

Smallmouth Bass Population Update for the

# South Branch of the Potomac River

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# Update Coverage:

- Abundance
- Size Structure
- Condition
- Mortality Trends
- Angler Utility
- Environmental Investigations

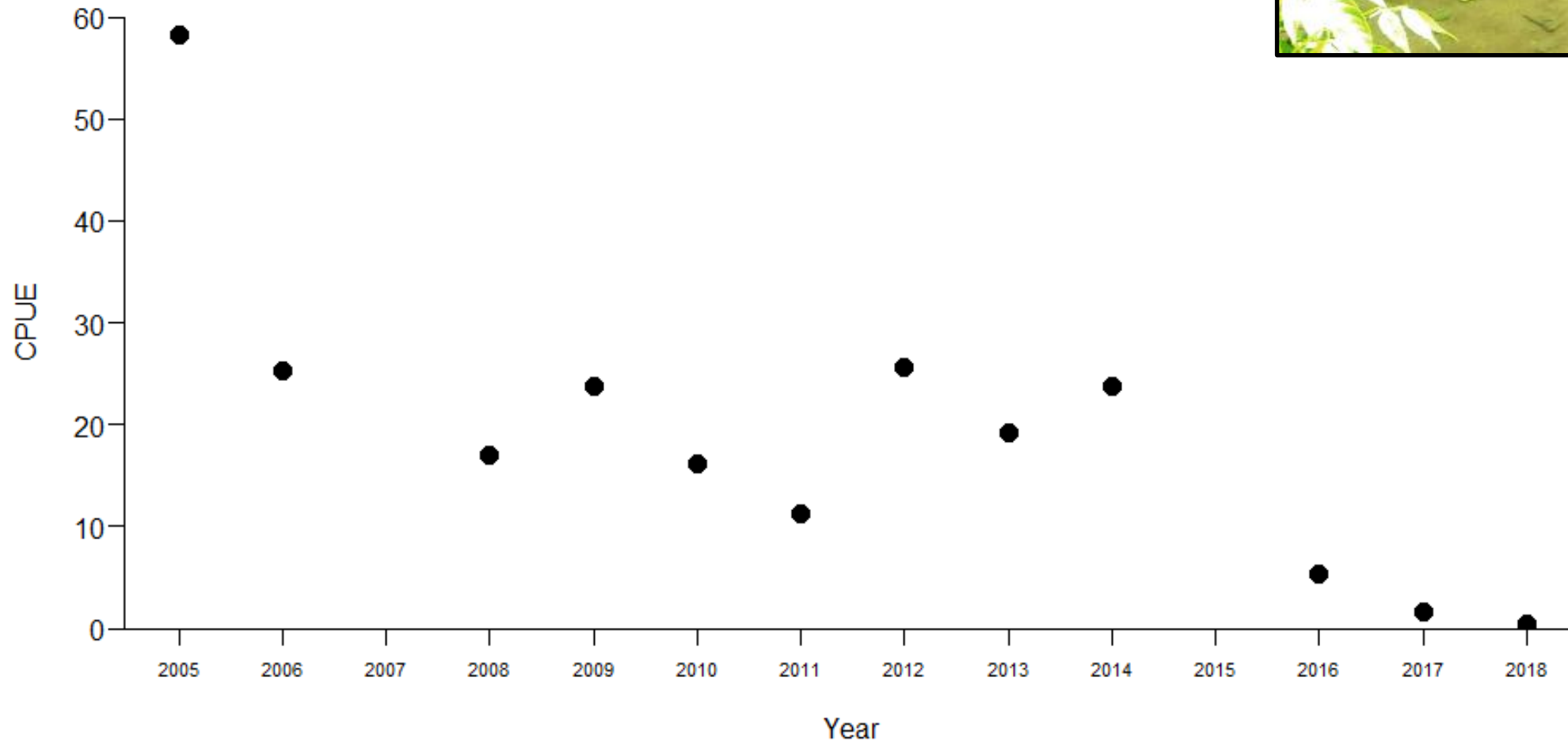




# Abundance - Young of Year:

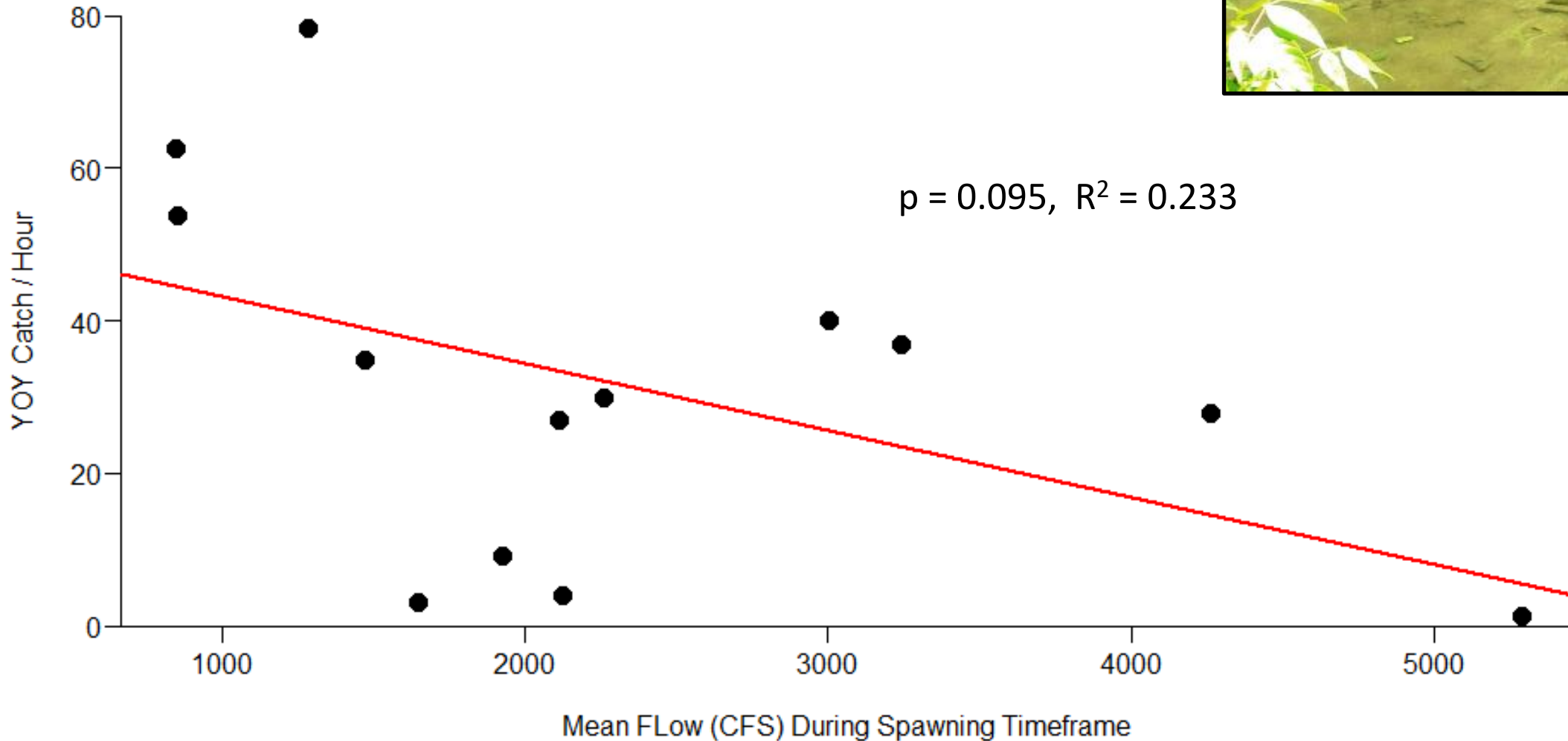


Catch Rates of YOY SMB by Year, South Branch River



# Abundance - Young of Year:

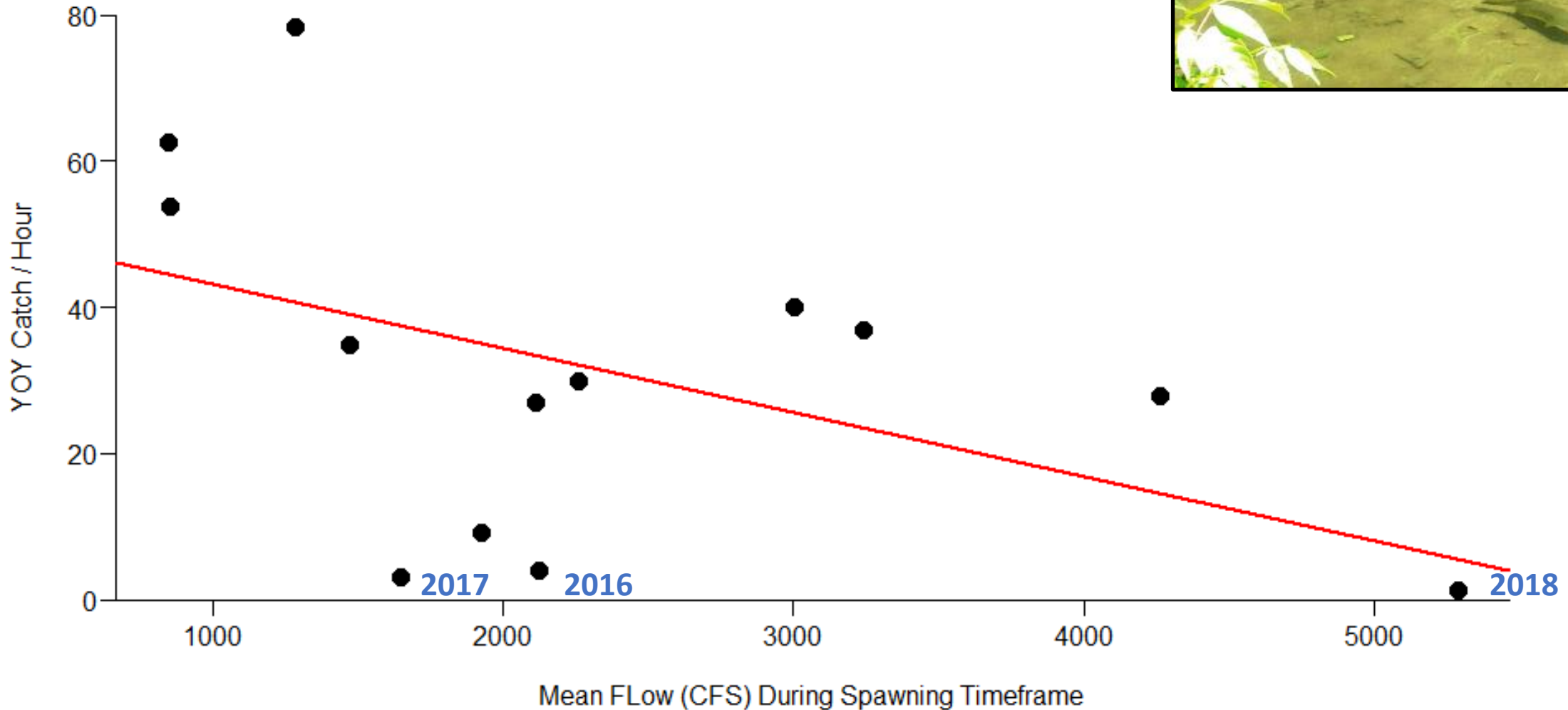
