



Working towards healthy watersheds and healthy communities.



**YUROK TRIBAL
FISHERIES
PROGRAM**



A KLAMATH RIVER TRIBUTARY

Watershed	Area (miles²)
North Fork Trinity River	152
New River	233
Salmon River	744
Shasta River	793
Scott River	813
South Fork Trinity River	929
Mainstem Trinity River (below dam)	1,318
Mainstem Klamath River (below dam)	1,543

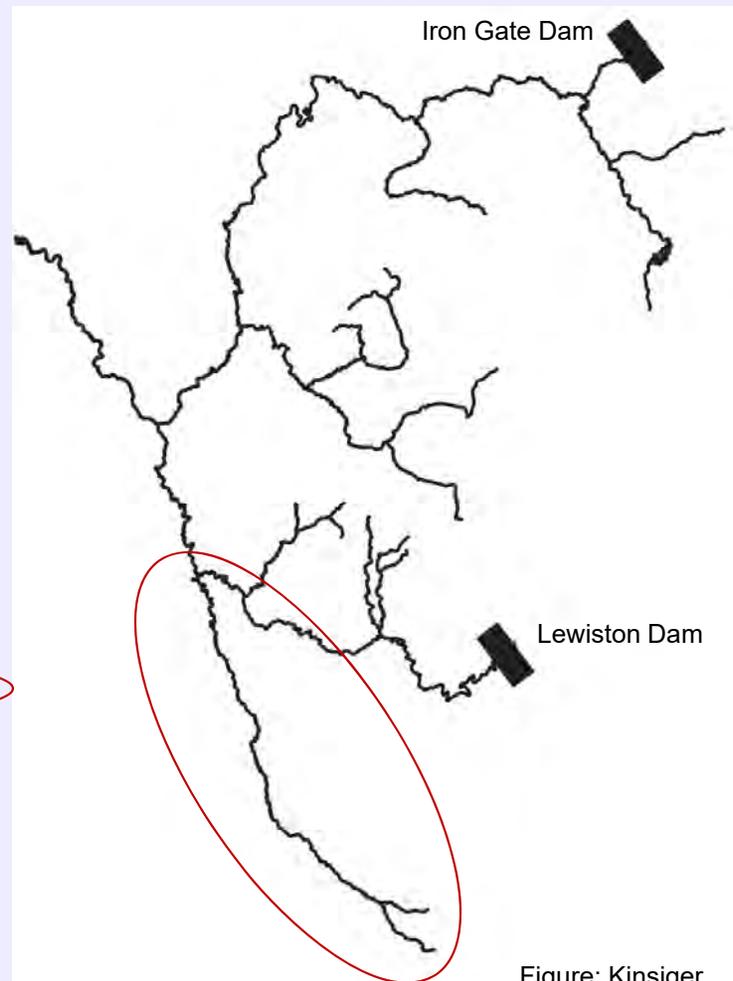
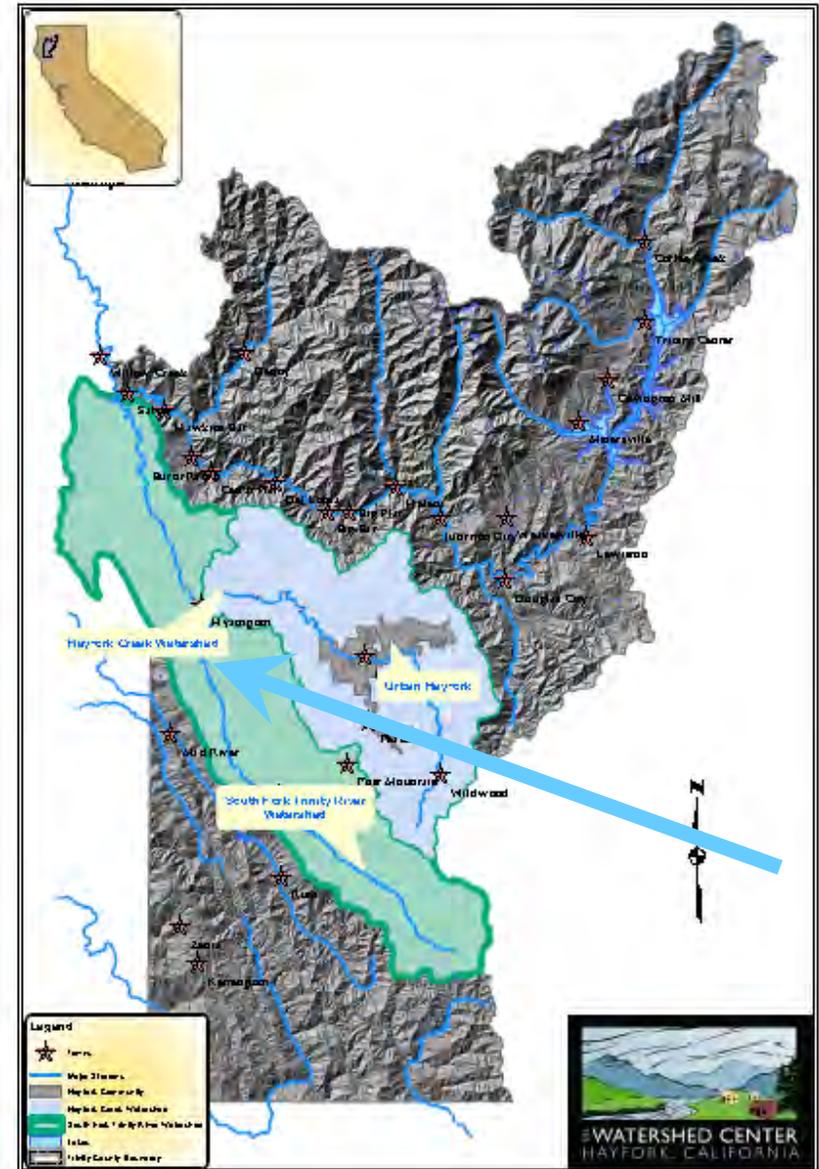


