

Klamath Basin Secretarial Determination on Dam Removal

PSMFC Annual Meeting
Portland, OR
August 29, 2011



Steelhead

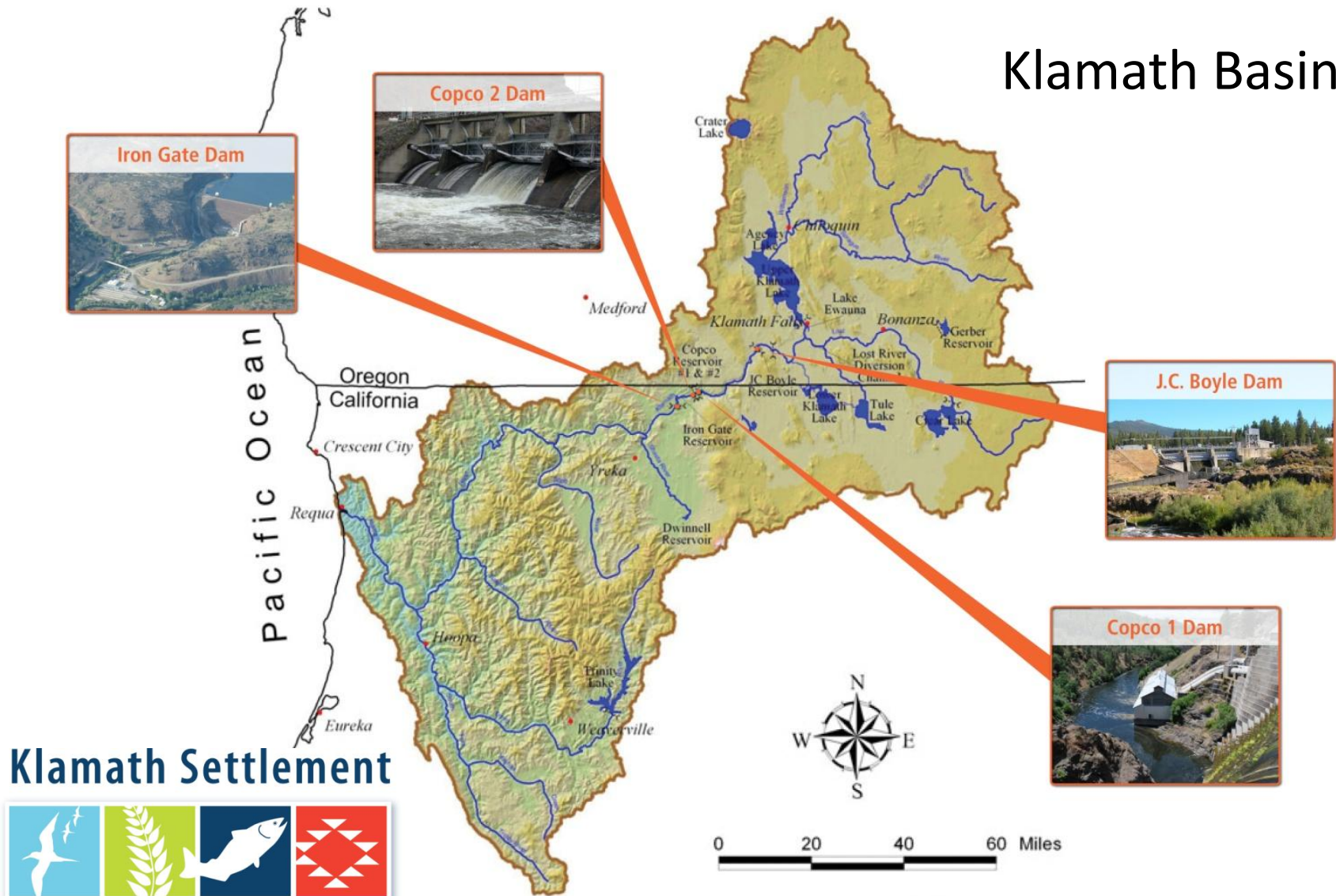
Dennis Lynch, USGS
Program Manager

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Klamath Basin and Dams

Klamath Basin



JC Boyle Dam 68 ft



Copco 1 Dam 115 ft

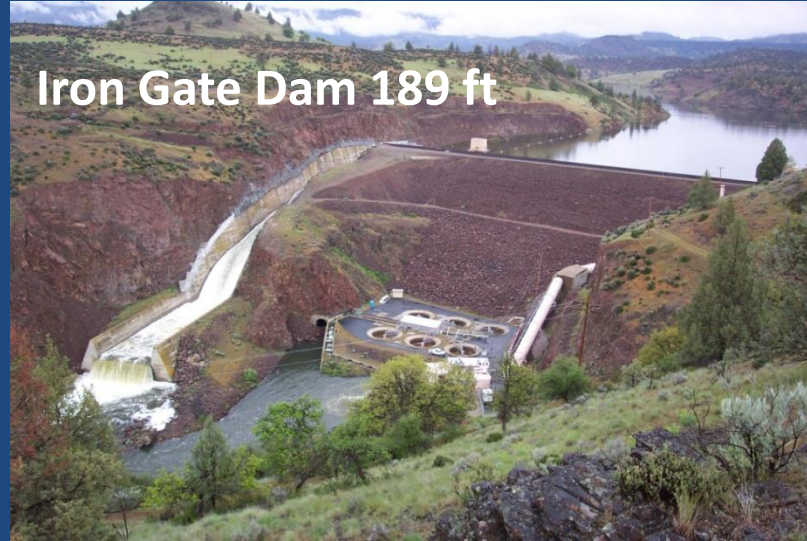


