THE WATERSHED CENTER
HAYFORK, CALIFORNIA

Working towards healthy watersheds and healthy communities.

YUROK TRIBAL FISHERIES PROGRAM

A KLAMATH RIVER TRIBUTARY

Watershed	Area (miles^2)
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

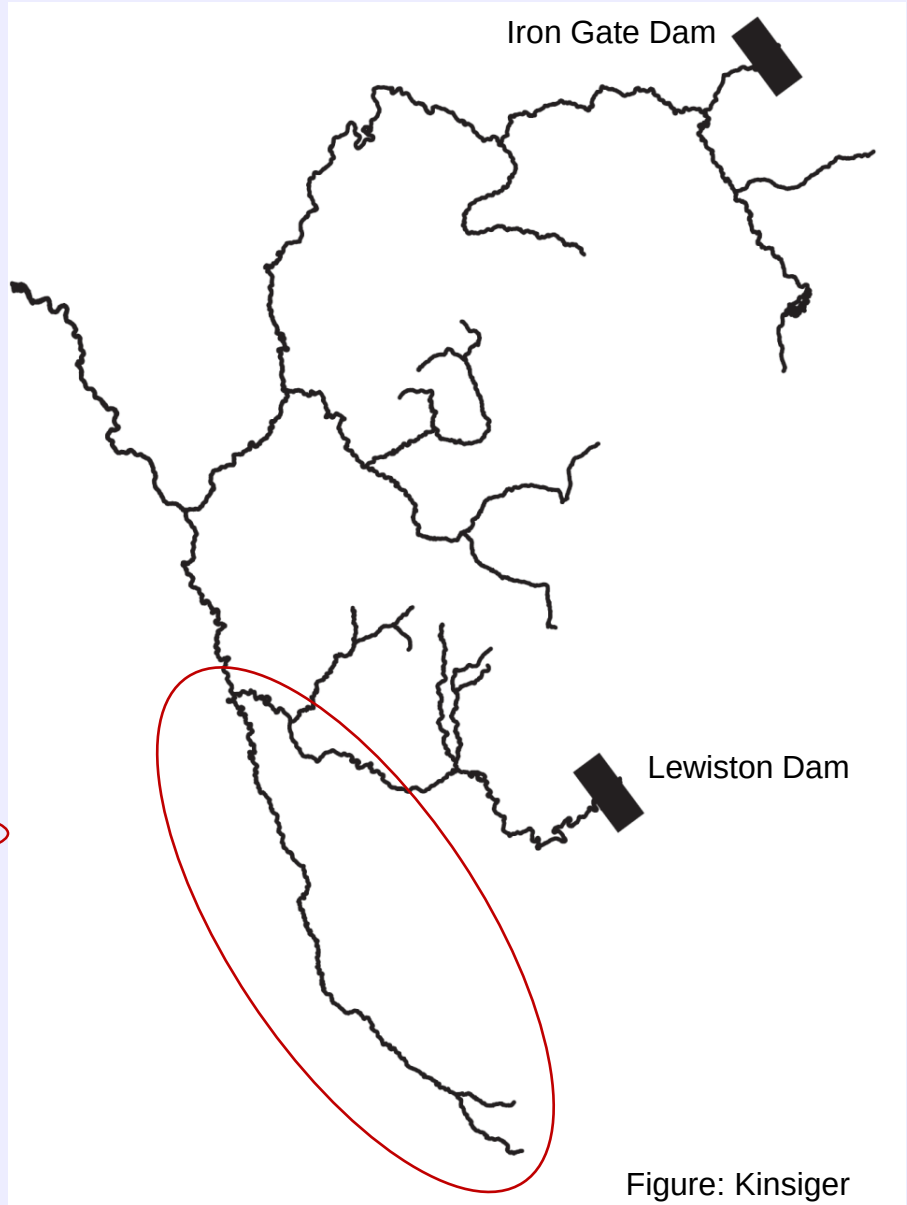
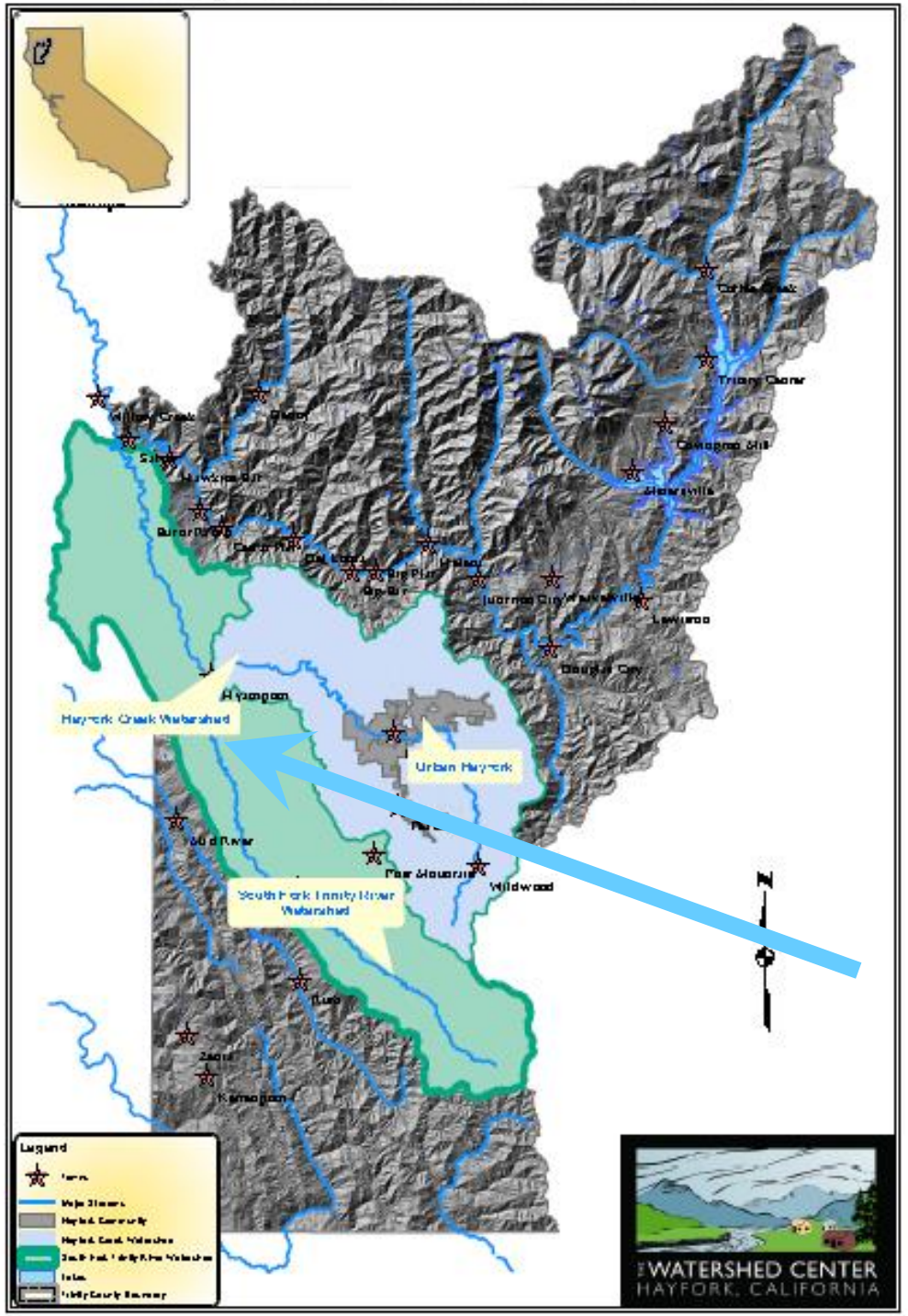


