matched and the funding cycles are matched up. Lots of work with coordinating and collaborations.

Commissioner Anderson highlighted multiple adaptive management approaches but sometimes they can be reluctant to explore new ideas. How open is the Adaptive Management Framework to outside collaborations? Mr. Creager said that the coordination is an ethic and not an entity. Water Resiliency? Commissioner Anderson expressed caution in projects that "fix" leaking, unlined canals, because they contribute to groundwater recharge. In some places, PG&E quit delivering water in the canals and now folks' domestic wells have been drying up. Commissioner Anderson cautioned the group to watch out for these types of unintended consequences.

Commissioner Byler put out that integration is another way to look at things to maximize the dollars on the ground to maximize the outcome.

Mr. Rice asked about the "license Transfer" term on slide 24. Mr. Creager indicated that there will be an entity was tasked with managing the monitoring of KHSA tasks.

Susan Miller – appreciates coordinating with landowners and agencies. The dams are part of all of it. Clayton said the dams are WQ impairments and not part of the things they are working on.

Chrissie Reynolds – your agency is one of the agencies responsible for posting the WQ issues. She wondered about the money that was spent on the reservoir posting about bad WQ issues on them. She claims the issues were not bad and not dangerous. Where does KTAP get its funding? Removing the reservoirs will cause a loss of water for birds. Lots of other species that impacted. Mr. Creager responded that Cal Trans is funding the KBMP for the next year.

Joe Watkins – He is questioning the accuracy of the data that KBMP uses and who reviews the science. Mr. Creager responded that reviews are done both outside and internal to the agency providing the information. KBMP is transparent with its data. Mr. Creager indicated that he does not have any qualms with the data presented.

Chair Lambert opened the meeting to public comment.

Commissioner Anderson requested that the public comments be focused on items under the authority and jurisdiction of the Commission.

Public Comment:

Richard Marshall, President, Siskiyou Water Users Association

Richard Marshall – president of Siskiyou Water Users raised the issue about the conflict of interest with Chair Lambert being a vocal opponent of the dams. No one talks about the water conditions of the Klamath River water quality. Has always been poor water quality. Has a lot of information of the history of the water quality. Read from a document that he will give to the recorder regarding role commission should take.

Rex Cozzalio, Siskiyou County Water Users Association

Rex Cozzalio commented on Clayton's presentation. Read from a document, a copy of which was added to the record. The theme was mostly about the water quality issues and abusing conflict of interests and the data that the NCWQ control board.

Robert Rice, Siskiyou County Water Users Association

Bob Rice – Klamath Forest Service Supervisor. His assignments was to determine whether the river should be designated a wild and scenic river. He interviewed all three of the previous federal Commissioners. The Commissioners said the challenges are great in 1990's. Challenges were low on water supply and high on pollution. Four Concerns: Public was concerned about high level of pollution. High need to provide water to the River. Recommend a study with BLM, Fish kill of 33,000 fish. Bucket Brigade was because of the PDO occurrence. Responsible laws.

Dr. Richard Gierak, Citizens United

Dr. Richard Gierak – removal of dams is violating 5 federal acts. Removing wetlands, Wild and Scenic Rivers act, some act relating to navigable rivers, and vote of the people.

Susan Miller, Siskiyou County Water Users Association

Susan Miller – Dam removal: secretary of interior retracted the letter of dam removal approval. Pacificorp has information that says dam removal is dangerous. Environmental hazards are going to be immense. She listed many species of animals will be affected. Damage with release of 200 million cubic yards of sediment.

Chrissie Reynolds, SCWUA

Chrissie Reynolds – suffered through 4 fires in a month. Lived in Siskiyou county 22 years and the lakes saved her life 2 times. The Power companies put them at risk. What about the fish that aren't discussed? She is concerned about the people that live near the lake. Smear campaign about the blue green algae and her livelihood is being threatened. Real issue for her and she is very passionate.

Jerry Bacigalupi, SCWUA

Commission is responsible for addressing and solving disputes. Upside down basin. Coho are not naive. Truck and haul was recommend but not carried out. Doubt that Coho could back to ocean. EIR did not recommend alternatives. Department of Dam Safety has inspected them

and are in good condition. They have not approved removal process. Dam's provide 25% reduction in peak flood reduction. Dam's provide habitat for the hatchery. Dam's provide a 3 month flow for fish flows. Release 20 million yards of sediment. Siskiyou and Klamath County voted to retain the dams.

Chair Lambert thanked those that gave public comment.

There being no further business, the meeting was adjourned.

Respectfully

submitted,

Nirvana Cook
Klamath River Compact Commission Staff Support

Please note, the recording system for the meeting failed due to technical difficulties. These minutes are based on the written notes of Kyle Gorman, Oregon Water Resources Department.

Public Written Comment:

Klamath River Compact Commission Meeting

Oct. 24, 2019
Klamath Falls, Oregon
Comments Submitted by Jerry Bacigalupi, Professional Engineer

THE KLAMATH RIVER HYDROELECTRIC FACILITIES (FERC Project No. 2082) have been requested for Decommissioning by PacifiCorp (Surrender of License #20160923-5370) for Iron Gate Dam, Copco No. 1 Dam, Copco No. 2 Dam, J.C Boyle Dam, and appurtenant hydroelectric works and to be transferred to a dam removal ("shell") corporation (KRRC).

IT IS WITHIN THE COMPACT COMMISSION'S RESPONSIBILITY AND DUTY to resolve problems, correct errors and deficiencies, and consider the public's interest to retain and pursue the relicensing of the hydroelectric facilities to a "responsible" entity.

Siskiyou and Klamath Counties, the Cities within, and the Compact Commission have the statutory responsibility to provide and protect the public's interest and safety to all citizens and protect the environment for present and future generations. **Through proper and legal voting procedures in 2010, the voting populous of Siskiyou Co. (79.04%), and in 2016 Klamath Co. (72%), OVERWHELMINGLY voted to retain the Klamath River Dams and Hydroelectric Facilities.**

Klamath River information: **1.** The Klamath Basin is the only **upside-down basin** ("a river upside down" according to National Geographic) on the west coast **(warm poor water quality above J.C. Boyles Dam)**, with water temperature and quality improving as it travels to the ocean. **2. Moonshine Falls, directly below J.C. Boyles Reservoir, is cited by CFW to be the upper most habitat for anadromous fish. 3. The downstream Dams have absolutely nothing to do with the Upper Basin water wars.** They improve the DOI Klamath Project regulated flows to farmers and ranchers by providing required minimum instream flows. **4.** The California dams have been recently inspected by the Division of Dam Safety and are in good condition. **5. These dams provide a 25+% down river flood and surge protection,** based on the 1964 flood hydrograph measured at the gage below Iron Gate Dam, and provides an average yearly water quality improvement. **6.** Given the condition of a complete Klamath River cutoff by the DOI or a severe drought, **the dams can also provide CDFG/CFW's 700 cfs minimum instream river flows for a three-month period with adequate storage retained for Lake Habitat.**

STOP the largest Proposed Dam Removal Project in the World and preserve the Klamath River Basin economy and ecosystem. It HAS NOT been established that anadromous fish habitat exists above J.C. Boyles Reservoir or that any other listed benefits justify Dam Removals.

As a Registered Professional Engineer, former State Employee with Caltrans Hydraulics and Hydrology Section, and the Resources Agency, and in private practice, I was responsible for drainage analysis and designs, the preparation and analysis of Environmental Impact Reports (EIRs), and Storm Water Pollution Prevention Plans (SWPPPs). The Department of Interior (DOI) and States of California and Oregon have failed to prepare and complete 401 Clean Water Act and environmental studies to legal and acceptable standards that support Dam Removals for the following reasons:

1. **Coho Truck and Haul Studies above J.C. Boyle Dam were demanded but refused by the DOI, probably because they realized anadromous habitat did not exist. A common analogy is that the only way Coho juveniles can get back from the tributaries of Upper Lake to the ocean is**

to become flying fish. This study must be completed to support Dam Removals. Without this study the environmental documents fail and will initiate MAJOR LAWSUITS.

2. The environmental documents are incomplete. (Fail to analyze alternatives with Dams in place). (Fail to provide a Cost Benefit Analysis). Including substantial crop and property value losses to Farmers and Ranchers due to unjustified DOI water cutoffs.
3. The release of 20 +/- million cubic yards of toxic sediments retained behind the Dams down river is Irresponsible, violates the 401 Clean Water Act, and requires the preparation of a "Storm Water Pollution Pretention Plan". It will decimate river habitat and the estuary for decades. It is irresponsible that sediment removal by dredging has been abandoned because of cost!!
4. The Calif. Division of Dam Safety, under existing law, requires that Dam Removal Plans be submitted, approved, and verify that Dam Removal Plans and Conditions are followed.
5. Siskiyou and Klamath Counties have and are mandated (within their existing regulations and public safety authorities) to require and approve Klamath River Dam Removal Permits (they are not preempted by State and Federal Governments).
6. The DOI and State Agencies have circumvented State and Federal Laws by certifying bogus scientific studies to justify dam removals, commonly cited by recognized professional Biologists, Scientists, and Engineers as SWAGs (Scientific Wild A** Guesses)
7. The Flood Control provided by the Dams proposed for removals is substantial: My comments on the Klamath Facilities Removal Final EIS/EIR to the BOR shows that my 100 yr. flood calculation of 37,000 cfs below I.G. Dam, based on the 1964 flood hydrograph, reduces peak flow by 26%. My 100-yr. peak flow should be much lower than what is being used for the Klamath River flows for the Lower Klamath Project. (Table 3.6-9 shows that the Dams only provide a 6.9% reduction in flood attenuation). See Attachment #1.
8. The Draft EIR fails to consider feasible and public-supported Alternatives with the Dams remaining in place.
9. My comments on the Klamath Facilities Removal EIR Public Draft EIS/EIR are also attached to address deficiencies and failures in the EIS/EIR process that need addressing. See Attachment #2.
10. Failure to address the above listed deficiencies, documentations, studies and permits WILL INVOLVE MAJOR LAWSUITS.

THE FOLLOWING PROJECTS (ALTERNATIVES WITH DAMS IN PLACE) HAVE BEEN PROPOSED TO FACILITATE "FERC" RELICENSING, PROMOTE THE PUBLIC AND ENVIRONMENTAL INTEREST, COMPLY WITH THE BI-STATE COMPACT, AND PRESERVE THE KLAMATH RIVER BASIN:

1. Implement the Shasta Nation Tunnel Unassisted Anadromous Fish Passageway around Iron Gate, Copco 1, and Copco 2 Dams at a cost of $50 million (1/6th the $300 million cost estimated for installing fish ladders and 1/20th the $1+ billion estimated for dam removals and restoration).This will provide anadromous fish passage around Iron Gate, Copco 1, and Copco 2 reservoirs to the pre-dam 20 miles of river habitat above Copco 1 Reservoir. This proposal has a very positive write up in the **DOI's EIR. (Note: It was not considered because it required retaining the Dams).** A former DFG official stated that he could not support this alternative. He also stated that he could not support proposed fish ladders either because there is no habitat above the Dams to warrant the expense of either.

2. Implement the 60,000 ac.ft. Klamath River/Shasta Valley Reserved Water Right (A0169580), transfer canal and storage facilities to supplement Montague Irrigation District's irrigation water with Klamath R. water (poor water quality containing high nutrients). This project augments current

irrigation supplies, allows for additional land to become irrigated, and replaces naturally impaired Upper Klamath River water with higher quality water. A portion of the reduced water demands (good water quality) can be released by the District from Lake Shastina or from their wells into the Shasta River, improving the water quality in both the Shasta River and in the Klamath River below Iron Gate Reservoir per FERC recommended requirements for relicensing. The Shasta Valley RCD & CDF&W contracted a similar augmentation study in 2007 that has since been politically shelved. *(Because it depends on retaining the dams scheduled for removals)* Ref: (CDFG Project No. P0310329)

3. **Combining Alternatives 1 & 2**

4. Establish additional reliable storage facilities within the Klamath River Basin, including increasing storage capacities of high-elevation lakes as recommended in the October 1991 Department of Water Resources Study: *SCOTT RIVER FLOW AUGMENTATION STUDY*, and introducing juniper removal projects. Added storage facilities and juniper removals projects will provide thousands of ac-ft. of additional surface and ground water storage, provide additional wildfire protection, increase late summer and fall instream flows, and augment irrigation waters.

5. Establish a Public Utility District (PUD) within Siskiyou and Klamath Counties to take possession of the hydroelectric facilities and pursue FERC re-licensing. (Note: This process is underway in Siskiyou Co. and planned to involve Klamath Co. and the Shasta Indian Nation in the future.)

These proposals will:

- **Save the Hydroelectric Dams** which generate clean, green, renewable power to 70,000 homes and protect the lake habitat and homes in and around the reservoirs by eliminating "dam removals" from the proposed Lower Klamath Project and the Klamath Basin Restoration Agreement (KBRA), and abolishing the Klamath Hydroelectric Settlement Agreement (KHSA).
- **Save Iron Gate Fish Hatchery,** which is dependent on cool, low-level water releases from Iron Gate Reservoir, which releases over **six million salmon and steelhead fingerlings per year** into the Klamath River. (**Note:** A former CDFW Game Warden stated, "It is *impossible* for the Klamath River Habitat above Iron Gate Dam to duplicate the production of fish generated from the Iron Gate Hatchery.")
- **Save future impacts on the Fall Creek Hydro-electric Facilities and Yreka City Fall Creek water supply.**
- **Save the Klamath River from complete destruction** by eliminating the proposed and **irresponsible** releasing of 20 million cubic yards of sediments and pollutants (retained behind the dams) down river. This equates to sediment 3 feet thick all the way to the estuary, assuming that the Klamath River is 150 feet wide & 190 miles to the ocean. **(Violates Clean Water Act Section 401)**
- **Save future Klamath River water demands for the Scott R. and Shasta R.** from State and Federal Agencies that are determined to satisfy requirements proposed in the KBRA for **Environmental Waters.**
- **Preserve the sacred Shasta Nation Villages and Burial Sites** beneath the waters of Iron Gate and Copco Reservoirs.
- **Provide additional storage facilities and instream flows** which will enhance fisheries and benefit the Tribes, NGOs and fishing interests, and improve Klamath River water quality.
- **Eliminate increased electricity rates for On and Off Project irrigators and all ratepayers and provide substantial power rate reductions with the establishment of a PUD.**
- **Provide Governmental Agencies common-sensed, professionally supported, and professionally engineered alternatives.**

My final recommendation as a Professional Engineer, if overseeing the Lower Klamath Project (which has proven very controversial, does not have local public support, and is flawed with highly questionable environmental documents) is to implement the following study to even consider Dam Removals:

If Dam Removals is selected as the preferred alternative, and prior to any decommissioning or work on Dam Removals, perform the following 5-year study:

1. **Remove plugs and install gate valves on bypass tunnels to allow maximum flows through the existing tunnels.**
2. **Plan controlled plug removals and installation of gate valves and their operation to sequence with anadromous fish runs and weather conditions.**
3. **Perform a 5-year study to determine if anadromous fish can or will utilize the upper Klamath Basin tributaries and see if their juveniles return to the estuary.**
4. **Study the impacts of sediment release on the Klamath River and the estuary.**
5. **Study the impacts on the Iron Gate Fish Hatchery.**
6. **Study the impacts on not being able to maintain minimum flows without dam storage.**
7. **Study the impacts on the Upper Klamath Basin agricultural water availability without Dam storage for minimum flow releases.**
8. **Study the River impacts from the release of lake aquatic life to the Klamath River.**
9. **Study the impacts on lake aquatic life and lake recreation.**
10. **Study the impacts on agriculture, recreation, the livelihoods of people and businesses within and around the Klamath River Basin.**

Note:

During this 5-year study period the Dams will provide flood control and the Fish Hatchery must be shut down which will allow a study on the benefits of the Iron Gate Fish Hatchery.

After the study period, which is likely to determine that anadromous fish habitat does not exist in the Upper Klamath Basin (with studies proving support for retaining the Dams and hatchery) the bypass tunnels can remain closed and the Hydroelectric Facilities can be put back into normal operation. And, the community can finally get back to what they do best: take care of the land, wildlife, and environment they love while providing the public with much needed, responsibly raised, locally grown food and fiber.

Do not allow politics to TRUMP common sense.

Respectfully submitted,

Jerry L. Bacigalupi

Jerry L Bacigalupi
Professional Civil Engineer, RCE 18,063
JLB Construction & Engineering
P.O. Box 309 Montague, CA 96064
(916) 768-5015
Jerry@JLB-n-DLB.com

Attachment #1:
June 13, 2013

To:
Gordon Leppig
California Department of Fish & Game
619 Second Street
Eureka, CA 95501

Ms. Elizabeth Vasquez
Bureau of Reclamation
2800 Cottage Way
Sacramento, CA 95825

From: Jerry L. Bacigalupi
Professional Engineer (P.E.)
P.O. Box 309
Montague, CA. 96064 (530) 459-5546 (916) 768-5015c

Dear Ms. Vasquez and Mr. Leppig:

Following are my comments to the **Klamath Facilities Removal Final EIS/EIR** (dated December 2012, but not mailed to respondents until 04/05/13)

As a citizen and Professional Engineer I am disappointed at the professional integrity within the DOI and CDFG. In reviewing several of the EIS/EIR comments submitted to the DOI and the DOI responses, I am disturbed at the DOI's lack of professional knowledge, goal oriented responses, and spin **supporting dam removals.**
After reviewing my comments and the DOI responses, I feel that my comments were not addressed. I **would make the same comments again.** The point being that the EIR/EIS has not been properly completed because the **EIS/EIR process is flawed** with responses that lack professional and scientific integrity, and with probable misconduct, all supporting the KBRA / KHSA (Dam Removals). In addition viable alternatives with dams in place were not studied, and the facts that the Upper Basin Water Wars and the Klamath Hydro-Electric Facilities are not physically related. The KBRA & KHSA improperly mandate stakeholders agreeing to Hydro- Electric Dam Facility removals.
In particular I would like to address my highlighted comment #5 and DOI response **(Comment 6 Hydrology).** To quote my comment:
"In Chapter 3 - 3.6 Flood Hydrology of the EIR/EIS, data provided does not accurately represent current independent scientific or historical data. The data and conclusions presented was data that supports the Lead Agencies' desired outcomes and not supported by recognized engineering practices.

Table 3.6-5 shows the 100-yr flows at Keno at 11,800cfs and Iron Gate at 31,460cfs. **A statistical analysis using data from Calif. Division of Dam Safety shows 100-yr. flows for Keno at 12,000cfs and Iron Gate at 30,600cfs. This is a close check, however;**
Table 3.6-9 shows a 6.9% reduction in the flood attenuation of Iron Gate and COPCO Reservoirs combined.

This is in substantial disagreement with an engineered independent evaluation. Using the 1964 flood data for Gage 11516530 (29,400cfs peak flow at Iron Gate) an inflow out flow hydrograph combining both reservoirs shows a 22% reduction in peak flow and a 9 hour delay in peak discharge.

Table 3.6-9, the 100 yr. flood plain below Iron Gate Reservoir, and the write up needs to be recalculated and re-evaluated using properly engineered procedures for inflow/outflow analysis **based on historic hydrographs** to **show that the Dams Provide Critical Flood Protection."**

The DOI Response to my comment :

GP_LT_1230_1220-6 Master Response HYDG-1 Flood Protection. The comment author refers to an analysis of the 1964 flood documented in a memo delivered to Siskiyou County (Bacigalupi, 2010). In this analysis, it was concluded that Iron Gate Dam and Copco Dam reduce the 100-yr flood by 22 percent. However, a time step of 3 hours was used in Bacigalupi (2010), which is too large and this caused **errors** in the results. If the same analysis was performed with a time step of 15 minutes or smaller, the flood attenuation effects would be very similar to Reclamation (2D12b) and find that the attenuation of the 100-yr is near 7 percent as stated in the Draft EIS/EIR.

My comment to the DOI response:
The same analysis was performed using the same computerized program, same data, and varying the time steps of the inflow outflow hydrograph as suggested by the DOI. The results are as follows:

Time Step Hr.	Inflow cfs	Outflow cfs	Peak Flow Delay Hr.	Increase In Flow With Out Dams %	Remarks
3	35,700	29,400	9	22	Original
1	36,800	29,400	10	25	1Hr. Steps
.25(15min.)	37,250	29,400	10.25	26.7	15min. Steps

The above results show that the DOI makes rudimentary conclusion and statements that are in **error** and that have definite impacts on the decision of dam removals. **The Dams do provide substantial (26.7%) flood protection. Table 3.6-9, the 100yr. flood plain and write up needs to be revised.**
The EIR/EIS process has not been completed. The EIS/EIR is flawed with responses that are in error, and lack professional and scientific integrity, all supporting the KBRA / KHSA (Dam Removals).

Respectfully submitted:

Jerry L. Bacigalupi 06/13/13

Attachment #2: **JLB CONSTRUCTION AND ENGINEERING**

November 18, 2011

To:

Gordon Leppig
California Department of Fish & Game
619 Second Street
Eureka, CA 95501

Ms. Elizabeth Vasquez
Bureau of Reclamation
2800 Cottage Way
Sacramento, CA 95825

From: Jerry L. Bacigalupi
Professional Engineer (P.E.)
P.O. Box 309
Montague, CA. 96064 (530) 459-5546 (916) 768-5015c

Dear Ms. Vasquez and Mr. Leppig:

The following are comments to the **Klamath Facilities Removal, Public Draft, EIS/EIR**

1. The DOI and DFG are improperly committed to dam removal such that they will not and cannot consider feasible alternatives and mitigation measures because they have already committed to the KBRA and KHSA. settlement agreements which will become invalid if dams are not removed.