Copco 2 Dam 33 ft



PacifiCorp Hydroelectric Dams

Iron Gate Dam 189 ft



- 82 megawatt
- No fish passage to upper basin
- Reservoir water-quality problems
 - algal toxins
 - DO and pH
 - Water temps

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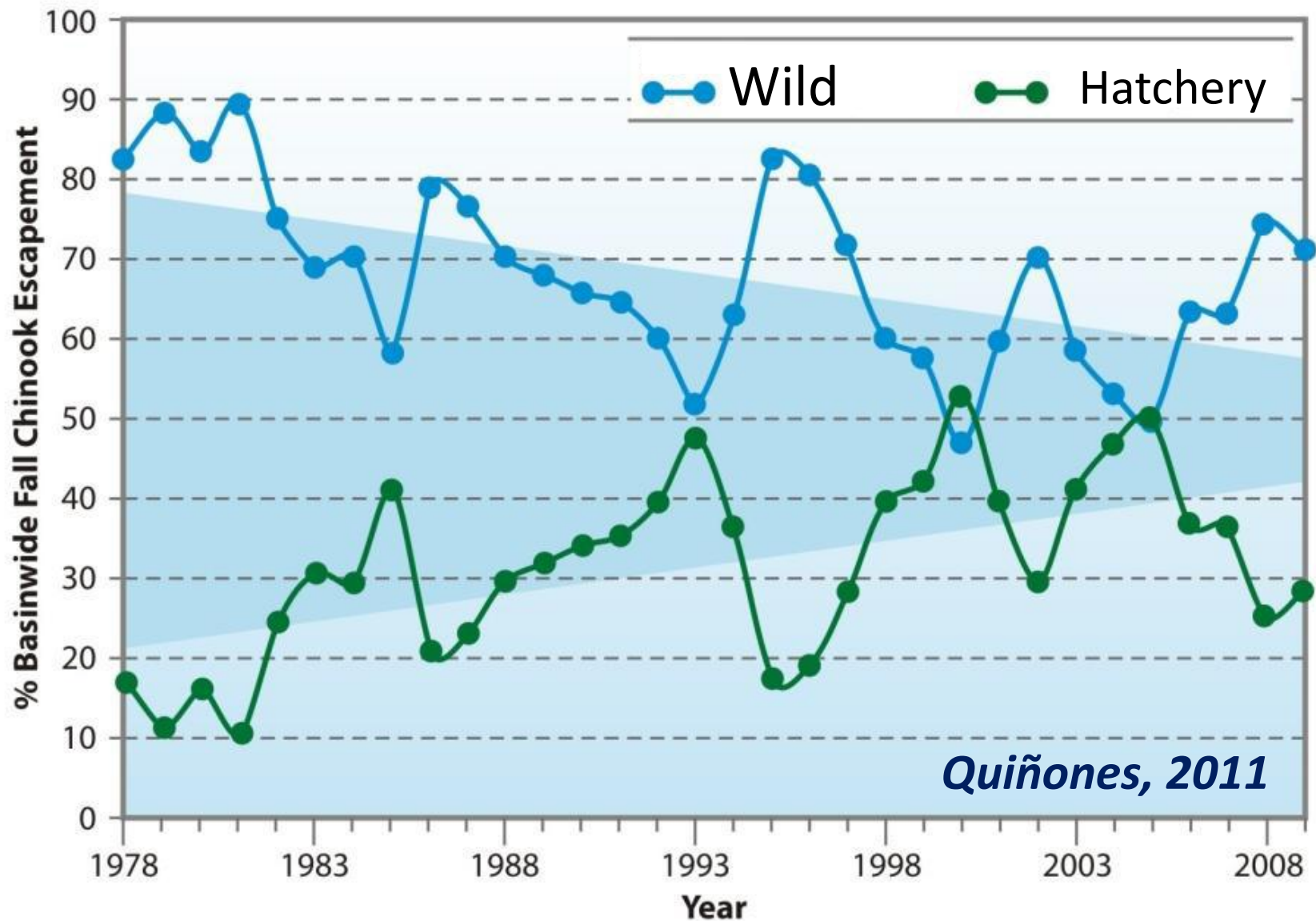
Historical Declines in Klamath River Anadromous Fish