Figure: Kinsiger



OUR WATERSHED: SOUTH FORK TRINITY RIVER

- Nearly 1,000² miles and >90 miles
- California's largest undammed river
- Land protections: 75% USFS, Wild and Scenic River, Roadless areas (18%), Wilderness areas (2%), and limited river access.
- Approximately 2-3 thousand people in the entire watershed
- One of the last remaining wild spring-run Chinook Salmon (*Oncorhynchus tshawytscha*) populations in California.



ANADROMOUS FISH

- Steelhead (*Oncorhynchus mykiss*) – primarily winter run
- Coho salmon (silver salmon) (*Oncorhynchus kisutch*).
- Spring-run (king salmon) and fall-run Chinook Salmon (*Oncorhynchus tshawytscha*).

Anadromous fish: born in fresh water, migrate to sea, returns home to spawn.



SPRING CHINOOK – “KING” SALMON

- Move up in the spring and over-summer before spawning.
- Life history strategy: feed heavily in ocean and load up on fatty oils so they can survive the summer.
- Most prized of the salmon species for size, taste, and oil content.
- Very vulnerable due to life history strategy – fish in a barrel.

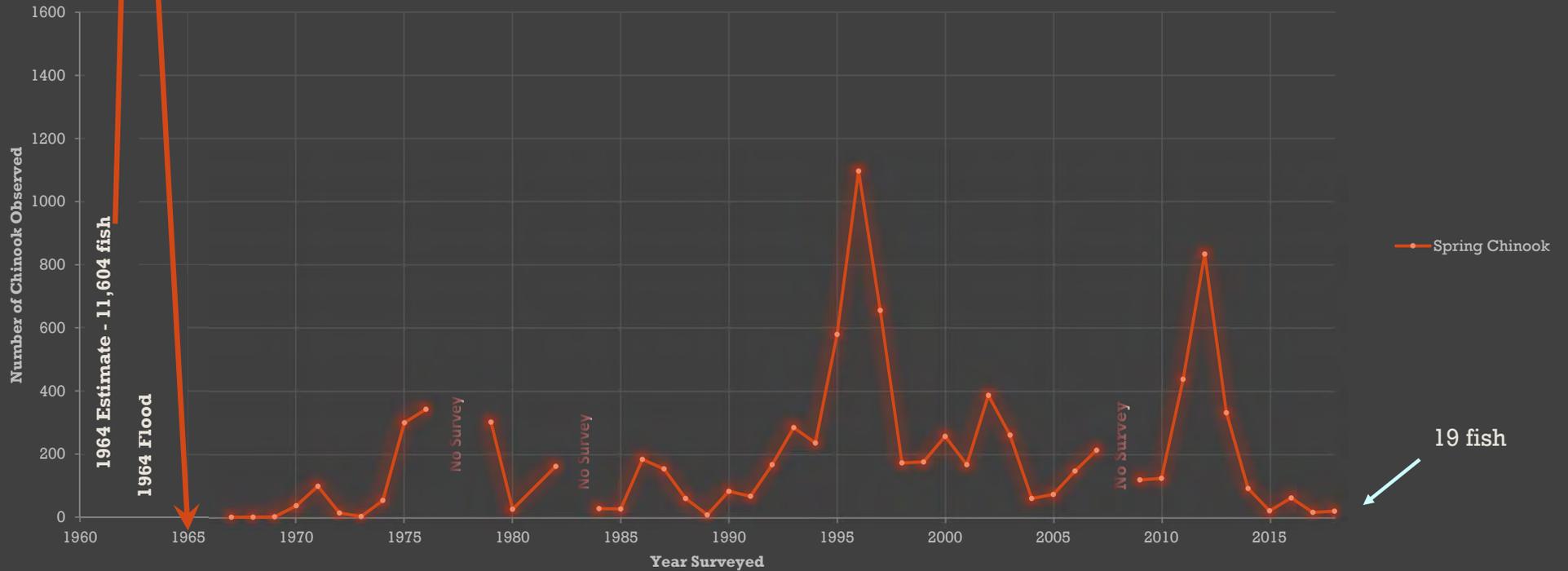
Photo: NMFS

Currently being petitioned to be listed as threatened or endangered by Karuk Tribe.

10,000-12,000 fish

POPULATION TRENDS

South Fork Trinity River Spring Chinook Snorkel Survey



LIMITING FACTORS

Sediment

- ❑ Geology
- ❑ Human impacts

Water Quantity and Quality

- ❑ Climatic
- ❑ Human impacts

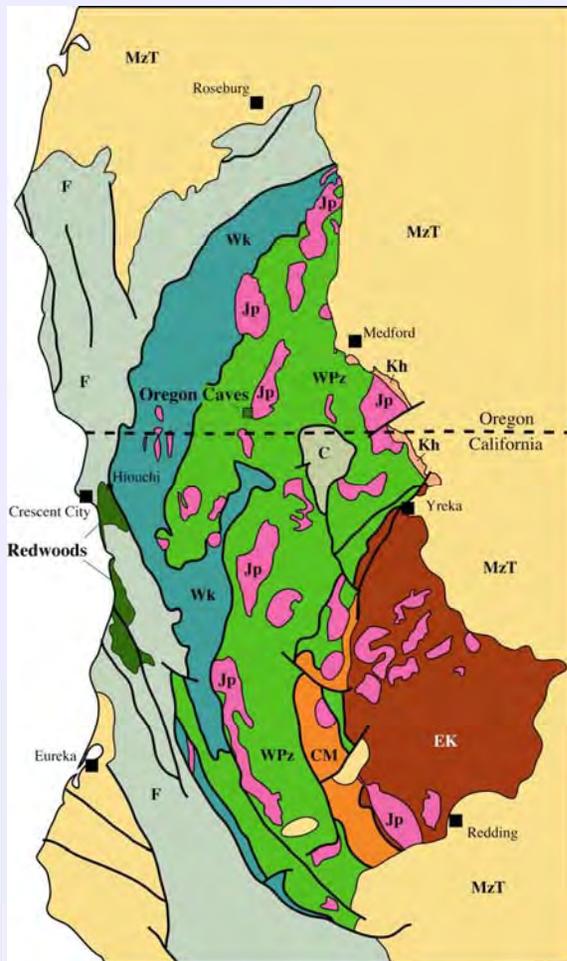
Harvest

- ❑ Commercial, sport, tribal, poaching (< 200!)

Genetic structure

- ❑ Hatchery influences
- ❑ Genetic bottleneck (inbreeding)