The California Supreme Court in *Save Tara v. City of West Hollywood* (2008) 45 Cal.4th 116 (*"Save Tara"*) cautioned lead agencies that CEQA compliance should occur before committing to a particular project so that environmental review does not devolve into a *post hoc* rationalization of a decision already made. "A fundamental purpose of an EIR is to provide decision makers with information they can use in deciding *whether* to approve a proposed project, not to inform them of the environmental effects of projects that they have already approved." (*Laurel Heights Improvement Assoc. v. Regents of the University of California* (1988) 47 Cal.3d 376, 394 [emphasis in original]). Accordingly, "before conducting CEQA review, agencies must not 'take any action' that significantly furthers a project 'in any manner that forecloses alternatives or mitigation measures that would ordinarily be of CEQA review of that public project.'" (*Save Tara*, *supra*, 45 Cal.4th at 138).

Page ES-17 states "This EIR/EIS is being prepared in compliance with NEPA and CEQA." This Statement is intentionally misleading since these actions were reached in secret meetings, with a pre-determined out-come as expressed by the Secretary of the Interior in his speech to the Commonwealth Club in San Francisco, California on September 9, 2011 (prior to the comment period for this document).

2. The Environmental Impact Report/Environmental Impact Statement (EIR/EIS) fails to follow the law as required by the National Environmental Policy Act of 1969 - (Pub. L. 91-190, 42 U.S.C. 4321-4347 January 1, 1070, as amended, and Pub. L. 94-52, July 3, 1975, Pub. L. 94-83, August 9, 1975, and Pub. L. 97-258, sec. 4(b), Sept. 13, 1982).

Title 42 of the United States Code 4331, Section 101 (b) states: Section 101 (42 USC 4331) states: " In order to carry out the policy set forth in this Act, it is the continuing responsibility of the Federal Government to use all practicable means, consistent with other essential considerations of national policy, to improve and coordinate federal plans, functions, programs, and resources to the end that **THE NATION MAY:**

1. Fulfill the responsibilities of each generation as trustee of the environment to succeeding generations;
2. Assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings;
3. Attain the widest range of beneficial uses of the environment without degradation, risk to health and safety, or other undesirable and unintended consequences;

4. Preserve important historic, cultural, and natural aspects of our national heritage, and maintain, wherever possible, an environment that supports diversity, and variety of individual choices;
5. Achieve a balance between population and resource which will permit high standards of living and a wide sharing of life's amenities;
6. Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources."

3. The "Lead Agencies", as defined in the EIR/EIS, have been and continue to violate applicable existing federal, state, and local laws and regulations.

The planning and zoning laws of the State of California, starting with Section 65000 of the Government Code, require that all lands be zoned appropriately with regard to their highest and best uses. The Siskiyou County Planning and Zoning Laws and the Land Use Element of the General Plan is required to designate the location and permitted uses of the land within and adjacent to these dam and reservoir areas, and identify **lands downstream which are subject to flooding.** The Conservation Element of the General Plan provides for the conservation, development, and utilization of natural resources including water and its **hydraulic forces, flood management, water conservation, and the prevention, control and correction of soil erosion.**

Recent legislation passed in 2007, AB 70 (Ch. 367) and AB 162 (Ch. 369) expands the requirement for Cities and Counties to incorporate **flood control and** management and provides that a city or county may be required to contribute its fair and reasonable share of the property damage caused by flooding, including State and Federal Government caused flooding by dam removal. As such, it is a critical legal and budgetary matter of the local city and county governing bodies to not only be included in this process, but to also weigh in on the final decisions in this matter. The Siskiyou County Board of Supervisors did not sign on to the KHSA for such matters and the Lead Agencies have failed to consider this and other important matters raised by this and other stakeholders.

The State Planning and Zoning Laws gave authority to the local governing body The Siskiyou County Board of Supervisors for controlling land uses and to protect resources and property rights.

The Secretary of the Interior does not have proper legal jurisdiction over private land use in Siskiyou County to make a determination to remove 4 privately owned dams with out coordination and approvals by Siskiyou County.

4. The Lead Agencies and this EIR/EIS have failed to identify and properly weigh and consider the benefits of environmentally preferable and superior alternatives per CEQA.

Per EIR/EIS section ES.7.3 Environmentally Preferable/Superior Alternative: "NEPA requires the Lead Agency to identify the alternative or alternatives that are environmentally preferable in the Record of Decision (ROD) (40 CFR Part 1505.2(b)). **The environmentally preferable alternative generally refers to the alternative that would result in the fewest adverse effects to the biological and physical environment. It is also the alternative that would best protect, preserve, and enhance historic, cultural, and natural resources.** Although this alternative must be identified in the ROD, it need not be selected for implementation."

Section 15126.6(e)(2) of the CEQA Guidelines requires agencies to identify the environmentally superior alternative in a draft EIR. If the No Project Alternative is the environmentally superior alternative, an additional environmentally superior alternative must be identified among the other alternatives.

The following environmentally preferable and superior alternative was not properly considered; Alternative 3 (Partial Facilities Removal of Four Dams) has been identified as the environmentally superior alternative. Alternative 3 would provide similar long-term benefits when compared with Alternative 2, but would reduce short-term impacts because it involves less construction. Alternative 3 would result in superior long-term beneficial environmental effects. **In summary, Alternative 3 is considered the environmentally superior alternative among all the alternatives because it provides long-term beneficial environmental effects, while reducing some of the short-term significant effects of the Proposed Action (Alternative 2)."**

The following environmentally preferable and superior alternative was not properly considered; Alternative 11 (Fish Bypass: Alternative Tunnel Route) on page 4-11 (4.2.11) clearly states that it

does not meet consideration because it is not consistent with the requirements of the KBRA and KHSA as it would not remove any of the four dams. Under NEPA and CEQA **THIS ALTERNATIVE MUST BE RECONSIDERED and must not be dependent on the predetermined, undisclosed KBRA/KHSA agreements.**

Alternative 11 (Fish Bypass: Alternative Tunnel Route) is identified by Siskiyou County as the "environmentally preferable alternative that would result in a cost of 1/6 the cost of installing fish ladders, 5% the cost of dam removals, and the fewest adverse effects to the biological and physical environment." THIS ALTERNATIVE IS SUPPORTED BY 80% OF THE COUNTY AND MUST BE RE-CONSIDERED under CEQA and NEPA requirements not dependent on secrete KBRA/KHSA agreements.

5. In Chapter 3 - 3.6 Flood Hydrology of the EIR/EIS, data provided does not accurately represent current independent scientific or historical data. The data chosen for the study was that the data that supports the Lead Agencies desired outcomes.

Table 3.6-5 shows the 100-yr flows at Keno at 11,800cfs and Iron Gate at 31,460cfs. **However, a statistical analysis using data from 1961 provides flows at Keno at 12,000cfs and Iron Gate at 30,600cfs** (close).

Table 3.6-9 shows a 6.9% reduction in the flood attenuation of Iron Gate and Copco Reservoirs combined. **This is in substantial disagreement with an engineered independent evaluation.** By using the 1964 flood data for Gage 11516530 and a t/c in of 24 hr, t/c out of 48 hr. an inflow out flow hydrograph shows a 22% reduction in peek flow and a 9 hour delay in peek discharge.

Table 3.6-5, the 100 yr. flood plain below Iron Gate Reservoir, and the write up needs to be revised to **show that the Dams Provide Critical Flood Protection.**

6. The EIR/EIS fails to weigh basic risks associated with Flood Hydrology.

The flood protection currently provided by the dams in place is notable. Without the dams much of the private property adjacent to the Lower Klamath River would be subject to severe flooding and erosion. Highway 96 may have to be relocated in several locations and many bridges may need to be replaced to provide the same level of service and protection that we currently enjoy.

The 1964 flood destroyed many bridges on the Lower Klamath and washed out much of Highway 96. All of the dams that are proposed for removal were in place during the 1964 flooding. All roadways and bridges were re-located above the calculated Base Flood Elevation considering all existing dams in place. DOI determined the existing floodplain by computing the 100 year flood and then mapping the extent of that floodplain on the existing topography. The existing floodplain may be different than that proposed by FEMA because it is based upon more current information.

DOI determined the 100-yr floodplain after dam removal. Based upon the most current inventory of structures downstream of Iron Gate Dam to Humbug Creek over 24 residences are within the existing 100 year flood plain. Less than 6 residences and other structures such as garages are outside of this flood plain, but may be put into the 100 year floodplain after removal of the dams. However, the final determination of the future 100-yr floodplain after dam removal will be made by FEMA. The purpose of the analysis was to estimate the costs to mitigate the increase in flood risk. The existing bridges are within the 100-year floodplain; however, these structures would need to be evaluated to determine if they would still maintain enough clearance to not be inundated by flooding. Not all of the structures that could be exposed to increased flooding risks are permanent.

7. The EIR/EIS Mitigation Measures downplay real risks presented and put the public and environment at severe risk. **The EIR/EIS change to the 100-year floodplain inundation area downstream from Iron Gate Dam 'less than significant.** This conclusion is, at best, irresponsible. By definition, an increase in risk to one habitable structure or bridge is to be considered significant according to the significance criteria.

8. Statements made in the EIR/EIS about current dam conditions and impacts of removing the dams are unsupported and dishonest. These dams are in very good condition according to the Ca.

Div. of Dam Safety. The primary benefits and reasons for building dams is for water conservation and management, clean energy production and flood control. For example;

The EIR/EIS states; *"removing the Four Facilities could reduce the risks associated with a dam failure.* The Four Facilities, collectively, store over 169,000 acre-feet of water when they are full. The dams are inspected regularly, and the probability for failure has been found to be low. However, if a dam failed, it could inundate a portion of the downstream watershed (Siskiyou County website 2011). **Removing the Four Facilities would eliminate the potential for dam failure and subsequent flood damages.** Therefore, eliminating the dam failure risk associated with the Four Facilities would have a beneficial effect on flood hydrology."

The EIR/EIS states; **"Therefore, it is anticipated that implementation of the Emergency Response Plan would generate no change in flood risk when compared to existing conditions, although it would likely help to reduce damage to property or loss of life due to a flood event which would be a beneficial effect to flood risks. Implementing the Emergency Response Plan will likely require the analysis of changes to flood risks in future environmental compliance investigations as appropriate."**

9. The EIR/EIS Mitigation Measures downplay real risks presented, offer inadequate mitigation measures and put the public and environment at severe risk ***For example;***

Per EIR/EIS section 3.6.4.4 Mitigation Measures, Mitigation Measure H-1: "Prior to dam removal, the **DRE will inform the National Weather Service, River Forecast Center, of a planned major hydraulic change (removal of four dams)** to the Klamath River that could potentially affect the timing and magnitude of flooding below Iron Gate. **The River Forecast Center is the federal agency that provides official public warning of floods.** As needed, the River Forecast Center would update their hydrologic model of the Klamath River to incorporate these hydraulic changes so that changes to the timing and magnitude of flood peaks would be included in their forecasts. As currently occurs, flood forecasts and flood warnings would be publicly posted by the River Forecast Center for use by federal, state, county, tribal, and local agencies, as well as the public, so timely decisions regarding evacuation or emergency response could be made. Prior to dam removal, the DRE will inform FEMA of a planned major hydraulic change to the Klamath River that could affect the 100-year flood plain. The DRE will ensure recent hydrologic/hydraulic modeling, and updates to the land elevation mapping, will be provided to FEMA so they can update their 100-year flood plain maps downstream of Iron Gate Dam (as needed), so flood risks (real-time and long-term) can be evaluated and responded to by agencies, the private sector, and the public.

10. The EIR/EIS Mitigation Measures display the agencies force of will over residents, fail to offer adequate mitigation plans to the potentially affected inhabitants and put the public and environment at severe risk ***For example;***

Mitigation Measure H-2: The **DRE will work with willing landowners to move or relocate permanent, legally established, permitted, habitable structures in place before dam removal.** The DRE will move or elevate structures where feasible that could be affected by changes to the 100-year flood inundation area as a result of the removal of the Four Facilities.

Effectiveness of Mitigation in Reducing Consequence These mitigation measures will be effective as they will identify the extent of the increased flood risks and take measures which will reduce the risks for loss, injury or death from flooding.

Agency Responsible for Mitigation Implementation. The DRE would be responsible for implementing mitigation measures H-1 and H-2.

These are not "Mitigation Measures"... a telephone call or radio broadcast to tell you that you are about to be flooded. As stated above, the EIR/EIS fails to present and weigh sound scientific data and make conclusions that are in the best interest of the environment, community and lives of humans and species downstream of the dams.

11. The sediment removal proposal is a scientific impossibility. The Lead Agencies failed to demonstrate adequate scientific knowledge to perform and make scientifically sound decisions.

Per the EIR/EIS; 3.2 Sediment Removal: Dam removal would release some of the accumulated sediments downstream. The Proposed Action includes the use of erosion from river flows to flush the sediment behind the dams downstream during facility removal. Reservoir drawdown would focus on the wet season in order to flush the sediment downstream with the natural seasonal high flows. Modeling studies indicate that

++drawdown would erode and flush 41 to 65 percent of the stored sediment downstream (DOI 2011). The initial drawdown would begin slowly, to minimize riverbank erosion, with the rate increasing as water levels drop to maximize the amount of sediment flushed down stream. Most of the sediment remaining on the riverbank slopes would stabilize and would not erode downstream in subsequent years.

As an engineer of dams and bridges, formerly with Cal Trans, I can attest that the standing water behind the dam will not transport sediments to the breached area of the dam during drawdown. The only sediment transport will be within the remaining river after the reservoirs are drained.

12. The EIR/EIS fails to consider logical scientifically supported impacts and mitigation measures related to the removal the sedimentation during and after dam removal. This failure leads to an unnecessary risks presented to the public and the environment.

Per the EIR/EIS section3.2.1 Option: Sediment Removal, "If analysis indicates that the release of sediment could result in significant effects, the EIS/EIR may include consideration of dredging sediments out of the reservoirs before removing the dams if this measure is determined to be feasible. Dredging would focus on the area within the new river area; sediment remaining above the new stream level would only require removal if the slopes would not be stable."

Surveys to date have shown water content in the sediments behind the reservoir to average 80 percent by volume (Eilers and Gubala 2003). Once dredging began, the spoils would be pumped to a detention area near the reservoir for the sediments to dry. Dredging and the mechanical removal of sediment from the reservoirs would require equipment in addition to that needed for dam removal. This additional equipment would include barges, dredges, and pumps.

Storing the spoils after removal from the reservoirs would require an area of sufficient size to allow the sediment to be spread and dried

This option, being the only viable option to mitigate sediment impacts upon dam removals is not on the table because of predetermined conclusions that funding would not be approved or available to support actual projected cost. This is the reason that Alternative 3 (Partial removal of 4 dams) was selected as the:

Initial sediment study: 20.4 million cubic yards with 84% washing down river

Recent sediment analysis: 13.1 million cubic yards with 41 to 65% washing down river

Analyses: Sediment depth below Iron Gate to the ocean assuming a river bottom width of 150'and a length of 190 miles Initial sediment study: 3.1 feet depth Recent sediment analysis: 1.0 to 1.5 feet depth

The recent study appears to be in line with recent attempts to reduce cost in support to dam removals with limited funding. The State Water Quality Control Board and Department of Fish and Game, and the U.S. Corps of Engineers regulate all private construction projects involving disturbed soil, within a drainage watercourse. **How could public agencies (for and by the people), even consider such an irresponsible action?**

13. The Lead Agencies failed to present a truthful and logical cost/benefit analysis for the Secretary or any reviewer to make a logical determination. **The cost proposals for all the alternatives are either intentionally omitted or were not conducted. How could you make a decision on a project without accurate detailed cost estimates?**

CONCLUSION:
This document is riddled with bias conclusions and inappropriate mitigation measures which are not supported by fact, respected science or properly engineered studies. **This document was prepared supporting a predetermined goal (Removing 4 dams on the Klamath River) and needs major revisions to comply with NEPA and CEQA regulations.**

Thank you for considering my opinions.
Respectfully submitted,

Jerry L. Bacigalupi P.E. (RCE 18063)

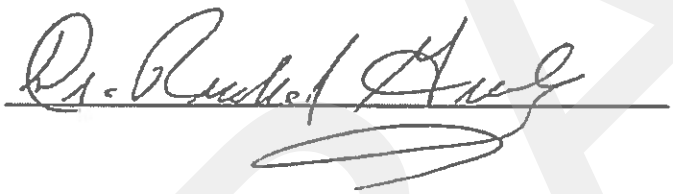
Dr. Richard Gierak
5814 Hwy. 96
Yreka, Ca. 96097
530 475-3212
Oct. 24, 2019

Members of the Klamath River Compact Commission

Re: Proposed removal of hydroelectric dams on the Klamath River

You were appointed to represent the populations of Jackson, Klamath and Siskiyou Counties in the matter of proper usage of the Klamath River waters and are responsible to the citizens of these three Counties. It has been made clear by their votes that they do not wish to see these dams removed for multiple reasons. The entire proposal is based on saving Coho Salmon which were deemed a non native species in the Klamath in 1999 and violation of six Federal Laws. You have the authority to stop this proposed action regardless of personal opinions and must utilize your positions in this matter irrespective of what pressure the States representatives are applying. Your were authorized to represent the people per the Constitution and they have spoken.

Respectfully submitted,



Dr. Richard Gierak
5814 Hwy. 96
Yreka, Ca. 96097
530 475-3212
Oct. 24, 2019

Re: Klamath Hydroelectric dam removal

Let me begin by stating that the KRRC plan to remove four dams on the Klamath River in Northern California and Southern Oregon by the States of California and Oregon are in violation of six Federal Laws. The people of Siskiyou County, Ca, Klamath County, OR and Jackson County, OR have voted to retain said dams. Secondly the Klamath River is designated a navigable river and is only subject to Federal laws and actions. States may not take action under any circumstance on navigable rivers in the U.S.

Violations include 1902 Reclamation Act, 1981 Wild & Scenic Rivers Act, Dormant Commerce Clause in Article 1 of the U.S. Constitution, Endangered Species Act, Klamath Basin Compact, Environmental Protection Agency and the Constitution of the United States.

Stephen Koshy, former director of the Central water commission, the ministry of water resources at the Government of India has stated that ;

For complete review of his analysis please go to the following link or review the attached letter from Mr. Koshy.

http://klamathbasincrisis.org/science/scientists/stephenkoshy/KoshyLetter032812toGuarino.pdf

October 24, 2019

Klamath Compact Commission Meeting
Comments by Susan Miller, Retired Environmental Engineer

A DIFFERENT PERSPECTIVE ON DAM REMOVAL

I would like to bring the attention of the Commission to several recent comments and documents affecting dam removal:

1. On May 19, 2019 the Secretary of Interior, David Bernhardt, retracted a support letter for the dams' destruction.
2. PacifiCorp, both in their recent comments to FERC as well as their Annual Status Report 2019 for the KHSA, have expressed deep concerns regarding the potential for extensive environmental damage from dams'removal. Quoting from their most recent submittal, PacifiCorp states, "PacifiCorp has always considered dam removal on the Klamath River to be **an exceptionally risky endeavor**."
3. Siskiyou County, in a letter submitted by their attorneys, Nossaman LLP, stated similar concerns as PacifiCorp regarding liability for dam removal in their most recent comments to FERC.
4. Lastly on September 3, 2019 the SWRCB for California issued a denial of KRRC's request for water Quality certification for the project to remove the dams.

What all these entities share is a common concern regarding the potential for massive environmental devastation and the resulting concern for "who is going to pay". This begs the question: "If dam removal will be so great for the environment and the fish, why all the concern? And why should it be necessary for KRRC to conduct such a massive PR campaign for dam removal?

I respectively request the Compact Commission to use their influence to bring reason to this ill fated idea and to protect the Klamath River's Wild and Scenic designation. The turtles, crayfish, river otters, fish, many species of birds and those of us who value all the amenities provided by the dams: green renewable power, recreation, flood and fire control, and year round consistent flows will thank you for protecting our way of life.

Clearly, those who propose for dam removal are NOT aware of the benefits provided by them, nor do they seem to be taking into consideration the damage which will be caused by the release of 200 million cubic yards of sediment behind the dams. By their own admission, KRRC recognizes that it will take 60 + years for the river to recover. Is it really worth the risk?

Thank you for your consideration.

Rcvd 10/24/19
Robert Rich

Presentation to the Klamath Basin Compact Commissioners on October 24, 2019

Subject: Flow dynamics of the Klamath River specific to the water quality parameter.

I have been a resident of the Klamath Basin for almost 40 years and during my 9 years as the Forest Service Administrator of 3 million acres of public lands and waters from the California state line to Orleans, 62% of the Klamath River's 100 tributaries provided much attention to the management of multiple resources, regulations were within my authority requiring a great deal of experience and knowledge of fish, wildlife silviculture, water, range utilization, recreation and wilderness prescriptions.

The flow dynamics of major rivers, water quantity, water quality and temperature require a great deal of water management attention and became an integral part in land use decisions.

Before my retirement in January of 1990, the Secretary of Agriculture in addition to my regular administrative duties to the Klamath River Basin Fisheries Task Force and the Wild and Scenic River suitability and eligibility, I was the supervisor for that portion of the Klamath National Forest.

Those two external assignments initiated a quest and strong interest to locate, review and understand historical and current research and interpretive documents especially for the Klamath River.

To get a full understanding of the Klamath River Basin Compact and the management considerations that each of the Federal Appoint Commissioners had, I asked for and received personal interviews with Kuone, Killian and Crisp. They not only provided me with the flavor of the compact, but guided me to the issues of the moment! "The 1990 reaffirmation of the compact" and their challenges of requiring corrective action for pollution abatement and control.

The subject of today's meeting and an opportunity to first observe presentations to the commission that focus on one of the three flow oriented dynamics "water quality and possible views on abatement".

I register my concern that much basic and historical information never reaches or has not been forthright presented to view alternatives and scope for commission members that proper steps to take.

I take this opportunity and liberty to share both from experience, both technical and administratively documentations, research and the sense of congress, that hopefully will consider addressing pollution abatement without interfering with temperature and water quantity, as they too need immediate consideration.

Reaffirmation of the compact presented challenges and solutions processes were a major point of discussion. It was endorsed by water resources of California, the state engineer of Oregon and the Federal Representative.

