

# New Eel-Russian Facility Assessment Update 1-31-2024

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2/29/2024

Eel-Russian Project Authority

# Today's Presentation

- Background and Previous Studies
- Alternative E-2 (Pump Station)
- Alternative E-3 (Roughened Channel)
- Technical Advisory Group (TAG)
- Evaluation Criteria (in development)
- Next Steps





Potter Valley Project Ad Hoc Committee

## Fish Passage Profiles Evaluation Report

December 2019

Developed by the Fish Passage Working Group

2/29/2024

### Fish Passage Working Group Report Contributors

#### Scenarios and Options Subgroup

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Paul Kubicek (PG&E)  
Jon Mann (CDFW)  
David Manning (Sonoma Water)  
Scott McBain (Consultant to RVIT)  
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# PVP Ad Hoc Alternatives

## Fish Passage Scenarios and Options Summary Table

This table provides a summary of the various options for each fish passage scenario that the working group developed and evaluated.

Scenarios	1 Fishway at Existing Scott Dam	2 Trap & Haul	3 Partial Scott Dam Removal	4 Remove Scott Dam and Modify Cape Horn Dam
Options	<p>1.1 Semi-Natural, Low-Gradient Bypass Channel</p> <p>1.2 Conventional Fishway 1.2a <a href="#">Mead &amp; Hunt Study</a> 1.2b Modified Mead &amp; Hunt</p>	<p>2.1 Trap &amp; Haul, Van Arsdale to Scott Dam</p> <p>2.2 Trap &amp; Haul, at Scott Dam</p>	<p>3.1 Lower Scott Dam to 80' ~ Meets current PVID water demand and <a href="#">NMFs 2002 BiOp</a> RPA environmental flows</p> <p>3.2 Lower Scott Dam to 50' ~ Retain and manage accumulated sediment, no water storage within Lake Pillsbury</p>	<p>4.1 Remove Scott Dam and Modify Cape Horn Dam Diversion to East Branch Russian River with modified Cape Horn Dam infrastructure</p> <p>4.2 Remove both Scott Dam and Cape Horn Dam With alternative diversion infrastructure</p>

TECHNICAL MEMORANDUM • NOVEMBER 2021

# Scott Dam and Cape Horn Dam Removal Alternatives



PREPARED FOR

Two-Basin Solution Partners  
California Trout  
Humboldt County  
Mendocino County Inland Water and Power Commission  
Round Valley Indian Tribes  
Sonoma County Water Agency

PREPARED BY

McMillen Jacobs Associates  
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2/29/2024

Eel-Russian Project Authority



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## Potter Valley Project Feasibility Study: Potential Ecosystem and Fisheries Responses to Project Alternatives



### PREPARED FOR

Potter Valley Project Planning Agreement Parties  
California Trout  
Humboldt County  
Mendocino County Inland Water and Power Commission  
Round Valley Indian Tribes  
Sonoma County Water Agency