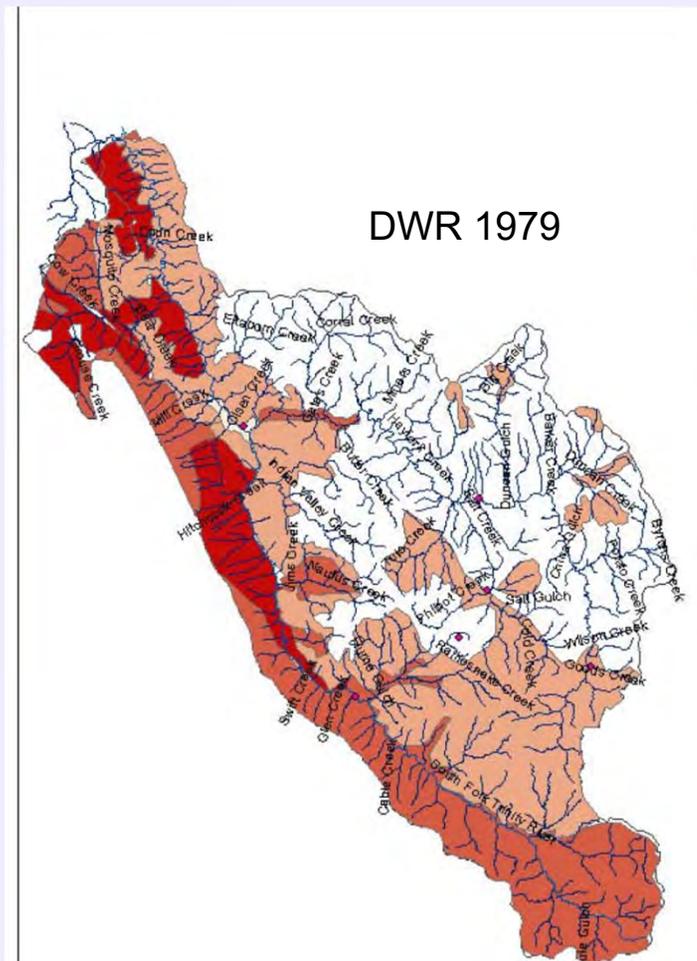
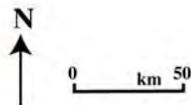
SEDIMENT ≈ FACTOR OF GEOLOGY



Terrane map of the Klamath Mountains, Oregon and California.

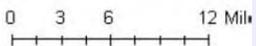
compiled by Mark Bryant Miller, University of Oregon

- MzT** Mesozoic and Tertiary sedimentary rock, postdates accretion of Klamath terranes.
- Kh** Cretaceous Hornbrook Formation.
- F** Mesozoic rock of Coast Ranges; mostly Franciscan Fm.
- C** Condrey Mountain Schist, Mesozoic.
- Wk** Western Klamath Terrane, mostly Jurassic.
- WPz** Western Paleozoic and Triassic Terrane.
- CM** Central Metamorphic Terrane (Devonian).
- EK** Eastern Klamath Terrane (Early Paleozoic to Jurassic).
- Jp** Jurassic Plutons.



Legend

- ◆ SF Towns
 - South Fork Trinity
 - trinity hydro 100K S
- level**
- Moderate
 - High
 - Very High
 - Extreme
 - South Fork huc



Map digitized by Amanda Brook
Source: South Fork Trinity River
Watershed Erosion Investigation
November 1979

Produced: 31 Jan 2012

1964 flood

- ❑ 1950-60's - Poorly built roads and poor forest harvest practices
- ❑ "1,000 year flood" on unstable geology
- ❑ All this lead to...