The challenge at that time was simply stated! "That if the commissioners from the two states do not take appropriate action, the commission will hold a hearing to make a finding as to whether interstate pollution exists and if so order correction". Without the guidance or hearing from the two states, their political regime formed the KRCC and they in turn have proceeded with an action that bypasses the prescription of the compact and has done so without the benefit of a full understanding of the sense of congress. The subject of today's meeting is an opportunity for the commissioners to begin a

focus on Klamath River flow dynamics and only one of the 3 parameters that need addressing. Water quality and possible views on what steps to take for the abatement of a very controversial subject. I register a concern that basic and historical research continues to be overlooked.

Available to the commission and over 1,000 concerned agencies, the publication, in a very detailed way, examined the suitability of classifying that portion of the Klamath River from milepost 204.5 (headwaters of Copco reservoir) and milepost 224.5 (location of Keno Dam). The Department of Interiors Study Team identified that the pollution that existed in Oregon impacted the rivers water flow as it proceeds to California. The Oregon standards that are violated are dissolved oxygen, ph unit's conductivity, total coliform and toxic pollutions of mercury found in the fish tissue, and the presence of lead, arsenic and zinc found and measured in bottom segments, that have been deposited and from point source pollution sources. They also reported that Keno Reservoir, Lake Euwanna and Upper Klamath Reservoir that will remain as hyper eutrophic bodies of water that support algae populations and will continue to enter the upstream of the Klamath River and continue to be accelerated by various ground disturbing activities.

The U.S. Department of Interior (USDI), Bureau of Reclamations Study Team also pointed out an interesting pollution feature: The State of Oregon has expanded on beneficial uses specifically for water quality management purposes. These uses include public and private water supply, industrial water supply, irrigation, livestock watering, salmon fish rearing and spawning, aquatic life, wildlife, hunting, fishing and boating.

California State Water Resources Board has established water quality objectives (specifically for water management purposes) for the uses of water, but categorized that management criteria as the supply of water for recreation, Fish and Wildlife habitat, navigation, power generation, and scientific study. One state specifies a standard of use, the other identifies objectives for supply. The picture that unfolds is that water quality abatement in California formulated its management parameters for beneficial use on supplying water objectives. Oregon formulates their management parameters on standards. The 1990 reaffirmation of the compact addresses the difference of water quality abatement between the two states. Oregon supplies the rivers waters from storage at Upper Klamath and Keno Reservoir and these flows are in violation of Oregon standards and they have not implemented abatement. California cannot achieve water quality objectives from the supply of river water that Oregon produces as it passes from Keno Dam to and thru the Lower Klamath projects.

Existing pollution conditions exist, and Oregon has not taken any infrastructure actions to abate, California's water quality supply and their objectives cannot be achieved.

In 2000, prior to the events that occurred, "Bucket Brigade" and Klamath River migrating salmon kill. The sense of congress was aroused, they prepared and endorsed a legal Federal Act for a designated Federal River, called the Klamath Basin Water Enhancement Act of 2000- Public Law 106-498, all of the Klamath Rivers Flow Dynamics, temperature, water quantity and water quality initiated major concerns that required investigation for research review and The Bureau of Reclamation in cooperation with federal and state agencies, tribal entities, local water interests and users wanted an examination of potential off stream water storage opportunities above Keno Dam to be investigated and identified, because of increasing demands and competitive conflicts for water and fish resources at each end of the Basin: The arid/dry region (east half) and the mountain region (west half) water quality abatement investigations and potential water supply storage opportunities were authorized by this act. Especially

because new principles of river water management begin arising on the horizon called The Klamath Basin Restoration Agreement (KBRA) and the Klamath Hydroelectric Settlement Agreement (KHSA). These stakeholder approaches became an experiment without research and historical social and legal foundation placed about 70 miles of flow dynamics in the arid basin in jeopardy and the residents of Klamath and Siskiyou County expressed ballot authorization against the expressed principles.

A special Bureau of Reclamation Study Team from the Colorado Regional Headquarters was assembled in 2006 to investigate opportunities for expanding water storage and quality treatment abatement. Precisely what was looking for by the compact commission in the reaffirmation endorsements.

The study teams completed report finished in 2014 is publically referred to as UKBOS-The Upper Klamath Basin Off-river Study. Included in that UKBOS investigation of particular interest to compact commission members was water treatment assessments for all of the potential water storage developments and the necessary water quality parameters to address water quality concerns for the nine water storage options investigated even to the extent of providing implementation costs of 2008 price levels, that address most of the contaminates of concern in the Department of Interiors Eligibility/Suitability 1990 Water Quality Study. They were ph, total phosphorus, ammonia, dissolved oxygen, temperature reduction and the removal of suspended solids. The design and cost, estimating assumptions used in the study, incorporated a maximum sustained flow into the treatment plant of 1,000 cfs during a 60-day period. The use of environmental protection agency cost curves for plant construction, the identity of treatment equipment, and chemicals available in 2008.

It can be assumed that the Klamath Basin Water Supply Enhancement Act of 2000, when the House and Senate determined in Bill examination in 2017 that to go beyond investigation as prescribed in the UKBOS legislation and an Act of Congress would be necessary to engage nationally "water resource development". In 2018 Public Law 115-270 was enacted by the Senate and House of Representatives of the United States in Congress assembled and is cited as "Americas Water Infrastructure Act of 2018".

Section 4308 of the Act deals specifically with Klamath River water and power and defines the Klamath Project as any dam, canal or other works or interests for water storage, delivery, drainage, flood control or any similar function that is part of the project and that are facilitated in the Pacific Northwest and receive project power. Item b of section 4308 on page 125 of the Act under effect says "None of the amendments made by this section (referring to the Enhancement Act of 2000) shall:

1. Modify any authority or obligation of the United States with respect to any Tribal Trust or Treaty obligation of the United States.
2. Create or determine any water right claim in existence on the date of the existence of this Act (January 2018) or
3. Authorize the use of Federal funds for the physical deconstruction of the Iron Gate, Copco 1, Copco 2 or John C Boyle Dams located on the Klamath River in the states of California and Oregon.

Items A & B found on page 123 under water activities and drought response says "To plan implement and administer programs to align water supplies and demand for irrigation water users associated with the Klamath Project". The seven linear hydroelectric water storage projects (authors

interpretation) with a primary emphasis on programs developed or endorsed by local entities comprised of representatives of those water users (Siskiyou County Flood Control Water Conservation District is one of those entities).

Under B of that same section says "Expenditures under this paragraph shall not exceed $10 million on an average annual basis.

On September 3, 2019, the California State Water Resource Control Board notified the Klamath River Renewal Corporation who wishes to separate Fall Creek and the 4 on-river dams from the existing FERC license 14803 so that the four on-river hydroelectric storage dams can be physically deconstructed was denied pursuant to the beneficial uses of water identified in section 401 (a) (1) of the Federal Clean Water Act. It is the majority opinion of electorate voters in Siskiyou County and Klamath County, that their quest for infrastructure stored river water and the utilization of hydroelectric power not be decommissioned. They understand the linear water relationships of the seven historical projects managed by PacifiCorp and that water quality standards prescribed as objectives cannot be met until Oregon physically implements abatement above the California/Oregon State line.

These point source and non-point source pollutants travel from the Keno Needle Dam to and thru the lower project facilities especially during the irrigation season, are visible on the surfaces and in the transported sediment. Water quality downstream from the sources may improve due to dilution as mixing occurs when mixed with the water column that arrives into the river from a few tributaries and springs that exist between river mile 224 and 195.

Simply stated from a hydrologist and administrative perspective water quality certification objectives via the supply from Oregon is not a burden that should be placed on the utility company for relicensing. Oregon flows are in violation of their water quality standards and historical records suggest that it has been going on since the reaffirmation of the Klamath Compact in 1990.

The compact commission has been asked and they have endorsed pollution abatement, before flows are released out of the Keno Needle Dam into a twice designated Federal River.

Implementation opportunities have been presented thru the UKBOS investigation that was performed by a select committee of Bureau of Reclamation specialists headquartered in the regional office in Denver Colorado.

The sense of congress for implementation of water treatment infrastructure has been provided to the Secretary of the Army under Title 1 water resource development and specified with financing under section 4308 Klamath Project Water and Power.

Article seven (7) pollution control in the Klamath River Bi-state Compact comments "that California and Oregon recognize the population growth and the economy of the Upper Klamath River Basin will expand and will affect upstream point and non-point sources of pollution and the state of Oregon has the primary responsibility to prevent, reduce or eliminate pollution, this constitutes a menace to the flow dynamics of many miles of the Klamath River. The Klamath River Basin Compact also places a responsibility on the commission members to exercise the duties and power to abate and control pollution.

The commission to cooperate with the states and water management agencies like Klamath and Siskiyou Counties. They have been designated as water origin local governments. Siskiyou County is the responsible authority under the Siskiyou County Flood Control and Water Conservation District to enforce the laws and regulations of use and distribution of water as recognized by the state of California under Article three (3) of the Compact.

Each state shall have the primary obligation to take appropriate action under its own laws, to abate and control interstate pollution which is defined as the deterioration of the quality of waters of the Upper Klamath River Basin and upon complaint to the commission that interstate pollution originating in another state is not being prevented or abated, there is a procedure identified in Article 7 to follow.

The Department of Interiors Bureau of Land Management has notified thru its suitability/eligibility report to the compact commission that the appropriation of surface waters to California is governed by state law and the Klamath River Basin Compact. It states that the Oregon Departments environmental quality standards are being violated by Oregon sources to the Klamath River.

Several historical and recent research publications exist that identify various degrees of pollution existing within the flow dynamics of the Klamath River mainstream and the opportunities for abatement are well spelled out in Article seven (7), the upstream storage investigations (UKBOS) Public Law 106-498 and section 4308 of Americas Water Infrastructure Act of 2018, Public Law 115-270.

Siskiyou County Water Users

October 24, 2019

Curtis Anderson
Northern Region Office Chief
Department of Water Resources

Tom Byler
Director Oregon Water Resources

Re: Klamath Basin Compact Commission Meeting Oct. 24, 2019

Commissioners,

We are writing this letter to you in your capacity as the Commission Representatives to the Klamath River Basin Compact Commission. Our organization, the Siskiyou County Water Users Association, represents the many citizens of Siskiyou County who have indicated through the voting process by nearly 80% their desire to retain the Klamath Hydro Electric Facilities on the Klamath River. As you are aware Siskiyou County has more than 60% of the frontage along the river that would be affected by potential Dam Removal. Many of our citizens including our then State Senator Randolph Collier served on the development of the Klamath River Compact. Our Board of Supervisors had a number of its members as well as advisors who served on the development of the Klamath Compact as well.

Firstly, we raise again the question of the authenticity of the Klamath Compact Commission being chaired by Chrysten Lambert. The Compact language is clear that the Federal Representative who is Chair of the Commission is to be appointed by the President of the United States as his personal representative. Ms. Lambert has not been authorized by President Trump as his representative. Secondly, under the Rules and Regulations posited by the Office of Management and Budget which oversees the Federal Representative, the Chair should not have any appearance of favoritism regarding the issues before the Commission. This is stated clearly in the "Guide for Federal Representatives on Interstate Water Compact Commissions" from the OMB as follows "The Federal Representative should maintain a completely neutral position... and should pursue and promote the Federal interest". Ms. Lambert has held herself out extensively as supporting the removal of the Dams as outlined in statements made in her many articles and most recently in letters submitted to the FERC under the letterhead of Trout Unlimited and under a joint submittal by several interested parties dated February 18, 2019 addressed to Senator Kathleen Taylor Joint Committee on Ways and Means Subcommittee on Natural Resources. These letters were signed by Lambert as Director of Oregon Water Project, Trout Unlimited.

In addition her father, Jim Root, serves on the Board of the KRRC which is actively involved in Dam Removal and would expect to have a financial interest in the outcome of the possible destruction of the Klamath Dams. For these reasons which give the appearance of impropriety and conflict of interest, Ms.

347 N. Main Street, Yreka, CA 96032 Phone 530 468-4204

Lambert should be disqualified as the Federal Representative Chairing the Klamath Compact Commission.

The topic listed for discussion on the agenda of this meeting is "water quality" of the Klamath Basin. We would have hoped that the State of California would have properly raised the question of the quality of water emanating from the State of Oregon into California. Since this directly impacts the County of Siskiyou amongst other counties in California it would be entirely proper for the State to raise the question but since they haven't we will. The water quality coming into the California watershed from Oregon is compromised by sediments, chemicals and microorganisms impacting the water in the Klamath Basin. The water actually leaving Iron Gate Dam is cleaner than that that which arrived from Oregon. Today you will hear from many of our members in regards to the issues concerning water quality and the importance of maintaining the hydro facilities as outlined in Article IV of the Klamath Compact.

I am sure that the Commission is already aware of the State of California Water Board, Denial of the Water Quality Certification requested by KRRC pursuant to Section 401 of the Federal Clean Water Act and a necessary ingredient of any procedure to remove the Hydro- electric facilities. This denial comes after many months and several hundred thousands of Dollars and time spent in the process of analyzing 6,600 pages of letters and documents in this regard.

We include with this letter comments from the Siskiyou County Water Users submitted to the California Water Board (February 25, 2019) and to the FERC (August 16, 2019) describing and substantiating issues which must necessarily be considered in the overall context of water quality. This includes issues such as the fact that the Klamath is a federally designated "Wild and Scenic River". The beneficial uses of the hydro facilities for many purposes besides hydro and the fact that there is no evidence supporting a conclusion that the removal of dams will result in an increase in population of the Salmon or their habitat being extended as blatantly stated by those who would remove the facilities without regard to the negative impact of their destruction. In fact the reduction of the Salmon population is more reasonably related to the Pacific Inter-decadal Climate Oscillation as described by Dr. Nathan Mantua in his study on Salmon production in the Bulletin of the American Meteorological Society. When one considers the proliferation of natural Salmon predators such as seals, otters and international fishing increases and gill netting it is apparent that many other issues are of greater impact to Salmon production than are the Klamath Dams.

We have also sought to look at a subject which is conveniently overlooked and has hardly ever been spoken about because it doesn't serve the purposes of those who are irrevocably committed to dam removal as though it was the only answer. That issue is the condition of the Klamath prior to the construction of any dams on the river. This in particular should be of utmost importance before tearing down these functioning hydro facilities which have many positive values. Although there isn't a lot of information there are eyewitness accounts from the time before the dams were built. These eyewitness accounts point to a problematic river which was known for low water in the late summers, algae flourished and resulted in very disagreeable water as pointed out in the 1850's accounts by early trappers and survey parties such as the account of George Gibbs Journal prepared under the authority of Congress as part of the Expedition of Colonel Redick McKee. It is substantiated by the account of Commissioner Moneypenney in an 1855 report (copy attached) which states in part that L. G. Whipple,

agent in charge of the Klamath River observed the "extremely warlike" disposition of the natives based on the "scarcity of fish in the Klamath". A further eyewitness account is provided by the letter of Glenn Briggs also enclosed whose family history on the Klamath extends back generations into the 1850's. They describe a river that would run nearly dry during the summer months and was heavily contaminated by the growth of algae. The pre- history of the Klamath is an issue which needs to be examined before any removal of these important hydro facilities can take place. What really should be happening is to examine how to improve the existing hydrology of the Klamath to repair the damages done in the past through flooding and in particular the flood of 1964.

The bottom line here is that the water quality coming into California from Oregon is improved by the settling process allowed by the Dam reservoirs. If the dams are removed the Klamath will be irreparably damaged by the impact of sediments choking the River and the return to flooding, loss of recreation, loss of fire protection, damage to property and to people along the river as well as the ecosystems related to the Klamath.

Thank you in advance for your consideration in this matter.

Regards,
Richard Marshall
Richard Marshall
President Siskiyou County Water Users Association

Attachments:

- Guide for Federal Compact Commissions
- Abbreviated Compact Clauses Article IV and Article IX
- Letter Feb18, 2019 signed Chrysten Lambert
- Letter August 2, 2019 signed Chrysten Lambert
- Denial without Prejudice of Water Quality Certification
- Letter dated Feb. 25, 2019 SCWUA/FERC Response Water Quality Certification State Water Board
- August 16, 2019 letter to FERC, Response KRRC BOC Recommendations
- Range Article "Inconvenient Truths" by Theodora Johnson
- Letter Jan 27, 2017, Glenn Briggs to State of Calif. Water Board
- Report 1855; Commissioner Moneypenney, House Doc 1, Vol 1, pp 321576

Guide for Federal Representatives on Interstate Water Compact Commissions

Many problems arise in connection with administration of interstate water compacts that affect important Federal interests. This guide has been developed to assure that these problems receive adequate consideration within the Executive Branch. It is intended primarily to provide a uniform basis for coordinating the activities of Federal representatives serving on approved interstate water compact commissions.

Duties of the Federal Representative

The Federal representative has the duty of assuring that the complete range of Federal or national interests is considered in compact commission discussions and actions. As the President's representative on the commission, he should avoid identifying himself with any agency, program, local faction, or sectional interest. The Federal representative should maintain a completely neutral position in all matters of purely State concern. The Federal representative should actively pursue and promote the Federal (national) interest and should not become solely a referee of State or sectional disputes.

Relationships with Federal Agencies

The following Departments and agencies will normally have an interest in interstate compact activities where water is concerned:

1. Department of Agriculture
2. Department of the Army
3. Department of Commerce
4. Department of Energy
5. Department of Health and Human Services
6. Department of Housing and Urban Development
7. Department of the Interior
8. Department of Justice
9. Department of Labor
10. Environmental Protection Agency

The Federal representative is encouraged to consult these agencies for information and to ascertain and keep abreast of their views on compact matters, either through their Washington offices, or through their designated field officials.

Technical staff from these agencies may be detailed to work with the Federal representative on specific assignments for reasonable periods of time.

Policy Guidance

Advice on major policy matters should be requested from the Director of the Office of Management and Budget (OMB). Coordination, as necessary, with appropriate Federal agencies will be undertaken by the OMB.

COMPACT CLAUSES

Article IV. Hydroelectric Power

It shall be the objective of each state, in the formulation and the execution and the granting of authority for the formulation and execution of plans for the distribution and use of the waters of the Klamath River Basin, to provide for the most efficient use of available power head and its economic integration with the distribution of water for other beneficial uses in order to secure the most economical distribution and use of water and lowest power rates which may be reasonable for irrigation and drainage pumping, including pumping from wells.

Article IX. Administration

A. 1. There is hereby created a commission to administer this compact. The commission shall consist of three members. The representative of the State of California shall be the Department of Water Resources. The representative of the State of Oregon shall be the State Engineer of Oregon who shall serve as ex officio representative of the State Water Resources Board of Oregon. The President is requested to appoint a federal representative who shall be designated and shall serve as provided by the laws of the United States.

2. The representative of each state shall be entitled to one vote in the commission. The representative of the United States shall serve as chairman of the commission without vote. The compensation and expenses of each representative shall be fixed and paid by the government which he represents. Any action by the commission shall be effective only if it be agreed to by both voting members.

TROUT UNLIMITED

August 2, 2019

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

RE: Klamath Dams, Docket Numbers P-2082-062 and P-14803-000

Dear Secretary Bose,

This letter conveys the support of Trout Unlimited (TU), Trout Unlimited chapters and state councils in Oregon and California, and of other sportsmen's businesses and organizations for the Klamath River Renewal Corporation's Lower Klamath Project transfer and surrender applications referenced above.

Trout Unlimited (TU), founded in 1959, is the largest and oldest sportsmen's organization dedicated to conservation of trout and salmon in North America. To fulfill our mission, we work with diverse partners, including farmers and ranchers, mining and timber companies, federal, state and local resource agencies, water contractors, and private landowners as well as other sportsmen's organizations to protect and restore habitat, water quality, and water sources and to sustain and grow our coldwater fishing heritage. TU has 300,000 members and supporters nationwide, with some 14,000 members residing in California and Oregon.

Historically, the Klamath River has been the third most productive watershed for Chinook salmon and steelhead on the West Coast (behind only the Columbia and Sacramento River systems). The tribal, commercial and recreational fisheries the Klamath supports are vital to rural communities and economies all along the Oregon-California border. For the past twenty years (since the inception of PacifiCorp relicensing proceedings for the Lower Klamath Project), TU has been actively engaged in the collective effort to develop new strategies and agreements for water management and sharing on the Klamath, and in restoring habitat, water quality and dry season streamflows and protecting water sources in this watershed. TU is a signatory to the Amended Klamath Hydroelectric Settlement Agreement (KHSA). The undersigned parties have all strongly supported this engagement and the KHSA.

The purpose of this letter is to request that you support the Klamath River Renewal Corporation's (KRRC) Lower Klamath Project (Project) transfer and surrender applications now pending before you.

There are multiple reasons why the KRRC's proposed license transfer and surrender should be approved. The current licensee does not want to retain ownership and operation of the Project, which is no longer sufficiently profitable for hydropower generation to justify renewing the license for that purpose. The KRRC's intended outcome for the four dams will improve water quality downstream of Klamath Lake and help listed and at-risk runs of salmon and steelhead by restoring fish passage to more than 400

miles of intact spawning and rearing habitat. In fact, a study released by the US Geological Survey in 2017 documented that salmon, steelhead and other anadromous fishes will return rapidly to the upper reaches of watersheds after dams are removed, even if those habitat areas have been blocked for decades or more.

Furthermore, TU has been working for the past decade with ranchers and landowners in the upper Klamath basin to improve water quality, restore habitats, and otherwise prepare the upper watershed for the return of salmon and steelhead and to minimize any related impacts on agricultural operations.

As a KHSA signatory, TU has been fully engaged in and apprised of the formation and subsequent work of the KRRC. The KRRC has demonstrated their financial capability to become the licensee, has developed a comprehensive risk management package that fully satisfies risk management requirements, and has assembled a world-class team of local and multinational contractors to conduct the actual dam removal and restoration work.

