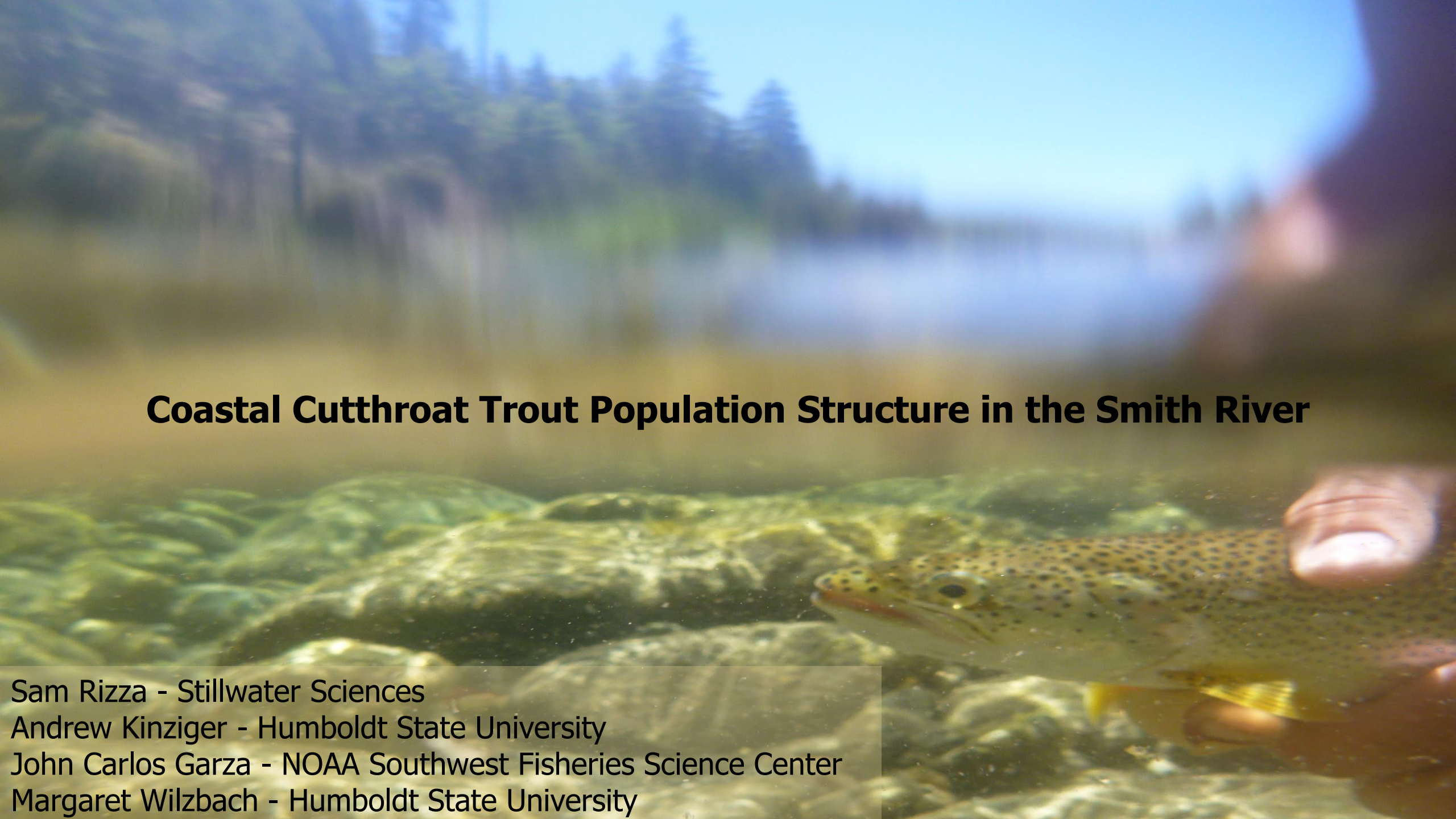


Coastal Cutthroat Trout Population Structure in the Smith River

Sam Rizza - Stillwater Sciences
Andrew Kinziger - Humboldt State University
John Carlos Garza - NOAA Southwest Fisheries Science Center
Margaret Wilzbach - Humboldt State University

What is Population Structure?

- Genetic drift
- Mutations
- Selection
- Gene flow

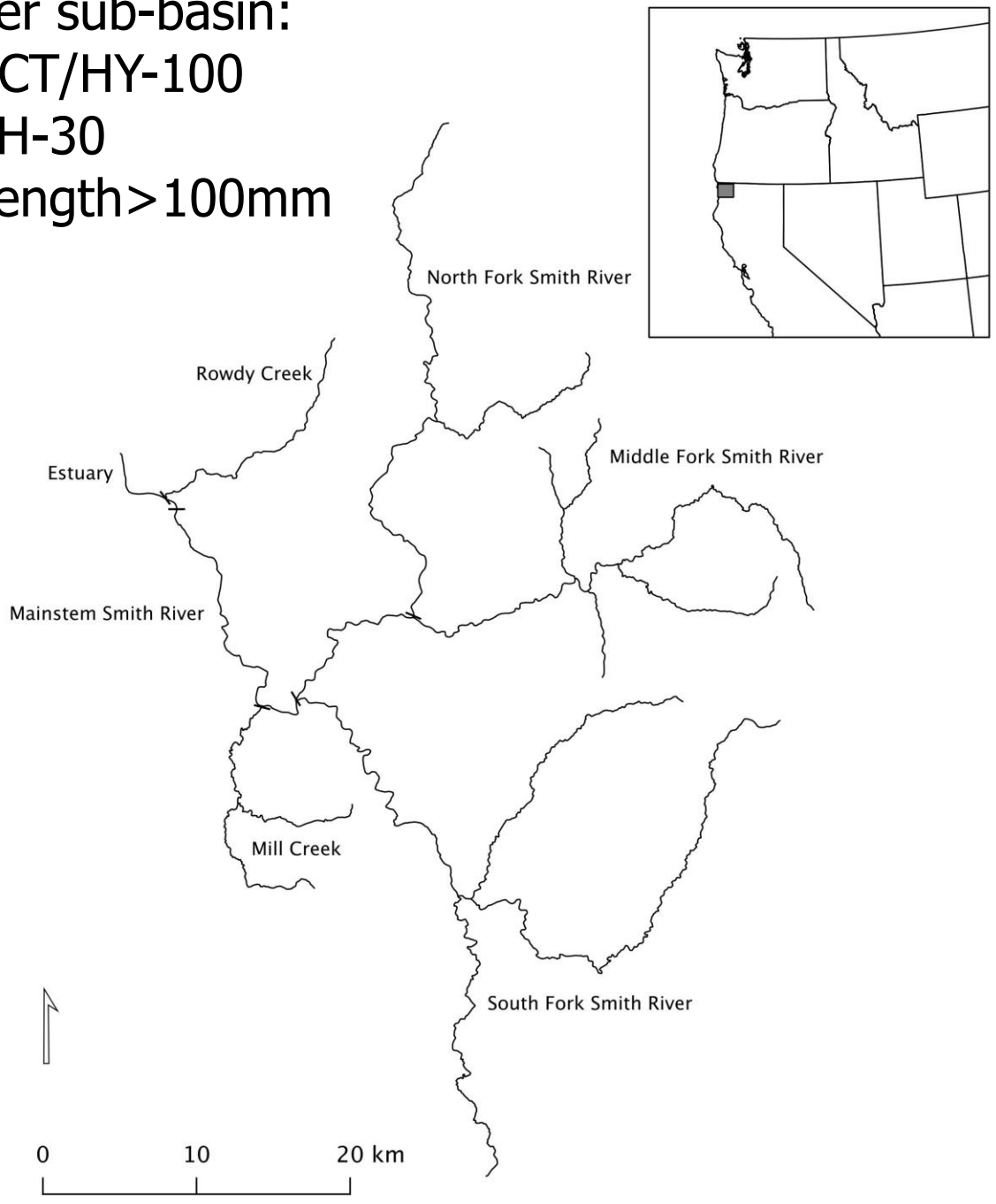
Landscape-scale evaluation of genetic structure among barrier-isolated populations of coastal cutthroat trout, *Oncorhynchus clarkii clarkii*