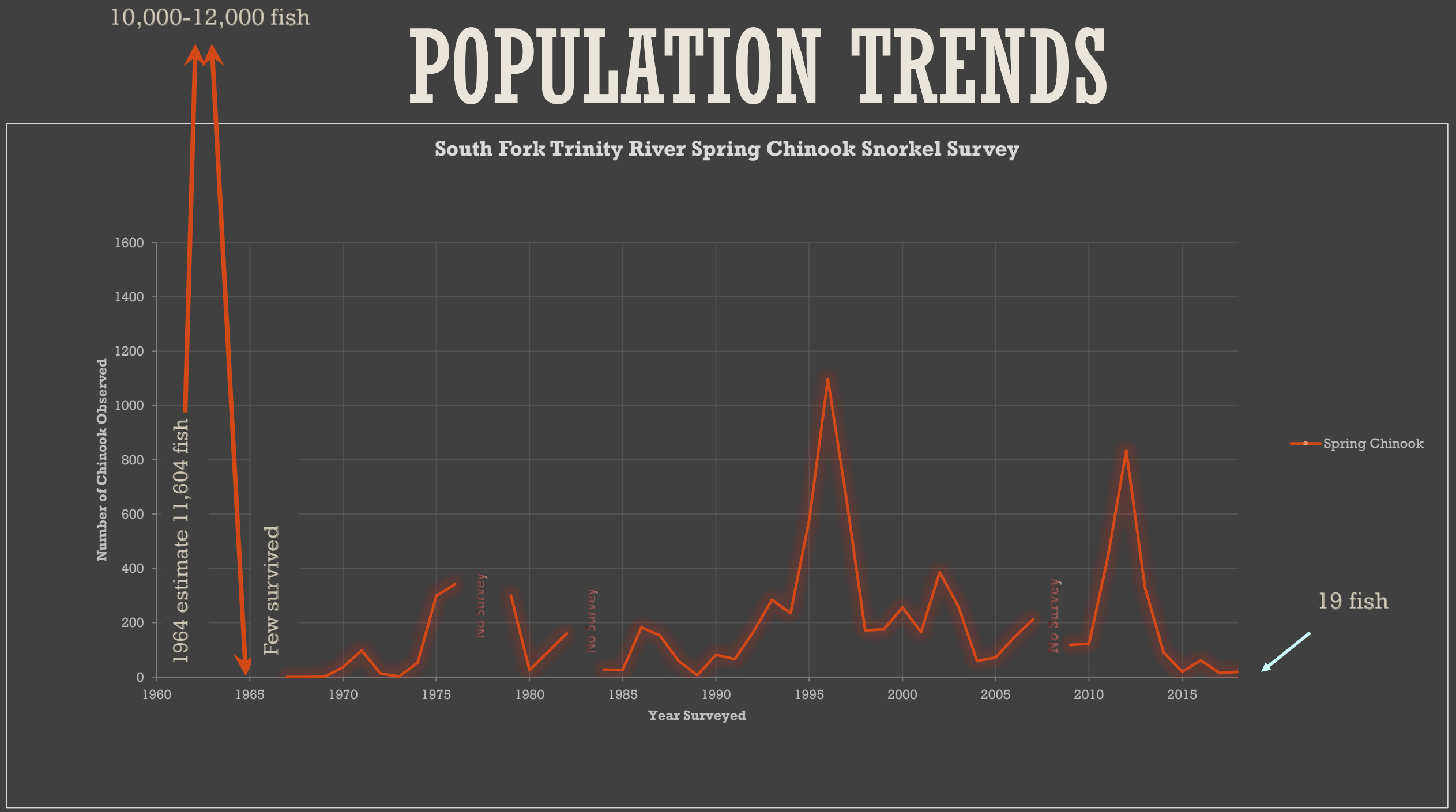
Figure: Kinsiger

SOUTH FORK TRINITY RIVER

- California's largest undammed river
- One of the last remaining wild spring-run Chinook Salmon (*Oncorhynchus tshawytscha*) populations in California.
- Nearly 1,000^2 miles and >90 miles
- 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



POPULATION TRENDS



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)