The KRRC has addressed all questions regarding its ability to fulfill the dam removal portion of the KHSA, and as their July 29 filing makes clear, has fully answered all other questions regarding fiscal viability and risk management. The entire Klamath Region will benefit—economically, culturally, and ecologically—by removing the four, no-longer-profitable Lower Klamath Project dams. We strongly encourage you to approve the KRRC's application so that this outcome, born out of years of consensus negotiations among all stakeholders in the Klamath Basin, can finally be realized.

Respectfully submitted,

Brian J. Johnson
Director of California Programs
Trout Unlimited

Chrysten Lambert
Director of Oregon Programs
Trout Unlimited

Cindy Noble
Chair, California Council of Trout Unlimited
President, Feather River Chapter, Trout Unlimited
Graeagle, CA

Mike Michalak
Owner, The Fly Shop
Redding, CA

Andrew Harris
President, Shasta Trinity Cascades Chapter
Trout Unlimited
Redding, CA

George Revel
Owner, Lost Coast Outfitters
San Francisco, CA

Charlie Schneider
President, Redwood Empire Chapter, Trout Unlimited
Healdsburg, CA

Anthony Carruesco
Owner/Lead Guide, AC Fly Fishing
Redding, CA

Erik Young
President, North Bay Chapter, Trout Unlimited
San Francisco, CA

Kris and Greg Kennedy
Owners, Fish Kennedy Brothers
Redding, CA

Jim Stimson
President, Eastern Sierra Chapter, Trout Unlimited
Mammoth Lakes, CA

Christy Fischer
President, Steinbeck Country Chapter, Trout Unlimited
Carmel Valley, CA

Travis Banks
President, Eldorado Chapter, Trout Unlimited
Placerville, CA

Patrick Kallerman
President, John Muir Chapter, Trout Unlimited
Oakland, CA

Trevor Fagerskog
President, Truckee River Chapter, Trout Unlimited
Truckee, CA

Michelle Titus
Owner, Clearwater Lodge
Fall River Mills, CA

Craig Nielson
Founder, Shasta Trout
Ashland, OR

Richard Anderson
Editor/Publisher
California Fly Fisher magazine
Truckee, CA

Bernard Byng
Conservation Chair, Tracy Fly Fishers
Tracy, CA

Dave Roche
Conservation Chair
Diablo Valley Fly Fishermen
Walnut Creek, CA

Bill Uyeki
President, Peninsula Fly Fishers
Redwood City, CA

John Rickard
Wild Waters Fly Fishing
Mount Shasta, CA

Bob Grace
Owner, Ted Fay Fly Shop
Dunsmuir, CA

Ken Rhodes
Shasta Trinity Fly Fishers
Redding, CA

Brandon Worthington
Owner, Worthington Fly Fishing
Ashland, OR

Jack Trout
Owner, Jack Trout Fly Fishing
Mount Shasta, CA

Mark Rockwell
President, Northern California Council
Fly Fishers International
Sacramento, CA

Corey Evans & Justin Bubenik
Co-chairs, California Chapter
Backcountry Hunters and Anglers

Drew Irby
Co-chair, Conservation Committee
Gold Country Fly Fishers
Nevada City, CA

Keith Pfeifer, PhD
Conservation Director
California Fly Fishers Unlimited
Sacramento, CA

Dave Fujiyama
Conservation Chair
Granite Bay Fly Fishers
Granite Bay, CA

Charlie Beals
Board, Conejo Valley Fly Fishers
Thousand Oaks, CA

Dean McKay
President, Tahoe Truckee Fly Fishers
Truckee, CA

Julie Haselden
Conservation Chair
Grizzly Peak Fly Fishers
Kensington, CA

Andrew Harris
Owner, Confluence Outfitters
Redding, CA

February 18, 2019

TO: Senator Kathleen Taylor, Co-Chair, Joint Committee on Ways and Means Subcommittee on Natural Resources

Representative Jeff Reardon, Co-Chair, Joint Committee on Ways and Means Subcommittee on Natural Resources

FROM: Klamath Water Stakeholders

SUBJECT: Support for Klamath Basin Water Funding Packages

Dear Co-Chair Taylor and Co-Chair Reardon and members of the committee:

The undersigned organizations are writing in strong support for funding packages proposed in Governor Kate Brown's recommended budget that will provide welcome advances toward the urgent need for water quality and quantity security in the Klamath Basin.

The Klamath Basin is one of the most ecologically and culturally diverse regions in the world. The Klamath River begins on a high plain that drains into a series of shallow lakes and wetlands, eventually descending over 4,000 feet to the Pacific as it meanders through some of the most rugged mountain ranges in America. Over the last 150 years, fisheries have dramatically declined, leading to hardships for Native American and commercial fishing communities. Ensuing environmental regulations and irrigation curtailments have similarly created hardships for farmers and ranchers, leading many to bankruptcy while ocean fishing closures have impacted communities up and down the Coast.

Despite these challenges, collaboration and local leadership from Tribes, water users, and conservation groups has positioned the Klamath Basin as one of the best candidates for full basin-wide restoration in the world. As the region prepares for removal of four major dams in 2021, and efforts to pursue complementary reclamation goals take shape, the State of Oregon has an important opportunity to help facilitate an effective transition that restores and sustains the ecological and economic well-being of the region. Governor Brown's recommended budget and vision for a secure and resilient water future propose urgent financial resources and staffing to enable this process. The following packages in

particular would provide significant assistance to the Klamath Basin and its diverse water users and ecosystems:

Klamath Ag Water Quality Monitoring (Oregon Department of Agriculture POP 330)
Provides $100,000 General Fund to support ODA's work with partner agencies and landowners to understand and address water quality issues associated with agricultural lands around Klamath Lake. Since 2017, Oregon Department of Agriculture, DEQ, OWEB and local partners have been working with farmers around Klamath Lake to address water quality issues associated with pumping return flows from crop fields into the lake. Phosphorus in this water is of particular concern because it can contribute to algal blooms in the lake. Farmers have been cooperative and share the agencies' goal to better understand the problem in order to develop solutions that will protect water quality while maintaining viable agriculture operations.

Klamath Basin Water Quality Improvements (Department of Environmental Quality POP 126)
Provides $640,000 General Fund, to phase-in 3 positions (2.5 FTE), in support of a coordinated, multi-agency effort to scale up watershed restoration efforts to improve water quality and fish habitat for native species and prepare for the arrival of salmon and steelhead following dam removals planned for 2021.

Conflicts and controversy between irrigators, tribes, and conservation groups over water quantity and quality have persisted for many years. However, we stand at the precipice of a new and better path forward to achieve collaborative solutions that recognize and meet the needs of these diverse stakeholders. By restoring riparian zones along tributaries to Upper Klamath Lake, removing four hydroelectric dams on the mainstem Klamath River, providing irrigation assurances for farmers, and providing economic security for the Klamath Tribes, we can work together to improve the Klamath Basin economy.

State and federal funding to provide water certainty to communities, water users, and fisheries in the Basin is greatly needed. We urge you to support these water funding packages to help supplement and achieve these laudable goals. Thank you for your consideration.

Sincerely,

Paul Simmons, Interim Director
Klamath Water Users Association

Russell 'Buster' Attebery, Chairman
Karuk Tribe

Glen Spain, Pacific Northwest Director
Pacific Coast Federation of Fishermen's Associations

Chrysten Lambert,
Oregon Project Water Director
Trout Unlimited

Greg Block, President
Sustainable Northwest

Molli Myers, President of the Board
Klamath Riverkeeper

Steve Rothert, Regional Director
American Rivers

Regina Chichizola, Executive Director
Save California Salmon

Water Boards

State Water Resources Control Board

SEP 03 2019

Mr. Mark Bransom, Chief Executive Officer
Klamath River Renewal Corporation
2001 Addison Street, Suite 317
Berkeley, CA 94704

Lower Klamath Project
Federal Energy Regulatory Commission Project No. 14803
Siskiyou County, California and Klamath County, Oregon

Dear Mr. Bransom:

SUBJECT: DENIAL WITHOUT PREJUDICE OF WATER QUALITY CERTIFICATION

On September 4, 2018, the State Water Resources Control Board (State Water Board) received a request from the Klamath River Renewal Corporation (KRRC) for water quality certification (certification) pursuant to section 401(a)(1) of the Federal Clean Water Act (33 USC § 1341 et seq.) for the Lower Klamath Project (Project). Waterbodies associated with the Project include the Klamath River, Fall Creek, and tributaries currently submerged in Project reservoirs.

In taking a certification action, the State Water Board must review the application, all relevant data, and any recommendations of Regional Water Quality Control Boards, other state or federal agencies, and interested persons, and either: (1) issue an appropriately conditioned certification; or (2) deny certification. (Cal. Code Regs., tit. 23, § 3859). A certification may be issued if it is determined that there is reasonable assurance that an activity is protective of state and federal water quality requirements and that the appropriate review has been conducted to support certification and meet the requirements of the California Environmental Quality Act (CEQA). When a proposed project's "compliance with water quality standards and other appropriate requirements is not yet necessarily determined, but the application suffers from some procedural inadequacy (e.g., failure to … meet CEQA requirements)," the State Water Board may deny certification without prejudice. (Cal. Code Regs., tit. 23, § 3837, subd. (b)(2).).

Since submitting its certification application on September 4, 2018, the KRRC has provided the State Water Board with several updates to its Project including, but not limited to: its July 29, 2019 *Responses to Independent Board of Consultants' Recommendations*; information on ice management at J.C. Boyle and offsite nighttime hauling; and an updated Aquatic Resource Measure 7 for Freshwater Mussels. Additional information is pending.

Additionally, the State Water Board is the CEQA lead agency for the Project. The State Water Board cannot issue a certification until the CEQA process is complete. On December 27, 2018, the State Water Board issued a draft environmental impact report for the Project, with the public comment period concluding on February 26, 2019. The State Water Board received approximately 2,500 comments.

The State Water Board issued a draft certification for public comment on June 7, 2018, and is considering changes to the draft certification in light of changes to the Project, comments on the draft certification, the draft environmental impact report, and comments on the draft environmental impact report. At this time, the State Water Board is unable to certify that the Project will comply with California water quality standards and other appropriate requirements of state law because of recent changes to the proposed Project requiring evaluation, the pendency of information requests, and the ongoing work necessary to comply with CEQA. The KRRC is hereby notified that the September 4, 2018, request for water quality certification for the Project is denied without prejudice, effective the date of this letter.

If you have questions regarding this letter, please contact Philip Meyer, Project Manager in the Water Quality Certification Program of the Division of Water Rights, at (916) 341-5369 or at Philip.Meyer@waterboards.ca.gov. Written correspondence should be directed to:

State Water Resources Control Board;
Division of Water Rights
Water Quality Certification Program;
Attn; Philip Meyer;
P.O Box 2000;
Sacramento, CA 95814-2000.

Sincerely,

Eileen Sobeck
Executive Director

cc: Ms. Kimberley D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, D.C. 20426

Mr. Tomas Torres, Director
U.S. Environmental Protection Agency
Region 9, Water Division
75 Hawthorne Street
San Francisco, CA 94105

Mr. Matthias St. John
Executive Officer
North Coast Regional Board
5550 Skylane Blvd., Suite A
Santa Rosa, CA 95403

Interested Parties Mailing List

February 25, 2019

Ms. Michelle Siebel
State Water Resources Control Board
Division of Water Rights
PO Box 2000
Sacramento, CA. 95812-2000

Part 1

Re: REPLY SISKIYOU COUNTY WATER USERS ASSOC.
State Water Board 401 Draft EIR Water Quality Certification Lower Klamath Project

The Siskiyou County Water Users Board of Directors hereby submits their review, analysis, and attachments relative to our response to the proposal by the California Water Board of conditions relative to the proposed destruction of four Hydro-electric generation facilities and resultant release of contaminated sediment laden waters into the Klamath River, a federally designated "Wild and Scenic and Recreational River". Not only will the destruction of these facilities cause widespread contamination of the Klamath but will result in a potential long term extirpation of numerous endangered aquatic species besides the Salmon which are claimed to be benefited by the proposed destruction. We have suggested previously as has the County of Siskiyou and other groups that before destruction of the clean energy producing hydro facilities that "truck and haul", a viable and inexpensive process be conducted to physically demonstrate the likelihood of the claimed production capability beyond the Hydro facilities. There has never been a scientific analysis which supports the creation of additional viable habitat beyond Moonshine Falls area.

We represent Siskiyou County citizens who indicated by voting nearly 80%, their desire to keep the Klamath Dams in place. We would hasten to add that a recent vote in Klamath County, Oregon, produced approximately the same result. Our concern which should be the concern of all citizens and agencies in California and Oregon is that once the hydro facilities are lost ***there will be no ability to replace them.*** Before such a step is taken and what will be a irretrievable condition resulting therefrom i.e. extirpation of numerous endangered species, loss of water storage for fires, loss of control of instream flow, loss of view, loss of recreational opportunities, loss of a valuable hatchery, loss of property values, and loss of lake fishing opportunities amongst other beneficial qualities. It should also be noted for example that the long nose and short nose sucker fish which are considered an endangered species and are a cultural value to the Klamath Tribe are planned to be nearly exterminated according to the ODEQ study (JC Boyle Dam). They report that the sucker fish population will be reduced by

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90%. We also know that a very fragile and unique fresh water trout will be eliminated by the loss of their current habitat at the edge of Copco I, II and Iron Gate.

CEQA vs NEPA

Our first issue with the project proposal is that this proposed project requiring an environmental study is not properly done by using CEQA. The Klamath River is a federally designated "Wild and Scenic River" and also qualifies under the navigable river federal waterway. The project as proposed impacts two states, Oregon and California. This alone demands that an environmental analysis concerning the destruction of the hydroelectric and associated storage capabilities; the destruction of environmental protected fish species not the least of which includes the Coho Salmon and the Green Sturgeon; as well as the short and long nosed suckerfish; and much of the aquatic life in the river system; together with the pollution of the riverine system by toxic sediment demands that the EIR/ EIS be done under NEPA rules and prepared by the US Commerce Department and the Department of Interior.

Furthermore, one can't study just part of the Klamath River system in California especially when it comes to sediments and pollution. One must look to the headwater source of the Klamath in Oregon. The production of nitrogen and microcystin which is wrongly attributed to the presence of the hydroelectric facilities occurs naturally and by way of the byproduct of farming operations and particularly the bird life in the Oregon side of the River system. The studies done previously by the Bureau of Reclamation make this point very clear. Among others they concluded that the pollution problems could be substantially reduced or even eliminated by the installation at Keno Dam of a water quality treatment facility. Within this same study the removal of the hydro facilities and storage capability will dramatically impact the ability to modulate the river flow especially in low water times. The BOR estimates that replacing this in stream flow capability may cost upwards of Eight Billion dollars. This would require the placement of significant water storage facilities in the upper Klamath Basin.
Therefore we object strenuously to the proposed actions which absent a thorough analysis of the Pacific Decadal Oscillation (Exhibit A), as well as all seven reaches of the Klamath cannot determine the full impact of the effort to remove the hydroelectric facilities. The study should further include an examination of the impact of the destruction of the facilities will have on the economic well- being of the counties which are impacted. For example there will be an immediate destruction of property values particularly at Copco Lake where owners have already experienced a loss in value.

Finally in this section we raise an objection to the State of California spending tax payer dollars to benefit a private 501 (3c) non- profit corporation, the KRRC, which although filed as a California Corporation was conceived and developed in New York City. It is bad enough that we ratepayers have been forced to pay an electric surcharge to remove the hydro facilities for

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many years now against our will and best interest for Siskiyou County. Either KRRC or PacifiCorp should be paying for the studies to be submitted to the State for review, analysis and potential approval. The KRRC has not been recognized by either the FERC or the CPUC to carry out the proposed activity. In fact the FERC raised an objection to the KRRC both filing simultaneously the license transfer from PacifiCorp to KRRC and filing to terminate the license and remove the hydro power facilities.
Before going into detail we would like to point out that right at the beginning of the Draft report in section 1.0 your author has misstated an important point that the project has been split into two elements by FERC. Our understanding is that shortly after the request was submitted and FERC proposed the split it was countered by PacifiCorp and their subordinate KRRC. Therefore the project is still under license to PacifiCorp and has not yet been split into two pieces. The FERC has never before approved a license transfer and immediately authorized a termination of an existing productive carbon free hydro -electric facility.

We have not seen any public hearings with the Siskiyou County Water and Flood Control who by statute have control over all waters in Siskiyou County including surface and subterranean waters. Prior to any actions which will impact the Klamath River and or its tributaries in Siskiyou County permits will have to be obtained from the Siskiyou County Water and Flood Control Agency.

Early History Klamath River

Over the years there have been numerous studies of the science of the river yet one of the most significant items which has been completely overlooked is the historic conditions of the Klamath River prior to the construction of any of the Dams. The earliest history of the Klamath River argues against the concept that removing the dams will somehow create more water or more Salmon. Instead the recorded information from eyewitness accounts shows that the Klamath River has historically evidenced cyclical periods of high and low water and an inability to provide enough water for Salmon in the late summer months. In addition it is well established fact that the River is impacted by algae blooms along with little water. We have included in the attached documents a letter dated January 27, 2017 from Glen Briggs, a retired engineer from the US Bureau of Reclamation, whose family has lived on the Klamath for generations. This letter is attached as **Exhibit B.** In addition we have included an early report from Commissioner of Indian Affairs Moneypenney in 1855. This report was also published as House Executive Document 1, Vol. 1 pp 321576, 34th Congress Seral Set no 840. The report indicates the earliest recorded history showed that there was a scarcity of fish in the Klamath. In addition we have included a selection from Reddick McKee's travel through the Klamath country in 1851. This report indicates the lack of water in the Klamath and lack of Salmon.

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Amended KHSA

On April 6, 2016 after the resounding failure of the previous KBRA and KHSA agreements, which had been pursued for many years by the Department of Interior, State of California, State of Oregon and numerous agencies and NGO'S, and ultimate rejection by Congress, the States of California and Oregon reconstructed the previously failed KHSA calling it the ***amended*** KHSA. This is the underpinning of your organizations efforts to legitimatize the effort to destroy the hydro-electric facilities. It is our opinion that this document is illegal as the Governor of California had no legislative authority to bind the State in a potentially super fund project without the benefit of appropriate studies and deliberations by the State Legislature. In short Governor Brown of California had no authority to enter into an abortive attempt to create a Federal Interstate Compact without Congressional approval.

Klamath Bi State Compact

The Klamath Basin is governed by the 1957 Compact between the States of California, Oregon and the Federal Government. This governing doctrine is referred to as "the law of the River". It is a Federal Statute enacted by both legislatures of Oregon and California and codified by U.S. Congress by Statute enacted on August 30, 1957 (71 Stat. 497). This document was developed after many years of negotiation between the States and their representatives and set forth the process for prioritization of beneficial uses of the Klamath River including the hydropower element which was negotiated at the time by COPCO, the predecessor to PacifiCorp. The negotiating team included officials from both Oregon and California and the Federal government. The Compact is still in effect and is still the "law of the River". This magnificently versatile agreement arrived at through earnest and considerate negotiations over five years included, a right to 60,000 acre feet of water for the benefit of Siskiyou's Shasta Valley to be taken from behind Iron Gate Dam and an additional 200,000 acre feet from behind Keno Dam for the Butte Valley area. Amongst those at the table were members of the Siskiyou County Board of Supervisors under the guidance of Senator Randolph Collier. It also resulted in the development of the very successful fish hatchery at Iron Gate which draws cold water to stimulate the development of SIX MILLION FINGERLINGS (6,000,000) per year to keep the Salmon population well stocked. This process if the dams were destroyed would go with them. There will be no way to make up the difference.

Siskiyou County Flood Control and Water Conservation District

A unique piece of legislation flowed from the adoption of the Compact to the benefit of Siskiyou County. Assemblywoman Pauline Davis, authored AB 1592 through the legislative process in California,. This was further codified under the California Water Code as Section 89-

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1. This unique piece of legislation blessed the ***County of Siskiyou with special water rights to govern all waters of Siskiyou County including subterranean and surface water excluding the water controlled by the upper basin federal project.*** This was intended to insure that Siskiyou County would be the master of its own fate to provide for development of hydropower and water usage to benefit industry, agriculture and domestic development. Again we would postulate that this unique water right conferred on the County of Siskiyou by the State of California trumps the efforts of the Water Board. These were "quid pro quo" for the County's spearheading the effort to develop the Federal Interstate Klamath Compact.

Sanctions

Although the 401 Report by the Water Board contractor states the parameters of the different rules which they expect KRRC to follow, there are no sanctions for failure to comply. Who we ask will pay the bills for damages done after the fact? Biological damages from dam removal as well as ongoing water quality problems are a most likely scenario yet there really is no provision to cover these costs. The insurance provided by KRRC mostly covers only KRRC officers. An example of potential damage includes besides those mentioned above a potential diminution in land values in Siskiyou County alone of perhaps ONE BILLION dollars. This is really not acceptable stewardship by the State by leaving unprotected the County of Siskiyou as well as other Counties both in California and Oregon. There is no evidence that removing the dams is anything other than a political event that will not benefit the Salmon or any other aquatic organisms or any other dependent animals that depend on the river for their needs. The Water Board needs to take cognizance of the Federal Laws relative to the Klamath and take into consideration as well the citizens who will be directly impacted by dam removal.

Conclusions

We reiterate our concerns over the legitimacy of the Draft Report by the Water Board, firstly because the study period was exceedingly short and begs the question of the intent of the board with respect to the group most impacted by the potential destruction of the hydro facilities i.e. Siskiyou County in which three of the four facilities to be destroyed are located and which has the greatest river frontage to be impacted by the release of contaminated sediment and opening up the prospect of flooding and resultant damage. Secondly, we object to the use of state funding to conduct the EIR/EIS for the benefit of a private company, the KRRC, which is not a proven entity. The KRRC has no demonstrated capability to manage such a huge undertaking and they have no significant funding of their own. Thirdly, we believe that the Governor of the State of California had no authority to enter into the Amended KHSA as it had never been reviewed or approved by the Legislature and by signing the agreement he has put the State of California and the citizens of Siskiyou County at great risk and peril. Fourthly, the Water Board planned action violates at least three Federal laws (NEPA, Federal Interstate Compact, Article 1 Sec. 10 Clause 3 of the US Constitution, and Endangered Species Act). Fifth,

the proposed objectives of the project under the KRRC are physically and scientifically unattainable. Sixth, and most importantly the existing Interstate Federal Compact has not been dealt with by Congress and therefore remains the law of the river.

