



2nd Steelhead Summit

October 27 & 28, 2016 in San Luis Obispo, CA

+ Session Overview

- Sponsors:
 - California Trout
 - City of San Luis Obispo
 - Sustainable Conservation
 - California Conservation Corps
 - Cachuma Operation and Maintenance Board
 - Wildnote

The year's Summit agenda highlighted adaptive genomic variation, steelhead recovery planning, coastal monitoring status reports, fish passage planning, and water conservation efforts.

The full-day symposium was followed by concurrent field tours to restoration sites that showcase fish passage improvements and water conservation projects.

+ Presentations

Instream Flow Needs for Improving for Steelhead Recovery Part 1

(Slide 4) Assessing Instream Flow Needs for Steelhead in Coastal California Creeks
Ethan Bell, Aquatic Ecologist, Stillwater Sciences

(Slide 38) Creative Water Transactions to Enhance Streamflow
Matt Clifford, JD, California Water Project, Trout Unlimited

Salmonid Restoration
Federation Steelhead
Summit
2016



ASSESSING INSTREAM FLOW NEEDS FOR STEELHEAD IN COASTAL CALIFORNIA

Ethan Bell



Stillwater Sciences

INTRODUCTION

- Central California is experiencing prolonged, extreme, drought.
- Interest in protecting and enhancing instream flows for coastal steelhead populations.
- Our *goal* is to identify watershed-specific flow requirements for steelhead.



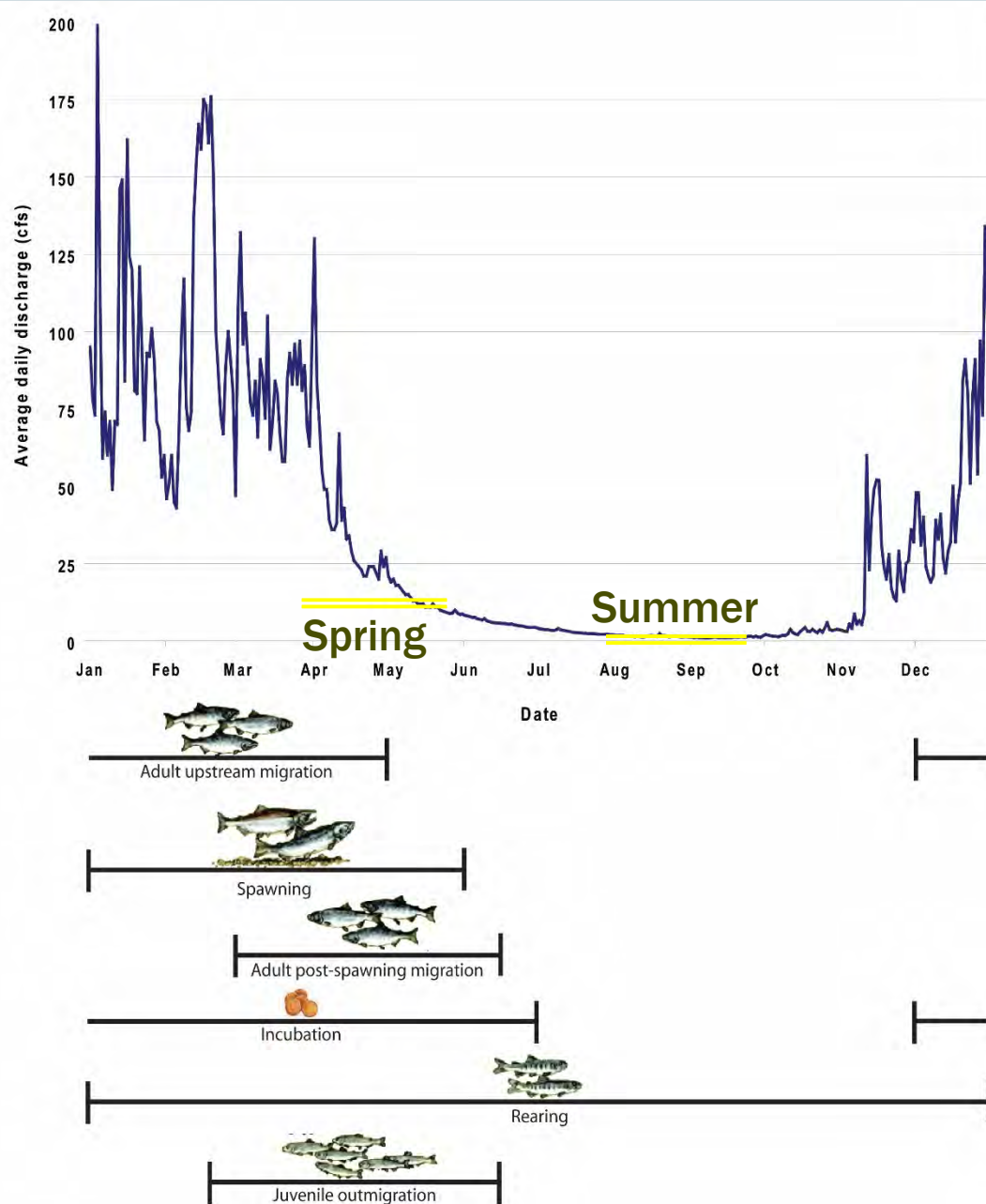
APPROACH

1. Develop appropriate metrics to measure flow requirements for steelhead
2. Implement methods to estimate flow requirements
 1. CDFW Critical Riffle SOP
 2. PHABSIM
 3. Habitat Criteria Mapping
 4. Regional methods



MEASURABLE METRICS

- Steelhead biology
 - Minimum flows to grow in spring
 - Minimum flows to survive in summer
 - Fish migration during winter and spring
- Water Depth
- Water Velocity



Methods -Fish Passage-

CDFW Critical Riffle SOP

Transect

- Adult >0.7 ft deep
- Juv >0.3 ft deep
- >25% of total width
- >10% of the continuous width