Fish Population	Historical levels	Percent reduction
Fall Chinook	500,000	92 to 96%
Spring Chinook	100,000	98%
Shasta R. Chinook	20,000 to 80,000	88 to 95%
Coho	15,400 to 20,000	52 to 95%
Steelhead	400,000	67%
Total	> 1,000,000	80 to 85%

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Klamath Chinook Returns – Wild vs. Hatchery



Last Decade of Natural Resource Problems

- Reductions in farm water deliveries (2001, 2010)
- 2002 major adult salmon die off
- Closed ocean salmon fishing 2006
- Ongoing juvenile salmon disease
- Water shortages on refuges
- Sucker fishery closed for 25 years



Klamath salmon
die-off, 2002



Status Quo Not Acceptable

- Water allocations needed resolving
- Fish and fishery declines reversed
- Tribal interests not met
- Needed a plan for four PacifiCorp dams
 - Costly to relicense (fish passage and water quality)
 - Loss of 20 to 25% power (flow prescriptions)
 - Remaining liabilities if water quality or fish passage issues remained



Klamath Hydroelectric Settlement Agreement (KHSA)

- Proposal to remove 4 PacifiCorp dams in 2020
- Secretarial Determination Analysis:
 - New federal technical studies
 - Environmental review (NEPA and CEQA)
 - Complete by March 2012
- Secretarial Determination information needs:
 - Dam removal plan, mitigations, and costs
 - Will it advance fish restoration?
 - Is it in the public interest?



Klamath Basin Restoration Agreement (KBRA)

- KBRA programs designed to complement dam removal agreement
- KBRA goals:
 - Reliable water and power supplies
 - Restore salmonid fisheries for all uses
 - Habitat, flows, water quality, fish reintroduction
 - Durable solutions for communities



Agreement signing ceremony in Salem



Dam Removal Plan

- Drawdown timing to minimize impact on coho
 - Winter in a single year (2020)
- Drawdown of 1 to 3 ft /d
- Physical dam removal by 9/2020
- Costs to be released on 9/22/2011 (low, high, likely)

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View with and without
Iron Gate Dam

Dam Removal Plan (continued)