Troy J. Guy, Robert E. Gresswell, and Michael A. Banks

Genetic variation and effective population size in isolated populations of coastal cutthroat trout

Andrew R. Whiteley · Kim Hastings ·
John K. Wenburg · Chris A. Frissell ·
Jamie C. Martin · Fred W. Allendorf

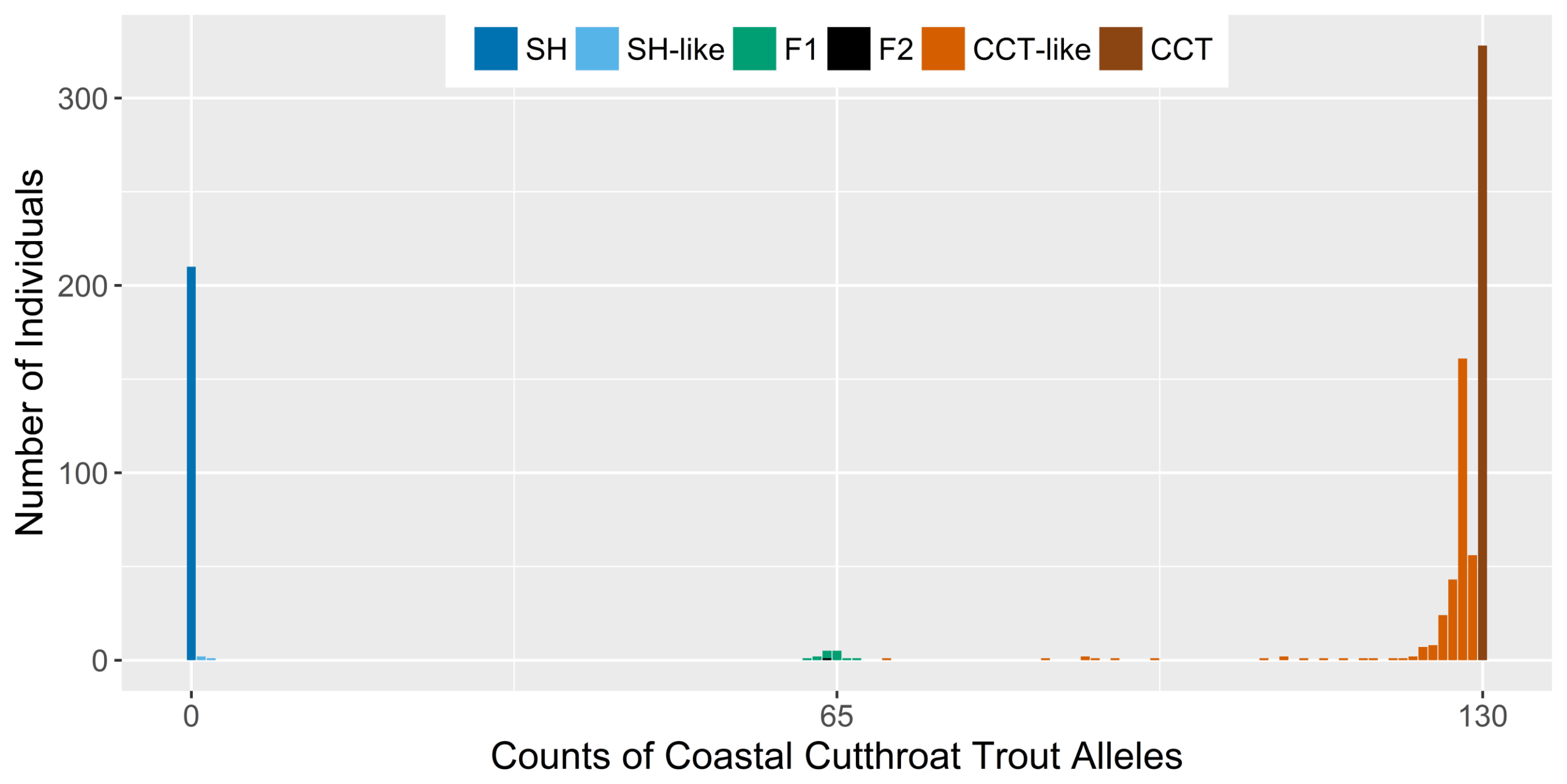
Per sub-basin:
CCT/HY-100
SH-30
Length>100mm