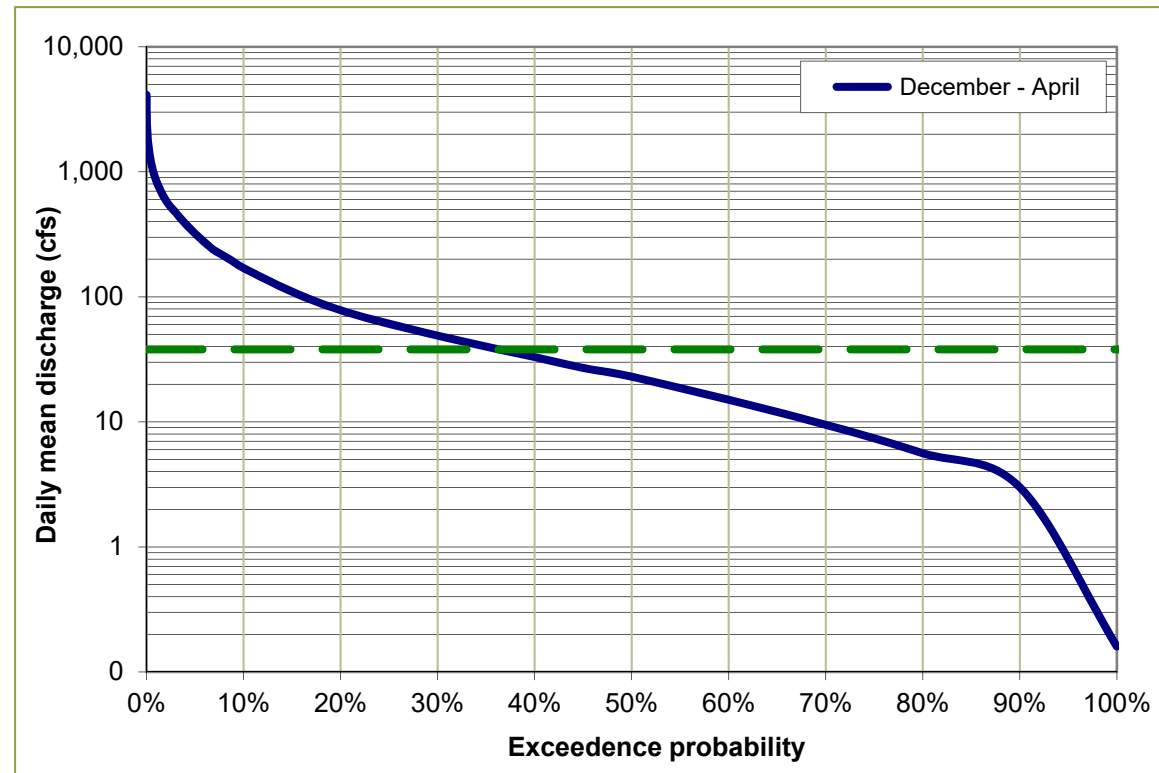
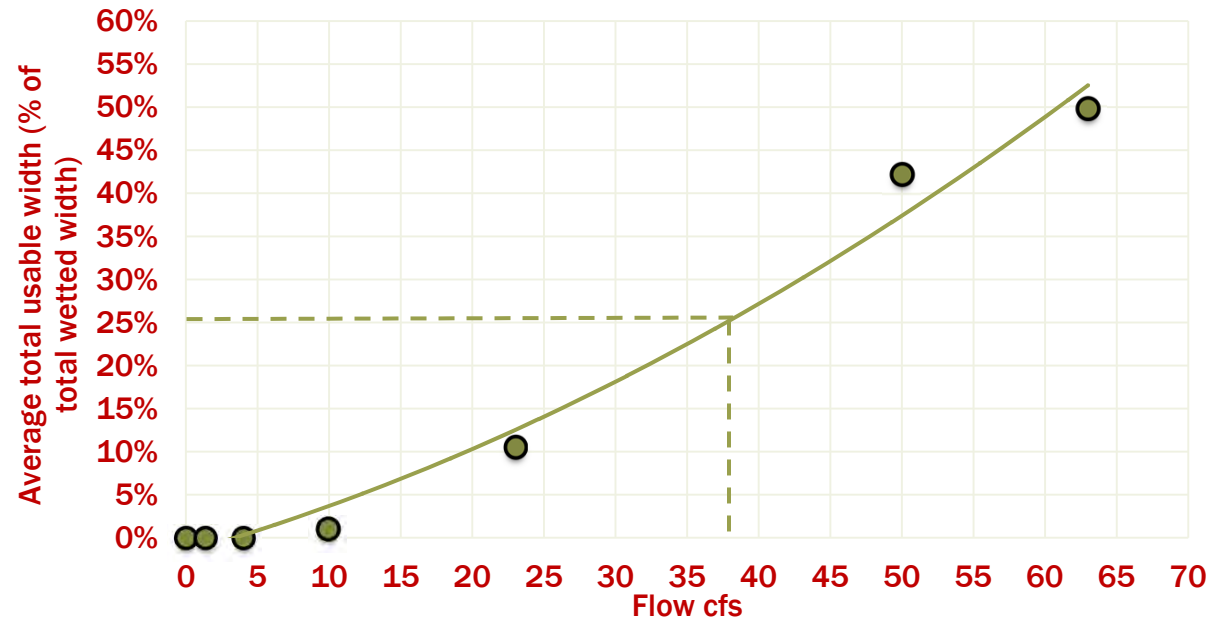


Methods -Fish Passage-

CDFW Critical Riffle SOP

Transect

- Adult >0.7 ft deep
- Juv >0.3 ft deep
- >25% of total width
- >10% of the continuous width



Methods -Fish Passage-

Obstacle assessment

CDFW guideline

“depth of a pool > 1.25
times jump height”