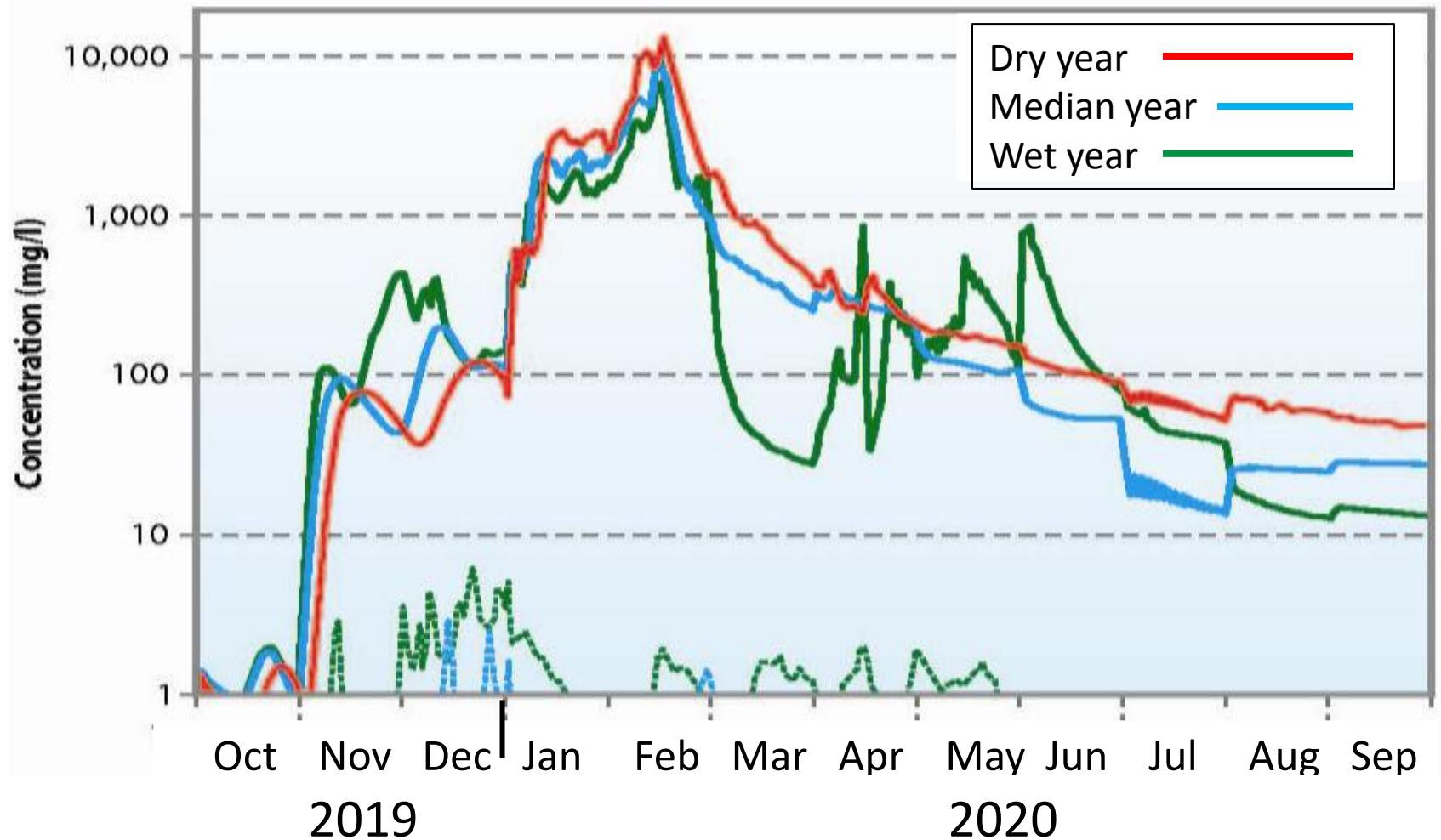
- Mechanical removal of sediments infeasible:
 - Removes < 45% erodible sediment
 - Does not eliminate impacts to fish
 - Large ground disturbance
 - Very expensive
 - Sediment contaminants low enough for natural erosion