1964 flood

Poor forest practices on unstable geology

1,000 year flood event

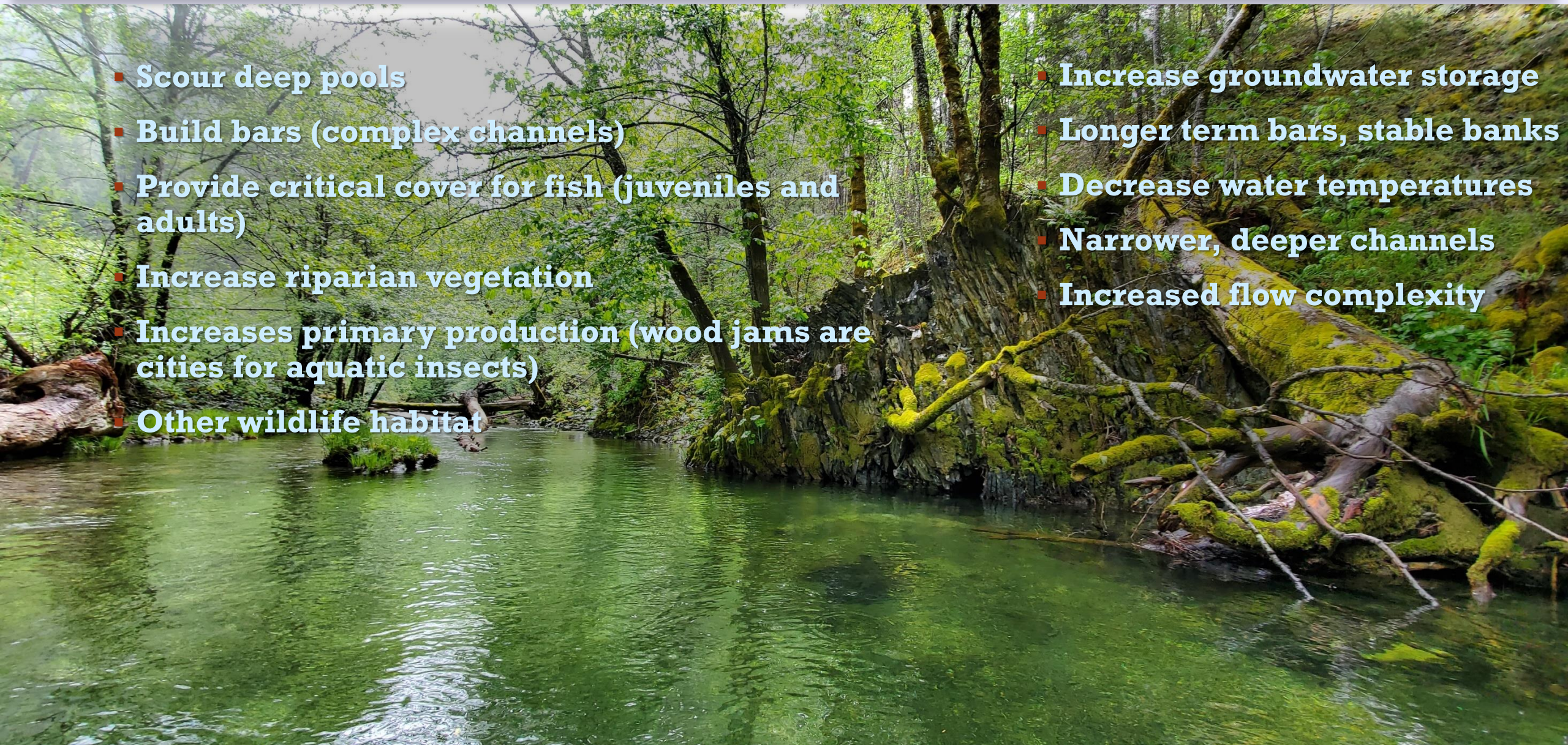
Landslides, roads, bridges

Decimated habitat – filled in deep pools

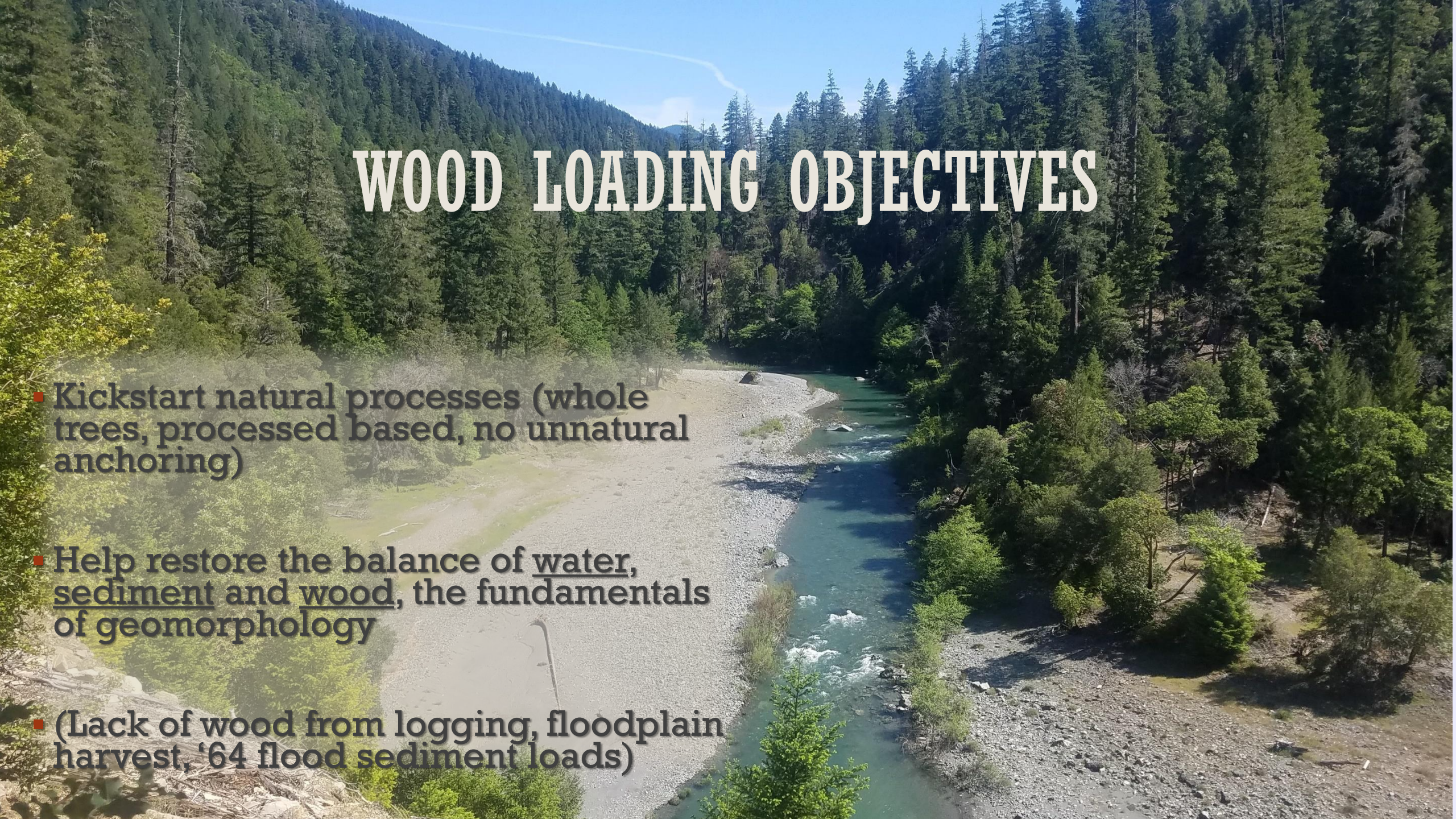
HELICOPTER WOOD RESTORATION PROJECT

Photo: McMahon

BENEFITS OF WOOD



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



WOOD LOADING OBJECTIVES

- Kickstart natural processes (whole trees, processed based, no unnatural anchoring)
- Help restore the balance of water, sediment and wood, the fundamentals of geomorphology
- (Lack of wood from logging, floodplain harvest, '64 flood sediment loads)

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
- **Grant management** - Humboldt County and DWR
  - Labor compliance plan
  - Reporting
  - Invoicing
  - Matching funds
  - Communications
  - Subcontracts
  - Deliverables
  - Final report
- **Partnerships - Yurok Tribe**
  - Sub-award
  - Budget coordination
  - Match
  - Contracting