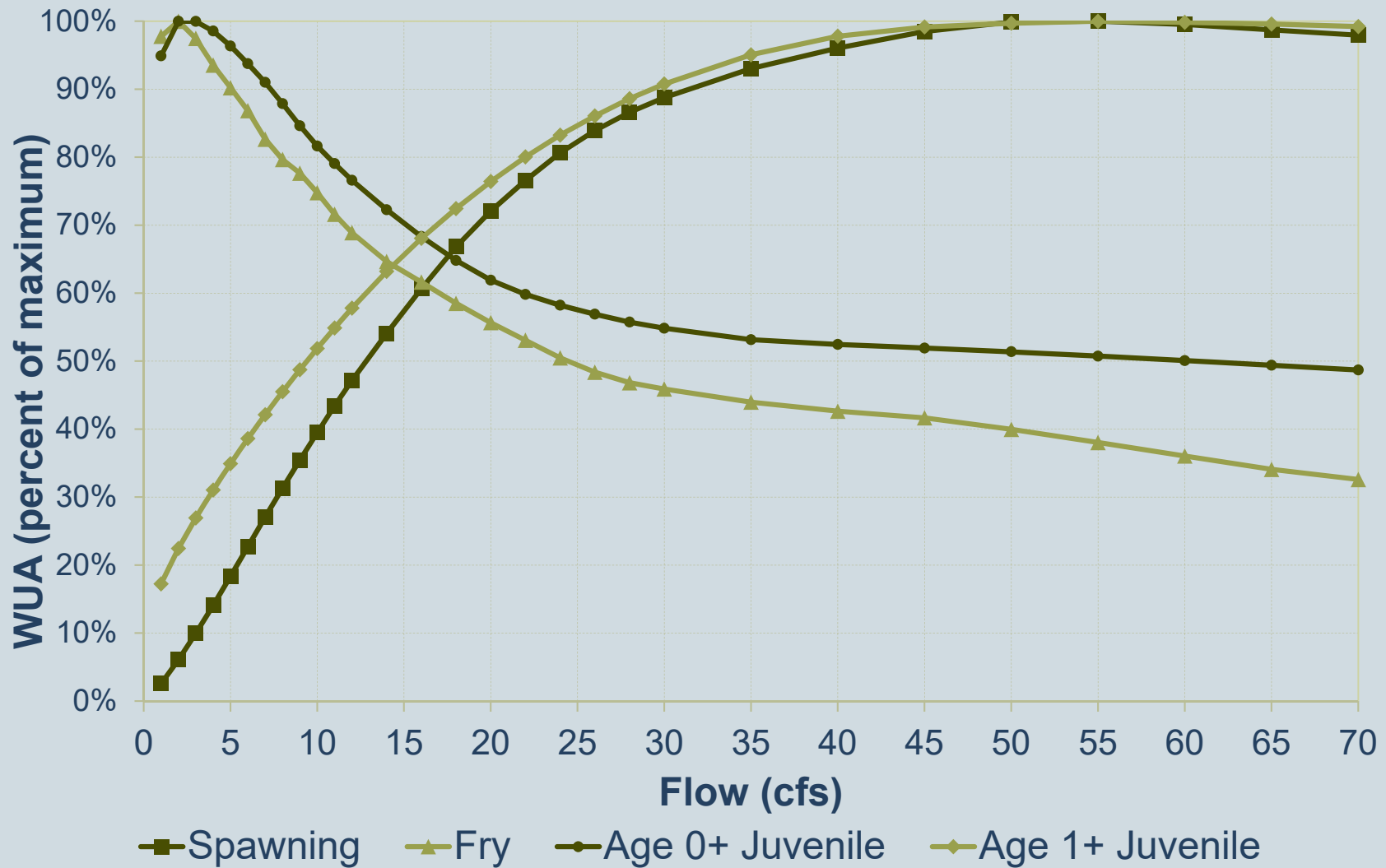
PHABSIM

Physical Habitat Simulation Modeling

- Study Sites
- Transect selection
- Hydraulic data
- Calibration flows
- Habitat Suitability Criteria (HSC)



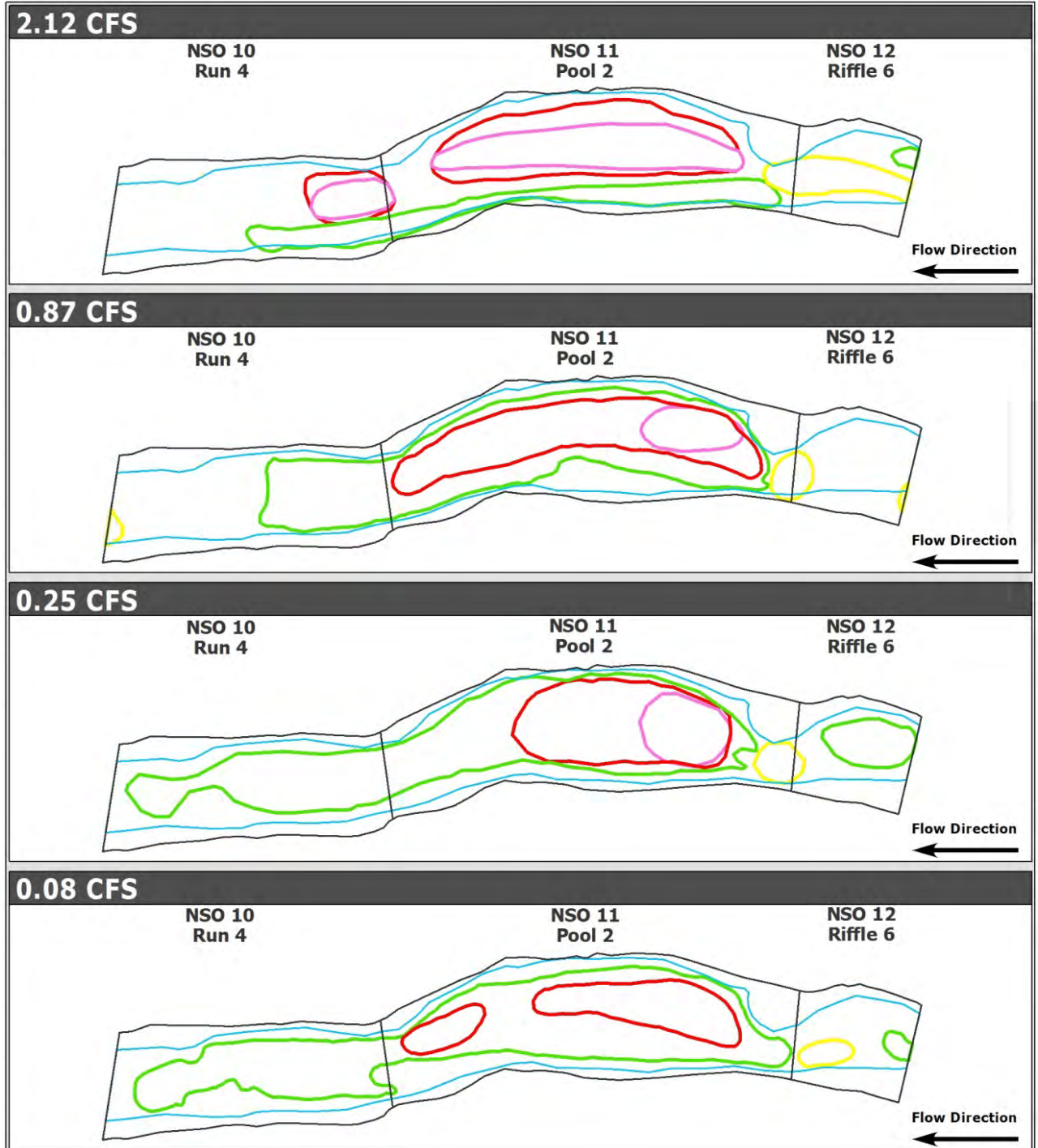
PHABSIM



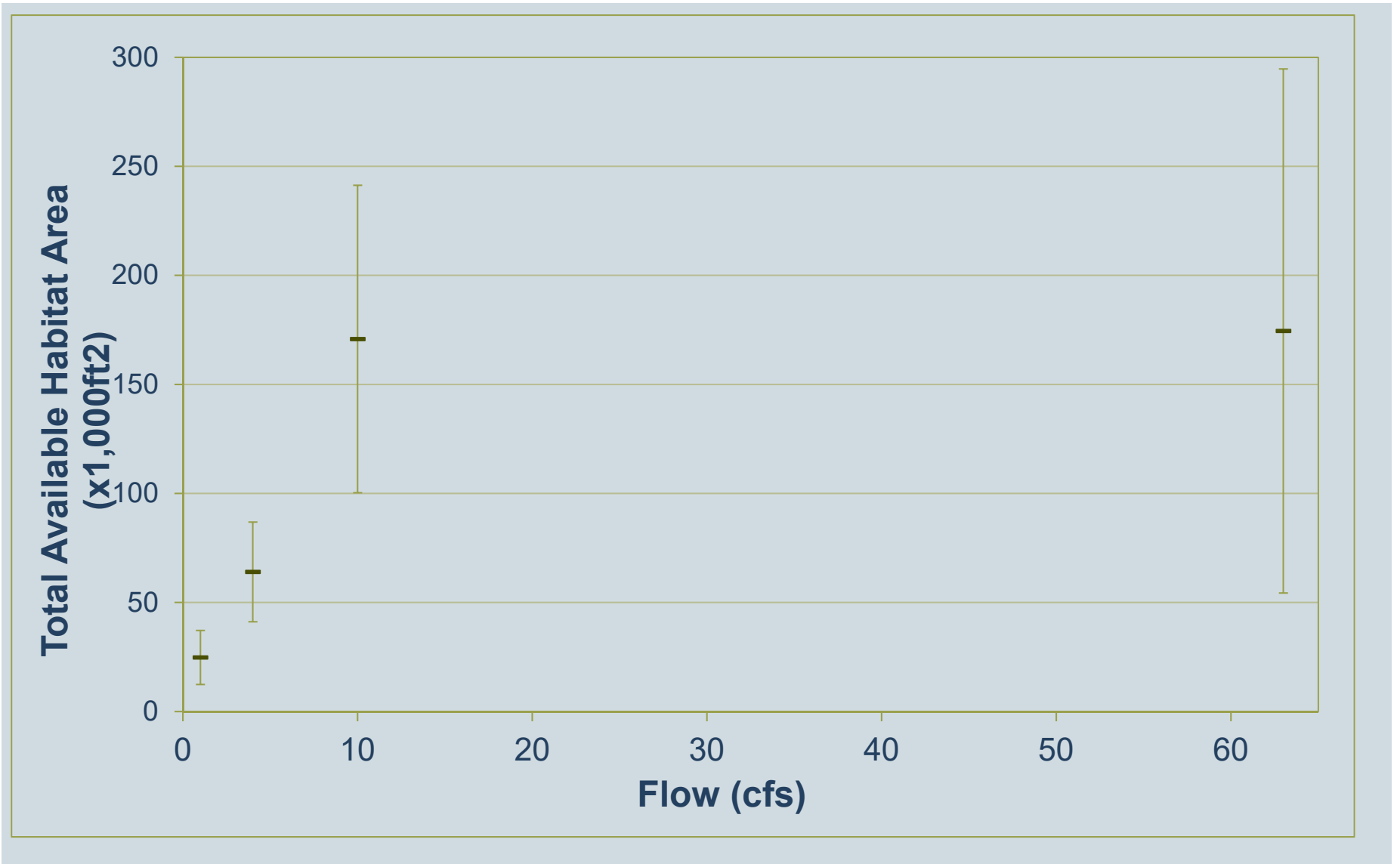
Habitat Criteria Mapping (HCM)