### PREPARED BY



## Cape Horn Dam Fish Passage Improvements



PREPARED FOR

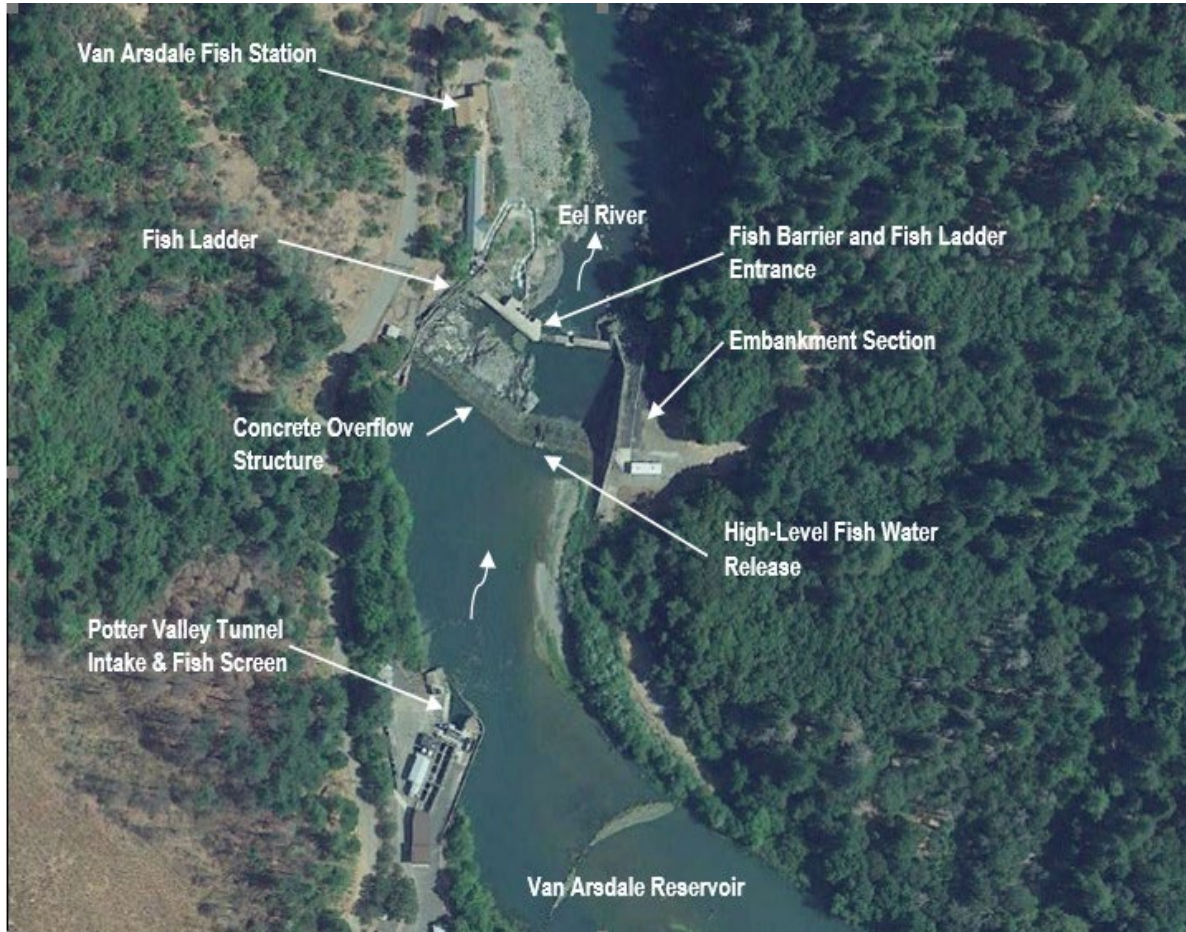
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# Cape Horn Dam Existing Conditions





# Existing Pool and Weir Fish Ladder





# Cape Horn Dam After High Flow in 2019



# Cape Horn Dam Fish Hotel and Ladder with Debris





# 2021 Report Evaluation But No Preferred Alternative

Potter Valley Project Feasibility Study

Cape Horn Dam Fish Passage Improvements

Table 7-1. Evaluation Matrix.

Criteria	Evaluation			
	Alternative 1 New Fish Ladder	Alternative 2 Control Section with Pump Station	Alternative 3 Roughened Channel with Gravity Supply	Alternative 4 Upstream Diversion with Gravity Supply
<b>Biological Efficiency</b>				
Volitional Upstream Passage	Low	High	Medium	High
Volitional Downstream Passage	Low	High	Medium	Medium
Energy Expenditure	High	Low	Medium	Low
Stress Factor	High	Low	Low	Low
<b>Constructability</b>				
Site Access	Medium	High	High	Low
Rock Excavation	Medium	Low	High	Low
Cofferdam Challenges	Medium	Medium	High	Medium
Dewatering Challenges	Low	Medium	Medium	Medium
<b>Environmental Considerations</b>				
Sediment Management	High	Low	Medium	Low
Footprint Impact	Low	Low	Medium	High
Permitting Effort	Low	Medium	Medium	High
<b>Operation</b>				
Mechanical Equipment	High	Medium	Low	Medium
Screen O&M Effort	Low	Medium	High	Low
Pump O&M Effort	NA	High	NA	NA
Gate(s) O&M Effort	High	Low	Low	Medium
<b>Design Approach</b>				
Proven Technology	Medium	High	Medium	Low
Ability to Meet Fish Passage Goals	High	High	High	High
Design Complexity	Medium	Low	High	High
<b>Safety</b>				
Safety Concerns	High	Medium	Low	Medium
<b>Cost</b>				
Construction Cost	Low	Medium	High	High
O&M Cost	Low	High	Low	Low