  - Harvest: LTO, RPF, Operators, Safety and fire,
- **Collaboration - Landowners**
  - Private residences
  - Landowner agreements
  - Public outreach
  - Public safety
  - Continual communications
  - Noxious weeds
- **Tree harvest**
  - New Island Capital timber landowner
  - CALFIRE collaboration
  - BBWA RPF 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
- **Contractors - 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

Pre Project:

Detailed UAV photo/SFM imagery

Surveys (xs, long pro, bathy)

Digital elevation models (UAV and LiDAR)

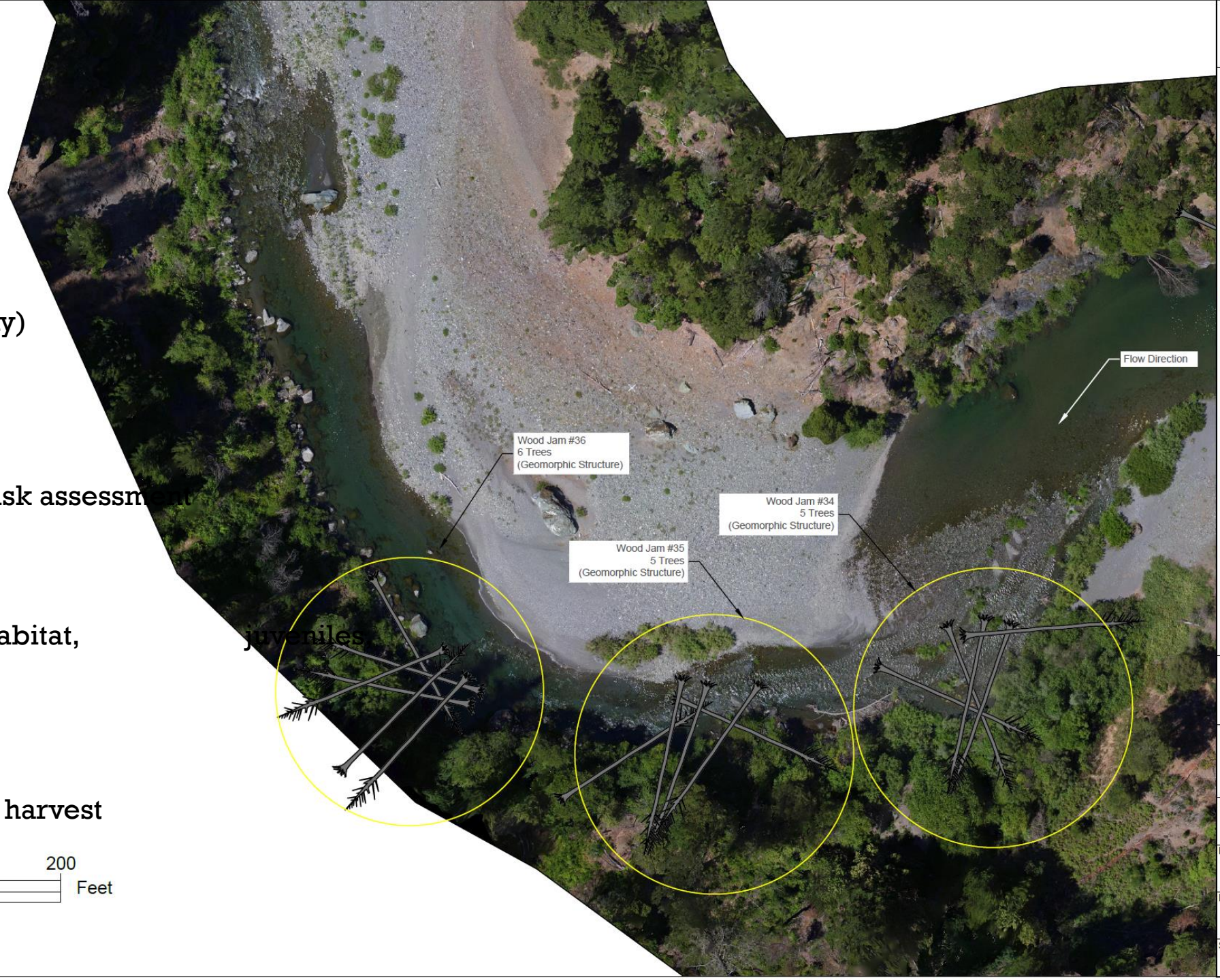
Hydraulic modeling and risk assessment

Designs

Monitoring (large wood, habitat, flow, temp, BMI, etc)

Forest inventory

Sustainable tree mark and harvest



0 100 200 Feet

SOUTH FORK TRINITY RIVER (SFTR)

SFTR - Heliwood Loading Project (Hitchcock Reach)

Planview - Large Wood Design - Wood Jam - #35 - 36

Yurok Tribe

Drawing Type:

PLAN

Drawn/Designed By:

DJ Bandrowski, P.E.