**FLOW**, and the role that it plays in recruitment success





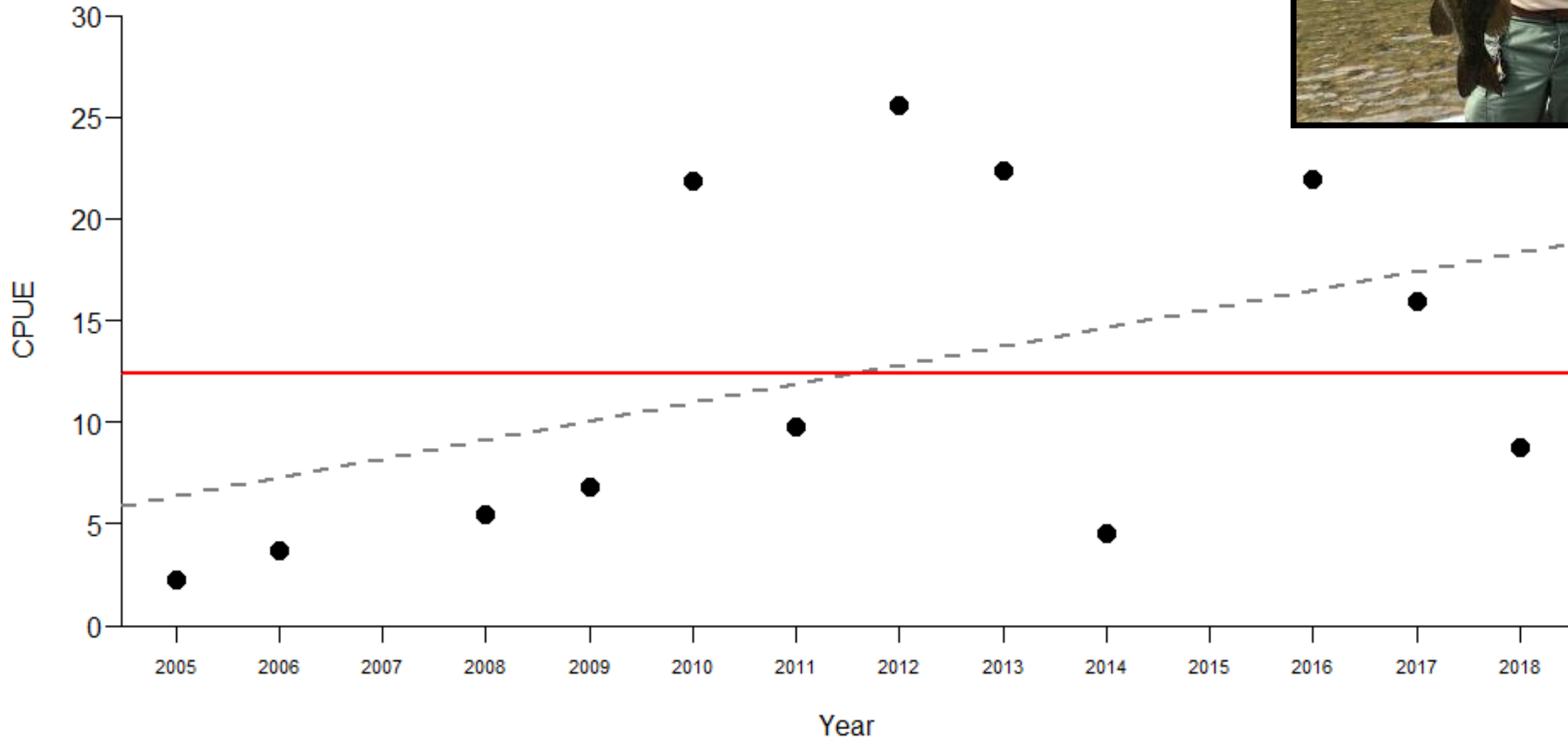
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FLOW, and the role that it plays in recruitment success