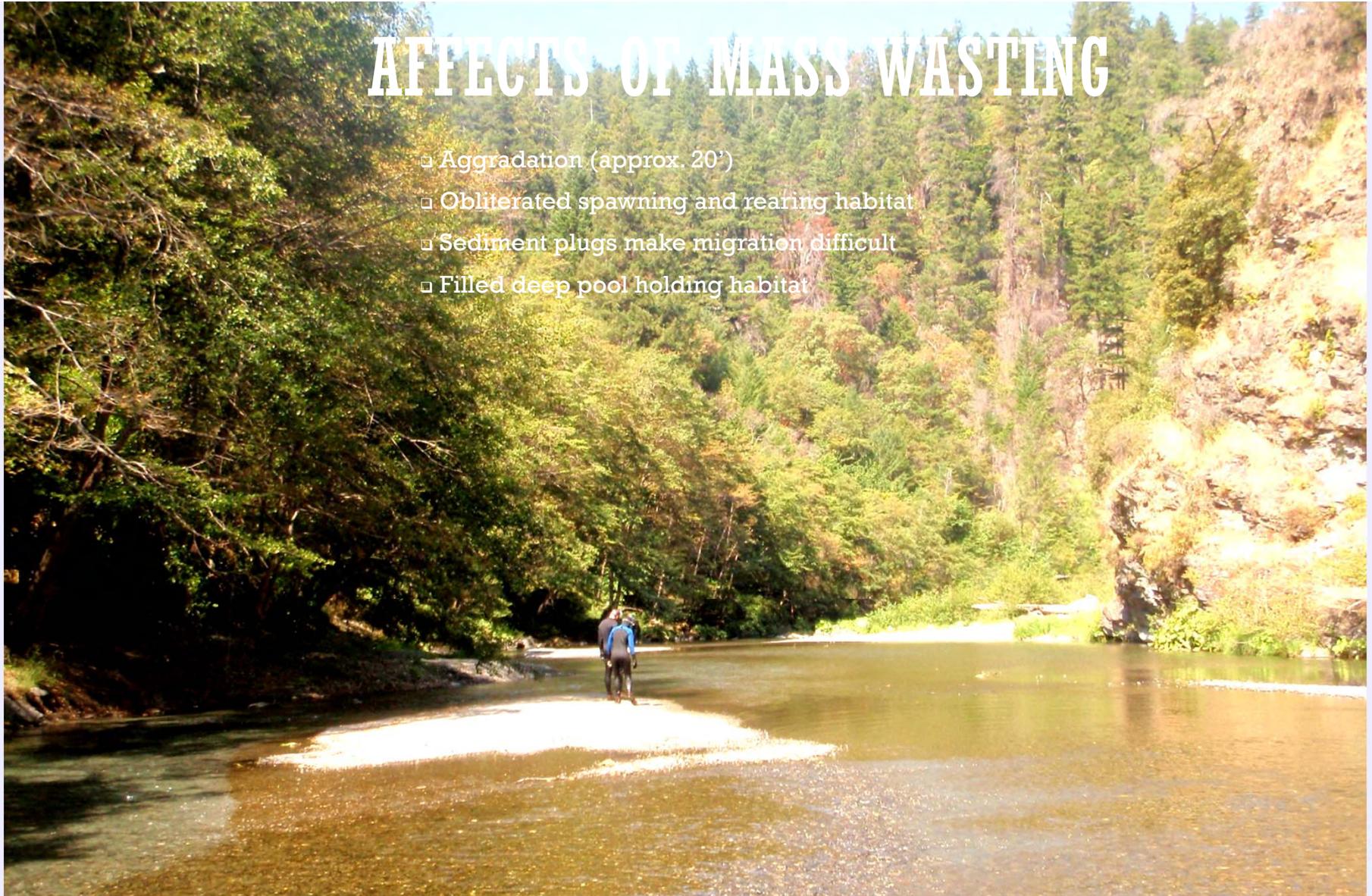
Mass wasting

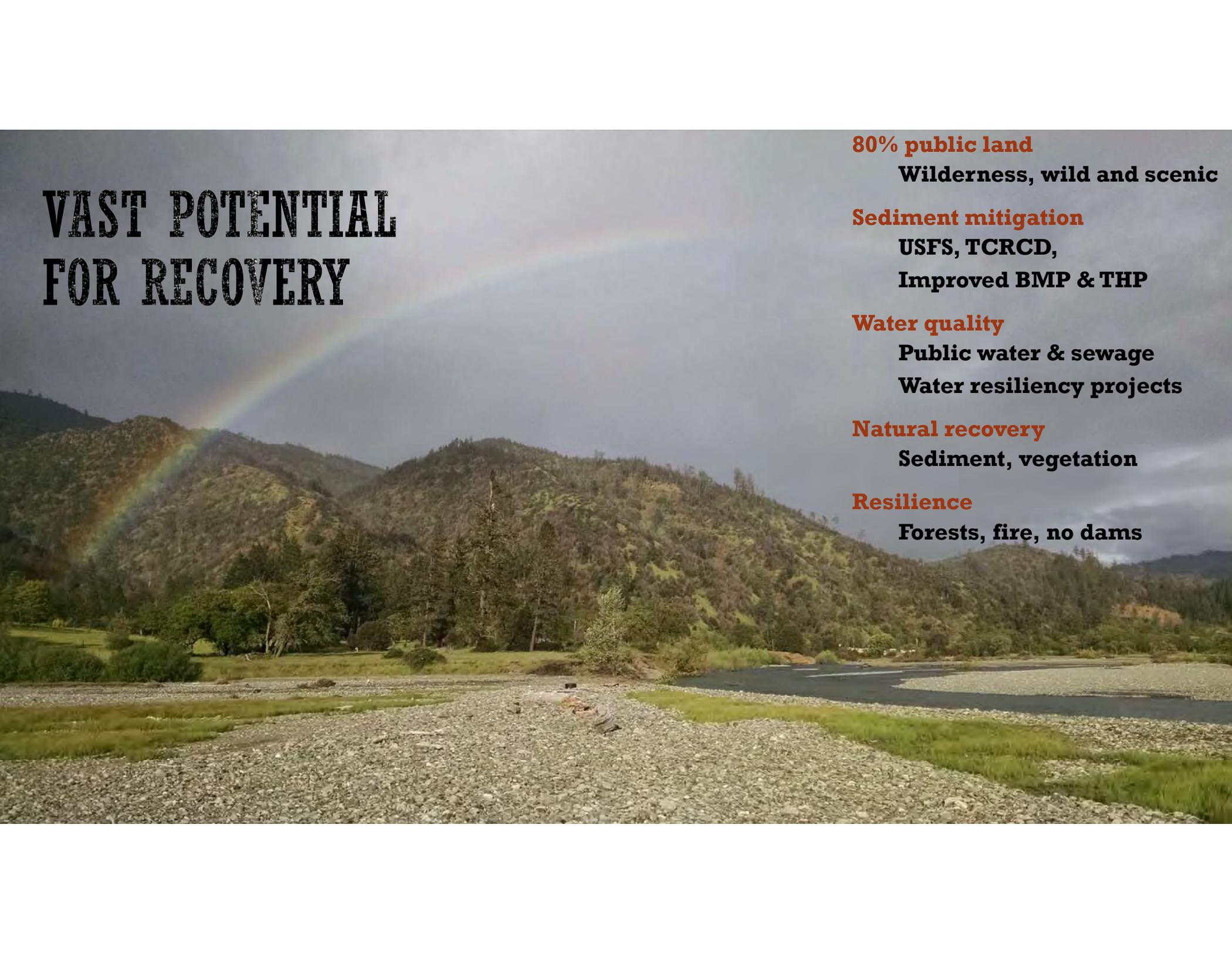
- ❑ Landslides < 100 ac
- ❑ Roads, bridges & homes lost
- ❑ Catastrophic sediment pollution