Reviewed By:

Aaron Martin

Eric Wiseman

Josh Smith

Design Date:

August 3, 2018

Sheet number

14 of 22

Implementation is challenging

- Plan, plan, plan… go!
- Timber harvest - a project on unto itself
- Heli limitations (wind, topography, weather…)
- 7-1 minute turnarounds
- Rock/snag fall dangers
- Needs flexibility, comms. and teamwork


107


Cold water habitat


Tree species experiments


Habitat (cover)

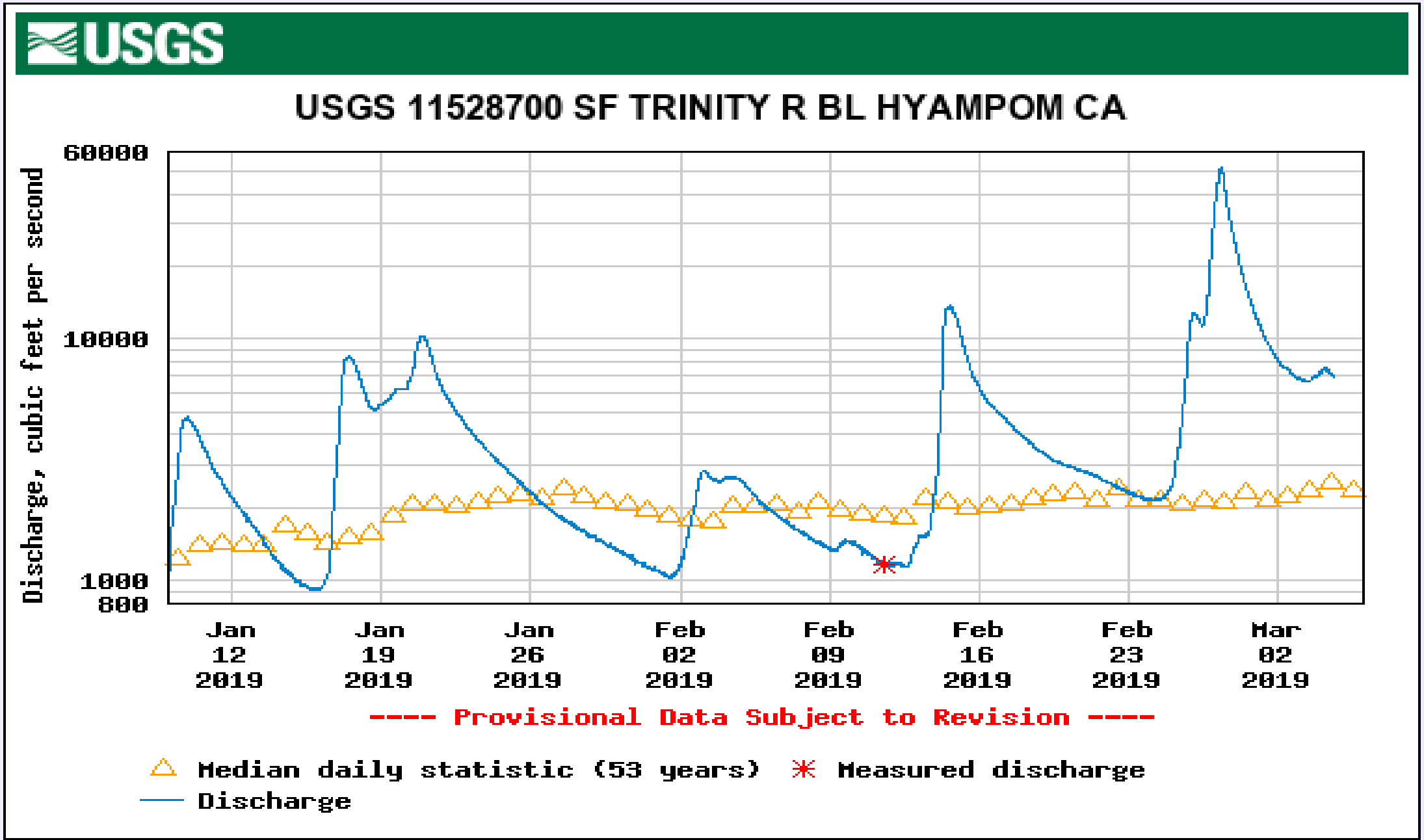

Geomorphic

TEAMWORK

Great partnerships: WRTC, Yurok, USFS, Landowners, Water Board, CDFW, Humboldt County, DWR, North Coast Resource Partnership, TRRP, etc.