- Study sites
- Flow selection
- Habitat Suitability Criteria
- Habitat mapping

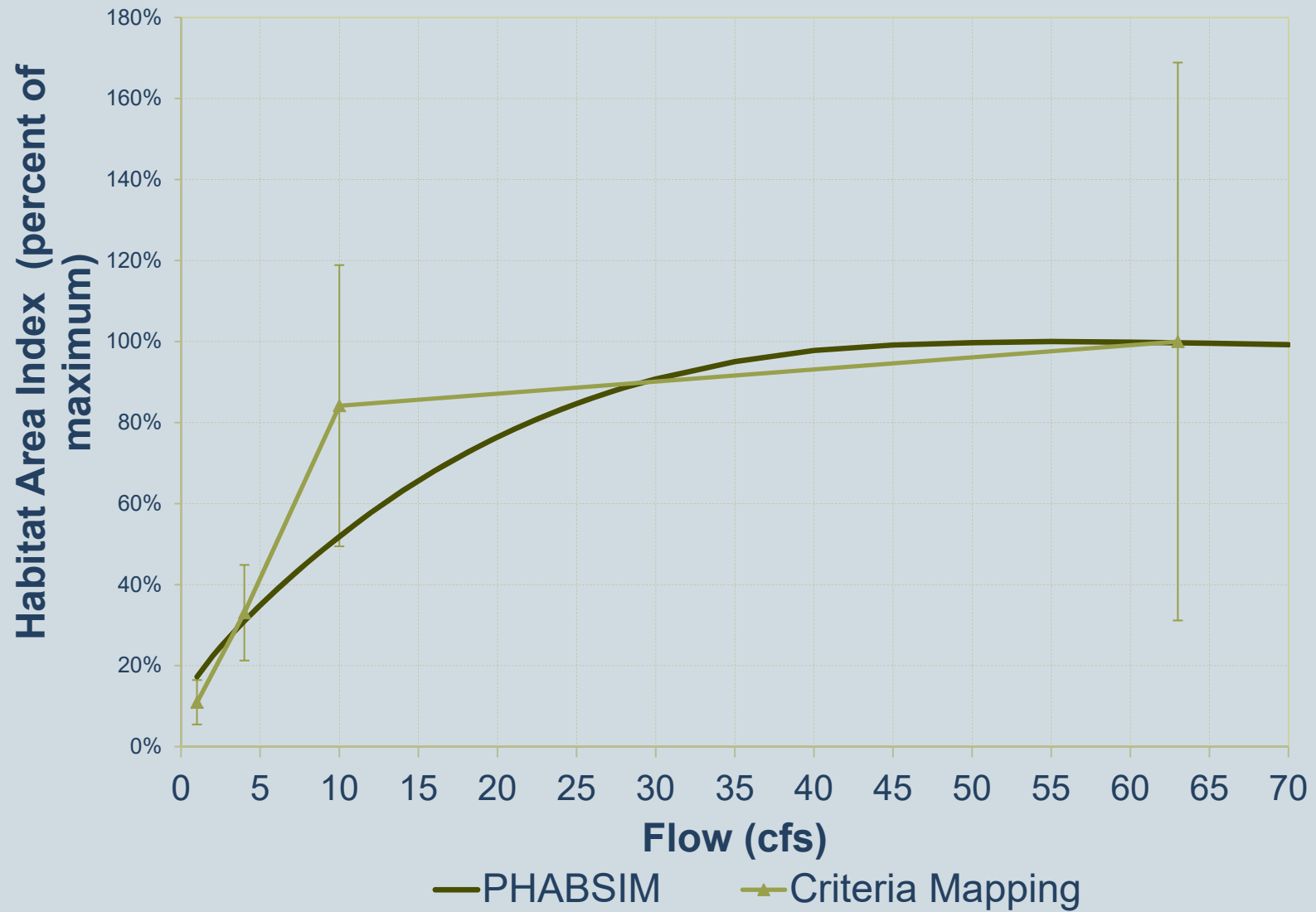
- Age 1+ spring
- Age 1+ summer
- Macroinvertebrate
- Age 0+



