Predation in the North Delta: Tales from the Digestive Goo

Brian Schreier, DWR

Scott Brandl, UCD

Melinda Baerwald, UCD

Louise Conrad, DWR

Interagency Ecological Program

Cooperative Ecological Investigations Since 1970

Department of Water Resources

State of California

Ecosystem Restoration Program

California Department of Fish & Wildlife

National Oceanic & Atmospheric Administration

US Fish & Wildlife Service

UC DAVIS

Acknowledgements

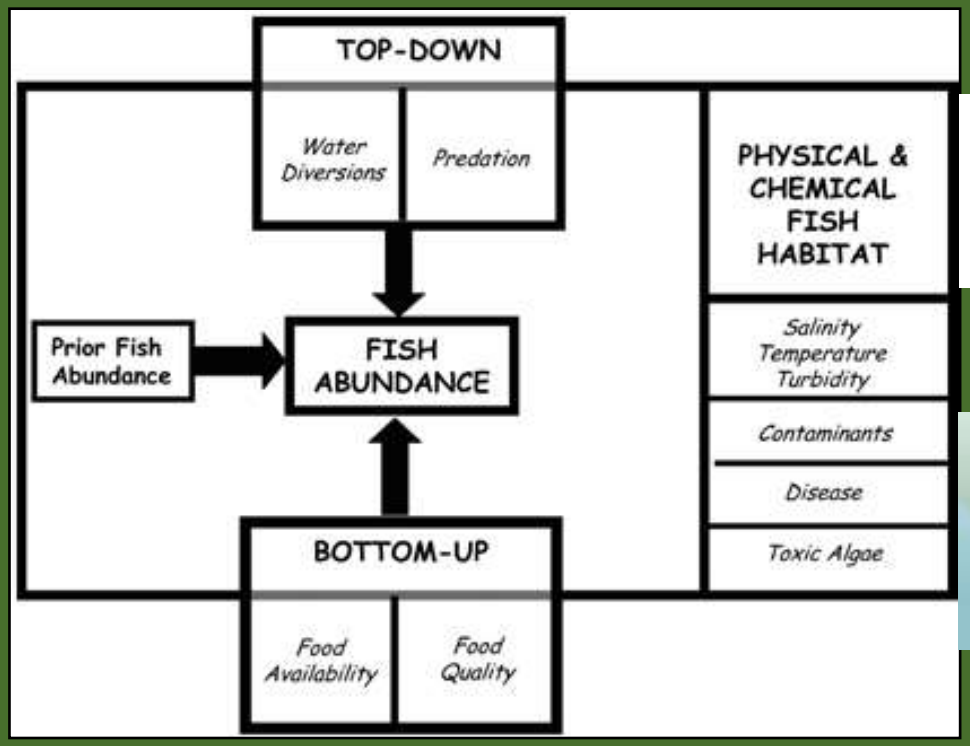
Funded by DFW's Ecosystem Restoration Program

DWR: Jared Frantzich, Naoaki Ikemiyagi, Brian Mahardja, Pascale Goertler, Lynn Takata, Angie Munguia, Molly Ogaz, Haley Carlson, Jasmine Shen, LeAnne Rojas, Phil Choy, Nick van Ark, Alice Tung

UCD: Alicia Goodbla, Kat Tomalty

DFW: Marty Gingras (vessel)