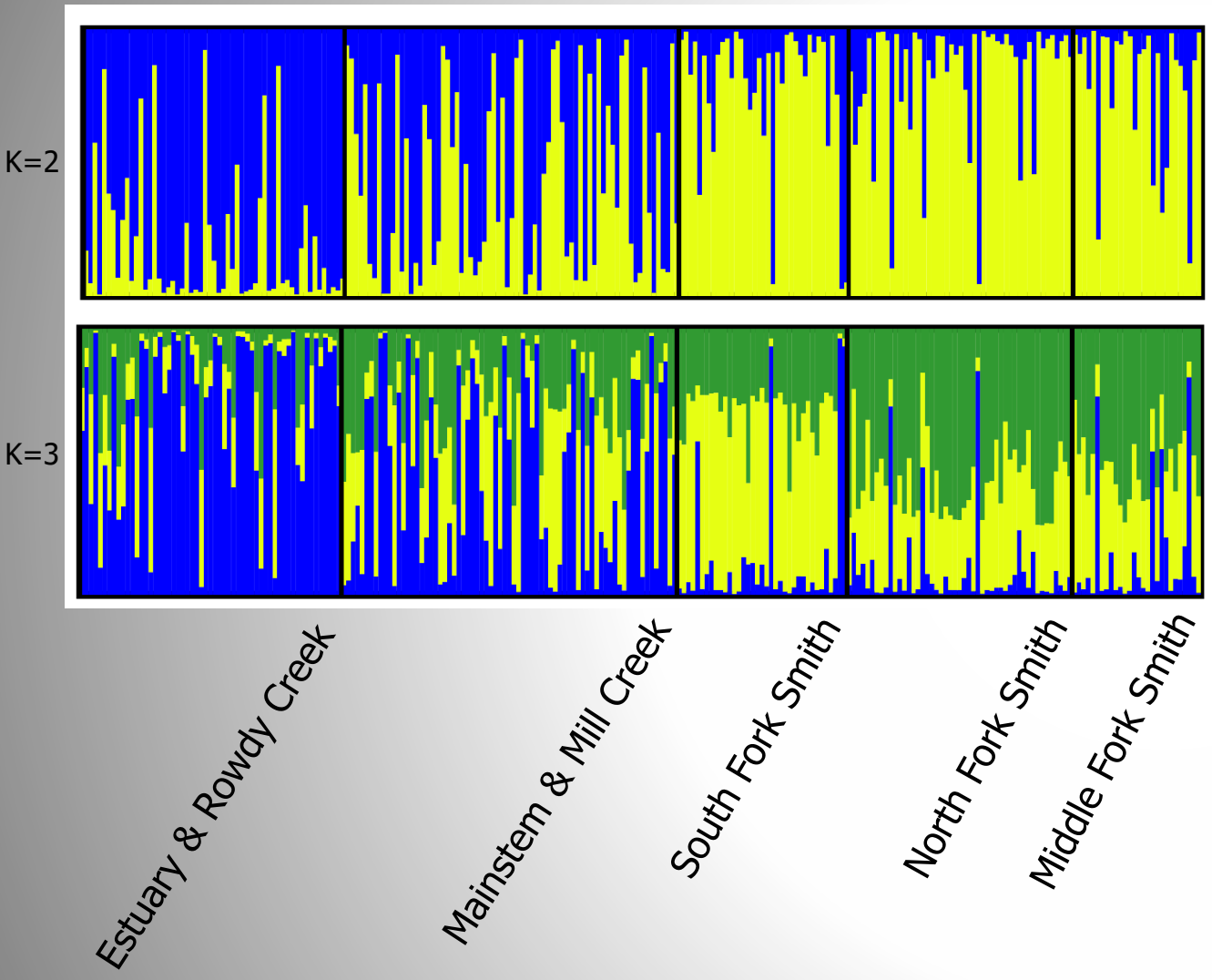
Field Methods

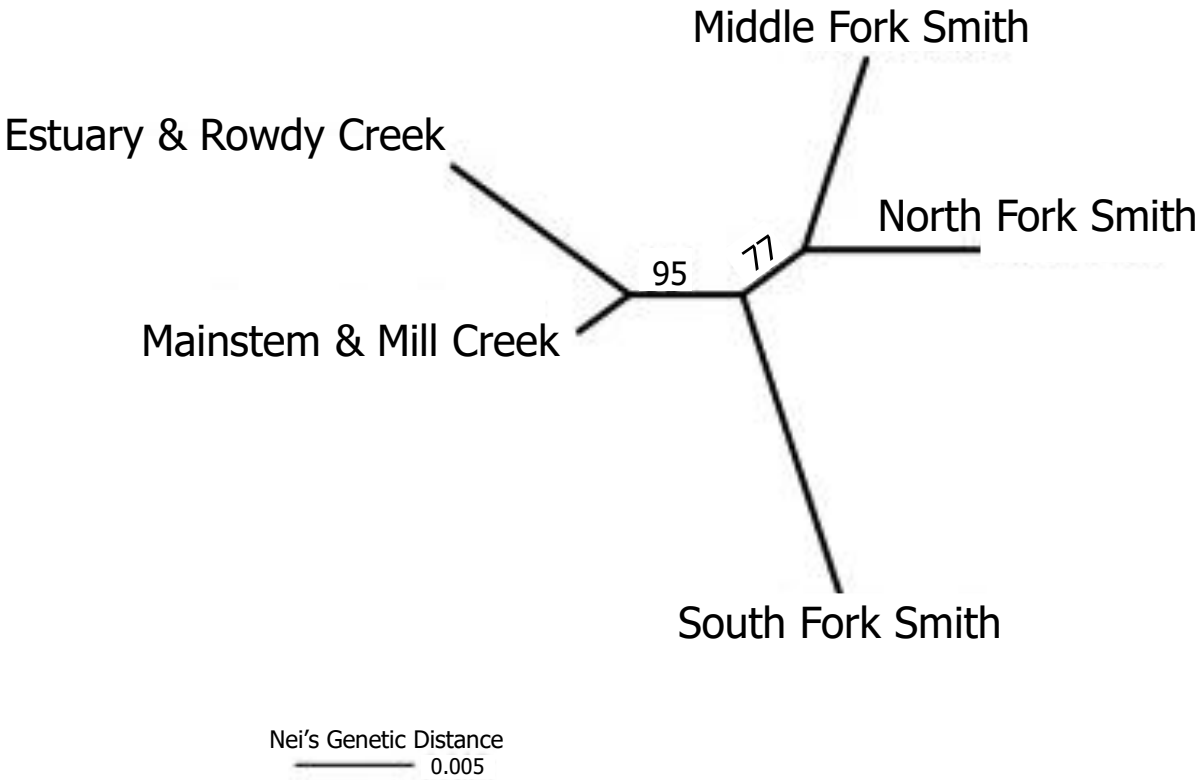
- 7 sub-basins
- Hook and line, weirs, electrofishing, and night netting
- 876 trout sampled