HABITAT CRITERIA MAPPING



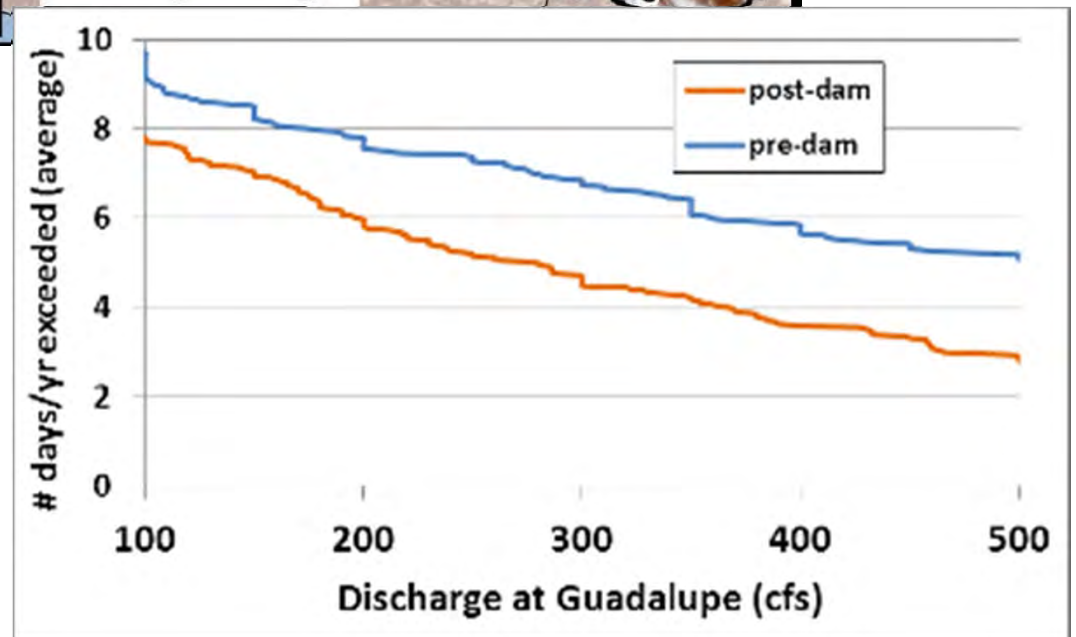
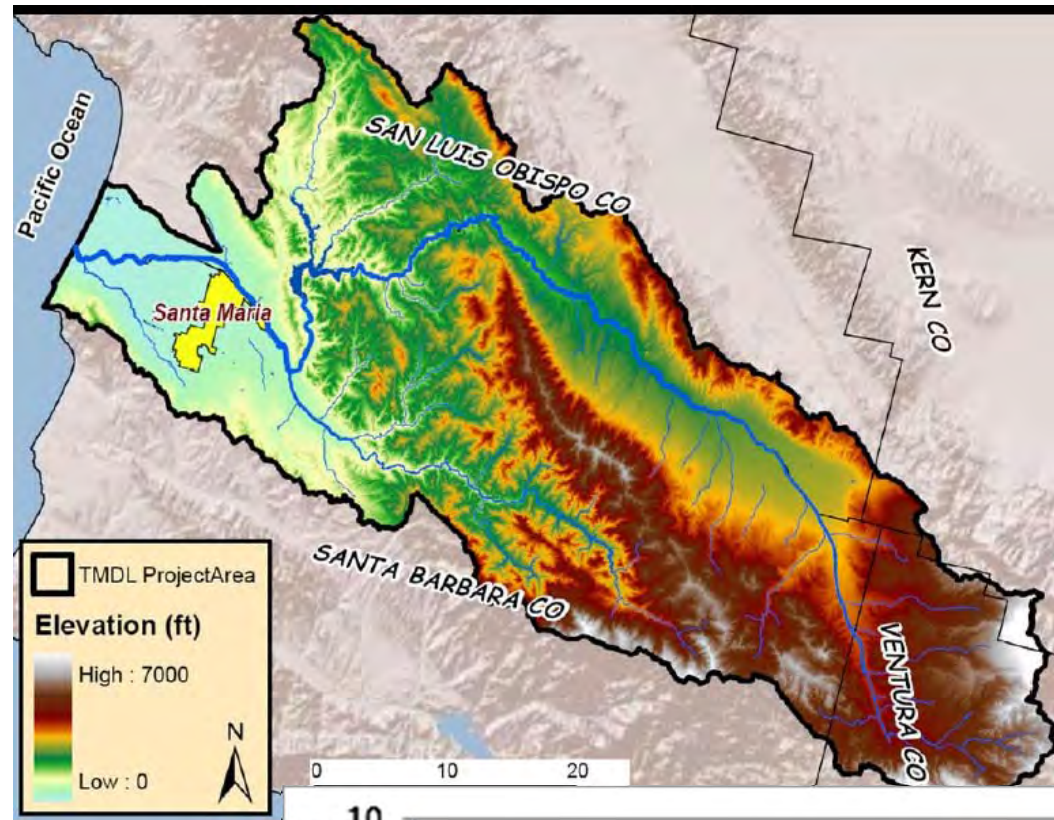
PHABSIM AND HCM



Santa Maria River

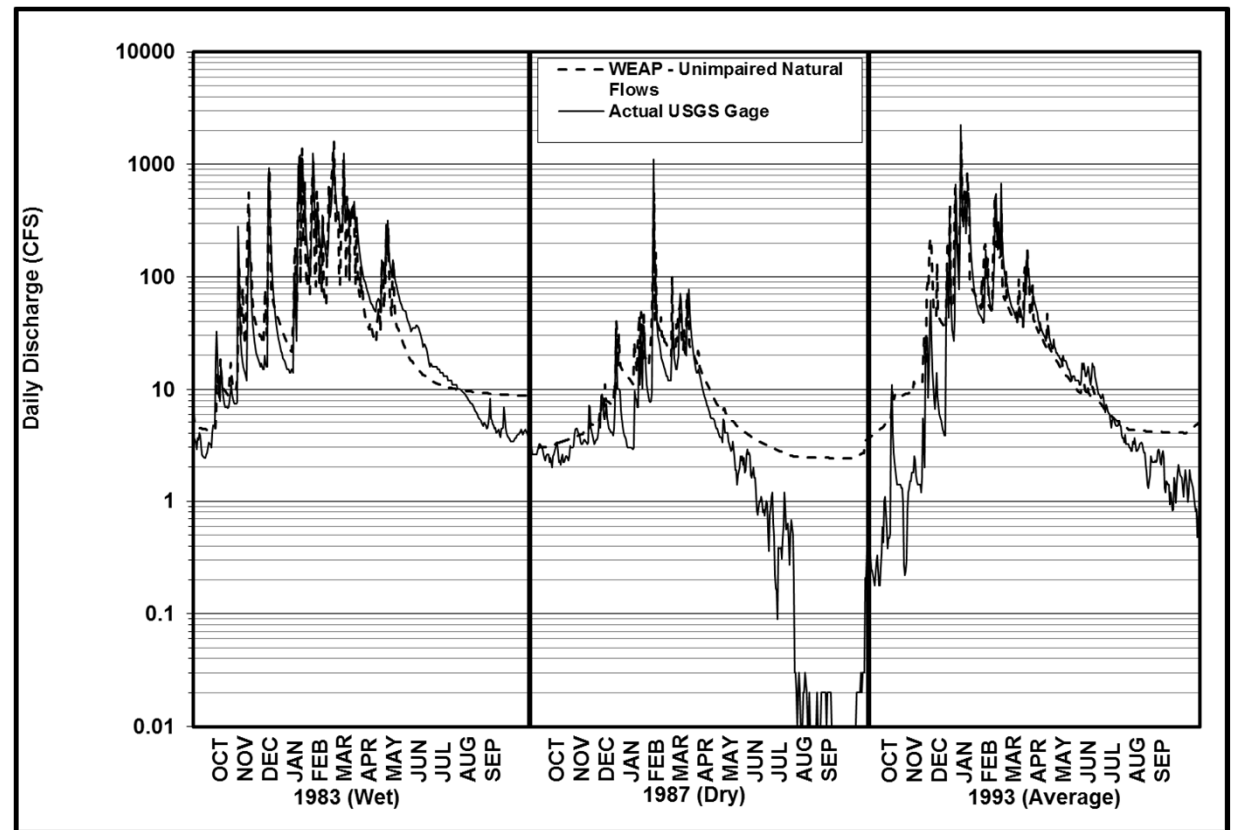
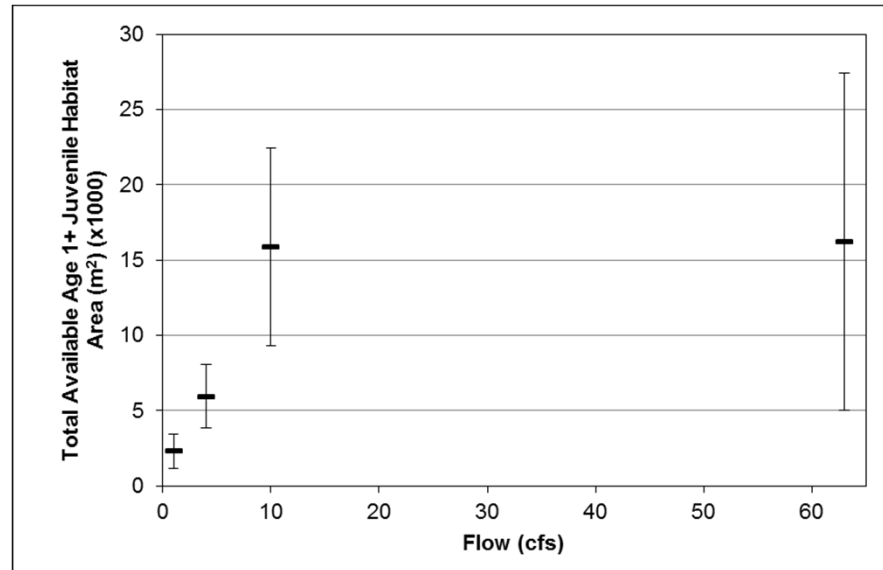
Upstream passage events one or two years per decade