The Problem



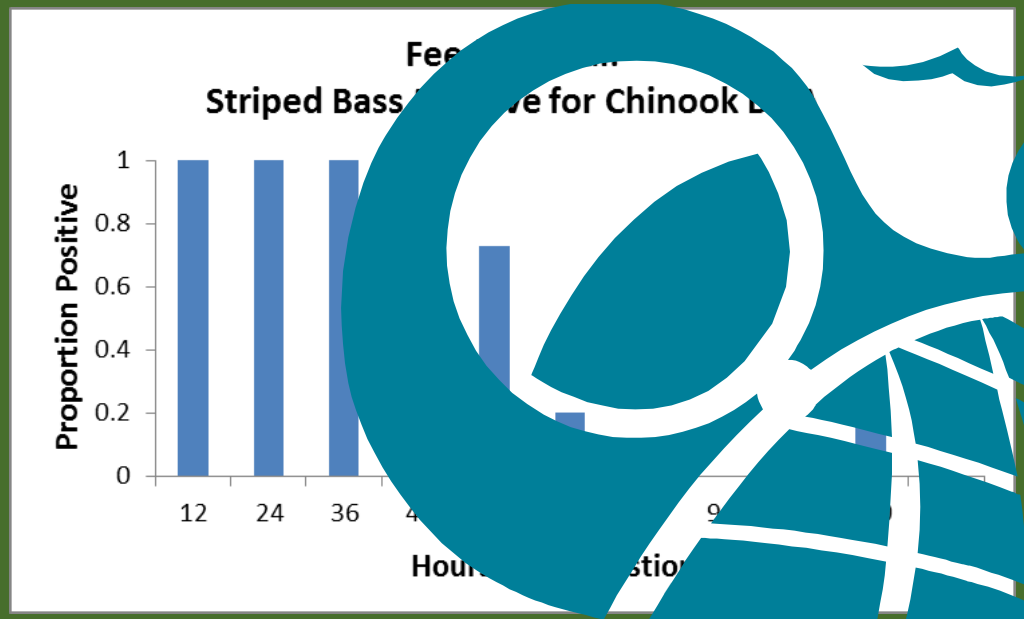
State of the Science Workshop on Fish Predation on Central Valley Salmonids in the Bay-Delta Watershed