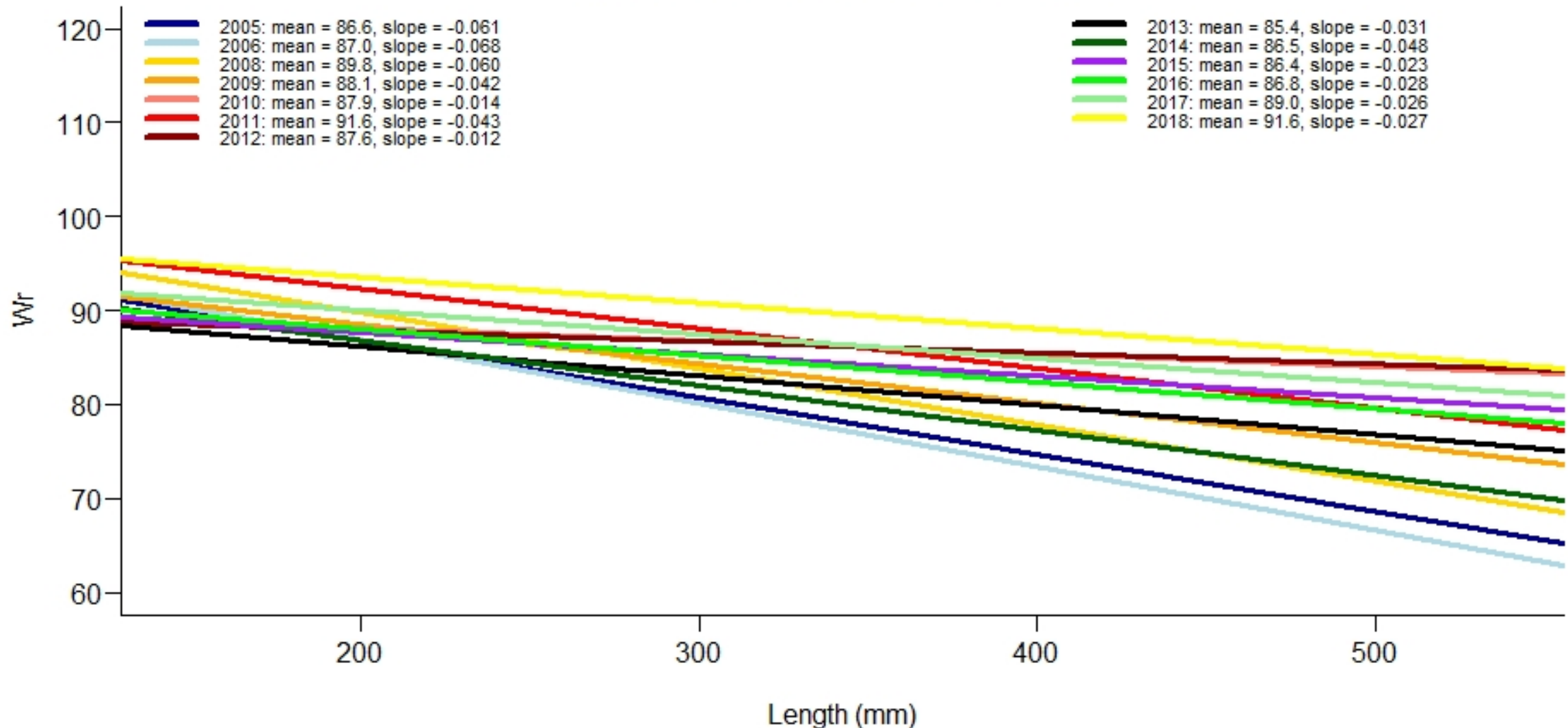
# Abundance Quality-sized ( $\geq 11''$ ):