Downstream steelhead passage about one-half of all years



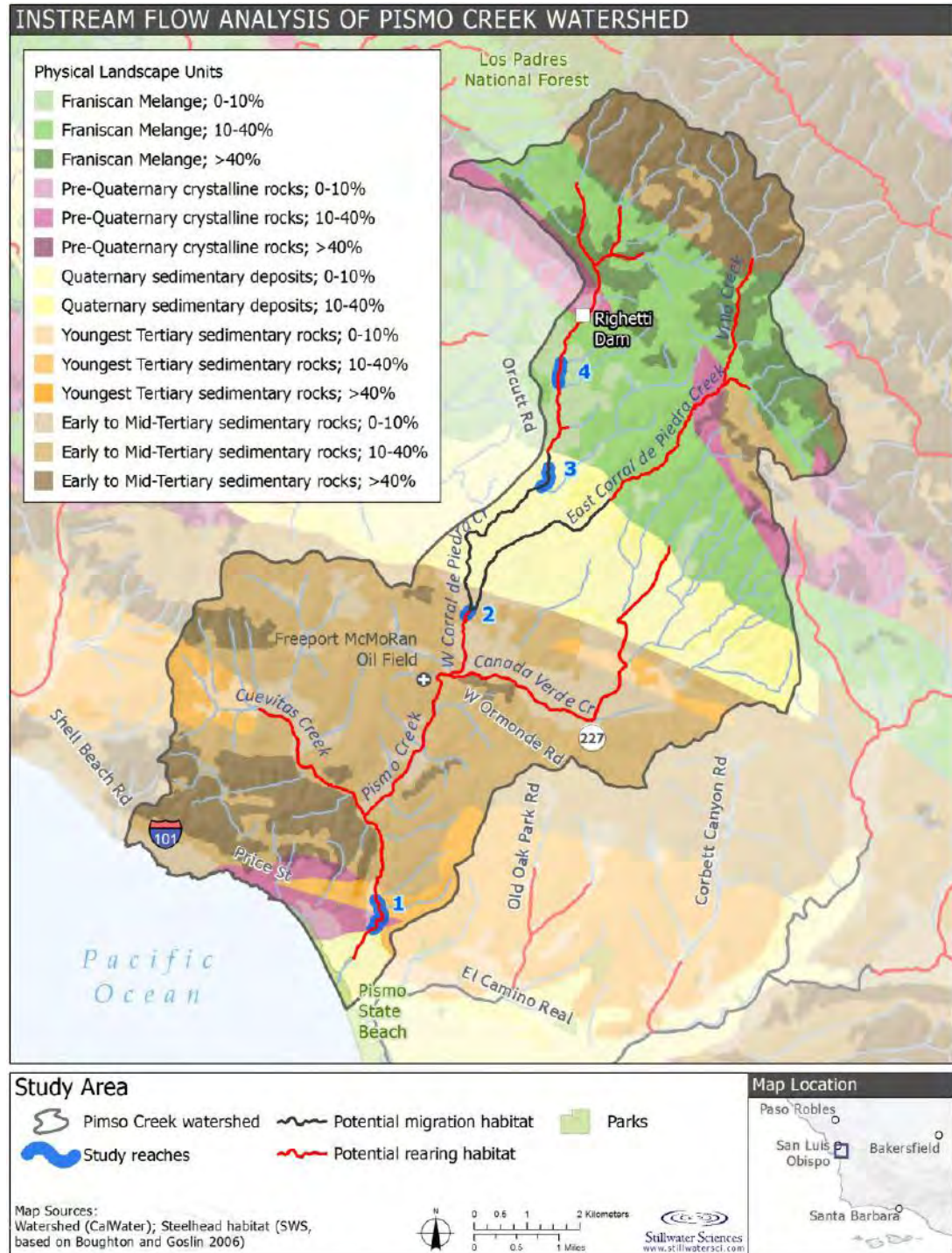
San Gregorio Creek

- Age 1+ steelhead rearing habitat during summer.