Coastal Cutthroat Trout Hybridization with Steelhead



Population Structure

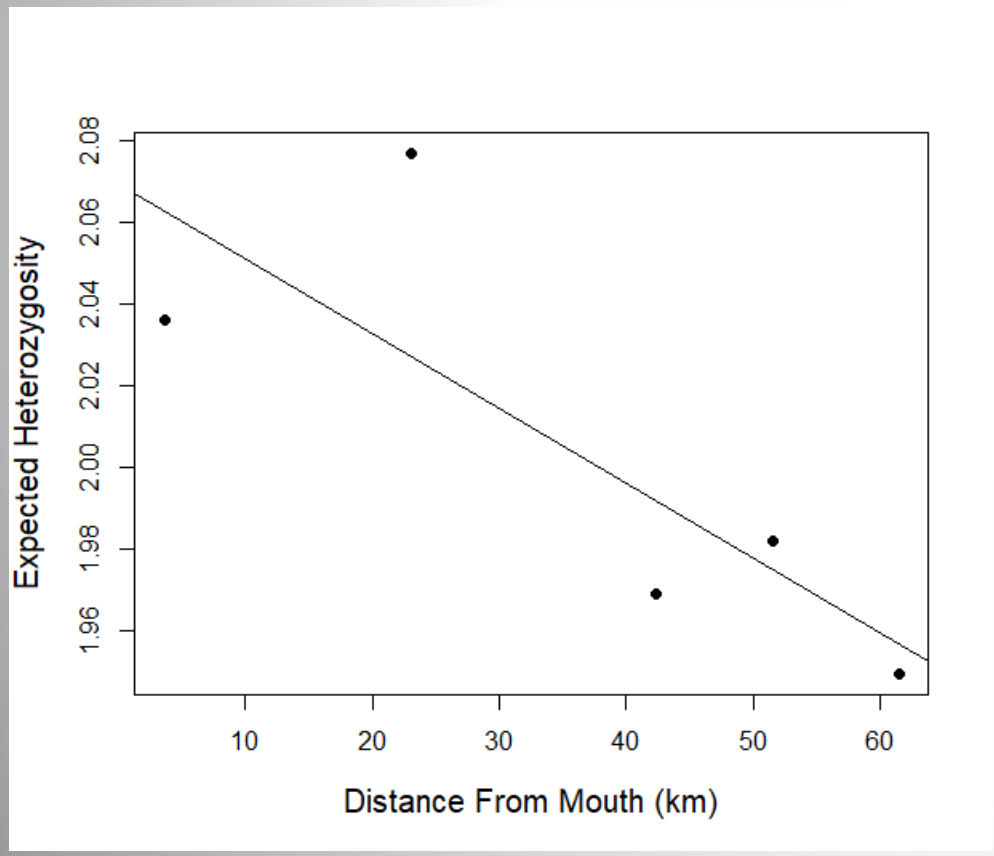


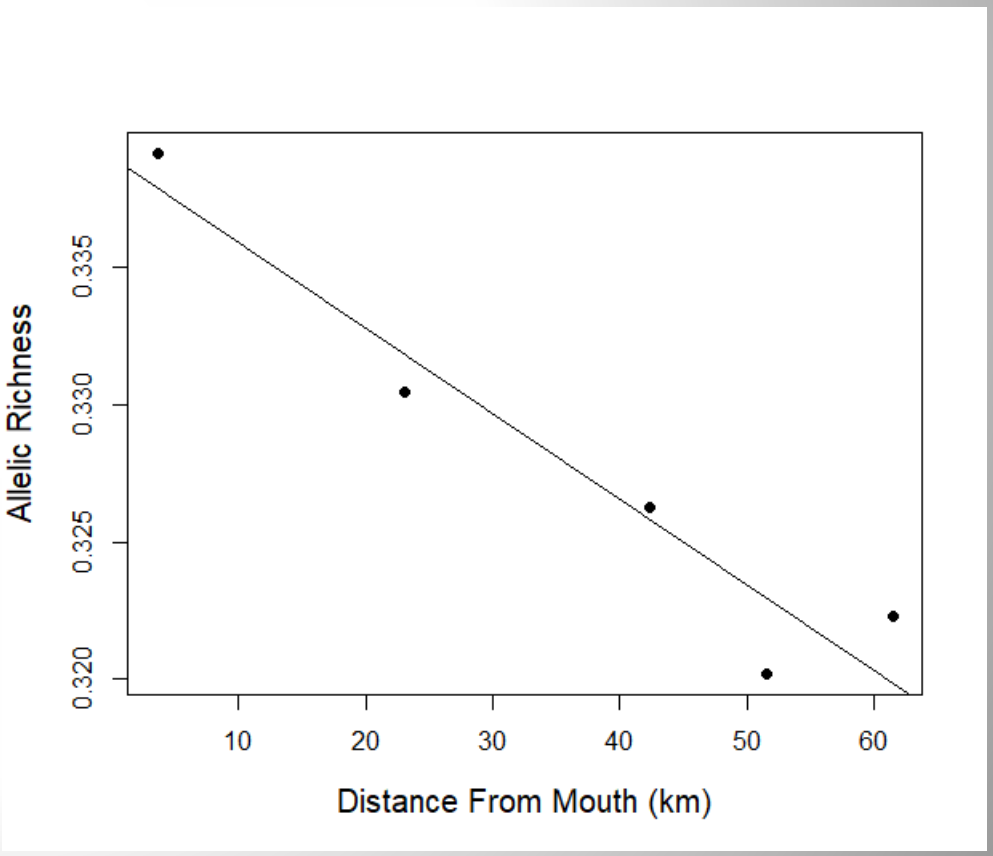


Downstream ← Upstream

Genetic Variation

- Upstream sample sites exhibit reduced genetic variation compared to downstream sites