Photo: Strazzante

Weather and storms of 2019




Post project:
8,000 cfs storm. January 2019


12,000 cfs storm. January 2019

54,000 cfs storm - February 2019
~ “15 year” storm, largest in 22 years

Largest storm in ~40 years in Hayfork Creek

SFTR Hyampom Video


575 cfs

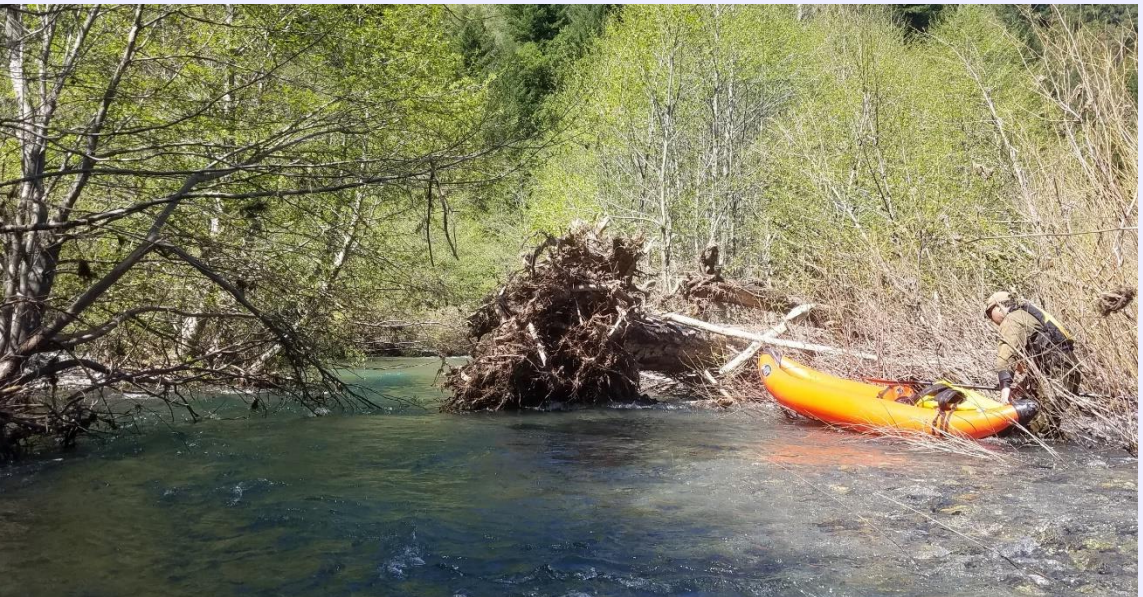

8,100 cfs

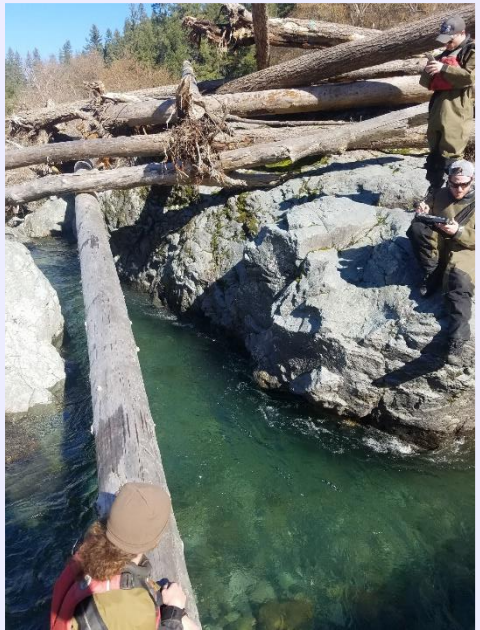

12,000 cfs

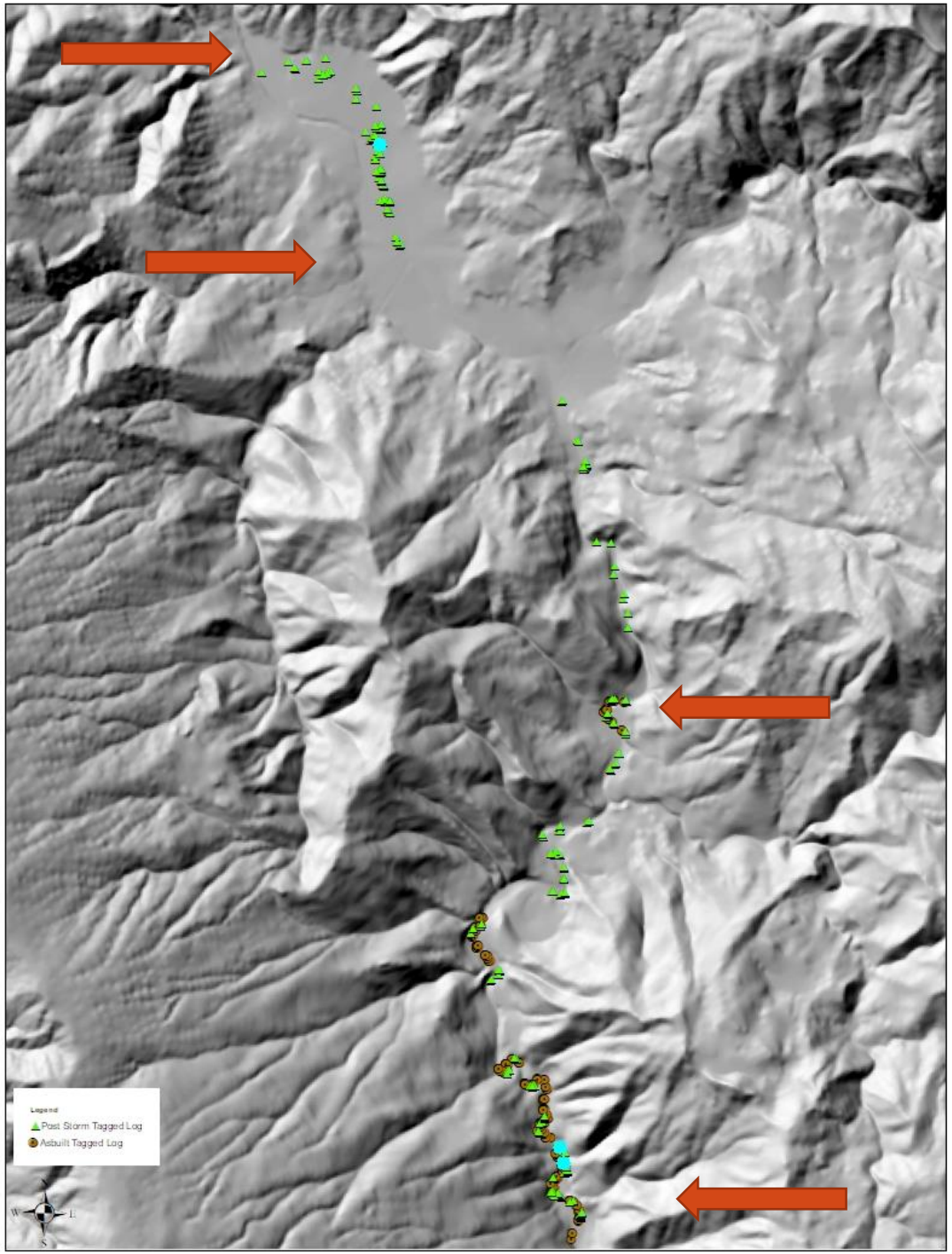

Post 54,000 cfs
Gone...
Panic?!