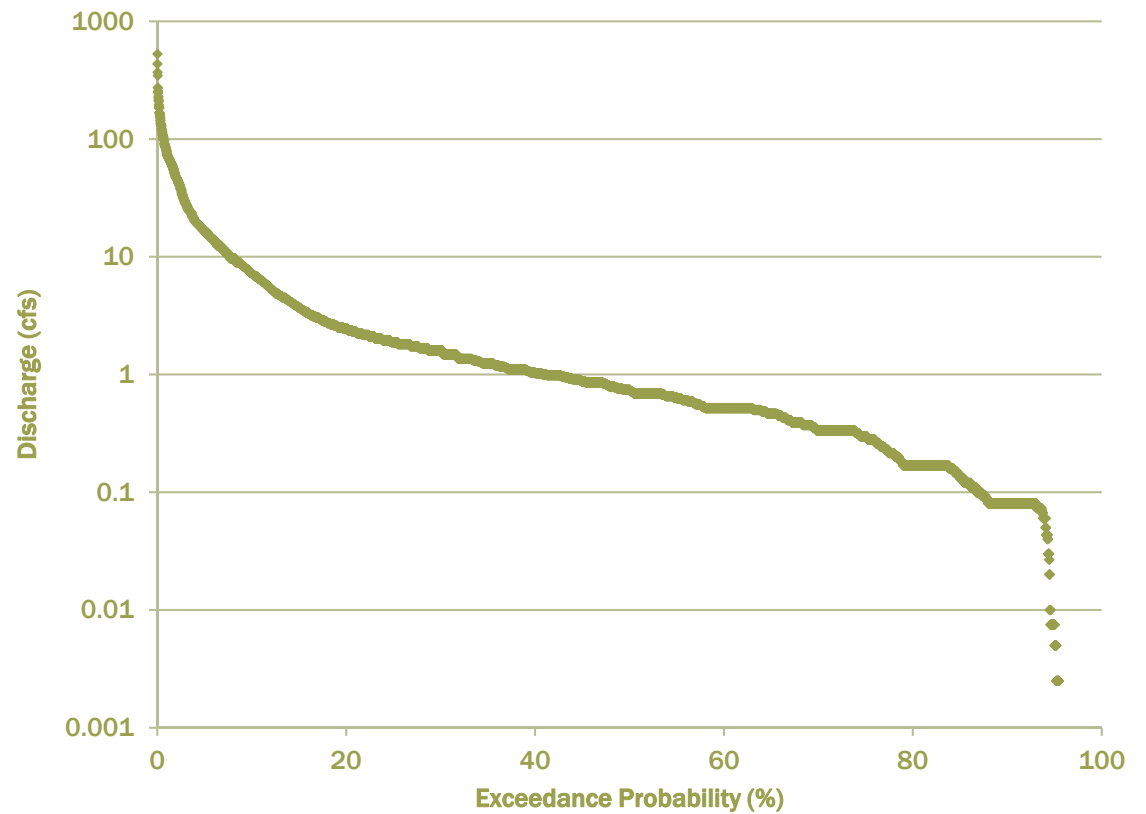
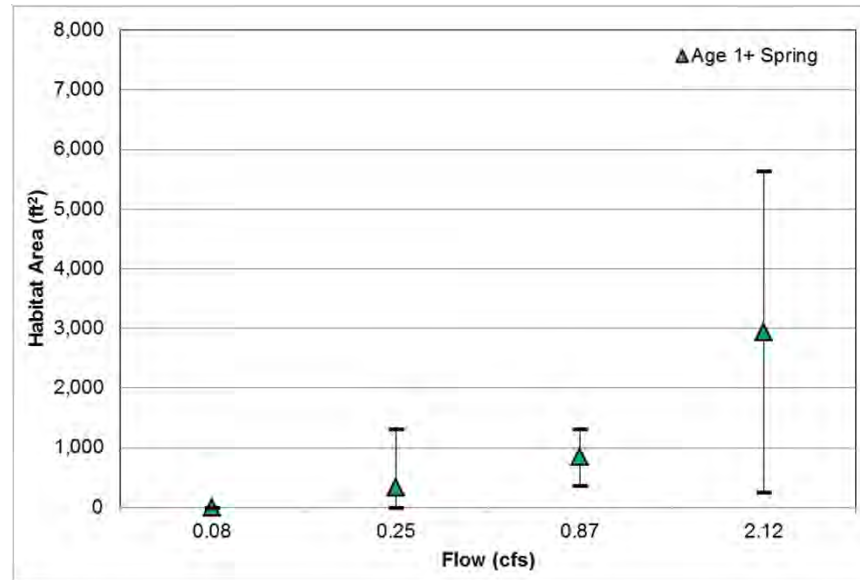
Pismo Creek

- Habitat segregation
- Fish Passage
- Age 1+ steelhead rearing habitat during spring



Goleta Slough Tributaries

- Fish passage obstacles
- Age 1+ spring



SUMMARY

- CDFW fish passage SOP works well.
- HCM works well and is consistent with PHABSIM.
- In small coastal streams, a little bit of water can be sufficient to provide suitable habitat.
- A little bit of water is hard to find in many streams.
- Age 1+ juveniles most sensitive life-stage.
- Fish passage and instream flows are related.



NEXT STEPS

- Instream flows support additional environmental factors
 - Geomorphic function
 - Lagoon habitat
 - Other species, including tidewater goby
- Water temperature



ACKNOWLEDGEMENTS

Coastal San Luis Resource Conservation District, Upper Salinas-Las Tablas Resource Conservation District, San Luis Obispo County, David Boughton (National Marine Fisheries Service), Central Coast Salmon Enhancement, Department of Water Resources, the Integrated Regional Water Management program, California Department of Fish and Wildlife, Trout Unlimited, American Rivers, and San Mateo County Resource Conservation District.

Contact me at:

Ethan Bell

ethan@stillwatersci.com

805-570-7499



Full reports: www.stillwatersci.com/case_studies



Water Transactions to Enhance Instream Flow in Coastal California - Matt Clifford, Staff Attorney, Trout Unlimited