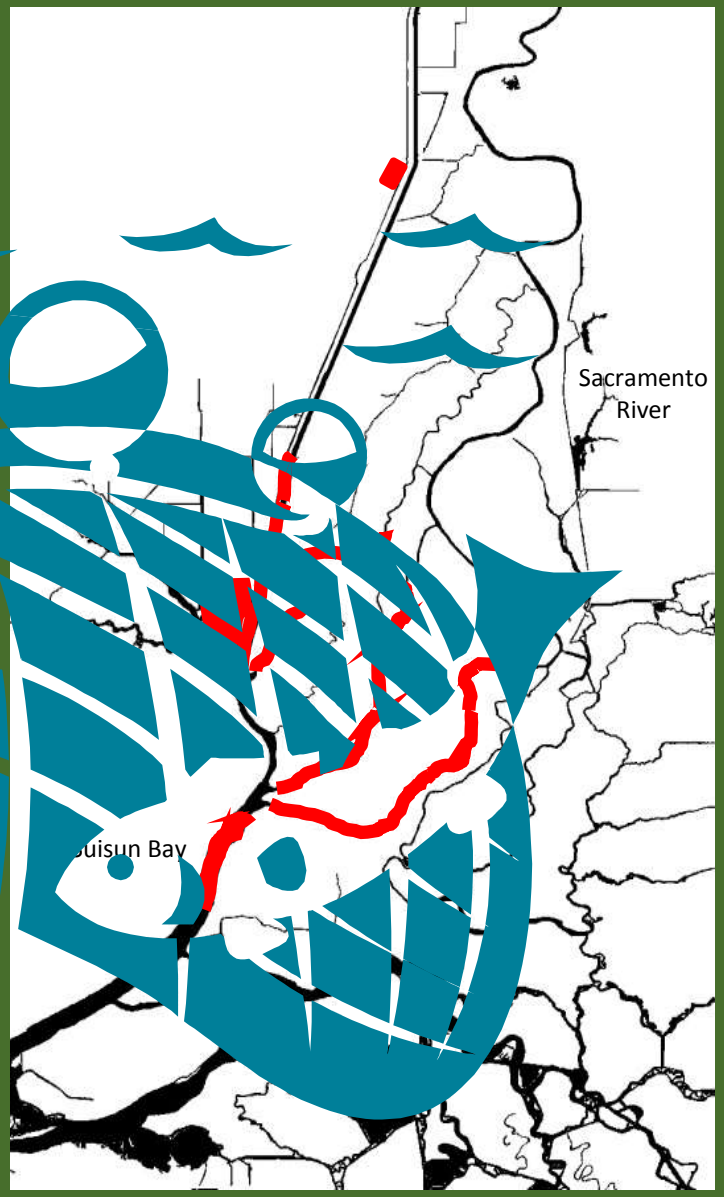
BAY DELTA CONSERVATION PLAN

THE SACRAMENTO BEE sacbee.com

Invasive Striped Bass Identified as Major Threat to Salmon

Methods


Striped Bass
for Chinook
Proportion Positive
1
0.8
0.6
0.4
0.2
0
12
24
36


Sacramento
River

More Methods

Predators:

Prey:

Chinook Salmon

Steelhead

Delta Smelt

Longfin Smelt

White and Green Sturgeon

Splittail

Silversides

Threadfin Shad

Wakasagi Smelt

Predator:

Pikeminnow

53% no prey detected

Prey:

17 / 64 positive for Striped Bass

27%

13 / 64 positive for Longfin Smelt

20%

Predator:

Smallmouth Bass

74% no prey detected

Prey:

7 / 42 positive for Striped Bass

17%

3 / 42 positive for Chinook Salmon

7%

Predator:

Largemouth Bass

82% no prey detected

Prey:

8 / 72 positive for Striped Bass

11%

3 / 72 positive for Pikeminnow

4%

Predator:

Catfish

64

Prey:

23 / 110 p **21%**

1 / 110 pc **1%**

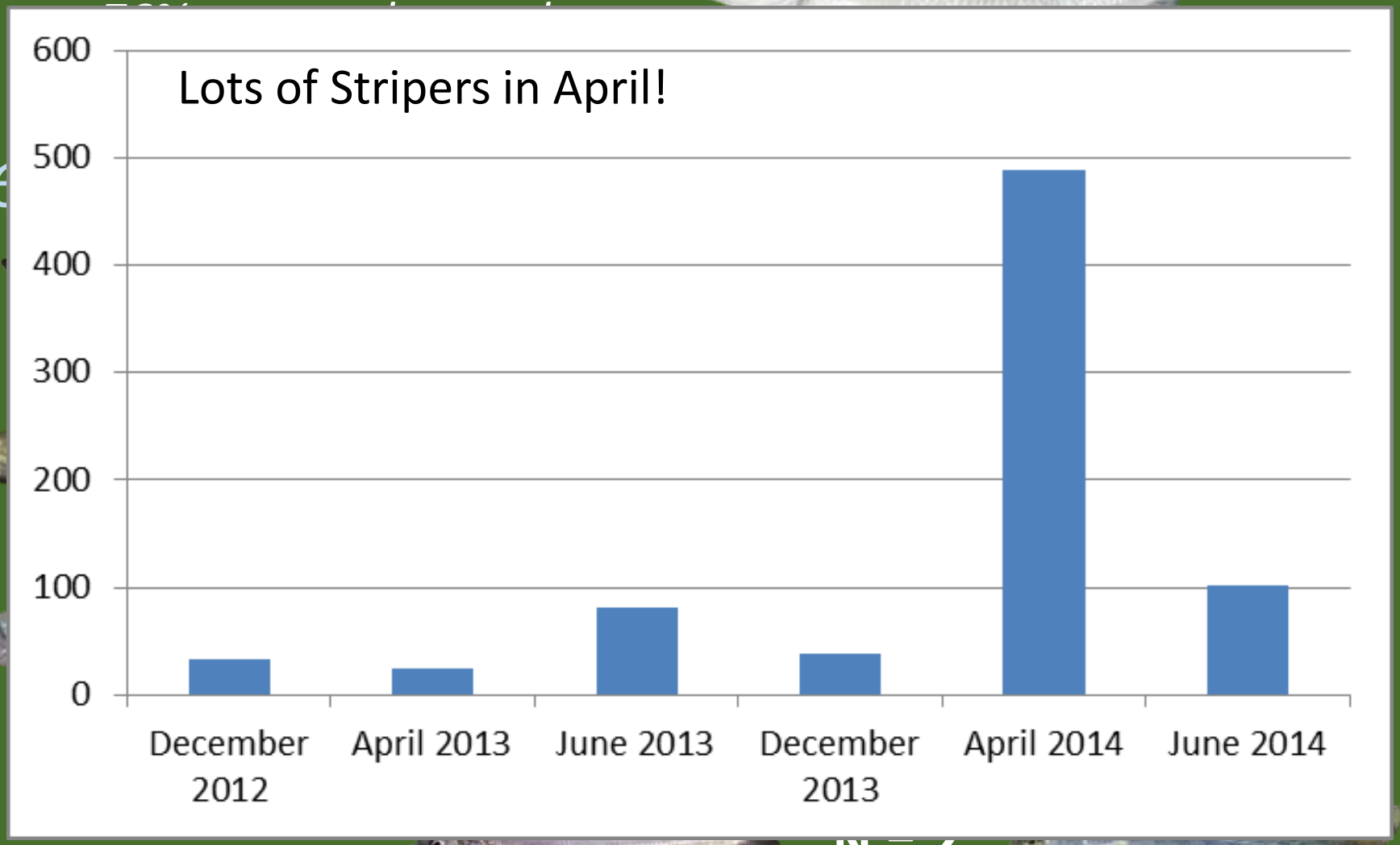
1 / 110 pc **1%**

Multiple detections for Splittail, Pikeminnow, Smallmouth, Threadfin, Largemouth, and Silversides

Predator:

Striped Bass

N = 682

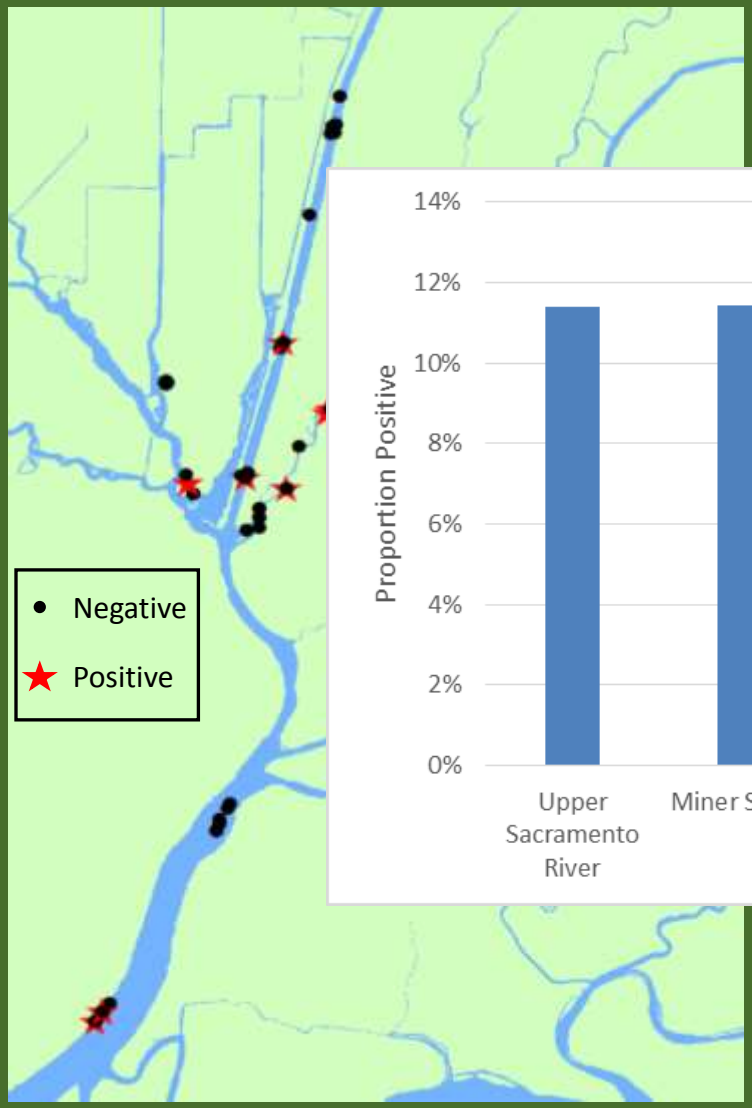


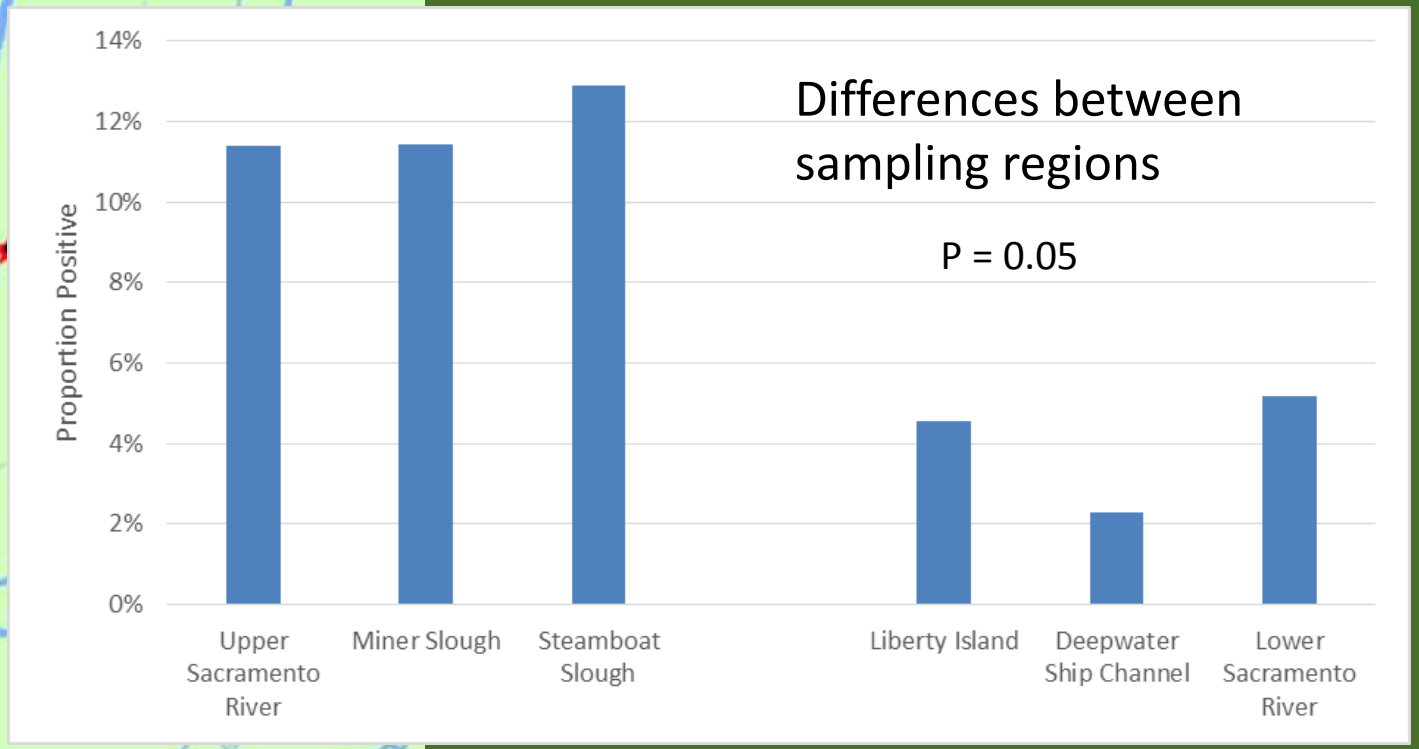
N = 2

April 2014

N = 28