We will look forward to the next step in the process and would request by submission of this letter that our voice be heard and that the Water Board ***subject itself to a public hearing conducted by the County of Siskiyou and surrounding counties.***

Sincerely yours
The Board of Directors
Siskiyou County Water Users

Richard Marshall
Richard Marshall
President

EXHIBITS ATTACHED

EXHIBIT A STUDY PUBLISHED BY DR. NATHAN MANTUA, "PACIFIC INTERDECADAL CLIMATE OSCILLATION WITH IMPACT ON SALMON PRODUCTION" (published by Bulletin of American Meteorological Society Vol 78, No. 6 1997)

EXHIBIT B LETTER DATED JAN 27, 2017 FROM GLEN BRIGGS, CE (Eyewitness accounts re the Klamath River conditions from 1860).

EXHIBIT C Excerpt from _____.

EXHIBIT D Excerpt from

~~August 16, 2019~~

Kimberly D. Bose
Secretary, Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

Re: FERC Nos. P2082; P-14803; Response to Filing by KRRC to BOC Recommendations

Dear Secretary Bose,

The Siskiyou County Water Users (SCWUA) in responding to the above submittal wish to reiterate our steadfast objections to the proposed removal of the Klamath River Dams as an inappropriate response to the issues at hand and most likely illegal in nature as the underlying document, the KHSA as Amended does not conform with the Compact Clause of the U.S. Constitution (Article 1, Section 10 Clause 3). In addition the funds being used by the State of California were obtained from Prop 1 Bond Funding (2014), which provided in part, that the funds would not be used to impact a federally designated "Wild and Scenic River" and it specifically indicated in its title that the funding was to construct additional water storage options. The Klamath River was designated by U.S. in 1968 and in California in 1972. In short the public was denied sufficient information in the voting process to determine that the funds raised would be used to destroy hydroelectric dams on the " Wild and Scenic Klamath River" subjecting the Klamath and the region to potential biological damage of immense proportions including both aquatic organisms and wildlife, exposing them to unknown and potentially catastrophic damage. It goes without saying that the removal of these dams will result in the largest dam removal in history. The voting public was never informed of this and in fact the language in the earlier (2012) version was modified to take out any reference to removing the Klamath Dams, an obvious fraud on the voting public. The misleading title on the ballot was "WATER BOND FUNDING FOR WATER QUALITY, SUPPLY, TREATMENT, AND STORAGE PROJECTS". Removing the Klamath Dams, the largest dam removal project in history was not one of those statements.

SCWUA represents those persons in Siskiyou County ranching and farming operations as well as the 79.4% of the voting public who indicated their request to keep the dams in place. This was indicated by the vote on "Measure G" at a General Election. In addition, a recent poll conducted by the Herald and News in Klamath Falls had a similar result where those who voted indicated by a vast majority that they did not want the dams removed. The official Klamath County vote was over 72% for retention of dams. These are the same people who are the ratepayers and taxpayers who will bear the burden both directly and financially of a politically inspired process from out of the area. A process aimed at depriving the area of control over its properties, environment and livelihood. Recently a campaign style form letter was circulated amongst numerous "fly fishing" groups evidently engendering a response directed to the FERC to support the KRRC. Such attempts from "outside" groups should give pause to the FERC over the

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lack of meaningful understanding of the issues involved by the members of these groups. Unlike those who are most intimately impacted by the Dam Removal such as those at COPCO Lake who lose not only their property values and have been damaged substantially now over a period of years, but they also will no longer have the fire protection offered by the existence of the dam reservoirs which have been used effectively to fight forest fires. Even now as we write this document a fire is raging in the area. Currently it is being fought by use of helicopters which are using water from the dam reservoirs to fight the fires. The nationally acknowledged "Klamathon Fire", which consumed thousands of acres, was eventually controlled by using water from behind the dams. We are attaching to this document a recent national article which appeared in the Fall 2019 issue of Range Magazine, entitled "Inconvenient Truths". This article by a local writer gives a powerful narrative of some of the truths which are being ignored by the powerful political interest groups who are funding this attack on our region. This article deals with some of the issues we have raised previously regarding Dam Removal.

We would point out to the Commission that historical eyewitness accounts and writings indicate that the Klamath River flow has always been questionable prior to the installation of the Klamath Dams. The quantity of Salmon has also cycled over various periods of time. See attached letter from Commissioner Moneypenny dated 1855. Early explorers found and reported the fact that the late summer months on the Klamath showed a very shallow river which had a foul smell based on the rotting algae along its banks. More modern history prior to building the Iron Gate dam shows that the River was so shallow in the summer months that you could walk across the River. The point of mentioning the above is to show that the statements made that somehow without the dams in place the Klamath would return to a productive life simply isn't borne out by the facts. In fact Iron Gate was partially installed to provide a way to establish a "flushing" ability of the River and in addition it provided capability for a steady flow of water throughout the summer months. A court order in fact establishes the viability and requirement for putting water into the River at a rate of 1000-1300 cfs, which if Iron Gate Dam is removed won't be possible. A study of the ocean currents shows a much more viable approach to understanding the Salmon productivity or lack thereof. This study by Dr. Nathan Mantua acknowledges the impact of the Pacific Decadal Oscillation on Salmon productivity (Bulletin of the American Meteorological Society; Vol 78 No 6 June 1997).

The submitted documents by KRRC to questions posed by the Board of Consultants (BOC), raises issues concerning its completeness. On page 8 of the report KRRC indicates that its contractor Kiewit won't complete the design process until January 31, 2020. It evidently is only at 60% in terms of completeness. Therefore not until after completion of the GMP (Guaranteed Maximum Price) will KRRC and its contractors be able to provide a more complete and accurate cost estimates for the project. This process makes it impossible to know with any certainty what the overall shortfalls may be. In their own words "the GMP will provide definitive market proof of the sufficiency of the overall project budget". Interestingly the original KBRA restoration project was projecting nearly 900 million dollars in costs to rehabilitate the River after demolition. It is hard to believe that nearly ten years later the costs will be substantially less in the current plan. In fact the funds available to KRRC most likely will just barely cover costs of demolition and some immediate area restorative work in the upper basin. The amount shown on page 10 for potential Pollution Liability in the amount of $100 Million for any unknown factor is impossibly small. It assumes a very limited geographical area of damage.

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~~The BoC was rightfully concerned about the long range issues that might involve continued liability as~~ expressed on page 14. The response from KRRC to this possibility is simply to state the obvious that they indeed will have to search for other funding opportunities. What isn't stated is that when the occasion occurs that additional funds are required, those opportunities to find other parties to make up the shortfall may not exist.

The Federal Energy Regulatory Commission has a duty above all else to protect the public in this matter. The potential bio remediation issues are substantial and the pockets of KRRC are limited. We would suggest that since the FERC is being pressured as indicated in the last paragraph on page 20 Section VII to both approve the license transfer and immediately approve the license surrender application, the FERC should **NOT AGREE TO REMOVE LIABILITY FROM ANY OF THE PARTICIPANTS.** PacifiCorp who has operated these dams for decades earning profits in the process should be held liable along with the States of Oregon and California for any damages to the public and shortfall from KRRC insurance provisions. The Dam Removal as stated some years ago by Secretary Salazar before the Commonwealth Club in San Francisco was that the removal success wouldn't be known for many decades. It has been referred to as a "Grand Experiment". The fact is that the public shouldn't be the fall guy in this process especially when there is no scientific assurance that removing the dams would result in proliferation of Salmon and not in a giant disaster resulting in a biological superfund site.

Respectively Submitted

Siskiyou County Water Users
Richard Marshall, President

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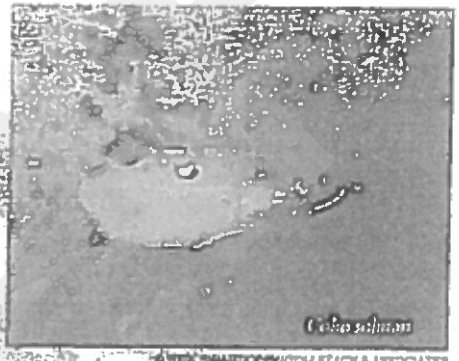
Inconvenient Truths

A little common sense on Klamath dam removal would go a long way.
By Theodora Johnson



DAM PHOTO © TOM STACK/TOM STACK & ASSOCIATES

Perhaps you've heard about the effort to tear out four major hydroelectric dams on the Klamath River in rural Northern California and southern Oregon? It's been an ongoing campaign for over 20 years. Dam huggers and haters alike call it the largest dam-removal proposal...ever.

The four dams—J.C. Boyle, Copco I, Copco II, and Iron Gate—were built between 1918 and 1962. They produce enough clean energy to power 70,000 residences. They are owned and operated by PacifiCorp, yet are federally regulated and licensed.

The dam-removal camp (environmental groups, several government agencies, and leaders of some local Indian tribes) says the goal is to tear out the dams in order to "restore" a "free-flowing" Klamath, thereby restoring tribal fisheries. They also claim the dams are creating "toxic" blue-green algae, hazardous to animals and humans.

But there's a growing heap of evidence that flies in the face of the dam-removal activists' claims—evidence that shows dam removal could be epically catastrophic for all wildlife and people on the Klamath. Stakeholders such as PacifiCorp (owner of the dams) and Siskiyou County (home to three of the four dams) are concerned that dam removal will, in fact, harm fish and all other life on the river, as detailed below. And as for that "deadly" algae? There's never been a reported case of toxic exposure on the Klamath or in the reservoirs. What's more, the reservoirs are documented to dilute and sequester the algae, which occurs naturally at the head of the Klamath River.

There's a heap of evidence that flies in the face of the dam-removal activists' claims—evidence that shows dam removal could be epically catastrophic for all wildlife and people on the Klamath.

Citing all the scientific evidence showing Klamath dam removal is a bad idea would take hundreds of pages. (It's been done in official comments by Siskiyou County, PacifiCorp, Siskiyou County Water Users Association, and many affected citizens.) So, in the interest of saving space, time, and readers' sanity, we present today the list, Things That Don't Make Sense, about the whole ordeal.

But first, a bit more background. Anti-dam zealots have failed at multiple attempts to secure federal legislation to take out the dams, most recently in 2015. After the last legislation went down in flames, the anti-dammers changed their tactic: attempt to circumvent Congress by using the regulatory process. They set their sights on the dams' operating license, which is reissued every 50 years by the dams' regulating agency, the Federal Energy Regulatory Commission. The license is due for renewal, so the anti-dam camp's plan is to convince FERC to hand over the operating license to a newly created "dam-removal entity," then approve the dams' decommissioning and removal.

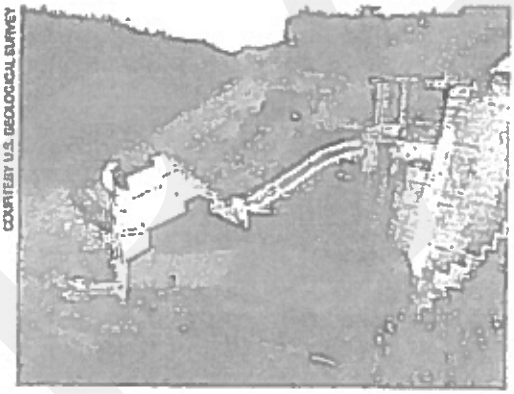
The plan, now known as the "amended Klamath Hydroelectric Settlement Agreement," was quietly crafted around the beginning of 2016, initially through secret meetings held by a few officials from the U.S. Department of Interior, California and Oregon agencies, and PacifiCorp (yes, PacifiCorp is officially on board with dam removal. See item number 14 of "Things That Don't Make Sense," below). Shockingly, any handpicked "stakeholder" who was allowed to participate in the meetings was forced to sign a nondisclosure agreement. (All this became public when staff of U.S. Rep. Doug LaMalfa infiltrated the meetings. LaMalfa's district encompasses 68 percent of the Klamath River, and he's fought dam removal relentlessly.)

The end product of this non-inclusive process, which LaMalfa called "entirely inappropriate" for public employees, was the creation of a dam-removal entity, the Klamath River Renewal Corporation. If permitted by FERC, it will take on the operating license for the dams and eventually remove them. A few years following dam removal, it plans to dissolve.

This method has never been tried by dam-removal activists elsewhere. It's a clear Hail Mary pass and here's why. There's just too much about this that doesn't make sense.

COURTESY DOREEN MITCHELL

The Klamath River, which used to go below ground for parts of the year in some areas, now flows year-round—thanks to the dams, located at the upper end of the river. This photo was taken from Independence Bridge, about 100 river miles down from the lowest dam, Iron Gate. Dams and all, the river was federally designated "Wild and Scenic" in 1981. A BLM webpage boasts about the river's beautiful scenery and rapids, noting that the Upper Klamath "has a lengthy season of use thanks to the steady water releases from the J.C. Boyle Dam and Powerhouse." The river is also an important "wildlife habitat corridor," another BLM webpage notes. It lists the river's anadromous fish populations—such as chinook, coho, and steelhead—as "outstandingly remarkable values." Despite the fact that the dams helped make all this possible, activists want to do away with them. BELOW LEFT: Copco I Dam and Powerhouse. The dam, completed in 1921, is one of the farthest downriver. It was built at the head of a canyon where a 130-foot ancient reef prevented salmon passage "since time immemorial," according to the local Shasta tribe. Yet, dam-removal activists claim the dams are an impediment to prime salmon habitat. BELOW RIGHT: Copco Lake. Here, it's partially drawn down, exposing some of the sediment that would be washed downriver should the dams be removed. All told, Copco and the other three dams hold behind them an estimated 20 to 30 million cubic yards of sediment. The low end of that estimate equates to two million dump truck loads.



COURTESY U.S. GEOLOGICAL SURVEY

COURTESY TED MOZILNI

THINGS THAT DON'T MAKE SENSE

(1) The goal of "restoring" the Klamath.

Before the dams, another name for the Klamath was Stinking River. Stretches of the upper Klamath would often go underground in the summer, leaving the aquatic life to rot in the sun. The upper Klamath is also naturally poor habitat for salmon and steelhead, as it starts out warm and rich in phosphorus in the marshes and volcanic rock of south-central Oregon. Phosphorus feeds algae and makes for low-oxygen conditions that are bad for salmon.

The dams have been documented to improve water quality by filtering the phosphorus and other pollutants. Plus, they keep the river running year-round, in turn allowing for both fall and spring salmon runs. They also make it possible to send "pulse flows" down the river, which the agencies believe help prevent fish disease.

"Unnatural" as it may now be, the Klamath has become famous for its excellent whitewater rafting, fishing opportunities, and beauty. It was designated a Wild and Scenic River in 1981.

(2) Releasing millions of tons of sediment to "restore" the river.

Even if the old river were, in fact, what the dam-removal activists wanted, it's not what they would get if the dams came out. An estimated 20 to 30 million cubic yards of toxic sediment is currently being held safely behind the dams. The low end of that estimate equates to a four-foot-deep, 150-foot-wide stretch of muck that would last for 200 miles. For context, the entire Klamath River is 257 miles long.

The effects this sediment will have on aquatic life in the river is a matter of great uncertainty. Some of the sediment is predicted to settle in the river and some of it may remain suspended in the water for several

years. "Deposition of fine sediments would adversely affect aquatic and riparian biota and important habitat," said PacifiCorp in surprisingly hard-hitting comments submitted to FERC in February 2019. It also threatens salmon habitat, PacifiCorp noted.

A panel of scientists from Interior also noted in 2012 that "oxygen demand resulting from high organic content of the sediment deposits may result in periods of hypoxia in the river that are not suitable for aquatic life."

Additionally, a 2012 peer-reviewed report prepared for Interior asked planners for more information regarding sediment discharge. "As is the case with most dam removals," the report read, "the fate of the sediments behind the dams is of primary importance."

To date, further studies as to the amount and effects of sediment have not been done—or, at least, have not been publicized.

Several populations of sucker fish living in reservoirs behind the dams have been designated as "endangered." Dam removal will obliterate many of them and much of their habitat. In a strange contradiction, some local tribal leaders—who call the fish "sacred" and "teetering on the brink of extinction"—are pushing for dam removal. At the same time, these leaders have been calling on Klamath farmers to give up their water for the sucker. RIGHT: U.S. Rep. Doug LaMalfa, a staunch supporter of the dams, meets with now-President Trump in Redding, Calif., May 2016. He seems to be making inroads with the administration: this May, Interior retracted a letter calling for Klamath dam removal, written by an Obama-era secretary of Interior. LaMalfa's been effective at stopping the dams' destruction in the past; his opposition was a primary reason that Klamath dam-removal legislation failed in 2014.

(3) Dam removers holding themselves harmless for any damages, while at the same time telling us not to worry about damages.

In the text of their document, the signatories to the Klamath Hydroelectric Settlement Agreement hold themselves harmless for: "any and all claims, actions, proceedings, damages, liabilities, monetary or nonmonetary harms or expense arising from, relating to, or triggered by facilities removal, including but not limited to: (1) Harm, injury, or damage to persons, real property, tangible property, natural resources, biota, or the environment; (2) Harm, injury, or damage caused by the release, migration, movement, or exacerbation of any material, object, or substance, including without limitation hazardous substances; and (3) Breaches or violations of any applicable law, regulatory approval, authorization, agreement, license, permit, or other legal requirement of any kind."

What about liability? Someone will have to be left holding the bag when the sediment hits the fan.

Well, seems like that pretty much covers everything. The trouble is, as pointed out by both PacifiCorp and Siskiyou County, just claiming you're not liable doesn't mean you're not liable. Someone will have to be left holding the bag when the sediment hits the fan.

(4) Taking out fish hatcheries to "save" the fish.

Iron Gate hatchery, which is made possible by cold and abundant water from the dams, annually releases 75,000 yearling coho salmon, 900,000 yearling fall chinook salmon, and 5.1 million fall chinook salmon smolts. PacifiCorp noted in its February 2019 comments that the "hatchery programs that currently conserve listed coho salmon and support harvest opportunities for chinook salmon" will come to an end.

(5) The goal of "restoring" coho salmon on the Klamath.

Protecting "threatened" coho salmon is likely the most-touted reason for Klamath dam removal. But the prevailing evidence shows that the Klamath has never been prime habitat for coho.

The Shasta Indian tribe, whose aboriginal territory encompasses the dams, has stated that the river was, "since time immemorial," historically unfit for coho. A California Department of Fish and Wildlife fishing guidebook refers to coho as a coastal fish that doesn't like to spawn farther than 20 miles inland. And if the coho *had* wanted to migrate upstream to the present locations of the dams, it would have been stopped by at least three high reefs impassable to salmon.

Oh, and just so we're clear, this is the same coho that you can buy at the store. Coho are caught in large numbers off the coast of Alaska, where it thrives in the cold northern waters. Northern California and southern Oregon waters are too warm to be prime habitat—yet in 1997 the federal government designated coho in that region as an "evolutionarily significant unit." Hence the protected status of a fish you can buy for dinner.

(6) Claiming dams have harmed salmon, when the numbers show salmon populations increased with the advent of the dams.

The first and largest dam, Copco 1, was built in 1918. Thanks to hatchery records, we know that salmon returns to that area made no significant changes in response to the building of the dam. But after Iron Gate's construction in 1962, salmon returns actually increased by over 20 percent. Between 1980 and the present—a period cited by some as the "salmon collapse"—salmon returns to Iron Gate have been 200 percent of those pre-Iron Gate.

(7) Creating a sucker fish versus salmon scenario, where neither can possibly win.

The anti-dam camp claims dam removal will help both salmon and suckers. The problem is, the two types of fish need totally different types of habitat—both of which are currently made possible by the dams. Suckers, which have been listed as "endangered," live above the dams, having adapted to the naturally high-nutrient, warm waters of the upper Klamath. Below the dams, "protected" salmon need cold water and deep refugia in the river. Taking out the dams will both jeopardize salmon habitat and obliterate sucker habitat and two entire sucker populations in the reservoirs.

(8) California Legislature giving the project a free pass to kill an endangered species.

How is the obliteration of "protected" suckers possible in a world where (usually) the Endangered Species Act trumps all? Unbelievably, the California Legislature last year passed a law (AB 2640) allowing the dam-removal corporation to kill endangered suckers. Yes, these are the selfsame suckers that farmers in the Upper Klamath Basin have been losing their livelihoods over. Remember the 2001 Bucket Brigade? More than 20,000 people showed up to support the 1,200 farmers whose water was shut off by the federal government in the name of the sucker. To this day, those farmers face the same threat each year. But killing suckers in the name of dam removal? No problem.

(9) Expecting government agencies that are already signatories to the dam-removal agreement to perform objective analysis of the possible effects of dam removal.

Multiple Oregon and California agencies, as well as the U.S. Department of Interior and National Marine Fisheries Service, signed on to the 2016 agreement to tear out the dams. Yet, per their respective environmental quality acts, these same agencies will be responsible for running "objective" analyses of the expected environmental and socioeconomic impacts, should this project advance. Can anyone say "predecisional document"?

Meanwhile, the county of Siskiyou (California), home to three of the four dams and 68 percent of the river's length, has expended hundreds of thousands of dollars of its limited resources fighting dam removal, including providing hundreds of pages of historical documentation and scientific studies. Many of those damning studies were actually commissioned or performed by the very state and federal agencies promoting dam removal. Why haven't we heard about them from the agencies? Well, when a study doesn't come out the way you wanted, you keep quiet.