Photo: Big Slide 2003, Fitzgerald

AFFECTS OF MASS WASTING

- ❑ Aggradation (approx. 20')
- ❑ Obliterated spawning and rearing habitat
- ❑ Sediment plugs make migration difficult
- ❑ Filled deep pool holding habitat



A landscape photograph showing a wide river valley. In the foreground, there is a large, flat area covered in grey gravel and some green grass. A river flows through the middle ground, bordered by green grass and some trees. The background consists of rolling hills and mountains covered in dense green forest. A vibrant rainbow is visible in the sky, arching over the hills. The sky is filled with grey, overcast clouds.

VAST POTENTIAL FOR RECOVERY

80% public land

Wilderness, wild and scenic

Sediment mitigation

USFS, TCRCO,

Improved BMP & THP

Water quality

Public water & sewage

Water resiliency projects

Natural recovery

Sediment, vegetation

Resilience

Forests, fire, no dams

HELICOPTER WOOD RESTORATION PROJECT



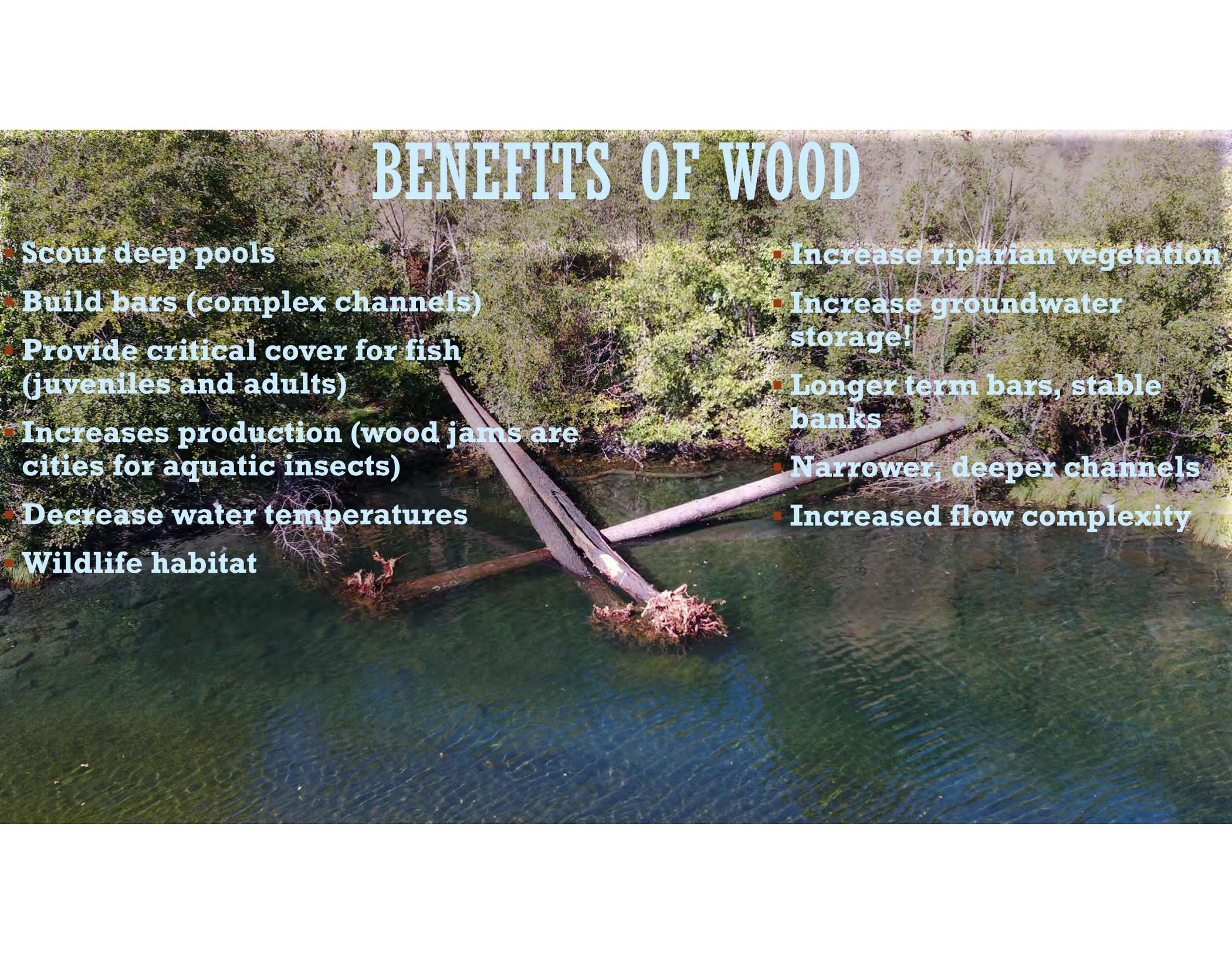
Photo: McMahon

WOOD LOADING OBJECTIVES

- Kickstart natural processes (processed based, no unnatural anchoring)
- Help restore the balance of water, sediment and wood, presently sediment is dominating



BENEFITS OF WOOD



- Scour deep pools
- Build bars (complex channels)
- Provide critical cover for fish (juveniles and adults)
- Increases production (wood jams are cities for aquatic insects)
- Decrease water temperatures
- Wildlife habitat
- Increase riparian vegetation
- Increase groundwater storage!
- Longer term bars, stable banks
- Narrower, deeper channels
- Increased flow complexity



Detailed photo/drone imagery

Digital elevation models

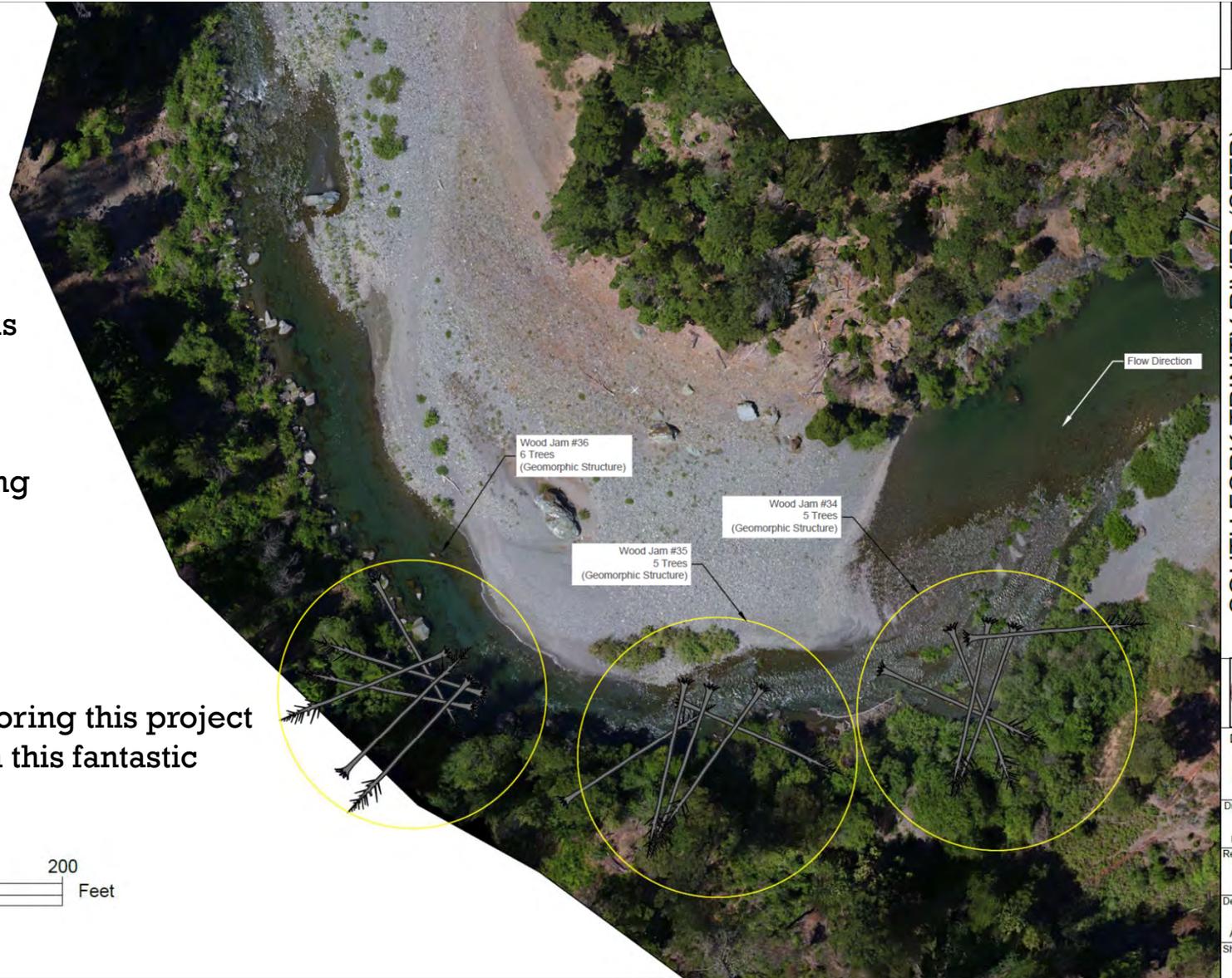
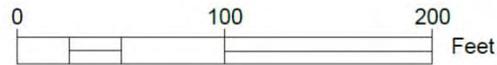
Wood movement