N = 388





No Detections in Yolo Bypass

April 2014

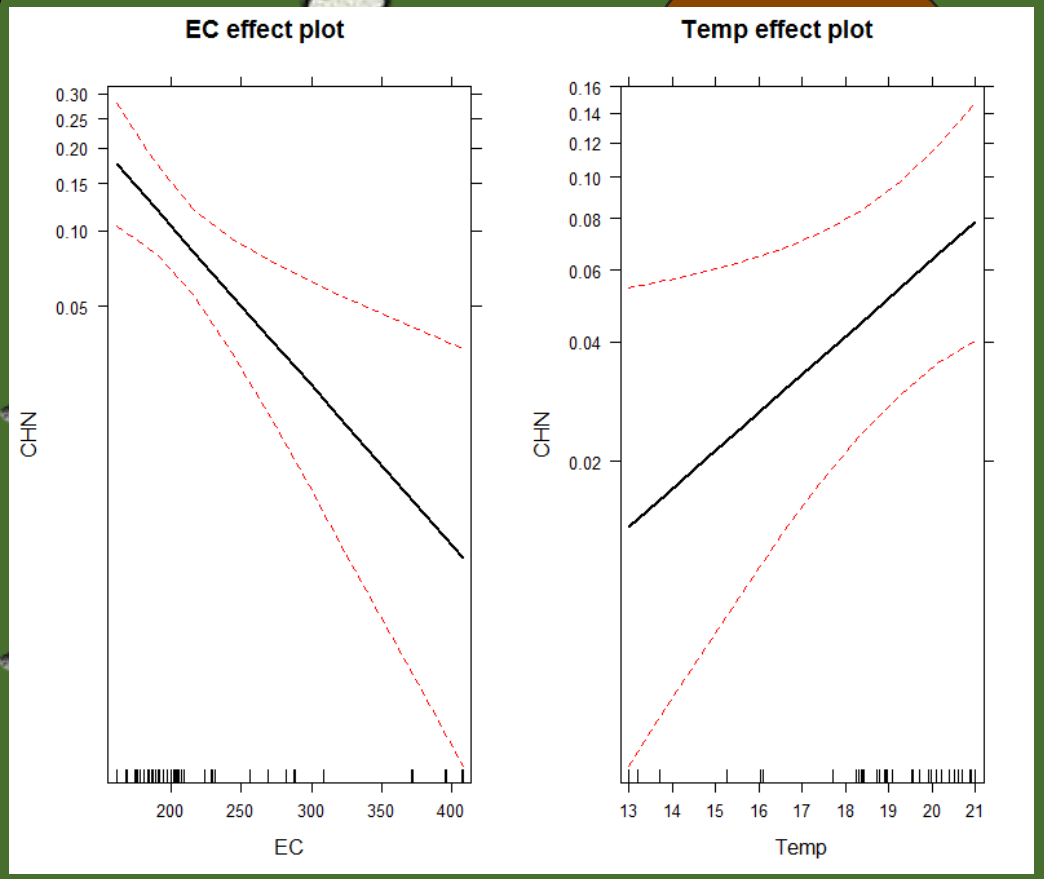
N = 28

N = 388

What factors affect predation?