# Cape Horn Dam Removal with Pump Station Alternative E-2

- Remove a large portion of the dam and fish barrier to the level of the existing riverbed downstream (44 ft. reduction in dam height)
- Construct new pump station to pump Eel River water to the existing Van Arsdale Diversion via large diameter pipeline
- Install array of vertical cylindrical screens to divert water and to screen fish
- Remove Van Arsdale Diversion fish screens and reconfigure to receive pumped water







# Alternative E-2: Cross Section View



Potter Valley Hydroelectric Project  
Initial Draft Surrender Application and Conceptual Decommissioning Plan

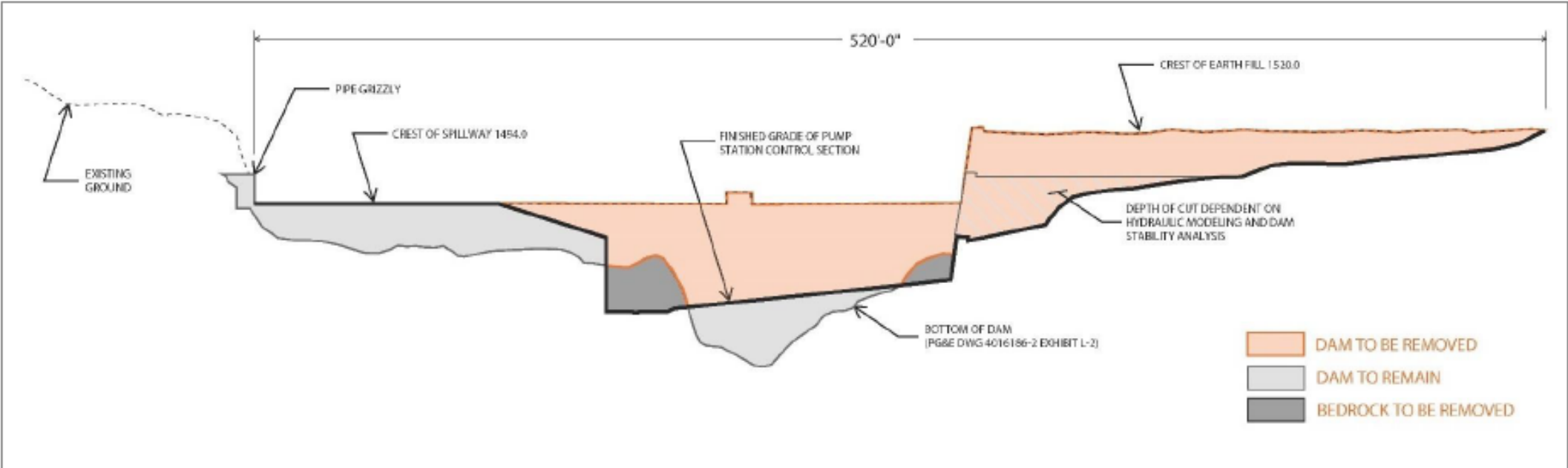


Figure 4-7. Cape Horn Dam Control Section with Pump Station - Final Dam Removal (Cross Section Through Dam)