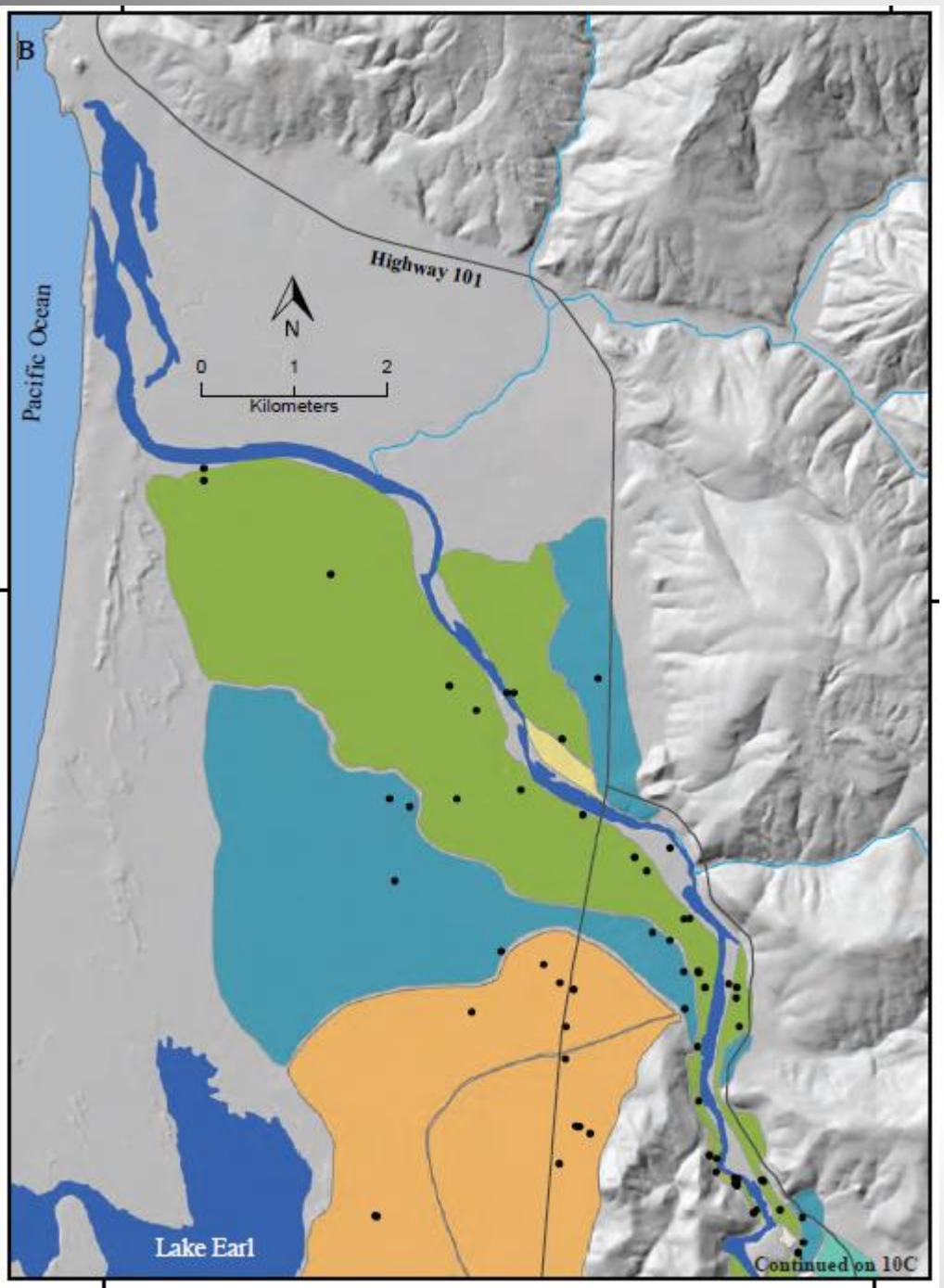


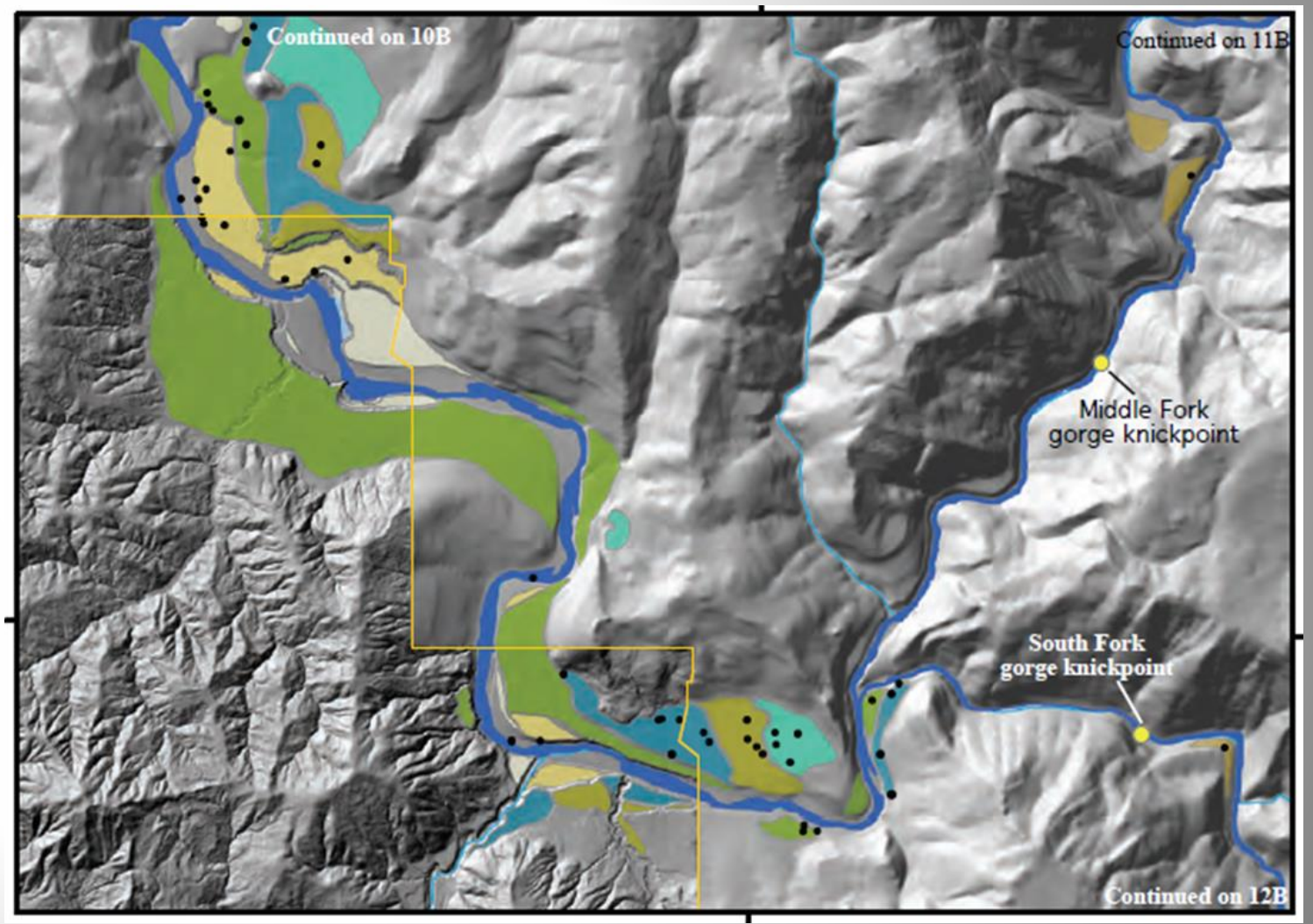
What Causes Population Structure?

- Homing to natal streams
- Anadromous vs resident life histories
- Partial barriers

Marine Terraces and Knickpoints

- Downcutting created a low gradient reach near the mouth





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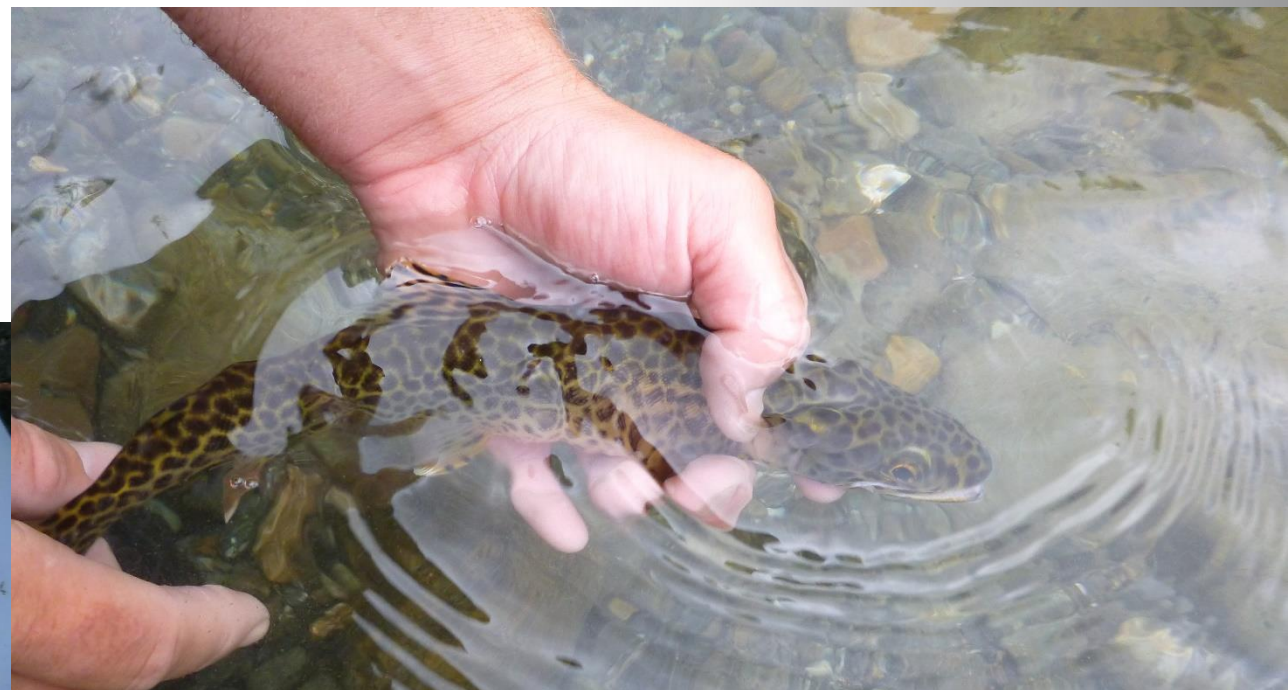
Management Implications