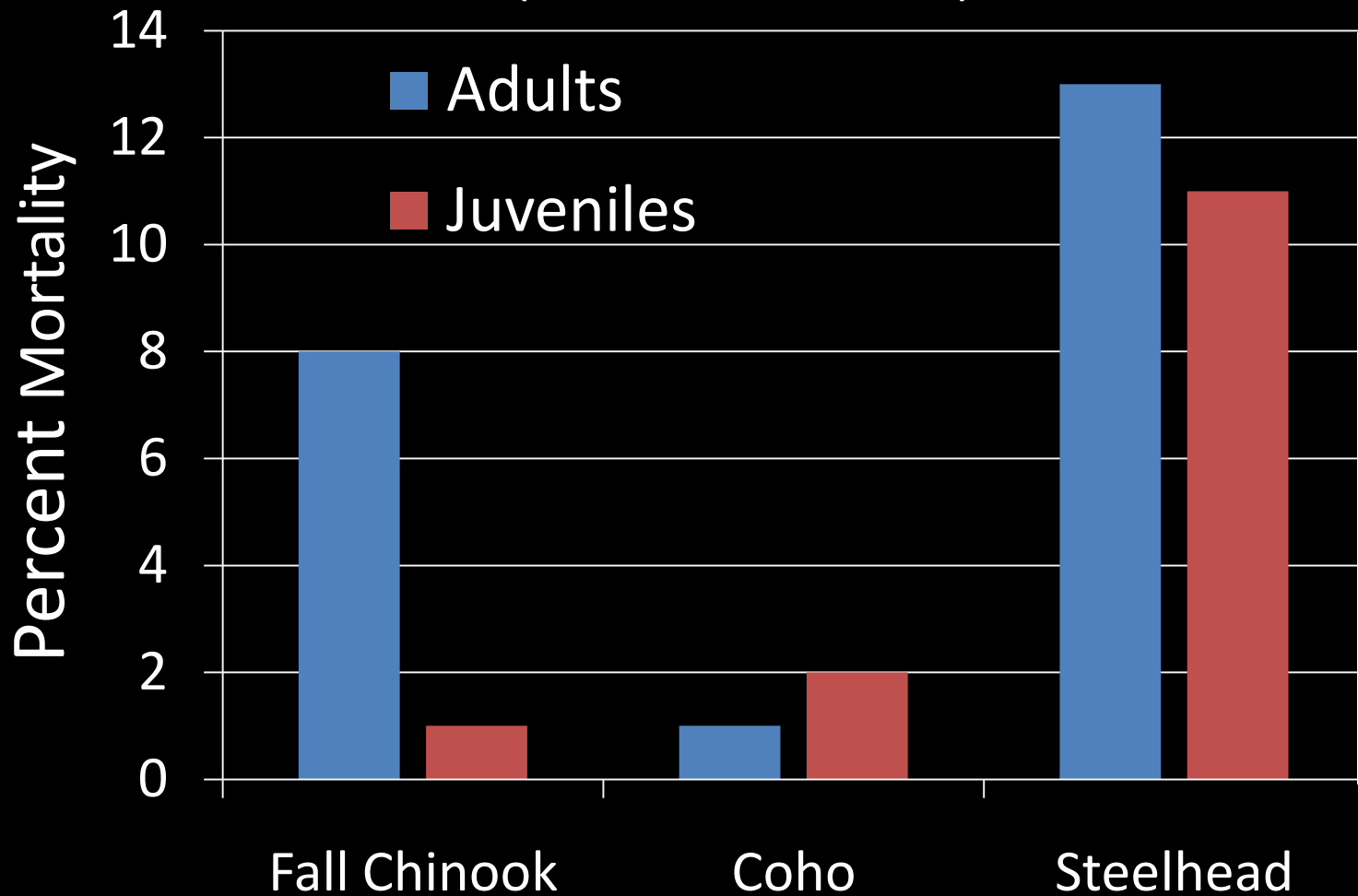
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Modeled Sediment Concentrations Eroded Downstream of Iron Gate Dam



Percent Fish Mortality from Sediment Erosion (Median Flow Year)



Dam Removal Mitigations

- Juvenile fish capture and relocations
- Flood protection for a few structures
- Reservoir “footprint” re-vegetation
- Replace infrastructure
 - Pipelines, culverts, GW wells
- Cultural site preservation



Rotary Screw Traps

Would Agreements Advance Salmonid Fisheries and Other Fish Species?

- Previously published literature
- 2011 federal fish synthesis report on effects of KHSA and KBRA
- Chinook fish-production model
- Four independent fish expert panels



Expert Panels on Implementation of KHSA and KBRA

- Lamprey – re-colonize newly opened habitat, but only small increases
- Bull trout – promise for preventing extinction and expanding abundance and distribution
- Suckers – promise for preventing extinction and increasing production

Pacific Lamprey



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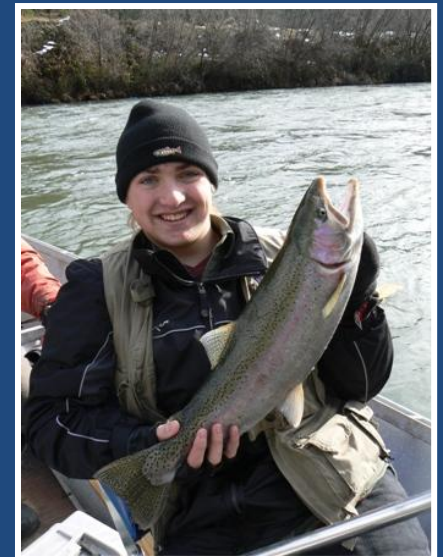


Lost River Sucker



Expert Panels on Implementation of KHSA and KBRA (continued)

- Redband trout – increase range, productivity, and recreational opportunities (up to 7 fold)
- Coho – small increase in abundance and spatial distribution, but contributing to resilience
- Steelhead – would increase spatial distribution and abundance