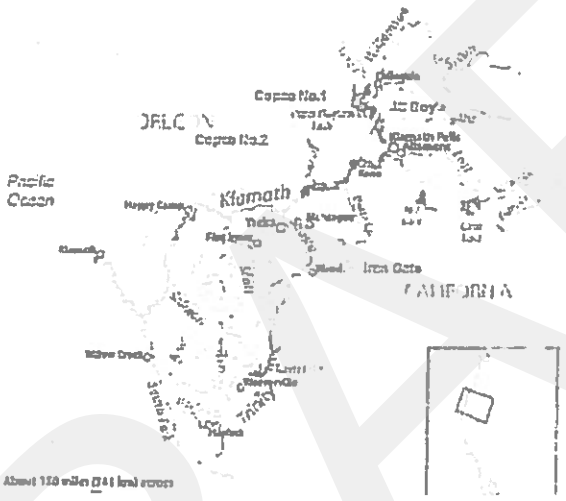
(10) Making local residents, who oppose dam removal, pay for it.

In 2010, Siskiyou County residents voted nearly 80 percent in opposition to dam removal. Later, citizens in Klamath County, Ore., voted 72 percent against dam removal. These same citizens are currently being forced to fund the very dam-removal effort they oppose—to the tune of $450 million.

Of that $450 million, $200 million is coming from electricity ratepayers of California and Oregon. Every month on their power bills, these PacifiCorp customers are paying a surcharge dedicated to dam removal…which, if accomplished, will make their electricity bills even higher.

"The Klamath dams provide green, renewable, already existing, low-cost power—and it's baseload power, meaning you can always count on it, unlike solar and wind."

—U.S. Rep. Doug LaMalfa, whose district encompasses 68 percent of the Klamath River



COURTESY U.S. GEOLOGICAL SURVEY

The Klamath Basin is located in rural Northern California and southern Oregon. The four dams being targeted for removal are owned and operated by PacifiCorp, a Warren Buffett subsidiary. They provide steady, cold, year-round water for salmon below them, and safeguard sucker fish habitat above them. BELOW: *Klamath Basin residents are being forced to pay for dam removal they oppose. Here they are protesting dam removal in Yreka, Siskiyou County, Calif., in February 2019. In 2014, 80 percent of Siskiyou County voted against dam removal.*

PHOTO COURTESY LOUISE GUATTO

The other $250 million is coming from—you guessed it—California taxpayers! The money has been siphoned from a 2014 water bond measure, Proposition 1. It was sold to voters as a bond for "water quality, supply, treatment, and storage projects." It includes a total of *zero* references to Klamath dam removal in its 26 pages of text. And, of course, nothing was mentioned about dam removal on the ballot.

Given the lack of evidence that dam removal will have a net benefit for animals or people, could the appeal of the project be the large sum of money associated with it?

(11) Convincing locals that they won't miss the dams.

Property along the river will be affected dramatically by a newly formed 100-year floodplain (remember those 20 to 30 million cubic yards of sediment), the loss of flood control currently provided by the dams, the loss of water in the river and reservoirs to fight wildfires, and a drop in the water table, which could dry up wells and possibly result in damages to homes as the ground shifts. The entire community of Copco, nestled along the banks of the Copco Reservoir, will be forever damaged.

One local group, the Siskiyou County Water Users Association, has pointed out yet another danger for residents in the Klamath Basin: when dam removal fails to provide more and better water for salmon, regulators will target residents—particularly farmers and ranchers—for water. That will include farmers in the Upper Basin and on tributaries to the Klamath, like the Scott and Shasta rivers.

The proposal's obvious danger to human existence on the Klamath begs another question: Is the effort being driven by an ideology that longs for a pre-human era?

(12) Claiming local tribes support the effort.

While it's true that (the *leadership* of) a few tribes do support dam removal—namely, the Karuk and Klamath tribal leadership—the Shasta tribe, whose aboriginal territory encompasses a large portion of the Klamath Basin, adamantly opposes dam removal.

The Shastas stated in a press release in 2008 that the project will "destroy socioeconomic resources to property owners, ranchers, farmers and residents of Siskiyou County."

The press release further reads, "It is the collective opinion of the Shasta Nation Tribal Council that the removal of Klamath River dams would be catastrophic to modern-day water conditions for fish habitat and water users."

Furthermore, the tribe fears that dam

removal will "obliterate Shasta Nation history, past, present and future." Removal of the dams would expose and possibly wash downriver the bones of the Shasta Nation people who are buried under the lake in their historic villages.

As for the position of the other tribes, one can only surmise that they either believe the myth of fishery restoration, or are after something else entirely.

(13) Convincing certain irrigation groups to sign on, even though there will clearly be less stored water available for irrigation, and even though dam removal will introduce new protected species both above and below the dams—which brings new regulations for farmers.

This one only makes sense when one considers that Upper Klamath farmers depend almost entirely on water controlled by the federal government, via the Klamath Reclamation Project (remember the Bucket Brigade). Those farmers are at the mercy of the agencies every time those agencies determine that fish—suckers or salmon—need that water.

Recognizing this vulnerability, the writers of the dam-removal agreement conjured a second agreement promising to "take every reasonable and legally permissible step to avoid or minimize any adverse impact" from new Endangered Species Act regulations that might befall farmers in the Upper Klamath—but only if they support dam removal. Otherwise, all bets are off.

The problem is the federal wildlife agencies (aka, the regulators) haven't signed the document making all those promises of protection. Even the document itself admits that "certain outcomes [are] not guaranteed or are more uncertain than others." Sure sounds like something to take to the bank, doesn't it?

(14) PacifiCorp supporting the removal of its own dams.

Actually, the company *did* want to relicense the dams after the 50-year operating license expired in 2006. But when it reapplied for a new license with FERC, other federal and state agencies demanded upgrades for fish passage and other expensive "mitigation" measures. As the mountain of regulatory roadblocks grew, PacifiCorp began to see dam removal as a more palatable route—especially when dam-removal proponents came up with the idea of making taxpayers and electricity ratepayers fund the whole thing.

COURTESY RAY HAUPT

Ray Haupt, member of Siskiyou County Board of Supervisors, has asked high-level Trump administration officials to save the dams. He is a forester and former U.S. Forest Service ranger with a background in ecology. When asked why the dam-removal activists seem unresponsive to the science showing dam removal will be environmentally devastating, he says: "I've come to realize this isn't about the science. It's about money, politics and an ideological agenda."

(15) Creating an interstate agreement to tear out the dams without congressional approval.

The Compact Clause of the U.S. Constitution requires that "No State shall, without the Consent of Congress…enter into any Agreement or Compact with another State." The Klamath Hydroelectric Settlement Agreement clearly does so, which is the thrust of a legal challenge brought by Siskiyou County Water Users Association. The challenge is currently pending before FERC.

THINGS THAT DO MAKE SENSE

Luckily, things are starting to happen that do make sense. For example:

Legal victory for Siskiyou County, January 2019: A federal court ruling says California and Oregon can't continue to use permitting delays to stop FERC, the federal regulator, from relicensing the dams.

PacifiCorp comments, February 2019: The owner of the dams wrote scathing comments, laying out all the reasons why the project was a huge liability. "Dam removal on the Klamath River is a natural-resource-management decision that PacifiCorp, as a regulated utility, is unwilling to undertake because of the substantial risks and uncertain benefits," the company wrote. It has since recommitted to dam removal in a press release, after a backlash of political pressure from dam-removal activists.

Secretary of Interior retraction of dam-removal support letter, May 2019: U.S. Interior Secretary David Bernhardt retracted a support letter for the dams' destruction, written by Obama-era Secretary Sally Jewell. This was a major victory for Rep. LaMalfa and Siskiyou County Supervisor Ray Haupt, who had both been pushing on the administration to retract the letter. The fact remains, however, that Interior is still a signatory to the dam-removal agreement.

FERC still waiting on answers from the dam-removal corporation: FERC, the regulating agency, hasn't yet accepted a "definite plan" from the dam-removal corporation, or even determined whether the corporation has the "legal and technical capacity" to take over the operating license. In making that determination, FERC has stated it will apply a "heightened public-interest standard" due to the unique nature of this endeavor.

Additionally, FERC has asked the corporation some pretty tough questions—like how will it get insured against the significant liability attached to this, and what will it do if costs exceed its $450 million budget, which seems likely? So far, instead of providing answers, the corporation has only asked for extensions.

Meanwhile, the corporation has already awarded an $18 million contract to Kiewit Infrastructure West Co. This initial contract, awarded in April 2019, is just for the exploratory "design phase" of the dam removal, yet it gives the disheartening impression that the project is a done deal. Next, Kiewit will come out with a cost estimate for the entire project—if the company thinks it can be done.

Here's an idea: instead of continuing the tough job of building a house of cards, why don't the dam-removal activists just pocket the $450 million and spend the rest of their days in the Bahamas? They'd be doing the Klamath Basin a favor. ◻

Theodora Johnson and her husband raise cows and kids in Siskiyou County. She was born on the Klamath, and has always known it as a beautiful river. However, her mother remembers before the last dam, Iron Gate, was built in 1962, and how low and smelly the river would get in the late season. Her generation was grateful for the flood control and proud to have its own clean self-sustaining hydroelectric power that made the river better. To see some of the extensive documentation supporting the dams, go to Siskiyou County's comments, found on its webpage (https://www.co.siskiyou.ca.us/naturalresources/page/klamath-dams), as well as PacifiCorp's official comments from February 2019 (found at https://tinyurl.com/pacificorpcomments2019).

January 27,2017

State Water Resources Control Board
Division of Water Rights
Water Quality Certification Program

Attention: Mr. Parker Thaler

P.O. Box 2000
Sacramento, Ca. 95812-2000

Dear Mr Thaler:

This letter is in response to the request for comments contained in your "NOTICE OF PREPARATION AND SCOPING AND MEETINGS FOR AN ENVIRONMENTAL IMPACT REPORT FOR THE LOWER KLAMATH PROJECT LICENSE SURRENDER"

First, as to the long-term changes to the water temperature regime, I feel there is an abundance of available evidence to show that removal of the dams and return to an uncontrolled river through the reach included in the study would be an environmental disaster for the downstream river for at least the next 100 miles, below which, incoming fresh water from clean, cold tributaries moderate the condition.

During late summer through fall to early winter, particularly during dry periods, water reaching the location of this project from above is, and will continue to be, extremely warm and contaminated as a natural condition created by the large shallow lake from which it derives and from whatever inflow happens to make it's way to the Klamath from the bird sanctuaries. This condition is commented on by George Gibbs on page 39 of "GEORGE GIBBS' JOUNAL OF REDICK McKEE'S EXPEDITION THROUGH NORTHWESTERN CALIFORNIA IN 1851" published by the ARCHEOLOGICAL RESEARCH FACILITY , Department of Anthropology, University of California, Berkley, 1972 and available on-line. On September of that year while describing the Trinity River, Mr. Gibbs writes "It is in size about half that of the Klamath, likewise rapid, are of transcendent purity; contrasting with those of the latter stream which never lose the taint of their origin." This must be taken in light of the fact that waters leaving the upper basin has already been diluted by inflow from major tributaries such as Beaver Creek, Indian Creek, Elk Creek, Clear Creek Salmon River and numerous lesser clean water creeks along the way.

A treatise on the condition of Klamath Lake in late summer or fall can be found in journals covering the explorations of John C. Fremont. Also, an article in an early Klamath Falls newspaper mentions the fact that during a very dry year, inflow into Upper Klamath Lake was so small that a strong wind from the south prevented any water from passing over the existing natural dam.

From a personal point of view, I have been involved with the Klamath River since 1931, the year of my birth, my mother, Violet Fehely Anderson was involved with this river from 1905 to 2009 and my grandmother, Catherine Wood Fehely from 1875 to 1970. My great grandfather, John C. Wood came to this area as a young man in 1860 and remained here the rest of his life. During this time, conclusions made and passed along have had a strong influence on my opinions. Stories about the diseased salmon contaminating the banks of the Klamath past their home 10 miles upstream from Happy Camp during the 1900's early teens substantiate accounts of warm, polluted water prior to dam construction. My brother-in-law, Richard Haley (deceased), a former employee of California Fish and Game confirmed through Fish and Game records that this die-off was indeed caused by a gill disease. Another, story evolving from this same period of time concerned how the family gathered on the river bar in late fall to catch and cook the large, red crawdads that came up the river by the hundreds. These runs have completely disappeared following construction of the dams. My guess is that the water stayed too cold for their existence.

Now to the fish. First, the Coho or Silvers as they were called, never naturally occurred in the mid to upper Klamath. Several attempts to introduce them, starting as early as the 1890's proved unsuccessful until after the 1940's when a small run has been maintained in the cooler water furnished by the reservoir. Even so, refuge areas must be provided to insure their survival. My earlier family consisting of several avid fishermen, as relayed by my mother, never knew of the Coho Salmon while fishing the mid-Klamath from the 1870's to the 1940's.

When the dams were constructed, there was good reason that the California Fish and Game did not insist on fish ladders. It is my belief that legend had it that few salmon, if any, ever made it to the upper basin and, that later comprehensive studies proved this, thus removing the need for ladders. This is very easily understood if one looks at the physical restraints. Elevation of Copco reservoir is listed as 2605 feet while the reservoir surface for J. C. Boyle reservoir is listed as 3795 feet. A difference of 1191 feet in 26 river miles. A very steep gradient for fish that have just completed swimming upstream in a swift river for 200 miles. Besides that a river channel that steep would be devoid of any bedding gravels and most likely would consist of rapids and deep holes in the bedrock.

It is my understanding that river releases from the power dams in question have been modifies in response to directives from the National Marine Fisheries Agency to benefit fish runs which, as a result, restricts efficient generation of available power capability. And, also, I am aware of required releases in addition to the regular requirements for specific fish problems such as fish diseases and efforts to sweep certain river sections free from some troublesome biota. All of this sharply impacts the ability of the Power Company to economically operate the dams and power facilities. When these dams are gone and extra water is requested by the fisheries people, where will that water come from? It seems logical that federal

fingers will be pointed upstream to the upper basin and demanding water presently needed to accommodate the irrigation demand.

In view of the above, you really have no moral nor ethical way to go except to determine major and unacceptable environmental impact to the mid-Klamath river region with removal of the power dams included in your study.

Thank You

Glen Briggs
Civil Engineer, Retired
U.S. Bureau of Reclamation
1960 to 1987

2005 State Hwy 96
Seiad Valley, Ca.
96086
(530) 496-3343

Copy To:
Richard Marshall
President
Siskiyou County Water Users Association
P. O. Box 187
Fort Jones, Ca.
96032

A Pacific Interdecadal Climate Oscillation with Impacts on Salmon Production*

Nathan J. Mantua,+ Steven R. Hare,# Yuan Zhang,+
John M. Wallace,+ and Robert C. Francis@

ABSTRACT

Evidence gleaned from the instrumental record of climate data identifies a robust, recurring pattern of ocean–atmosphere climate variability centered over the midlatitude North Pacific basin. Over the past century, the amplitude of this climate pattern has varied irregularly at interannual-to-interdecadal timescales. There is evidence of reversals in the prevailing polarity of the oscillation occurring around 1925, 1947, and 1977; the last two reversals correspond to dramatic shifts in salmon production regimes in the North Pacific Ocean. This climate pattern also affects coastal sea and continental surface air temperatures, as well as streamflow in major west coast river systems, from Alaska to California.

September 1915 (*Pacific Fisherman* 1915)

Never before have the Bristol Bay [Alaska] salmon packers returned to port after the season's operations so early.

The spring [chinook salmon] fishing season on the Columbia River [Washington and Oregon] closed at noon on August 25, and proved to be one of the best for some years.

1939 Yearbook (*Pacific Fisherman* 1939)

The Bristol Bay [Alaska] Red [sockeye salmon] run was regarded as the greatest in history.

The [May, June and July chinook] catch this year is one of the lowest in the history of the Columbia [Washington and Oregon].

August/September 1972 (*National Fisherman* 1972)

Bristol Bay [Alaska] salmon run a disaster.

Gillnetters in the Lower Columbia [Washington and Oregon] received an unexpected bonus when the largest run of spring chinook since counting began in 1938 entered the river.

1995 Yearbook (*Pacific Fishing* 1995)

Alaska set a new record for its salmon harvest in 1994, breaking the record set the year before.

Columbia [Washington and Oregon] spring chinook fishery shut down; west coast troll coho fishing banned.

1. Introduction

Pacific salmon production has a rich history of confounding expectations. For much of the past

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In final form 6 January 1997.

two decades, salmon fishers in Alaska have prospered while those in the Pacific Northwest have suffered. Yet, in the 1960s and early 1970s, their fortunes were essentially reversed. Could this pattern of alternating fishery production extremes be connected to climate changes in the Pacific basin?

In this article we present a synthesis of results derived from the analyses of climate records and data describing biological aspects of variability in the large marine ecosystems of the northeast Pacific Ocean. Our goal is to highlight the widespread connections between interdecadal climate fluctuations and ecological variability in and around the North Pacific basin.

A considerable body of literature has been devoted to the discussion of persistent widespread changes in Pacific basin climate that took place in the late 1970s (Namias 1978; Trenberth 1990; Ebbesmeyer et al. 1991; Graham 1994; Trenberth and Hurrell 1994). Several studies have also documented interdecadal climate fluctuations in the Pacific basin, of which the changes that took place in the late 1970s are but a single realization (Ebbesmeyer et al. 1989; Francis and Hare 1994 and Hare and Francis 1995, hereafter FH–HF; Latif and Barnett 1994, 1996; Ware 1995; Hare 1996; Zhang 1996; Zhang et al. 1997, hereafter ZWB).

Widespread ecological changes related to interdecadal climate variations in the Pacific have also been noted. Dramatic shifts in an array of marine and terrestrial ecological variables in western North America coincided with the changes in the state of the physical environment in the late 1970s (Venrick et al. 1987; Ebbesmeyer et al. 1991; Brodeur and Ware 1992; Roemmich and McGowan 1995; Francis et al. 1997). Rapid changes in the production levels of major Alaskan commercial fish stocks have been connected to interdecadal climate variability in the northeast Pacific (Beamish and Boullion 1993; Hollowed and Wooster 1992; FH–HF), and similar climate–salmon production relationships have been observed for some salmon populations in Washington, Oregon, and California (Francis and Sibley 1991; J. Anderson 1996, personal communication).

Our results add support to those of previous studies suggesting that the climatic regime shift of the late 1970s is not unique in the century-long instrumental climate record, nor in the record of North Pacific salmon production. In fact, we find that signatures of a recurring pattern of interdecadal climate variability are widespread and detectable in a variety of Pacific basin climate and ecological systems. This climate pattern, hereafter referred to as the Pacific (inter) Decadal Oscillation, or PDO (following coauthor S.R.H.'s suggestion), is a pan-Pacific phenomenon that also includes interdecadal climate variability in the tropical Pacific.

2. Data and methodology

We analyze a wide collection of historical records of Pacific basin climate and selected commercial salmon landings. Specifically, this study examines records of (i) tropical and Northern Hemisphere extratropical sea surface temperature (SST) and sea level pressure (SLP); (ii) wintertime North American land surface air temperatures and precipitation; (iii) wintertime Northern Hemisphere 500-mb height fields; (iv) SST along the west coast of North America; (v) selected streamflow records from western North America; and (vi) salmon landings from Alaska, Washington, Oregon, and California.

Monthly mean SST data for the period of record 1900–93 were obtained from an updated version of the quality-controlled U.K. Meteorological Office Historical SST Dataset (HSSTD) provided by the Climatic Research Unit, University of East Anglia (Folland and Parker 1990, 1995). These data are on a 5° lat × 5° long grid. The monthly mean, 1° lat × 1° long gridded data of the Optimally Interpolated SST (OISST, Reynolds and Smith 1995) are averaged into 5° boxes and used to extend the HSSTD through the January 1994–May 1996 period of record. We also use 2° lat × 2° long Comprehensive Ocean–Atmosphere Data Set (COADS, Fletcher et al. 1983) SST for the period of record 1900–92 in the construction of Fig. 2.

Monthly mean SLP data were obtained from two sources: first, 5° lat × 5° long gridded fields from the Data Support Section/Computing Facility at the National Center for Atmospheric Research (NCAR) for the period of record 1900–May 1996 (Trenberth and Paolino 1980); and second, 2° lat × 2° long gridded surface marine observations from COADS for the period of record 1900–92, which are used to construct the station-based Southern Oscillation Index (SOI) shown in Fig. 1 and the SLP map in Fig. 2.

For the period of record 1900–92, the COADS-based SOI used here was constructed following

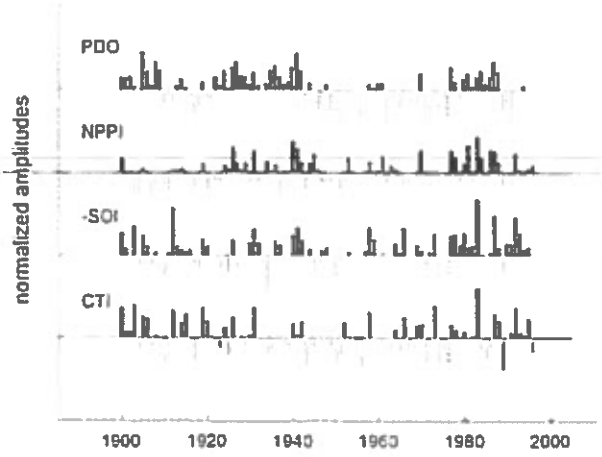

FIG. 1. Normalized winter mean (November–March) time histories of Pacific climate indices. Dotted vertical lines are drawn to mark the PDO polarity reversal times in 1925, 1947, and 1977. Positive (negative) values of the NPPI correspond to years with a deepened (weakened) Aleutian low. The negative SOI is plotted so that it is in phase with the tropical SST variability captured by the CTI. Positive value bars are black, negative are gray.