Predation ~ EC + Temp

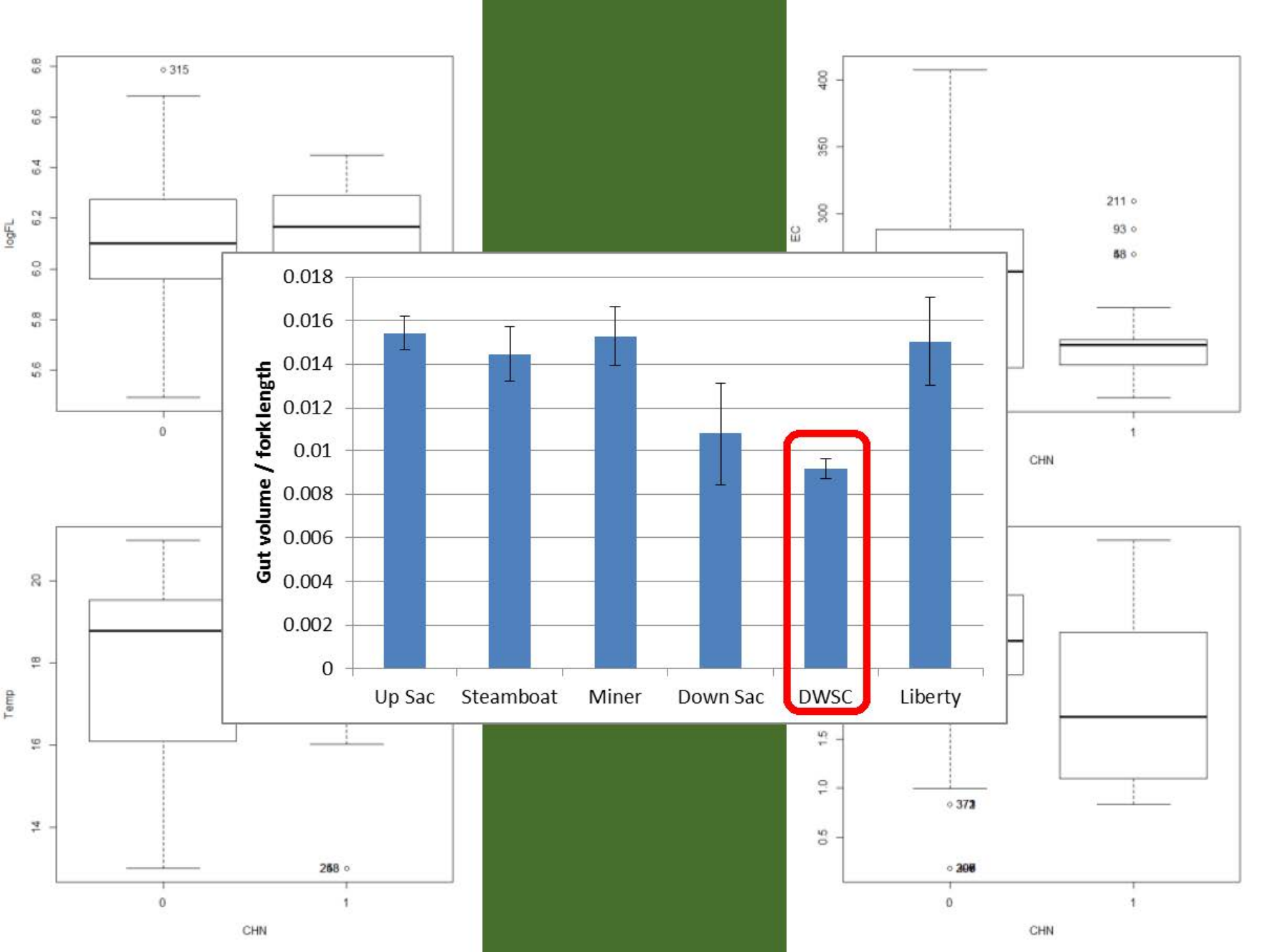
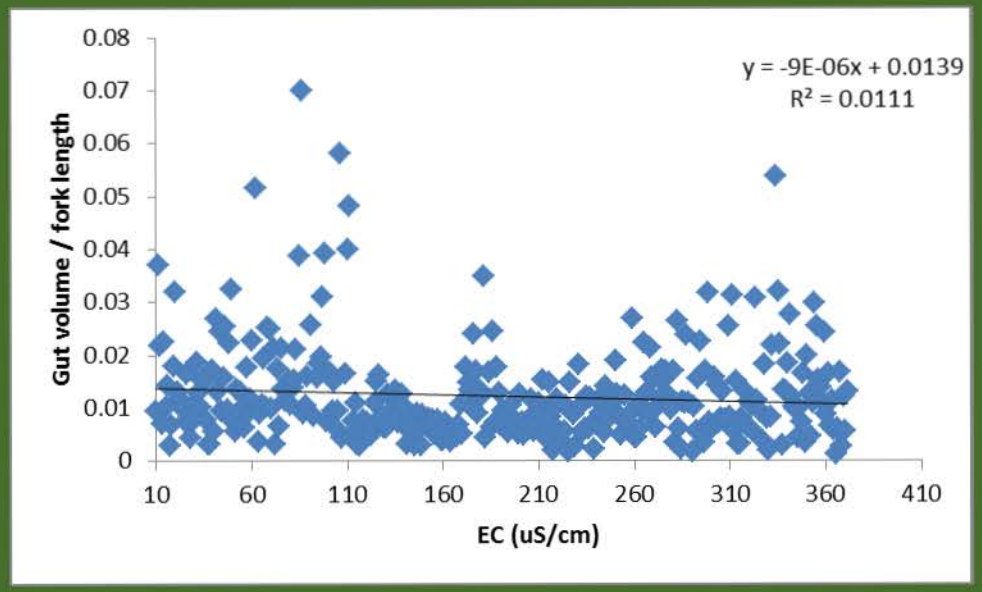
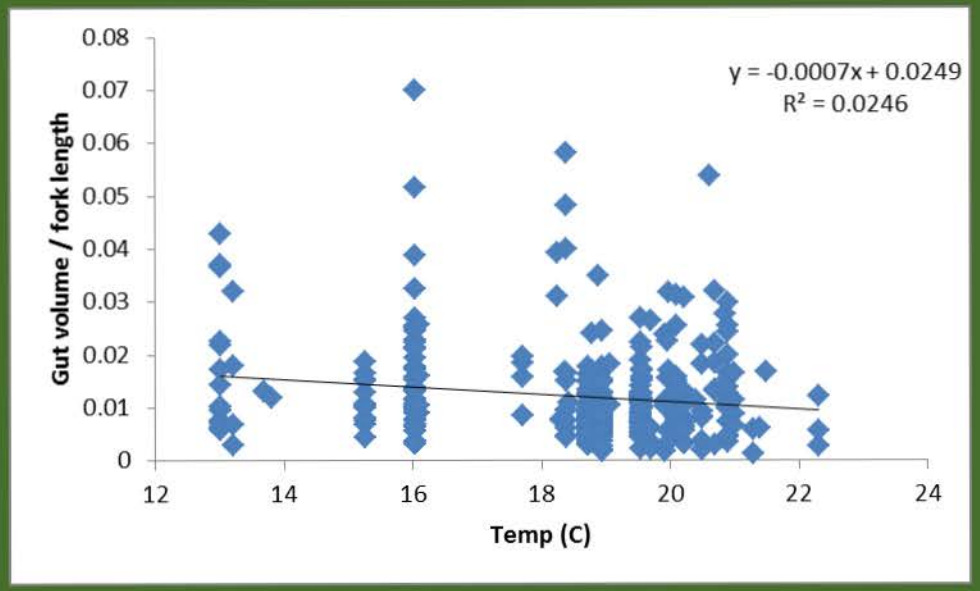
	Coefficient
EC	- 0.0157**
Temp	0.2275*



Conclusions

1) Pikeminnow -> Longfin Smelt
2) Everything eats Striped bass*
3) Striped Bass eat everything, but not much
4) Striper predation on Chinook
    1) ↑ with water temperature
    2) ↓ with EC
    3) Higher in narrower, upstream channels

Stay tuned!...


logFL
315
CHN
EC
211
93
CHN
Temp
258
CHN
372
CHN
Gut volume / fork length
0.018
0.016
0.014
0.012
0.01
0.008
0.006
0.004
0.002
0
Up Sac
Steamboat
Miner
Down Sac
DWSC
Liberty

Gut Contents Volume vs Temp and EC?