Rainbows and pots of gold

Some fascinating results of wild wood





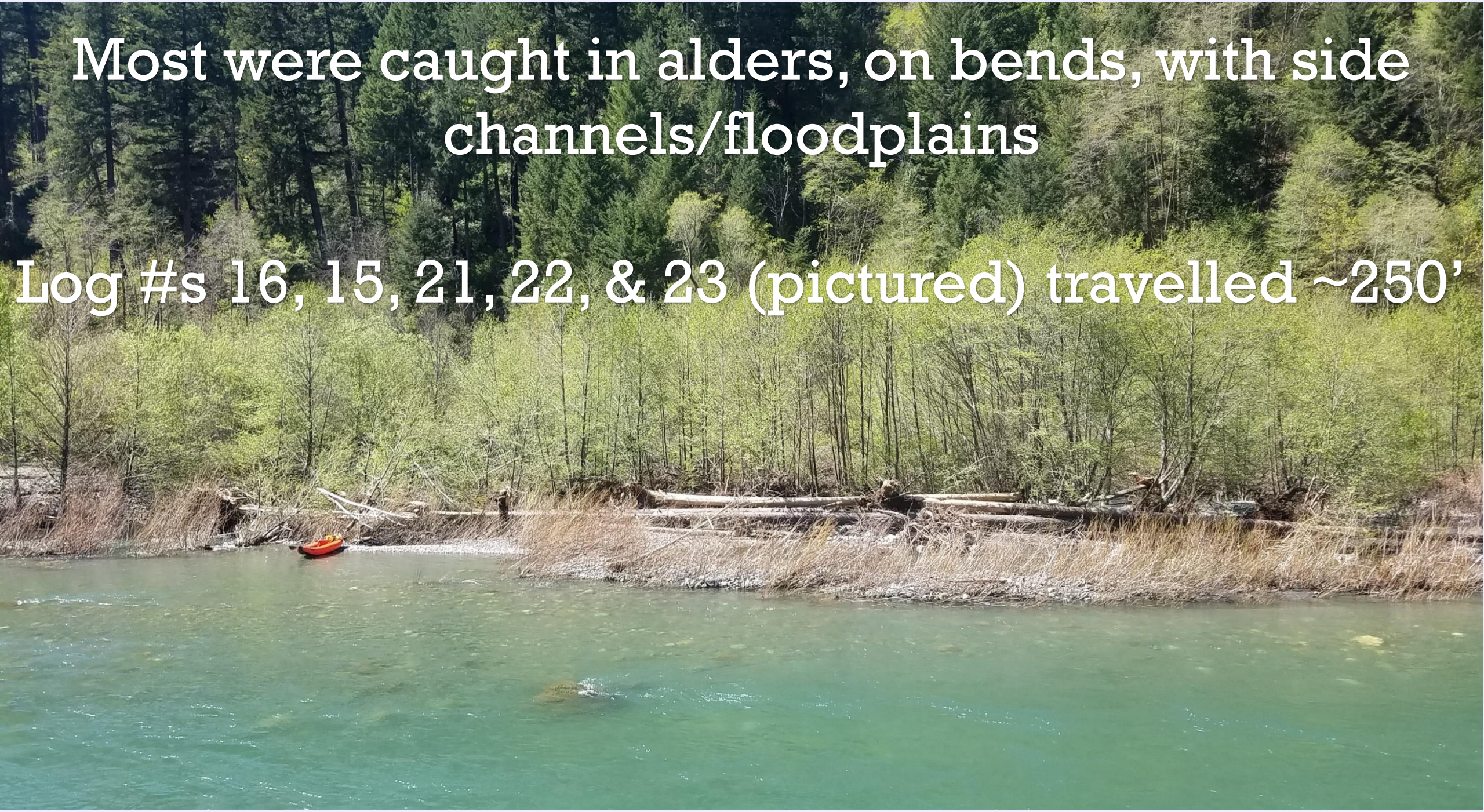


Some initial lessons learned:

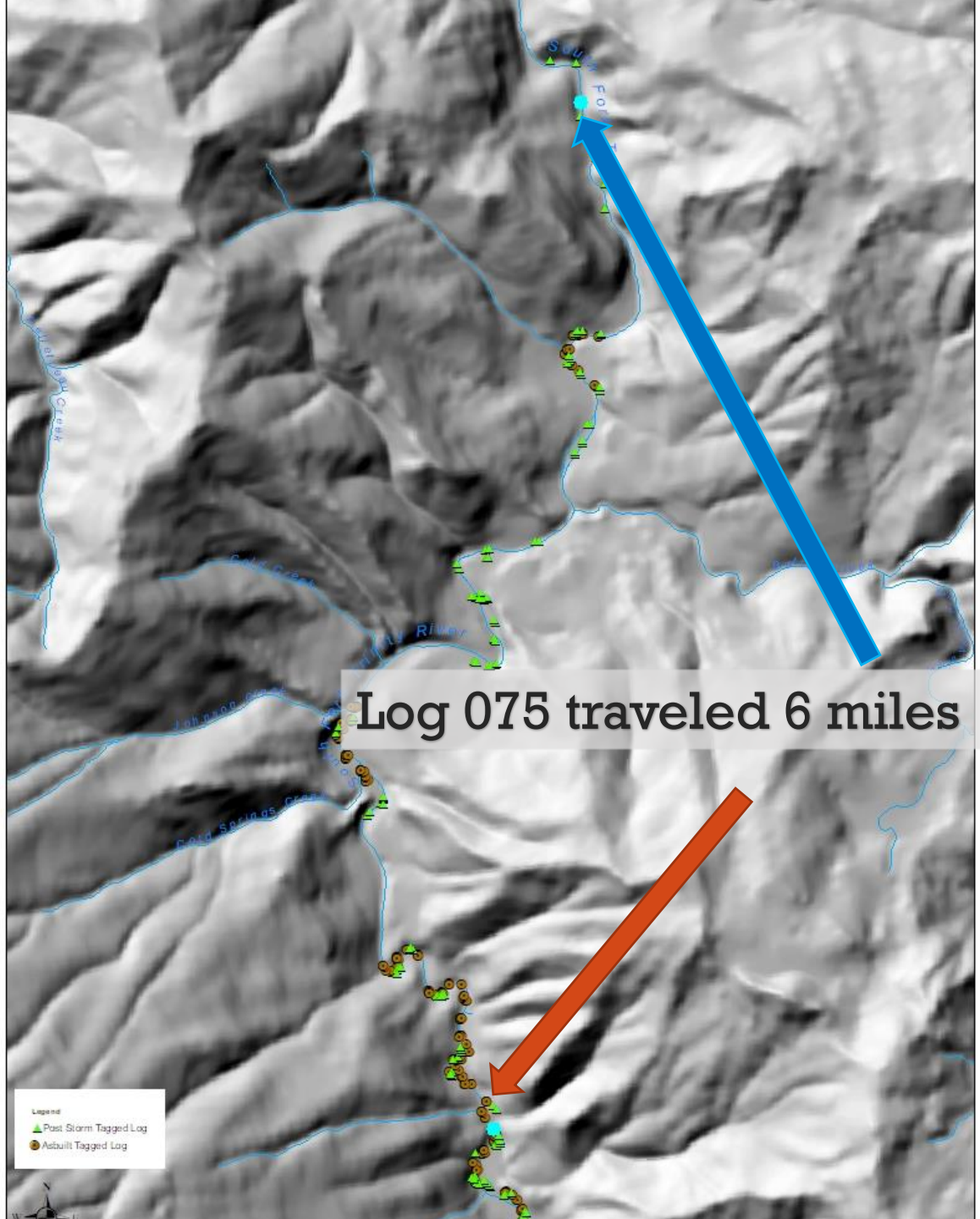
- Found 195 of 309 trees (63%)
  – did not search downstream of Hyampom
- 84 in project reach
- 99 in Hyampom reach
- Wood travelled – lots up to 15 miles and still is beneficial