# Vertical Cylindrical Fish Screens (Elwha River)



# Cape Horn Dam Removal with Roughened Channel Alternative 3

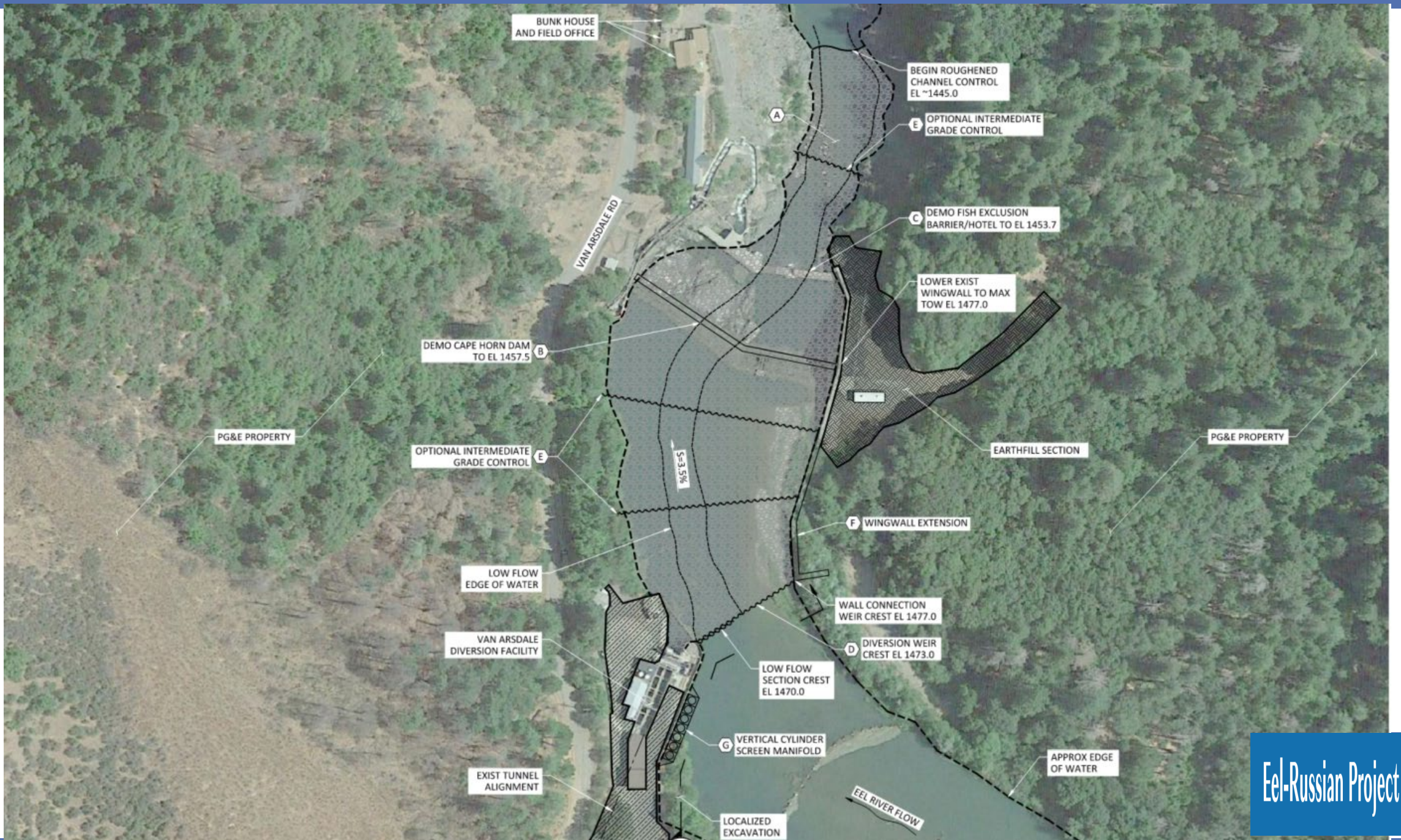
- Gravity diversion, no mechanical pumping
- Lower spillway portion of dam to appropriate elevation to achieve target roughened channel slope
- Build out roughened channel “skeleton” using combination of sheetpile and existing concrete structures
- Install roughened channel beginning downstream near riffle control and extending upstream to existing diversion (5-15 ft. diameter boulders, 800 ft. long at 3% slope)
- Install low flow section in upstream diversion weir
- Reconfigure Van Arsdale diversion to include array of vertical cylindrical screens along outside guide wall



# Mainstem Eel Reference Reach









# Alternative E-3: Cross Section View



Potter Valley Hydroelectric Project  
Initial Draft Surrender Application and Conceptual Decommissioning Plan