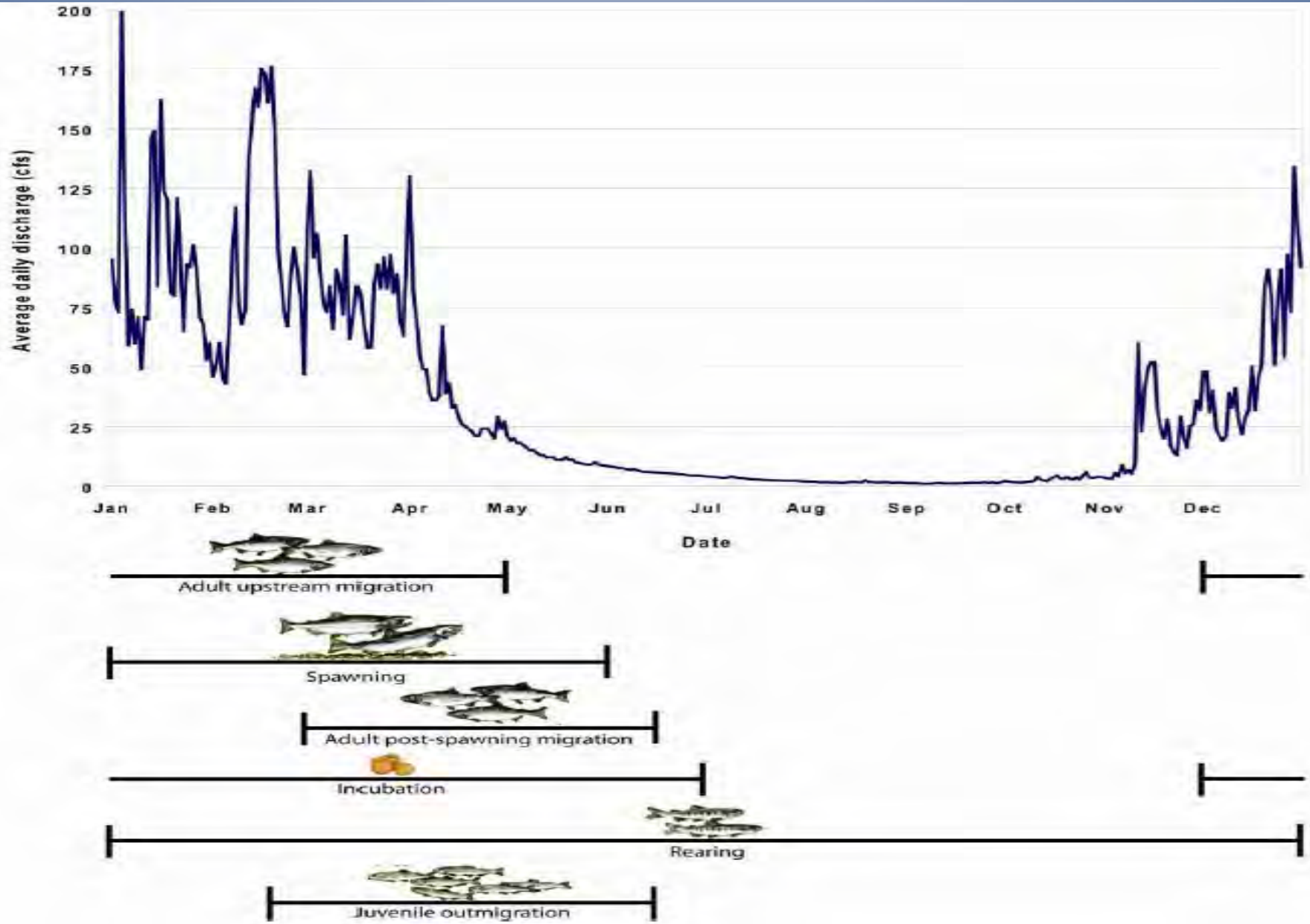
August 2009



January 2010

Water is locally-sourced





Project Elements:

- **Alternative source of water for dry season**
- **Incentive for water user to change water management**
- **Means of enforcing management changes**
- **Water rights and other permitting**
- **Funding**

Need to have:

- **alternative source of water** for dry season
- **incentive** for water user to **change** water management
- Means of **enforcing** management changes
- **water rights/ permitting**
- **Funding**



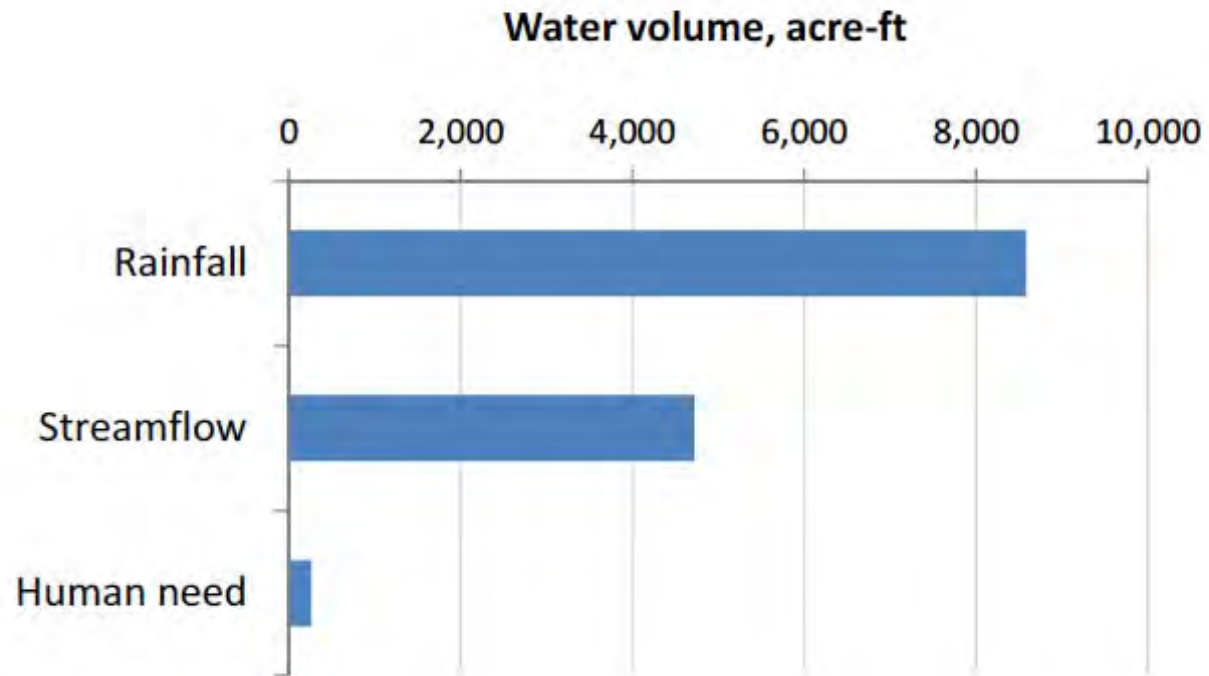


Figure 21. Comparison of average annual rainfall, streamflow, and human water need in the Grape Creek watershed

Storage



Other Sources of Dry Season Water

- Rainwater
- Groundwater
- Conservation/ Efficiency



Incentives

Why am I doing this?



A photograph of a stream with a green pipe discharging water into it. The pipe is positioned diagonally across the frame, with water flowing from its end into the stream. The stream is surrounded by rocks and some vegetation. The text "Water Rights Changes" is overlaid in large, bold, yellow letters across the center of the image.

Water Rights Changes

Grant Sources

An aerial photograph of a dense green forest. In the center, there is a circular area filled with light-colored gravel. To the right of this circle, there is a small, dark, rectangular structure, possibly a shed or a small building, partially obscured by trees. The surrounding forest is lush and green, with some brownish ground visible between the trees.

- Prop 1
- CA Dept. of Fish and Wildlife
- NOAA
- NRCS
- USFWS
- IRWMP
- NRCS (Farm Bill funds)
- Water Districts
- Coastal Conservancy
- Private foundations

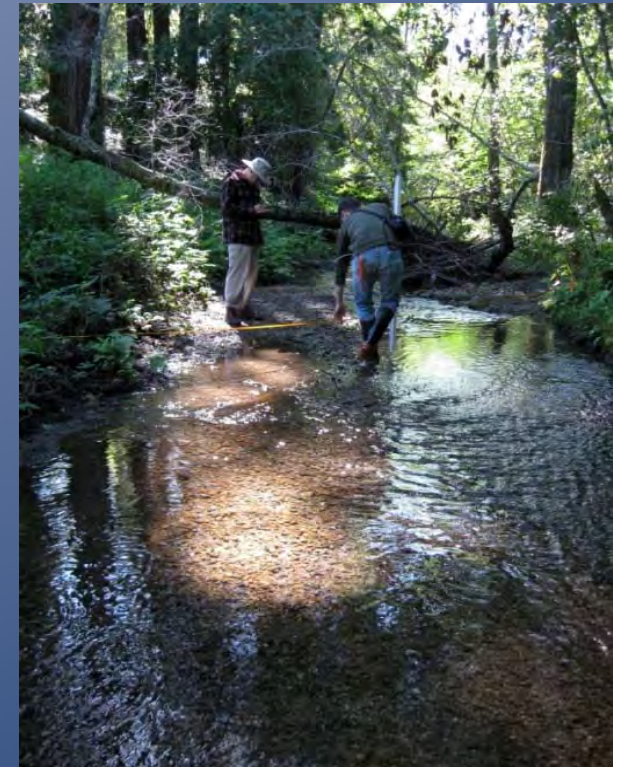


Sample Project – Little Arthur Creek

Series of residential tanks on key
Steelhead tributary of Upper Pajaro

Example – Pescadero/ San Gregorio Creeks

- Important steelhead/ coho tributaries on San Mateo Coast
- Water use dominated by a few large high-value farms





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