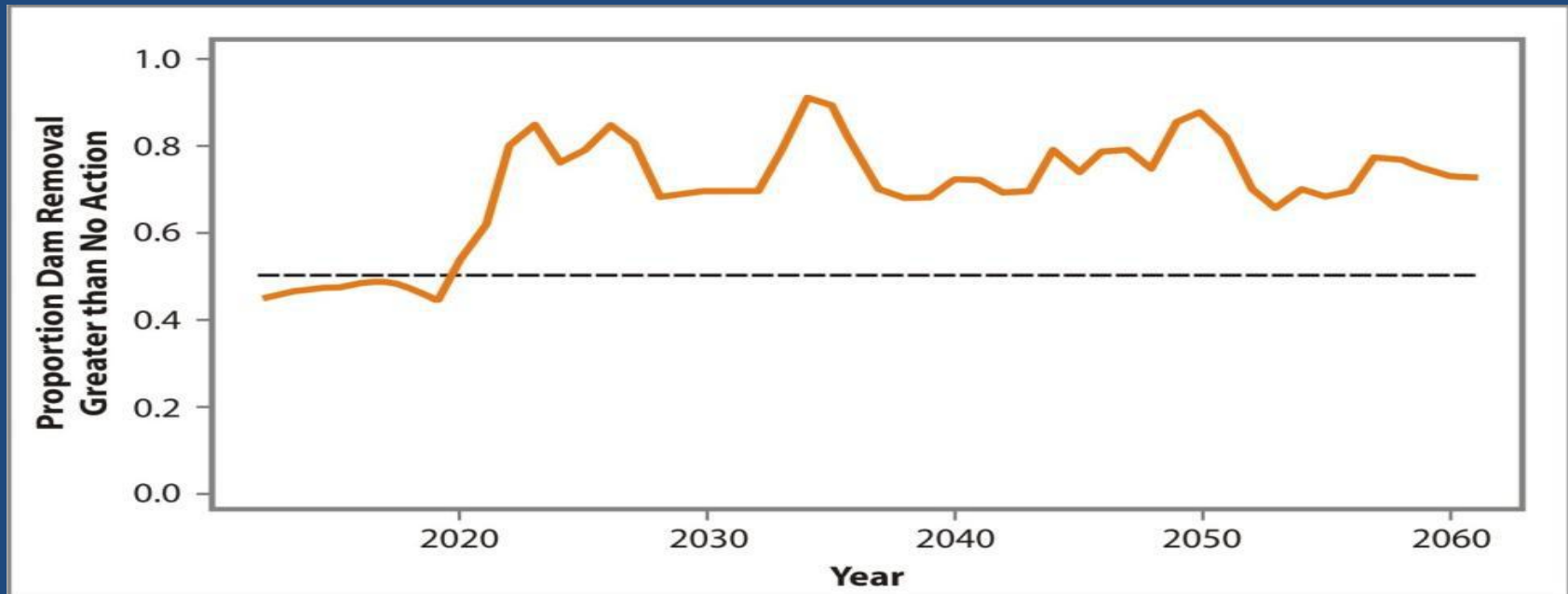
Expert Panels on Implementation of KHSA and KBRA (continued)

- Chinook:
 - “Appears to be a major step forward in conserving Chinook compared with decades of vigorous disagreements, obvious fish passage barriers, and continued ecological degradation”
 - Maximum success depends on KBRA effectiveness:
 - Water quality
 - Juvenile disease
 - Habitat



Klamath Chinook Production Model (Hendrix 2011)

- Median escapement to Klamath River increases 72 percent (42,300 to 73,000)
- Natural escapement greater with dam removal in 75 percent of simulated years



Federal Team Synthesis Report on Fish (Hamilton et al, 2011)