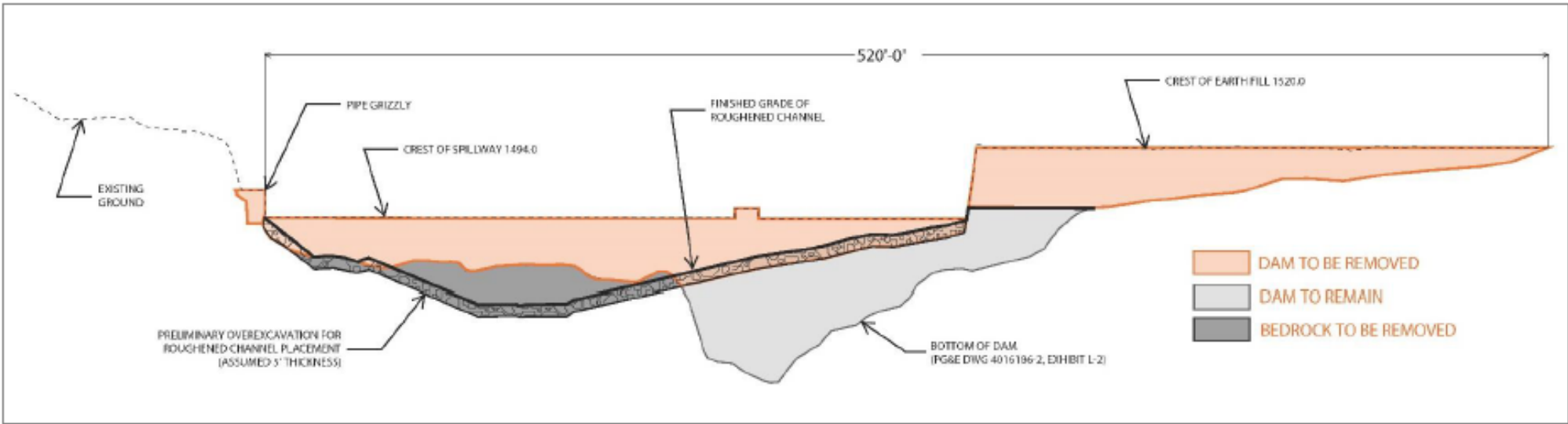


Figure 4-9. Cape Horn Dam Roughened Channel with Gravity Supply - Final Dam Removal (Cross Section Through Dam)



## Much Smaller Scale Roughened Channel Example: Trout Unlimited Mill Creek (Russian River Watershed) Dam Removal Project



The site after construction.

# Technical Advisory Group

Biologists, Engineers, Water Managers from:

- California Department of Fish and Wildlife
- National Marine Fisheries Service
- U.S. Fish and Wildlife Service
- California Trout
- Round Valley Indian Tribes
- Mendocino IWPC
- Sonoma Water
- McMillen, Assoc. and Stillwater Sciences

# Technical Advisory Group Meetings

- 10 Meetings from July 2023 to March 2024
- Conceptual Designs
- Advancing Two Alternatives
- Fish Passage Criteria
- Hydraulic Model Results
- Preliminary Engineering Report Review
- Alternatives Evaluation Criteria and Scoring
- Recommend One Alternative (March 2024)



# Evaluation Criteria

- Biological Feasibility for Upstream Passage
- Biological Feasibility for Downstream Passage
- Habitat and Water Quality
- Resiliency and Reliability
- Constructability
- Cost