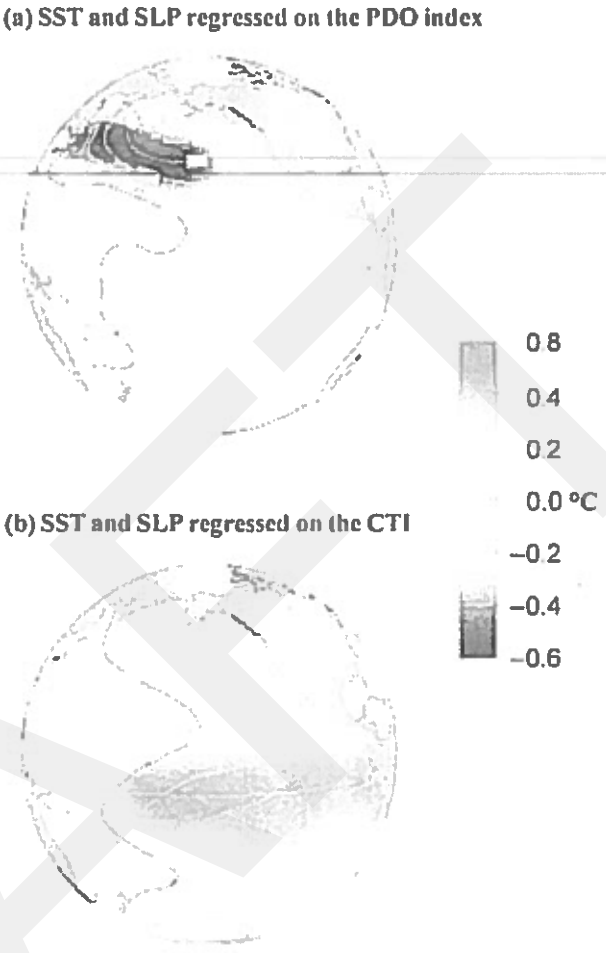

FIG. 2. COADS SST (color shaded) and SLP (contoured) regressed upon (a) the PDO index and (b) the CTI for the period of record 1900–92. Contour interval is 1 mb, with additional contours drawn for +/–0.25 and 0.50 mb. Positive (negative) contours are dashed (solid).

ZWB. The Tahiti pole is defined as the average SLP anomaly from 20°N to 20°S latitude from the international date line to the coast of South and Central America, while the Darwin pole is defined as the average SLP anomaly over the remainder of the global tropical oceans within the same range of latitudes. Missing SOI values for the period of record 1913–20 and 1993–May 1996, were estimated from a linear regression with the traditional Tahiti–Darwin SOI based on the common period of record 1933–90, obtained from the National Oceanic and Atmospheric Administration/National Centers for Environmental Prediction (NOAA/NCEP) Climate Prediction Center. For an early description of the Southern Oscillation the reader is referred to Walker and Bliss (1932).

Gridded, global, land surface air temperature and precipitation anomalies for the period of record 1900–92, based on station data, were obtained from the Carbon Dioxide Information Analysis Center in Oak Ridge, Tennessee. The air temperature data are provided as monthly anomalies on a 5° lat × 10° long grid, over land only (Jones et al. 1985). We used "cold-season" means (November–March) for Fig. 3a. The precipitation anomalies are provided as (3 month) seasonal mean anomalies on a 4° lat × 5° long grid, over land only (Eischeid et al. 1991). We used the December–February seasonal mean anomalies in constructing Fig. 3b.

Gridded, Northern Hemisphere 500-mb height fields were obtained from NMC (National Meteorological Center, now NCEP) operational analysis fields, as described by Kushnir and Wallace (1989). November through March mean anomalies were used in constructing Fig. 4.

Monthly mean streamflow records for the Kenai River at Cooper's Landing, Alaska; the Skeena River at Usk, British Columbia, Canada and the Fraser River at Hope, British Columbia, Canada; and the Columbia River at The Dalles, Oregon, were obtained from the National Water Data Exchange, which is part of the United States Geological Survey (USGS). The monthly records were used to generate annual water year (October–September)

flow indices for each stream. The time series labelled BC/Columbia Streamflow in Fig. 5 is a composite of the normalized Skeena, Fraser, and Columbia river water year streamflow anomalies.

Coastal SST time series for British Columbia stations were obtained from the Institute of Ocean Sciences in Sidney, British Columbia, Canada. The time series for coastal BC SST shown in Fig. 5 is a composite of eight individual time series from the following coastal observing stations: Amphitrite Point, Departure Bay, Race Rocks, Langara Island, Kains Island, McInnes Island, Entrance Island, and Pine Island. We use a composite index in an attempt to emphasize regional-scale nearshore SST variability over the finescale variability that exists in that topographically diverse region.

Monthly mean values for Scripps Pier SST were obtained from the Scripps Institution of Oceanography in La Jolla, California. Scripps Pier SST variability is well correlated with that along the Alta and Baja California coastline (J. McGowan 1996, personal communication).

Coastal Gulf of Alaska cold season air temperatures were obtained from the National Climate Data Center. The November March mean Gulf of Alaska air temperatures shown in Fig. 5 are a composite of Kodiak, King Salmon, and Cold Bay, Alaska, station records.

Prior to compositing, each individual SST, streamflow, and air temperature time series was normalized with respect to the 1947–95 period of record, a period for which data are available for all the time series used in the construction of Fig. 5. The mean for the available period of record was then removed from the composite time series before plotting in Fig. 5.

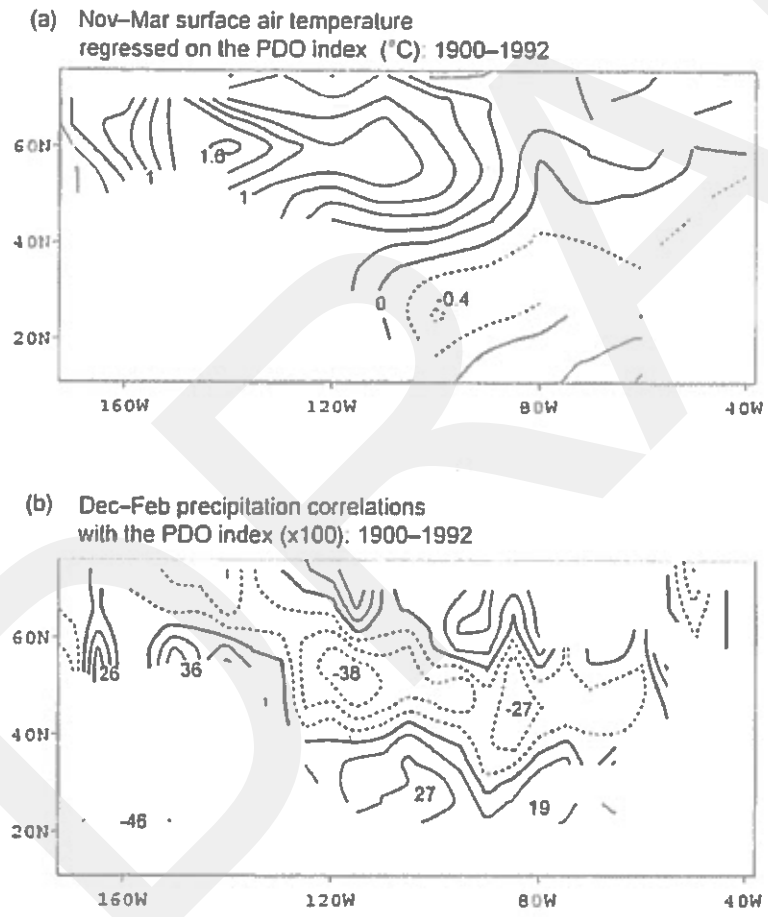

FIG. 3. Maps of PDO regression and correlation coefficients: (a) November–March surface air temperature regressed upon the PDO index shown in Fig. 1; contour interval is 0.2°C. (b) Correlation coefficients (× 100) between December–February precipitation and the PDO index shown in Fig. 1; contour interval is 10. Positive (negative) contours are solid (dashed).

Alaska salmon landings for the period of record 1925–91 were provided by the Alaska Department of Fish and Game (1991). Catch data for 1992 through 1995 were obtained from Pacific Fishing magazine (1994, 1995). We focus on the catch records of sockeye salmon in western and central Alaska, and that of pink salmon in central and southeast Alaska (shown in Fig. 6). These four regional stocks account for about 75% of Alaska's annual salmon catch. The period of record from 1920 through the 1930s represents a "fishing-up" period while the industry was experiencing rapid growth. Subsequent to the late 1930s, fisheries for these stocks have been fully developed, and the catch records are good indicators of stock abundance (Beamish and Bouillon 1993; FH–HF).

Additionally, the record of chinook salmon catch from the Columbia River for the period of record 1938–93 and coho landings from Washington–Oregon–California (WOC) for the period of record 1925–93 are also shown. These records were obtained from the Washington Department of Fisheries (WDF), the Oregon Department of Fish and

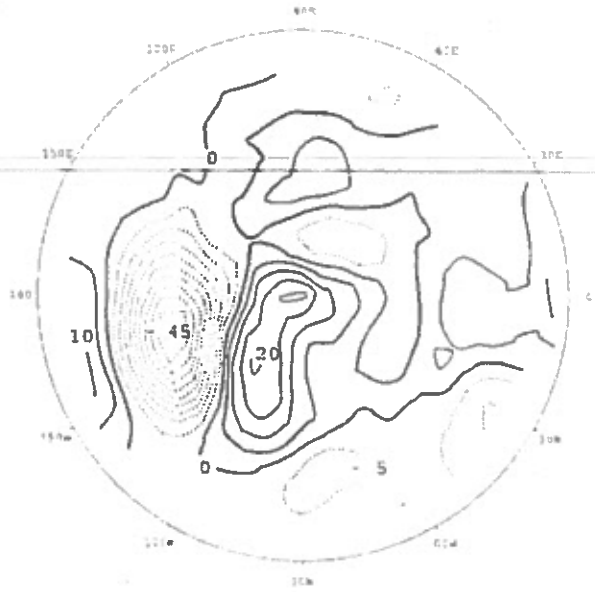

FIG. 4. Wintertime Northern Hemisphere 500-mb heights regressed upon the PDO index for the period of record 1951–90. Contour interval is 5 m, positive (negative) contours are solid (dashed).

Wildlife (ODFW), and the California Department of Fish and Game (WDF and ODFW 1992).

Parallel EOF/PC analyses of the monthly SST and SLP anomaly fields, carried out independently by two of the present authors, were based on the temporal covariance matrix from the 1900–93 period of record. For SST, we used the covariance matrix created from monthly HSSTD anomalies poleward of 20°N in the Pacific basin (Zhang 1996). For SLP, we used the covariance matrix created from monthly NCAR SLP anomalies poleward of 20°N and between 110°E and 110°W (Hare 1996). The resulting November–March mean PCs were normalized prior to plotting in Fig. 1. The leading PC for SLP in the North Pacific sector is labelled NPPI, while that for SST is labelled PDO.

3. Characteristics of the PDO

Of particular interest to this study is the fact that, since at least the 1920s, interdecadal fluctuations in the dominant pattern of North Pacific SLP (NPPI) have closely paralleled those in the leading North Pacific SST pattern (PDO) (Fig. 1; Zhang 1996; ZWB; Latif and Barnett 1996). It is this coherent, interdecadal timescale ocean–atmosphere covariability that we see as the essence of the PDO climate signature. For convenience, throughout the remainder of this report we refer to the time history of the leading eigenvector of North Pacific SST as an index for the state of the PDO.

Also shown in Fig. 1 are the SOI and the Cold Tongue Index (CTI, which is the average SST anomaly from 6°N to 6°S, 180° to 90°W), indices commonly used to monitor the atmospheric and oceanic aspects of ENSO, respectively. The SOI and CTI are correlated with the PDO (see Table 1) such that warm- (cold-) phase ENSO-like conditions tend to coincide with the years of positive (negative) polarity in the PDO. Interestingly, fluctuations in the CTI are mostly interannual, while those in the PDO are predominantly interdecadal (ZWB).

Interdecadal and interannual timescales are both apparent in the indices of atmospheric variability at low and high northern latitudes over the Pacific. The NPPI and SOI are correlated such that the mean wintertime Aleutian Low tends to be more (less) intense during winters with weakened (intensified) easterly winds near the equator in the Pacific.

Correlations between the atmospheric and oceanic climate indices shown in Fig. 1 within respective high- and low-latitude ranges are relatively strong. The NPPI is moderately well correlated with that of the extratropical SST, while at tropical latitudes the SOI and CTI are very well correlated (see Table 1).

By regressing the records of wintertime SST and SLP upon the PDO index, the spatial patterns typically associated with a positive unit standard deviation of the PDO are generated (Fig. 2a). The largest PDO-related SST anomalies are found in the

TABLE 1. Correlation coefficients for the Pacific basin climate indices, shown in Fig. 1, for the period of record 1900–92. Correlation coefficients have been adjusted to reflect the effective degrees of freedom, as a function of autocorrelation, in each time series.

	PDO	NPPI	SOI	CTI
PDO	—	0.50	−0.35	0.38
NPPI	—	—	−0.39	0.42
SOI	—	—	—	−0.82
CTI	—	—	—	—

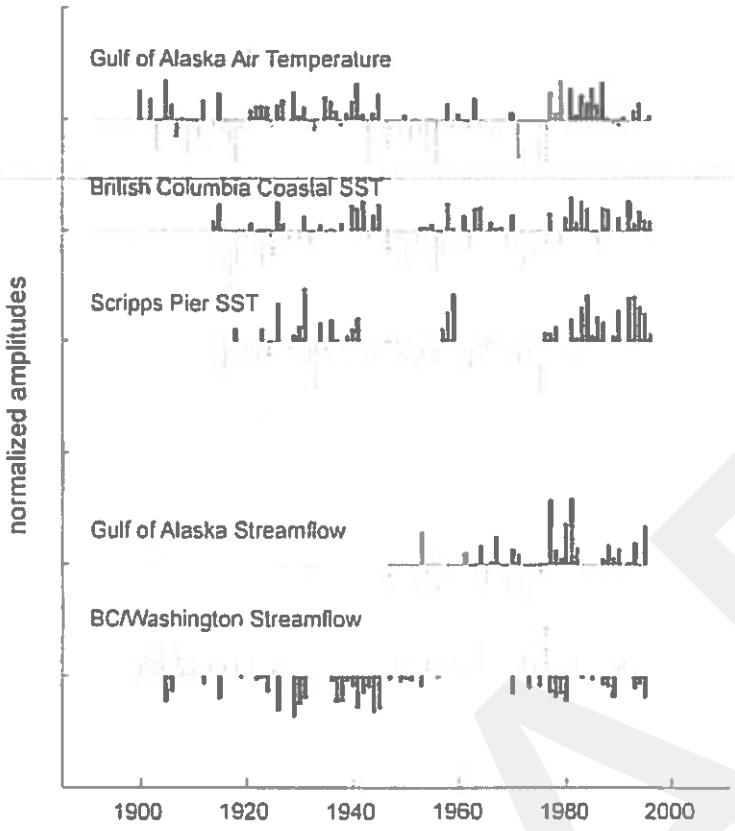

FIG. 5. Selected regional climate time series with PDO signatures. Dotted vertical lines are drawn to mark the PDO polarity reversal times in 1925, 1947, and 1977. Bars are shaded as in Fig. 1, with the shading convention reversed for the BC/Washington streamflow index.

central North Pacific Ocean, where a large pool of cooler than average surface water has been centered for much of the past 20 yr. The peak amplitude of the SST regression coefficients in the cold pool are on the order of −0.5°C. The narrow belt of warmer than average SST that, in the past two decades, has prevailed in the nearshore waters along the west coast of the Americas is also a distinctive feature of this pattern. Note also that the Southern Hemisphere midlatitude SST signature is very similar to that in the northern extratropics. The SLP anomalies that are typical of the positive PDO are characterized by basin-scale negative anomalies between 20° and 60°N. The peak amplitude of the midlatitude wintertime SLP signature is about 4 mb, which represents an intensification of the climatological mean Aleutian low. This SLP pattern is very similar to the dominant pattern of wintertime North Pacific SLP variability. It is noteworthy that there are no strong PDO signatures in the Atlantic or Indian Ocean SST and SLP fields.

Shown in Fig. 2b are the SST and SLP fields regressed upon the CTI, thus this map shows anomalies typically associated with a unit standard deviation ENSO index. Comparing Fig. 2a with Fig. 2b, it is evident that the tropical PDO-spatial signatures are in many ways reminiscent of canonical warm-phase ENSO SST and SLP anomalies (Rasmussen and Carpenter 1982). However, the PDO amplitudes in the tropical fields are weaker than those obtained by regressing the surface fields upon the CTI. Likewise, the PDO-regression amplitudes in the Northern Hemisphere extratropics are stronger than those obtained from regressions upon the CTI (ZWB).

To establish the significance and consistency of polarity reversals in time—referred to by some authors as regime shifts—FH–HF and Hare (1996) utilized a technique known as intervention analysis (Box and Tiao 1975), which is an extension of Autoregressive Integrated Moving Average (ARIMA) modeling (Box and Jenkins 1976). We applied this analysis to each of the time series shown in Fig. 1. Intervention analysis is essentially a two sample *t* test that can be applied to autocorrelated data, which is a common feature of environmental time series. While interventions can take many forms, we tested only step interventions. The implicit model, therefore, for each variable is a sequence of abruptly shifting levels, accounting for a significant portion of the total variance, around which occurs residual variability, either random or autocorrelated.[1]

[1]We followed the standard three-step process in fitting the intervention models. First we identify a model. For all time series, the initial model consisted of five parameters: Three interventions, a lag-1 autoregressive term and a constant. The three interventions (phase reversals) we used were 1925, 1947, and 1977. The timing of the interventions was derived independently in earlier studies by several of the authors in this study (FH–HF; ZWB). In the second step, parameters are estimated for significance. If any parameters are statistically insignificant, the least significant is dropped and the remaining parameters reestimated. This sequence is repeated as necessary. The model is then accepted if the final step, a white noise test for model residuals, is passed.

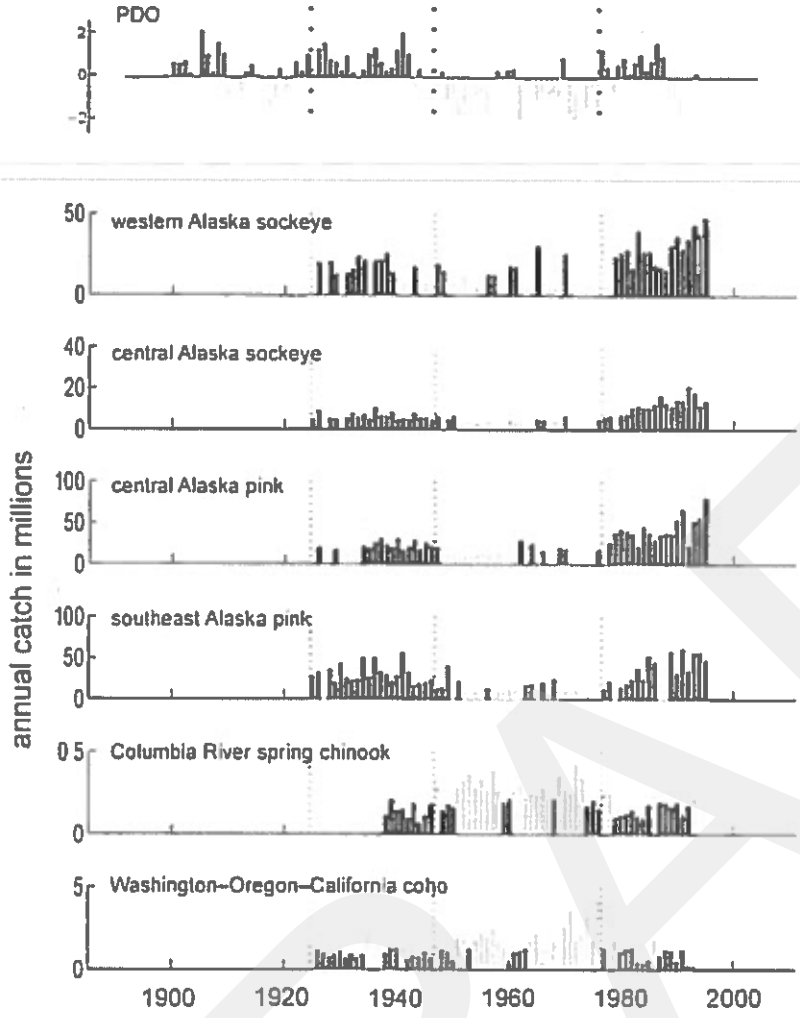

FIG. 6. Selected Pacific salmon catch records with PDO signatures. For Alaska catch, black (gray) bars denote values that are greater (less) than the long-term median. The shading convention is reversed for WOC coho and Columbia River spring chinook catch. Dotted vertical lines are drawn in each panel to mark the PDO polarity reversal times in 1925, 1947, and 1977. At the top, the PDO index is repeated from Fig. 1.

The statistical significance of the intervention model parameters are shown in Table 2. Excluding the CTI, polarity reversals in 1977 are supported in each of the time series shown in Fig. 1. Additional sign reversals in 1925 and 1947 are supported by the PDO and NPPI time series but not for the SOI or CTI.

The implications of this statistical exercise are as follows. We have identified an interdecadal climate signal that is evident in the oceanic and atmospheric climate record. We attribute these signatures to the PDO. During this century, using the North Pacific SST pattern time series as the indicator of polarity, the PDO was predominantly positive between 1925 and 1946, negative between 1947 and 1976, and positive since 1977. Note that these multidecade epochs contain intervals of up to a few years in length in which the polarity of the PDO is reversed e.g., the positive PDO values in 1958–61, and the strongly negative PDO values in 1989–91).

4. Coastal and continental signatures of the PDO

The signature of the PDO is clearly evident in the wintertime surface climate record for much of North America but not for that of the other continents. The strongest coefficients of wintertime air temperature regressed upon the PDO index are located in northwestern North America (Fig. 3a; cf. Latif and Barnett 1994, Fig. 5b), with local maxima of opposing centers over south central Alaska–western Canada and the southeastern United States. The PDO is positively correlated[2] with wintertime precipitation along the coast of the central Gulf of Alaska and over northern Mexico and south Florida, and negatively correlated with that over much of the interior of North America and over the Hawaiian Islands.