Cross section monitoring

Thalweg profile

Fish habitat

We will continue monitoring this project to learn all we can from this fantastic opportunity.



SOUTH FORK TRINITY RIVER (SFTR)
SFTR - Hellwood Loading Project (Hitchcock Reach)
Planview - Large Wood Design - Wood Jam - #35 - 36



Drawing Type:
PLAN
Drawn/Designed By:
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Eric Wiseman
Josh Smith
Design Date:
August 3, 2018
Sheet number
14 of 22

TEAMWORK

Great partnerships: WRTC, Yurok, USFS, Landowners, funders, etc.



Photo: Strazzante



Photo: Mais

COMPLEXITY

- **Assessment and Monitoring**
 - Drone flights
 - Photogrammetry DEMs
 - RTK surveys (long-pro and xs)
 - Hydraulic modeling
 - Large wood risk assessment
 - Habitat mapping
 - Adult snorkel surveys, Juvenile/CHAMP
 - Benthic macroinvertebrate sampling
 - LWD counts/mapping/tracking
 - Thermograph/pool stratification
- **Humboldt County/Department of Water Resources**
 - Labor compliance plan
 - Reporting
 - Invoicing
 - Matching funds
 - Communications
 - Subcontracts
 - Deliverables
 - Final report
- **Yurok Tribe**
 - Sub-award
 - Budget coordination
 - Match
 - Contracting
 - Harvest: LTO, RPF, Operators, Safety and fire,
- **Landowners**
 - Private residences
 - Landowner agreements
 - Public outreach
 - Public safety
 - Continual communications
 - Noxious weeds
- **Tree harvest**
 - New Island Capital timber landowner
 - CALFIRE collaboration
 - BBWA forester
 - WRTC LTO
 - Units 1 and 2 compliant
 - Slash plan
 - Sustainable tree mark
 - Detailed tree inventory and map
 - Wood properties research
 - Harvest
 - Post project inspection
- **Columbia Helicopters**
 - Skycrane scale
 - Contract
 - Budget vetting
 - Safety plan
 - Grapple
 - Choker logistics
 - Safe zones
 - Communications
- **Permitting**
 - USFS NEPA: Biologic Opinion, Decision Memo, Wild and Scenic Section 7
 - NCRWQCB – Warmerdam, NOE, HRE 401
 - Army Corps – NP 27 for 404
 - NOAA Biologic Opinion
 - CDFW HREA for 1653
 - CALFIRE EN for THP
 - Other: frogs, owls, turtles, etc.



Photo: Strazzante

You can help



Wood is good!

THANK YOU



QUESTIONS?