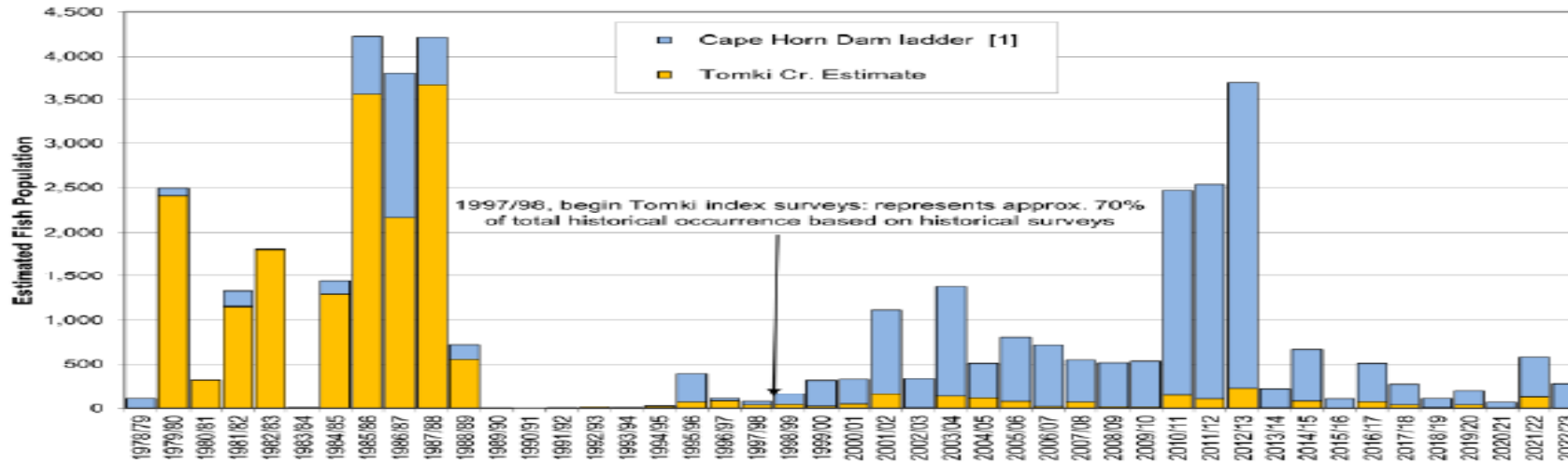


# Species Life History Stages and Timing

Table 4-2. Adult Migration and Smolt Outmigration Timing (Source: Stillwater Sciences et al. 2021).

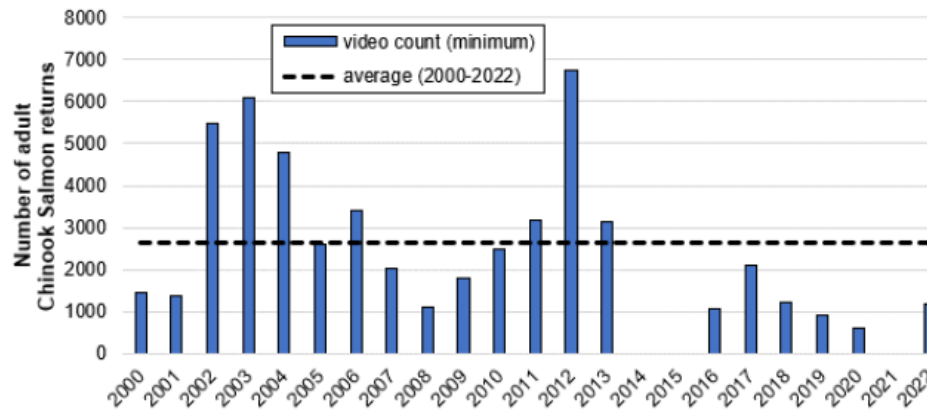
Species	Life Stage	Month											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Chinook Salmon (Fall-run)	Adult Migration												
	Smolt Outmigration												
Steelhead (Summer- and Winter-run)	Adult Migration (Winter-Run)												
	Adult Migration (Summer-Run)												
	Smolt and Kelt Outmigration												
Coho Salmon*	Adult Migration												
	Smolt Outmigration												
Pacific Lamprey	Adult Migration												
Sacramento Sucker	TBD												

# California Coastal Chinook Salmon



Upper Eel River (Cape Horn Dam / Van Arsdale Fisheries Station) Fish Ladder Counts

Figure 2. Historical adult Chinook salmon returns to the upper Eel River at the Cape Horn Dam fish ladder and Tomki Creek. PG&E Potter Valley Project 2023 Annual Agency Meeting.



Russian River Mirabel Dam Fish Ladder Counts

Figure 4. Video counts of adult Chinook salmon passing through the fish ladder at Mirabel Dam on the lower Russian River (Sonoma Water 2022).



# Next Steps

- CA Dept. of Water Resources (DWR) Grant - underway
  - Van Arsdale / Cape Horn Dam Diversion Facility Assessment
    - Preliminary Engineering Report (1/22/24)
    - Tech Advisory Meeting #7 Final Criteria (2/23/24)
    - Full Draft Report (2/23/24)
    - 3 Meetings in March to Score Criteria
    - Recommended Alternative by March 15, 2024
  - New Eel-Russian Facility (NERF) Design and Operations Technical Advisory Group (TAG) “NERF-TAG”
    - Eel River Flow and Diversion Criteria – guidance for NERF operations
- US Bureau of Reclamation (USBR) Aquatic Ecosystem Restoration Program
  - One Diversion Facility Alternative to 60% design



# Thank You

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2/29/2024

**Eel-Russian Project Authority**