The continental PDO surface climate signatures are consistent with PDO-related circulation anomalies on the hemispheric scale. The Pacific–North America (PNA) (Wallace and Gutzler 1981) pat-

[2]To highlight the regional patterns of the PDO Dec–Feb precipitation signal over the North American continent, the correlation map is shown instead of the regression map. The regression coefficients are skewed toward extreme values in the Pacific Northwest and central Gulf of Alaska. Typical precipitation anomalies for a unit standard deviation positive PDO are about +20 to +30 mm for the central Gulf of Alaska, −20 to −30 mm for western Washington state, −40 mm for the Hawaiian Islands, +5 mm over northern Mexico, and −10 mm over the Great Lakes.

TABLE 2. P values for tests of step-changes in the mean level of the Pacific basin climate indices shown in Fig. 1. The four time periods tested for changes in the mean level were 1900–24, 1925–46, 1947–76, 1977–96. P-values greater than 0.05 are labeled "ns" (not significant).

Climate Index	Intercept	1925 step	1947 step	1977 step
PDO	ns	0.001	0.000	0.000
NPPI	0.005	0.001	0.000	0.000
SOI	ns	ns	ns	0.001
CTI	ns	ns	ns	ns

tern emerges when the cold season (November–March) 500-mb height fields are regressed upon the PDO index for the period of record 1951–90 (Fig. 4). This relationship suggests that during epochs in which the PDO is in its positive polarity, coastal central Alaska tends to experience an enhanced cyclonic (counterclockwise) flow of warm, moist air, which is consistent with heavier than normal precipitation. Washington state and British Columbia also tend to be subject to an increased flow of relatively warm humid air, but in their case it is within an area of enhanced anticyclonic circulation that is dynamically unfavorable for heavier than normal precipitation.

In an analysis of springtime (1 April) snowcourse data for the western United States, Cayan (1996) finds that the leading eigenvector of snowpack variability, what he calls the Idaho pattern, is centered in the Pacific Northwest. Cayan's time series for the Idaho pattern has tracked our PDO index since at least 1935 (when his data begins). This pattern of snowpack variability is consistent with the PDO-related wintertime air temperature and precipition patterns shown in Fig. 3: relatively warm (cool) winter air temperatures and anomalously low (high) precipitation during positive (negative) PDO years contribute to reduced (enhanced) snowpack in the Pacific Northwest. Furthermore, Cayan's composite wintertime 700-mb height fields for the extreme years reveal that variability in the Idaho snowpack pattern is largely controlled by PNA circulation anomalies (cf. Cayan's Figs. 3 and 6 with our Figs. 3b and 4).

We used the PDO correlation and regression maps (Figs. 2 and 3) as guides to search for the local and regional instrumental records of PDO-driven climate variability shown in Fig. 5. Wintertime surface air temperature along the Gulf of Alaska, and SST near the coast from Alaska to southern California, varies in phase with the PDO. During positive PDO years the annual water year discharge in the Skeena, Fraser, and Columbia Rivers is on average 8%, 8%, and 14% lower, respectively, than that during negative PDO years. In contrast, positive-PDO-year discharge from the Kenai River in the central Gulf of Alaska region is on average about 18% higher than that during the negative polarity PDO years. Cayan and Peterson (1989) also noted that this dipole pattern in west coast streamflow fluctuations is related to the favored pattern of SLP variability in the North Pacific.

5. The PDO and salmon production in the northeast Pacific

Commercial fisheries for Alaskan pink and sockeye salmon are among the most lucrative in the United States (U.S. Department of Commerce 1994, 1995). The unique life history of salmon, which begins and ends in freshwater streams and involves an extensive period of feeding in the ocean pasture, makes them vulnerable to a variety of environmental changes. A growing body of evidence suggests that many populations of Pacific salmon are strongly influenced by marine climate variability (Pearcy 1992; Beamish and Bouillon 1993; FH–HF; Beamish et al. 1995; Francis et al. 1997).

A remarkable characteristic of Alaskan salmon abundance over the past half-century has been the large fluctuations at interdecadal timescales that resemble those of the PDO (Fig. 6, see also Table 3) (FH–HF; Hare 1996). Time series for WOC coho and Columbia River spring chinook landings tend to be out of phase with the PDO index (Fig. 6), though the correspondence is less compelling than that with Alaskan salmon. The weaker connections between the WOC and Columbia River salmon populations and the PDO may be a result of differing environmental biological interactions. On the other hand, climatic influences on salmon in their southern ranges may also be masked or overwhelmed by anthropogenic impacts: Alaskan stocks are predominantly wild spawners in pristine watersheds, while the WOC coho and Columbia River spring chinook are mostly of hatchery ori-

gin and originate in watersheds that have been significantly altered by human activities.

The best-fit interventions for the Alaskan sockeye stocks occur 2 and 3 yr after those identified in the PDO history, while the best-fit interventions for the Alaskan pink salmon stocks occur 1 yr following the climate shifts (FH–HF). It is believed that sockeye and pink salmon abundances are most significantly impacted by marine climate variability early in the ocean phases of their life cycles (Hare 1996). If this is true, the key biophysical interactions are likely taking place in the nearshore marine and estuarine environments where juvenile salmon are generally found.

Recent work suggests that the marine ecological response to the PDO-related environmental changes starts with phytoplankton and zooplankton at the base of the food chain and works its way up to top-level predators like salmon (Venrick et al. 1987; FH–HF; Roemmich and McGowan 1995; Hare 1996; Brodeur et al. 1996; Francis et al. 1997). This "bottom-up" enhancement of overall productivity appears to be closely related to upper-ocean changes that are characteristic of the positive polarity of the PDO. For example, some phytoplankton–zooplankton population dynamics models are sensitive to specified upper-ocean mixed-layer depths and temperatures. For the decade following the 1960–76 period of record, such models have successfully simulated aspects of the observed increases in Gulf of Alaska productivity as a response to an observed 20%–30% shoaling and 0.5° to 1°C warming of the mixed layer (Polovina et al. 1995).

To the extent that high streamflows favor high survival of juvenile salmon, PDO-related streamflow variations are likely working in concert with the changes to the near-shore marine environment in regard to impacts on salmon production. For Alaskan salmon, the typical positive PDO year brings enhanced streamflows and nearshore ocean mixed-layer conditions favorable to high biological productivity. Generally speaking, the converse appears to be true for Pacific Northwest salmon.

TABLE 3. Percent change in mean catches of four Alaskan salmon stocks following major PDO polarity changes in 1947 and 1977. Mean catch levels were estimated from intervention models fitted to the data and incorporating a 1-yr lag for both pink salmon stocks, a 2-yr lag for western sockeye, and a 3-yr lag for central sockeye.

Salmon stock	1947 step	1977 step
Western AK sockeye	–37.2%	+242.2%
Central AK sockeye	–33.3%	+220.4%
Central AK pink	–38.3%	+251.9%
Southeast AK pink	–64.4%	+208.7%

6. Discussion

Our synthesis of climate and fishery data from the North Pacific sector highlights the existence of a very large-scale, interdecadal, coherent pattern of environmental and biotic changes. It has recently come to our attention that Minobe (1997) has compiled a complementary study of North Pacific climate variability that includes SST indices from the coastal Japan and Indian Ocean–Maritime Continent regions. Especially relevant to our work is the fact that Minobe used instrumental records to independently identify the same dates we promote for climatic regime shifts (1925, 1947, and 1977). Also intriguing is Minobe's analysis of (tree ring) reconstructed continental surface temperatures that suggest PDO-like climate variability has a characteristic recurrance interval of 50–70 yr and that these fluctuations are evident throughout the past 3 centuries.

It is clear from a visual inspection of the time series shown in Figs. 1, 5, and 6 that not all changes in our PDO index are indicative of interdecadal regime shifts that are equally apparent in the other indices. The difficulties inherent in real-time assessment of the state of the PDO are illustrated by the recent period of record: Alaskan salmon catches and coastal SSTs have remained above average since the late 1970s, while, in contrast, the PDO index dipped well below average from 1989–91 and has hovered around normal since this time. Without the benefit of hindsight it is virtually impossible to characterize such periods and to recognize long-lived regime shifts at the time they occur.

The ENSO and PDO climate patterns are clearly related, both spatially and temporally, to the extent that the PDO may be viewed as ENSO-like interdecadal climate variability (Tanimoto et al. 1993; ZWB). While it may be tempting to interpret interdecadal climatic shifts as responses to individual (tropical) ENSO events, it seems equally

conceivable that the state of the interdecadal PDO constrains the envelope of interannual ENSO variability.

To our knowledge, there are no documented robust relationships between Pacific salmon abundance and indices of ENSO. The slowly varying time series of salmon catches examined in this study are much more coherent with the interdecadal aspects of the PDO than the higher frequency fluctuations in tropical ENSO indices. In the future it seems very likely that the PDO will continue to change polarity every few decades, as it has over the past century, and with it the abundance of Alaskan salmon and other species sensitive to environmental conditions in the North Pacific and adjacent coastal waters.

This climatic regime–driven model of salmon production has broad implications for fishery management (Hare 1996; Adkison et al. 1996). The most critical implication concerns periods of low productivity, such as currently experienced by WOC salmon. Management goals, such as the current legislative mandate to double Washington State salmon production[3] (Salmon 2000 Technical Report 1992), may simply not be attainable when environmental conditions are unfavorable. Conversely, in a period of climatically favored high productivity, managers might be well advised to exercise caution in claiming credit for a situation that may be beyond their control.

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[3] "The [Washington State] legislature hereby establishes a production goal to double the state-wide salmon catch by the year 2000" (Salmon 2000 Technical Report 1992).

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SCARCITY OF FISH **1855 REPORT COMMISSIONER MONEYPENNY**

This excerpt is from "Indian- White Relationships in Northern California
>>> 1849-1920" ~ < Article 32. Annual report of the Commissioner of Indian
>>> Affairs, 1855 ~ 34th Congress, 1st session, Senate Executive Document 1,
>>> vol. 1, November 26, 1855. pp. 321-576. Serial set no. 810.

Commissioner Manypenny notes that the annual report from California has
>>> not been received, but other correspondence received indicates that the
>>> Indians are generally quiet except in the northern part of the State.
>>> There have been occasional difficulties in the mining regions, but the
>>> agents and the military have kept them from becoming serious. The
>>> whites are a least as much at fault as the Indians, for the mere
>>> appearance of an Indian often provokes assault upon him, and petty
>>> Indian thievery is unduly magnified in importance. L.G. Whipple, agent
>>> in charge of the Klamath River, where a reservation is contemplated,
>>> thinks news of Indian unhappiness in Oregon, the extremely warlike
>>> disposition of the border-Indians, and the scarcity of fish in the
>>> Klamath, increase the danger of trouble.
>>>
>>> This report was also published as House Executive Document 1,vol.1,
>>> pp.321576, 34th Congress, 1st session. Serial set no. 840.

Rex Cozzalio
10/24/19

Klamath Compact Meeting

In letters to the media promoting KHSA special interest signatory agenda despite all of the historic documentation, empirical data, and recent studies refuting destruction benefit, and after his prior failed premise of downstream temperature impacts, Mr. Creager has interestingly landed on one particular 'study' to validate his personal certainty. The 24 page Otten Report, in its efforts to identify definitive environmental factors affecting microcystis growth over years of primarily ratepayer paid Interim Monitoring data, instead revealed a profound lack of knowledge regarding their objective, raising far more questions and hypothesis than the virtually none they were able to answer. Even more interesting is that the one apparent 'take' Mr. Creager gleans from the report was his validating 'proof' the lakes regrow algae, something NOONE of the most knowledgeable and affected local majority familiar with Klamath Project environmental and regional benefits has EVER denied. In fact, that regrowth is one of the major factors contributing to the Project downstream EXPERIENCED water quality improvements. Oddly, he did NOT notice other statements conflicting with his leap to destruction benefit, such as the acknowledged IMPROVED water quality and nutrient loads in the successive lakes, the Klamath's ONLY deep water lakes in which such improvements occur. He also does not mention from another study that EXCEPT for the REDUCTION of UKL springtime nitrogen, the total biomass and microcystis generation has remained essentially unchanged since long before ANY Upper Basin 'anthropogenic' impacts, a condition of cited diseased/distressed salmon documented downstream BEFORE any significant settler presence. Also missed in his letters was that while the lakes may vary in dominant subspecies regrowth, the parent algae fed from Upper Klamath Lake biomass along with high nutrient water prime for instream growth is the greatest at the lowest flow and warmest temperature most detrimental time of year were it not for the intervening lakes sequestering and delaying that transport for approximately 2 months, past the time of greatest potential harm. Also unknown is why he fails to note the now proven REDUCED infection, periphyton, and toxicity rates in the river reach directly below Iron Gate compared to those downstream, with some of the highest occurrences 160 miles downstream, clearly demonstrating the ability for instream competitive microcystis growth. Nor does he mention the recent research indicating microcystis appears to produce LESS toxicity under high light/ higher surface temperatures than in lower light/ cooler surface environments, or that the dams retain well over 86% of algae which dies, gases and settles, or that the ONLY environmental conditions in which microcystin is known to break down in nature is within DEEP WATER LAKES, the ONLY two of which exist in the entire Klamath system being the ones he endorses for destruction.

It is not for me to know or question Mr. Creager's motives, but with multiple acknowledgements of the profound 'unavoidable and unmitigated' damages from Project destruction to the affected environment, community, and residents, readily available within his own Agency affiliated documents, his preference for 'rewilding' regardless of consequence becomes evident. And why should those damages mean anything to him? Paid to support a signatory Governmental policy agenda of Project destruction, the more damages created for which he is held harmless, the more funding and authority his position will likely realize. Unfortunately, one thing is glaringly clear. The special interests orchestrating largely unmitigated Project destruction and harm to the region, such as represented by Chrysten Lambert here, have specifically designed it to be paid for by the very people harmed, accept ZERO accountability for imposed damages, and thereby personally benefit REGARDLESS of failed lies and promises, knowing from the same tactics during past forest shutdowns that they can later simply ignore the suffering left in their wake and subsequently alter reality in the media. Abusing the Klamath Compact so that the Commission can create a 'recommendation' to FERC for destruction is a corrupt travesty which morally should never occur, and the refuting information should not be buried. Sadly, with the orchestrating parties designing no negative consequence for themselves, I do not hold my breath.

"Further Comments to Bureau of Reclamation" from Clay-Core Engineer Stephen Koshy
regarding "catastrophic collapse" of Klamath River Dams if they are destroyed
To KBC News 4/17/18

Please read this along with my 2 letters to the Bureau of Reclamation (BOR), a letter each to the County Board of Supervisors and the County Counsel, and the BOR reply to my comments as reference.

Bureau of Reclamation (BOR) in response to my comments, through their technical memorandum, says that they are giving 'detailed responses to my each comment'. Unfortunately, they are not.

The BOR sent me a printed version of the EIS/EIR in Oct 2011. I thank them for that. I do not have it with me now . Their online electronic version seems to have some changes from the printed version that I had quoted from.

My original comments: In my letter dated Dec. 21, 2011, I quoted from the printed version Chapter 3, para 3.11.3. 5, which had mentioned potential landslides: …. **<Quote>** relatively steep slopes, underlain by tuff ….. wave action at the shoreline of the reservoir has eroded sand and volcanoclastic tuff beneath diatomite beds and has resulted in the calving of diatomite into reservoir creating vertical exposures as high as 20 ft. in the diatomite."……."the (fine grained) red volcanoclastic material underlying the hill slopes ……. may be vulnerable to rapid erosion, if subjected to concentrated water flows." Also that ….

Chapter 3. Figure 3.11-2 identifies existing potential landslide areas in the iron gate and Copco 1

Reservoir areas. EIS/ EIR has enough information to suggest the certainty of slope failures on draw down, but failed to investigate them. The slope failures will add to the sediment release. **<end of quote>**

The BOR, in reply to my comment, informs that they did not conduct detailed slope stability analysis because there are no important structures atop the slopes, but my concern is the sediment release, which the BOR do not address. The BOR states in reply that they will consider detailed stability analysis during dam removal. My further comment to BOR is that it will be too late by then. I have concern also that possible instability of abutments during 174 ft. draw down will be catastrophic to the iron gate dam.

As another comment in letter dated Nov 18, 2011 to BOR (Mr. Thomas Hepler), I said that "these dams have clay in the middle, saturated in water for decades" …… My comment on Dec 21, 2011 to Mr. Thomas Hepler said that … "The dam's clay core is saturated in water …… The dam's instrumentation would reveal the pore pressure at different elevations."

In reply, the BOR says that …….. "**it is Reclamation's understanding** that they are primarily composed of silt and sandy silt". They are wrong. The BOR document " Detailed plan for Dam Removal, Klamath River dams, US Department of the Interior, Bureau of Reclamation Sept. 2011" on page 19 says:

<Quote> "The embankment includes a **central impervious clay core** with filter zones and a downstream drain and is flanked by compacted pervious shells" **<end of quote>**

My further comments: According to BOR's own document, the core is of impervious clay

.The **central impervious clay core** is predominantly of clay and validates my contention. The core is made from the "fine grained red volcanoclastic material underlying the hill slopes". BOR should please re-examine the borrow areas from where the material for the core was taken and processed. It is true, it would have some silt, even some fine grained sand. But the predominance of clay gives it the properties of clay. The question is what % is clay, what % is silt and what % is fine sand. The BOR ought to respond.

To me, the sediment behind the iron gate dam gives a clue . After all, it is made from erosion of similar volcanoclastic material that has been placed in the core of the dam. As reported by the online version of the EIS/EIR, the sediment in the lower section of the reservoir consists of 60.7% clay 25.5% silt, 2.4% sand and 0.4% gravel. Mind you, the gravel and sand were already there before the construction of the dam. A lot of the clay particles, being in the top layers of the reservoir, have gone out of the reservoir with the overflow during the past 56 years. The % of clay in the core could be even higher than these.

For the lay man's information, silt is less than 74 microns or 0.074 mm in size, passing the ASTM 200 sieve. Clay is classified arbitrarily as less than 2microns or 0.002 mm in size What passes through the 200 sieve or 74 micros size contain also 2 microns size which is clay. In this instance it is predominantly clay so that **BOR terms the core as impervious clay core**. Sand is classified as more than 74 microns in size.

To say that it is **BOR's understanding** is a vague language. Engineers look at facts and evidence and not here say. The BOR ought to examine the dam's permanent records since every dam's specifications and test results of samples are kept as permanent records.

Another issue that I raised and again repeat now is that taking down the earth dam by heavy earth moving machinery is not just doable. The Core of the dam after soaking under reservoir water for decades is extremely slushy and cannot support the heavy weight of the machinery. Even lay men without Civil engineering degrees can understand that. Yet the BOR seems to think that it can be done. I would argue that it can not be done.

Above issues are important. However, the most important issue that I raise is that **the clay in the core** is saturated with water and its water content is over its plastic limit, if not its liquid limit. The BOR or for that matter any civil engineer would agree that the outer gravel shell exerts lateral pressure on the clay core. This lateral pressure is huge and can be calculated. It depends on the internal friction and cohesion of the gravel shell and approximates to 0.7 of the vertical pressure at each level. When the deconstruction of the earth dam reaches the level of the saturated clay, the clay will yield to the lateral pressure of the gravel shell and the dam will collapse. It would be catastrophic. It is due to the voids in the clay core being filled by reservoir water under pressure for decades and the water content in the clay exceeding the plastic limit (or even the liquid limit closer to the core contact face with the reservoir). At progressive depths, there is progressive water pressure.

Conclusion. My analysis is purely technical. I do not have any political affiliation. Nor am I a stakeholder. I attempt this for the sake of God and Country, for the Glory of God and duty to the Country.

I anguish over the unfortunate Salmon. If Salmon would be helped by trying to deconstruct the dams, I would be happy. But that is not the case. As I said in earlier

letters, its effect to the Salmon would be adversarial. Seven years ago, I offered to help with an engineering solution, but BOR would not accept. After all it is their turf and I understand. But I have concern about the error in the EIS/EIR. My request is that the County Board of Supervisors, the County Counsel (who have my several letters) and others such as the Honorable Members of Congress on both sides of the border who have the resources, refer my submission/analysis to peer review by authorities on the subject, who are without conflict of interest.

Yours Sincerely,

Stephen Koshy

Rec'd 10/24/19
Chris Anderson

The following is a summary of some of the KRCC files held in the DWR office in Red Bluff:

1. Summary of Interstate Water Compact (no date) by Allan Bird, counsel for the KRCC.
2. Various typed drafts of the Compact starting March 10, 1955 to May 9, 1956
3. KRCC Financial Transaction 1954 to 1967
4. KRCC Annual Reports 1957 to 1964
5. KRCC Report 1962 to Investigate Agea Control
6. KRCC Report for year 1977 - 1980
7. KRCC General Correspondence 2/17/1981 to 1/1989
8. KRCC Financial Statement - March 31, 1982
9. KRCC meeting material - June 4, 1986
    a. KRCC meeting minutes - August 15, 1985
10. KRCC Chronology File 1989
11. KRCC meeting material - July 31, 1989 in Tulelake
12. KRCC Chronology File 1990
13. KRCC Chronology File 1991
14. KRCC Chronology File 1992
15. KRCC Financial Statement - March 31, 1992
16. KRCC meeting material - September 23, 1992 in Redding
17. KRCC meeting material - October 28, 1992 in Redding
18. KRCC Chronology File 1993-1994
19. KRCC Financial Statement - March 31, 1993 and 1992
20. KRCC meeting material - September 10, 1993 @ Klamath Falls
21. KRCC meeting material - March 14, 1994 in Klamath Falls
22. KRCC Chronology File 1995
23. Public notice of KRCC fact finding tour of the Klamath River Basin on August 10-12, 1999
24. KRCC Financial Statement - March 31, 2002
25. Letter to KRCC from James R. Ottoman - May 19, 2010
26. KRCC Minutes from 1957-1972 (20 different meetings)