- Within-basin population structure can exist without anadromous barriers
- Further exploration is needed to understand resident and anadromous life histories



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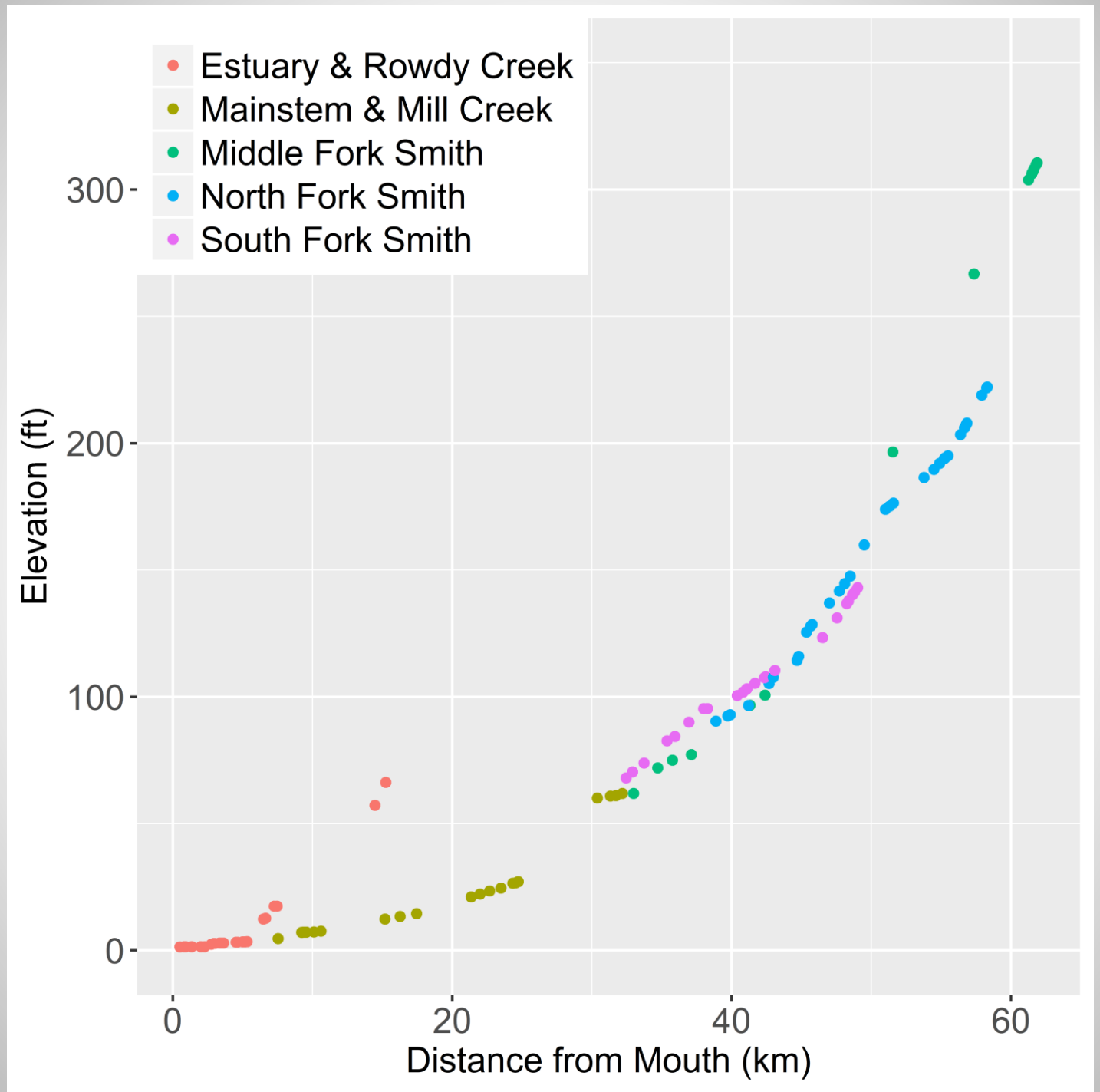
CALIFORNIA COOPERATIVE FISH & WILDLIFE RESEARCH UNIT