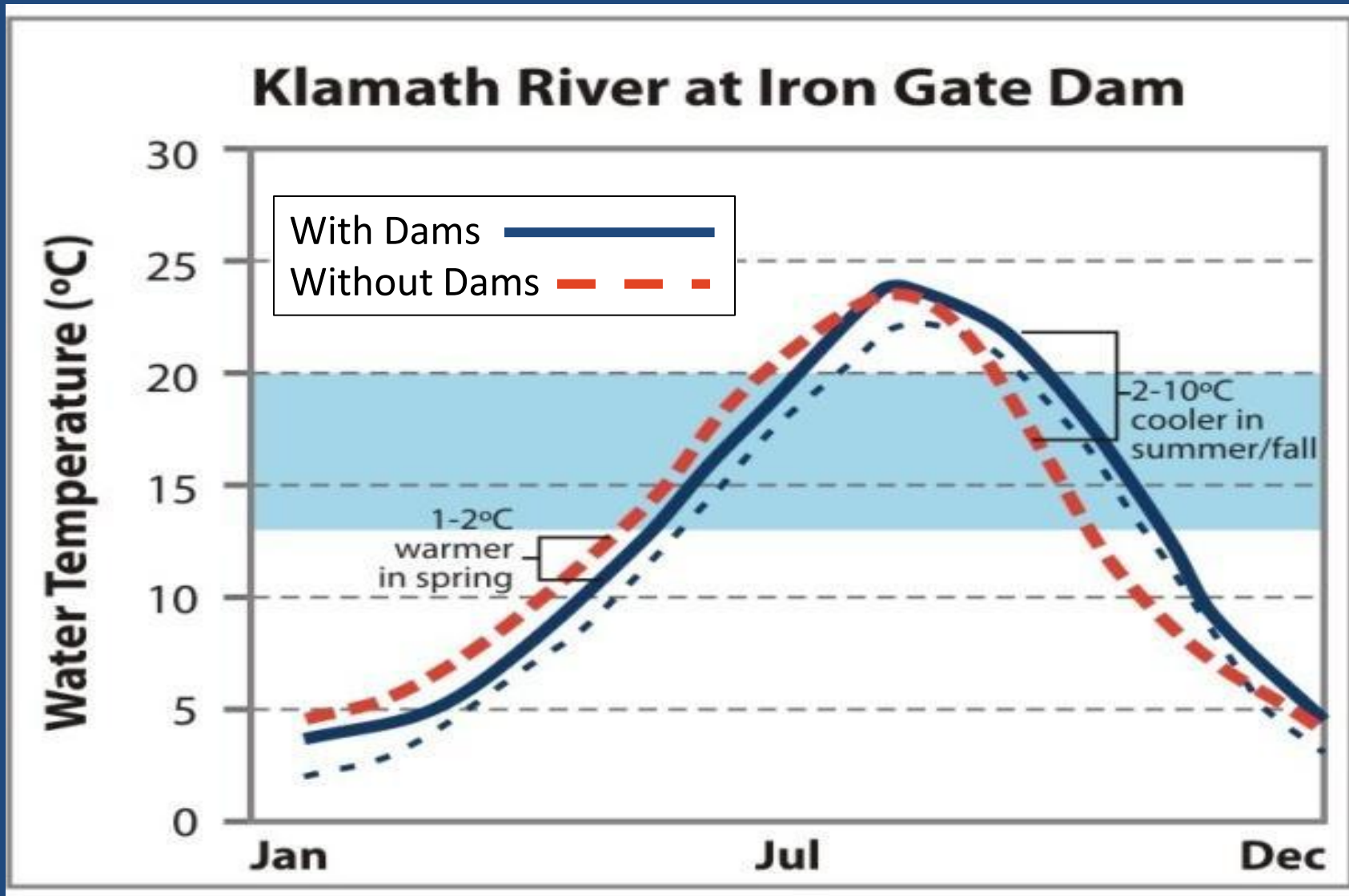
- Dam removal and KBRA salmonid benefits:
 - Opens the upper basin (> 400 stream miles)
 - Habitat restoration
 - More natural hydrograph (base flows and peaks)
 - Decrease in juvenile disease
 - Improvements in algal toxins and DO
 - Access to thermal refugia
 - More natural thermograph



Cyanobacteria
bloom in Iron
Gate Reservoir



Modeled Water Temperatures, With and Without Dams



Are the Agreements in the Public Interest?

- Analysis of Regional Economic Development Effects
 - including regional jobs
- Analysis of National Economic Development Effects
 - including a benefit/cost analysis
- Non-monetary effects on tribes

Traditional fishing by Karuk Tribe at Ishi Pishi Falls. Photo by Karuk Tribe.



Non-Monetary Effects on Indian Tribes

- Cultural values
- Spiritual values
- Subsistence fishing
- Water quality improvement
- Tribal member health
- Two tribal reports:
 - Existing effects of dams
 - Potential effects of dam removal



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Regional Economic Development Impact Analysis – Including Jobs

- Local community effects
 - Commercial fishing
 - Recreational fishing
 - Other recreational activities
 - Refuge hunting/viewing
 - Whitewater rafting
 - Flat-water boating/fishing
 - Agricultural production
 - Spending for KBRA, dam removal, and mitigations



National Economic Development Benefit-Cost Analysis

- Benefits:

- Irrigated agriculture
- Commercial fishing
- Sport fishing, river
- Sport fishing, ocean
- Refuge recreation
- Non-use values



- Costs:

- KBRA costs (new)
- Facility removal costs
- Site mitigation costs
- Lost reservoir recreation
- Lost whitewater recreation
- Foregone hydropower (but PUCs ruled better for ratepayers)



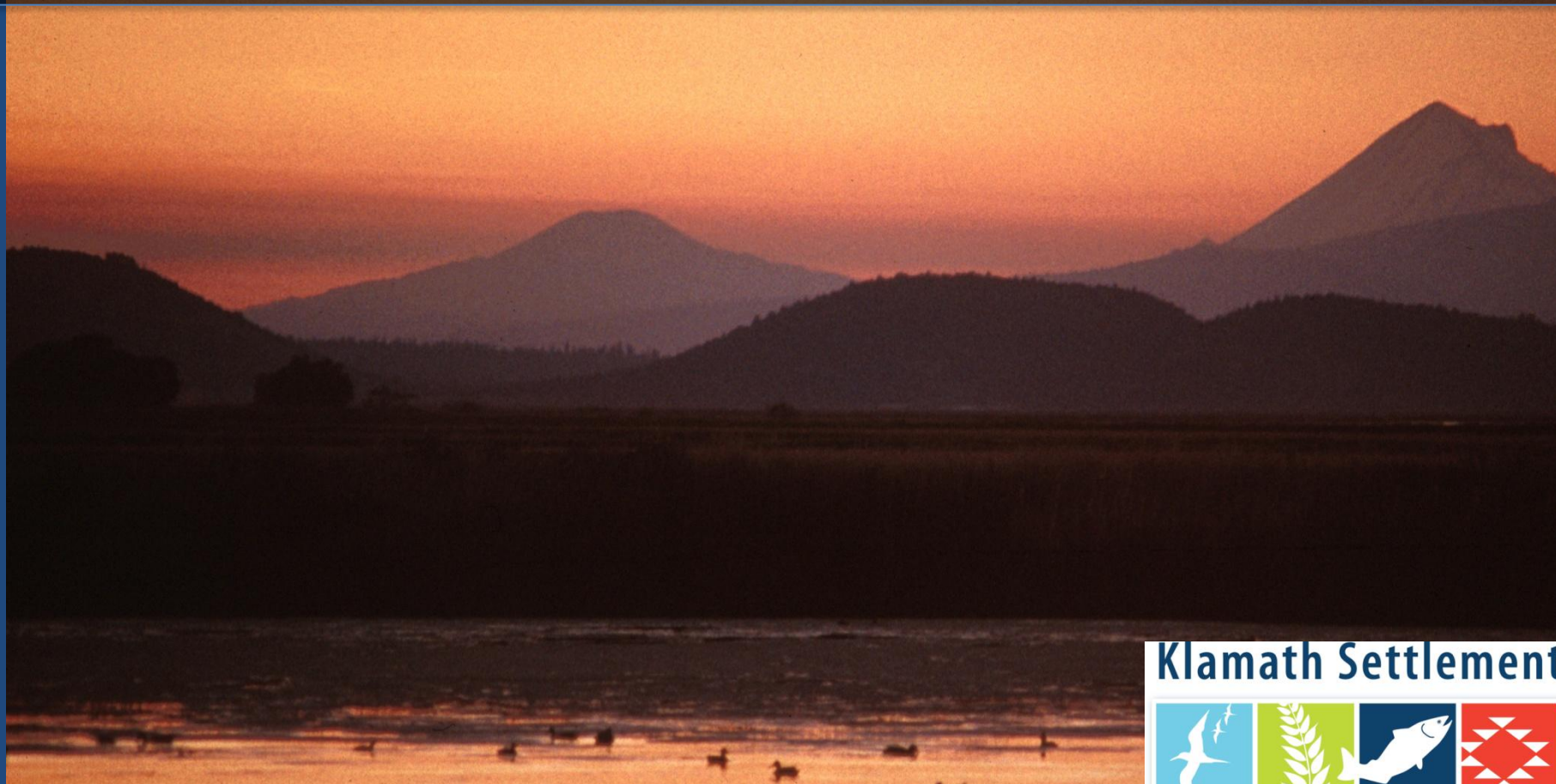
Secretarial Determination Schedule

- Technical studies posted by 9/22/2011 on KlamathRestoration.gov
- Final technical “overview” report by 3/2012
- Public Draft EIS/R on 9/22/2011
- Final EIS/R on 2/28/2012
- Record of Decision (Secretarial Determination) by 3/30/2012
- What does the future hold?



Questions and Comments

KlamathRestoration.gov



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