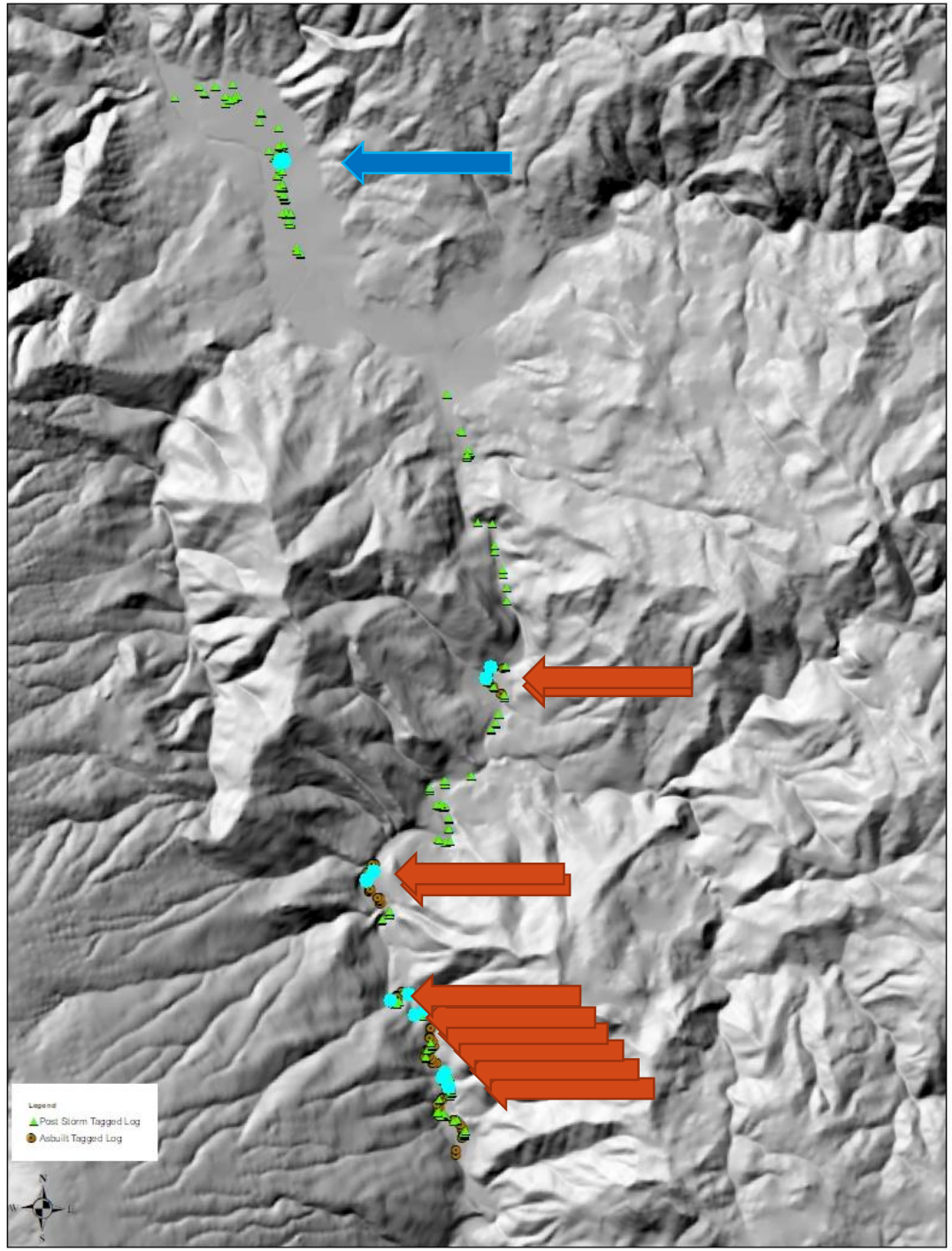

31 trees stayed within 200’ of placement location
Logs # 5, 7, 8, 9 & 11 (pictured) travelled ~50’


Logs # 29-31 barely moved
In a side channel with a huge floodplain


Most were caught in alders, on bends, with side channels/floodplains
Log #s 16, 15, 21, 22, & 23 (pictured) travelled ~250’

Tree Species Diversity: Oaks stayed in the water





These 14 logs moved 10+ miles and racked in this jam: 71, 77, 86, 88, 161, 176, 182, 188, 214, 157, 258, 270, 290 and 300


A large percentage of the wood in Hyampom was NOT tagged ~ helped accumulate natural wood jams.
This key log racked 25 trees.


Key log #115 racked 18 logs


8/17/2015
Scour
© 2020 Google
Lower South Fork Rd
Google E

Riparian Reveg

Wood poachers

Hyampom Geomorphic

Conclusions:

- We are still learning (check-in again in another 10 years)
  - Lots of good work happened before wood floated
  - Geomorphic analysis in the works
- Oak stays wet, madrone splinters, fir is great but floats, pine is fine, the more complex (branchy, split stem, etc.) the better
- Unexpected benefits of racked wood: scour, riparian protection/enhancement, and habitat improvements
- Even more good work will occur with "naturally placed" wood as it interacts with the river in future

<u>Wood is good, rivers know what to do with it.</u>

You can help

THANK YOU

THE WATERSHED CENTER
HAYFORK, CALIFORNIA

QUESTIONS?