SMITH RIVER ALLIANCE

Stillwater Sciences

NOAA NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

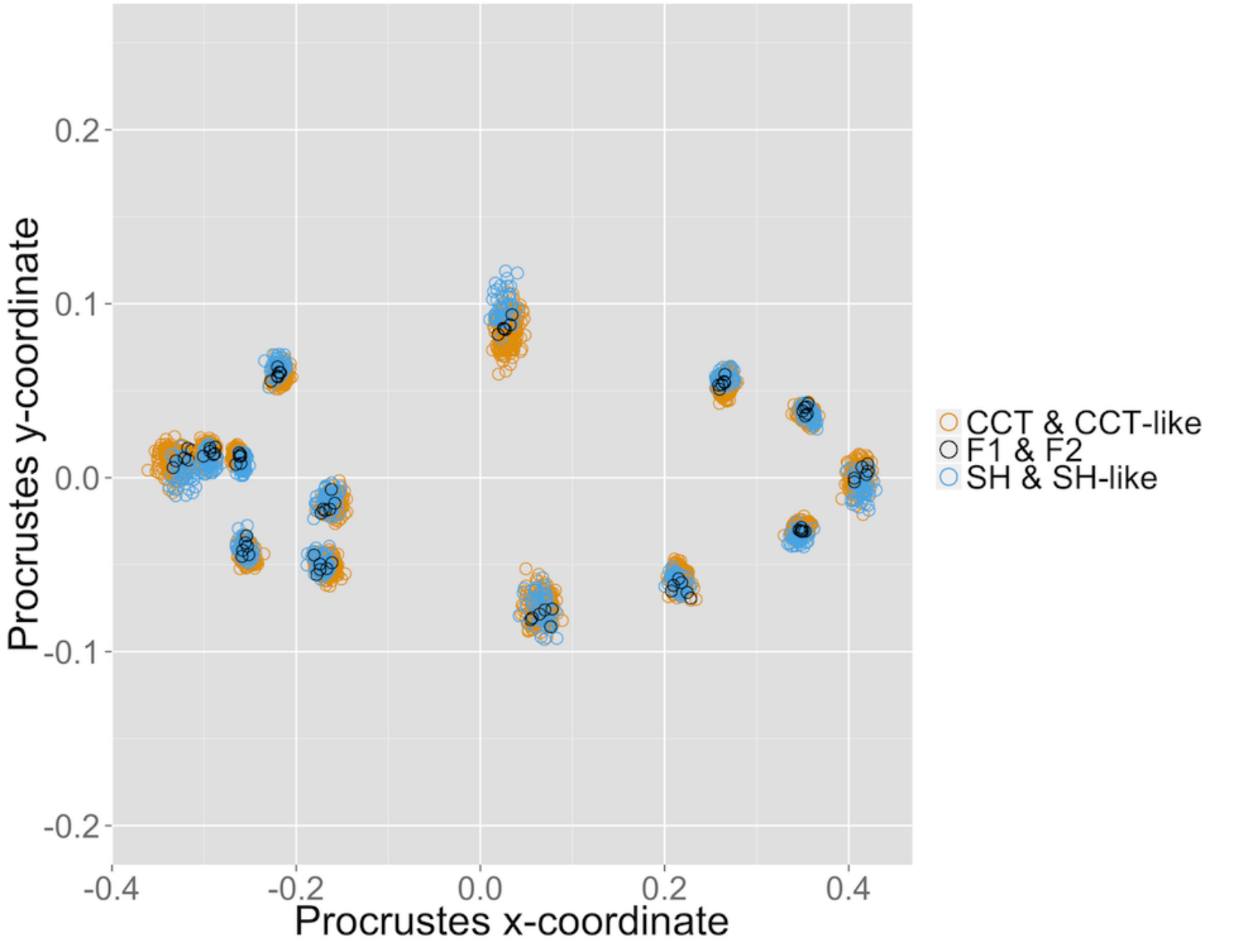

Questions?


Estuary & Rowdy Creek
Mainstem & Mill Creek
Middle Fork Smith
North Fork Smith
South Fork Smith
300
200
100
0
Elevation (ft)
0
20
40
60
Distance from Mouth (km)

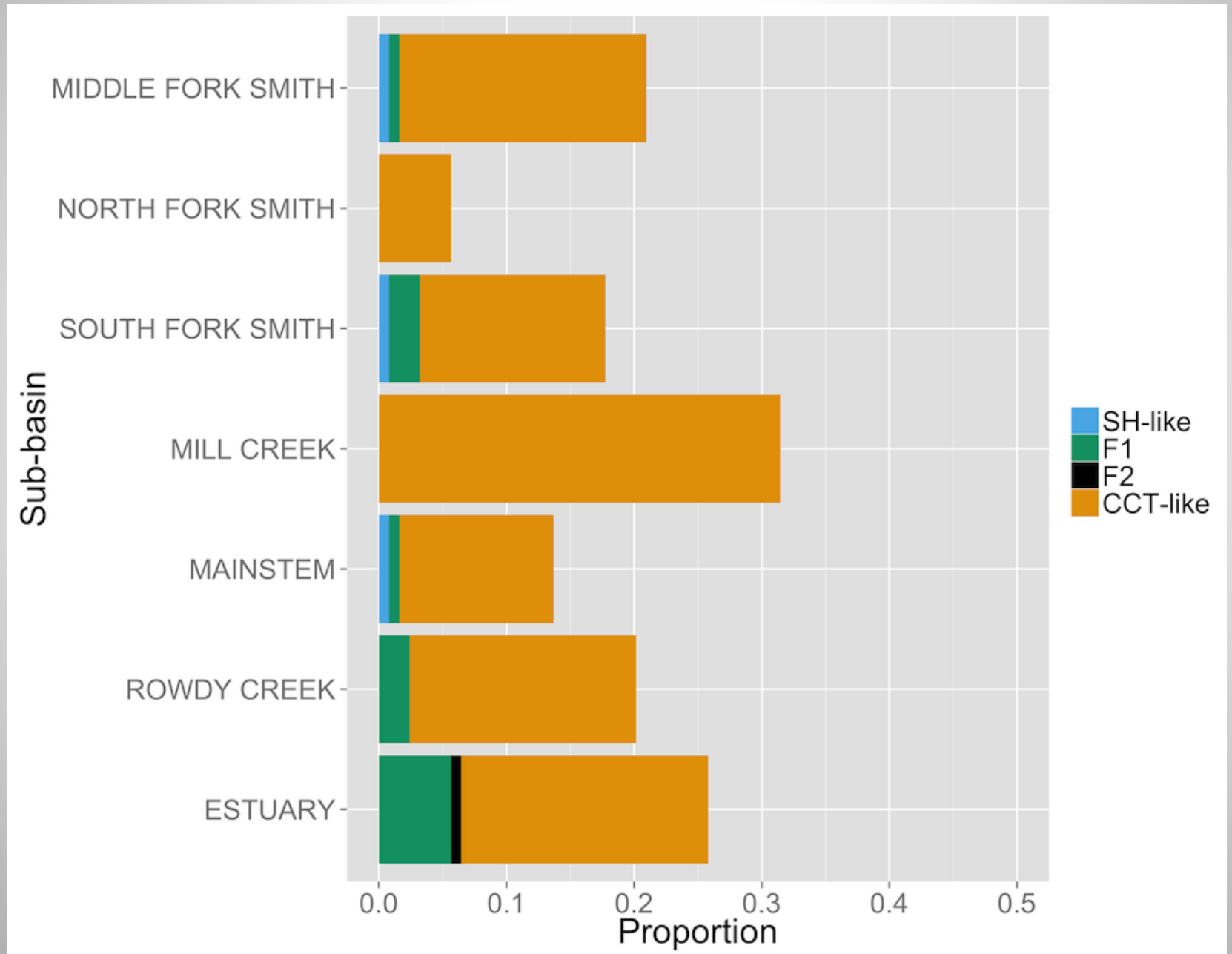
Procrustes Analysis

Adult

- Coastal Cutthroat Trout
  - -Shallow body
  - -Shorter snout
- Steelhead
  - -Deep body
  - -Longer snout
- Hybrids?



Hybrids by Sub-basin



Coastal Cutthroat Trout Population Structure

(Oncorhynchus clarki clarki)

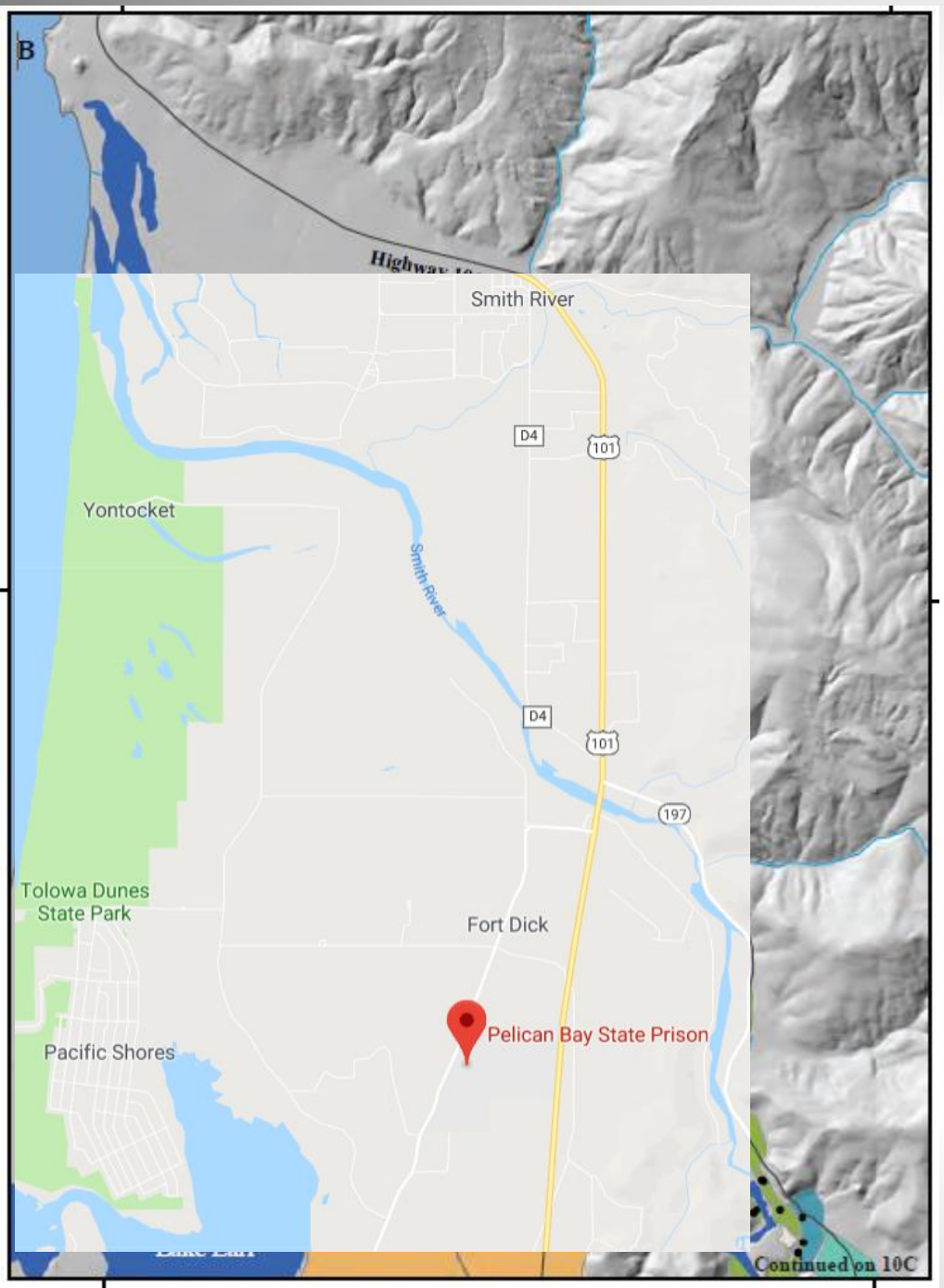
Life History:

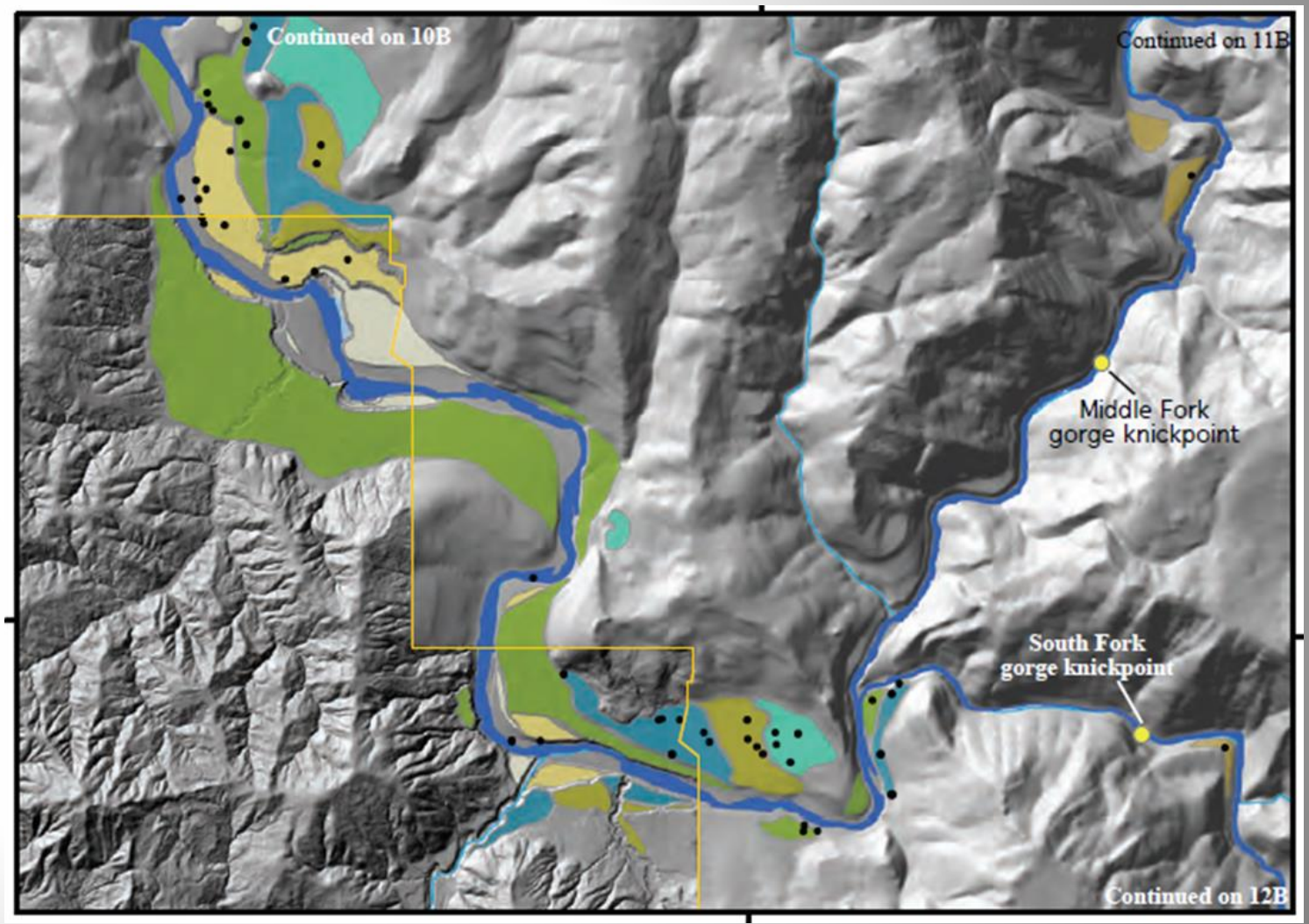
- Spawn during January-May
- Smaller headwaters where cobble and gravel size is decreased
- Piscivorous (eat fish!)
- Short ocean/estuary migrations

(Behnke 2002)

Marine Terraces and Knickpoints

- Downcuting creates low gradient near the mouth





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