Catch Rates of Quality-sized SMB by Year, South Branch River



# Condition (weight compared to length):

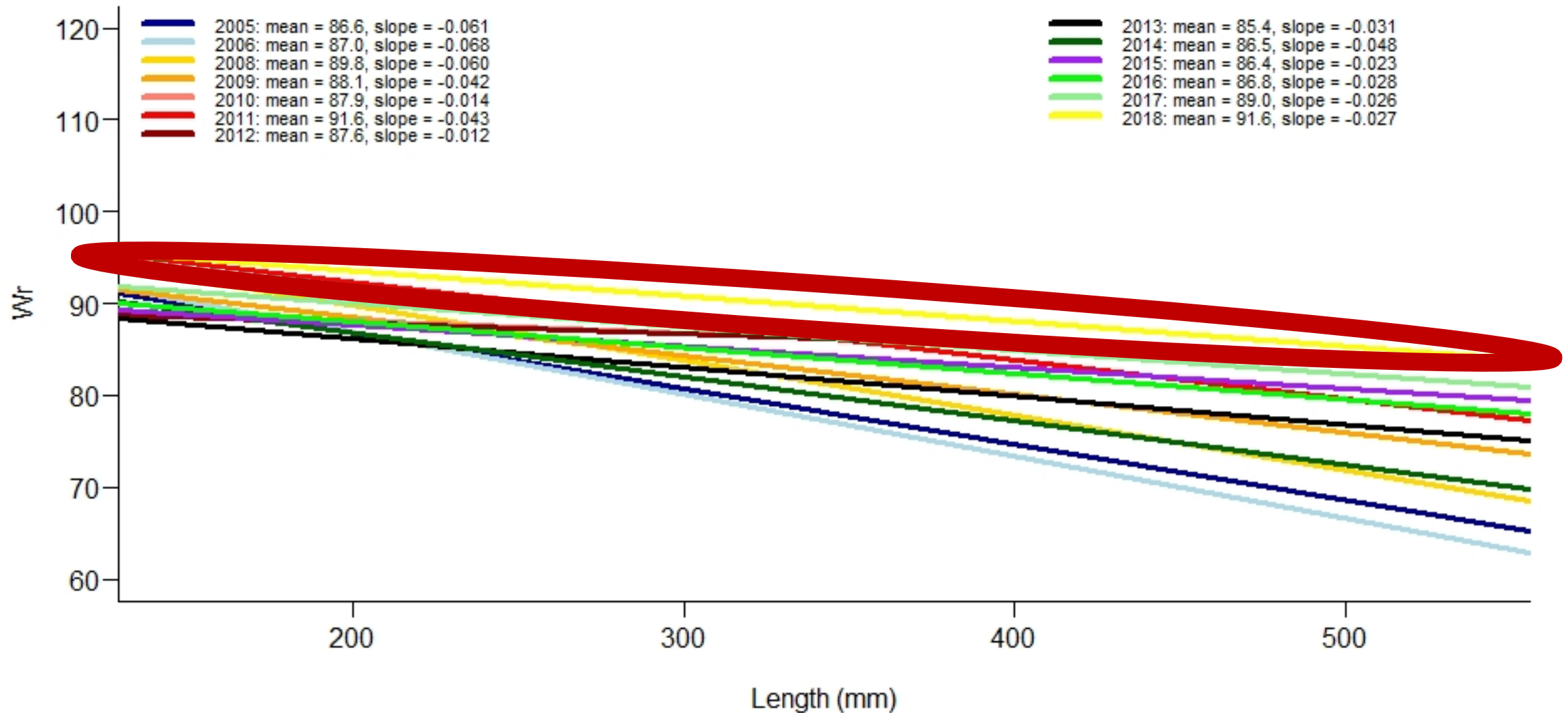
## Wr Regressions 2005 - 2018





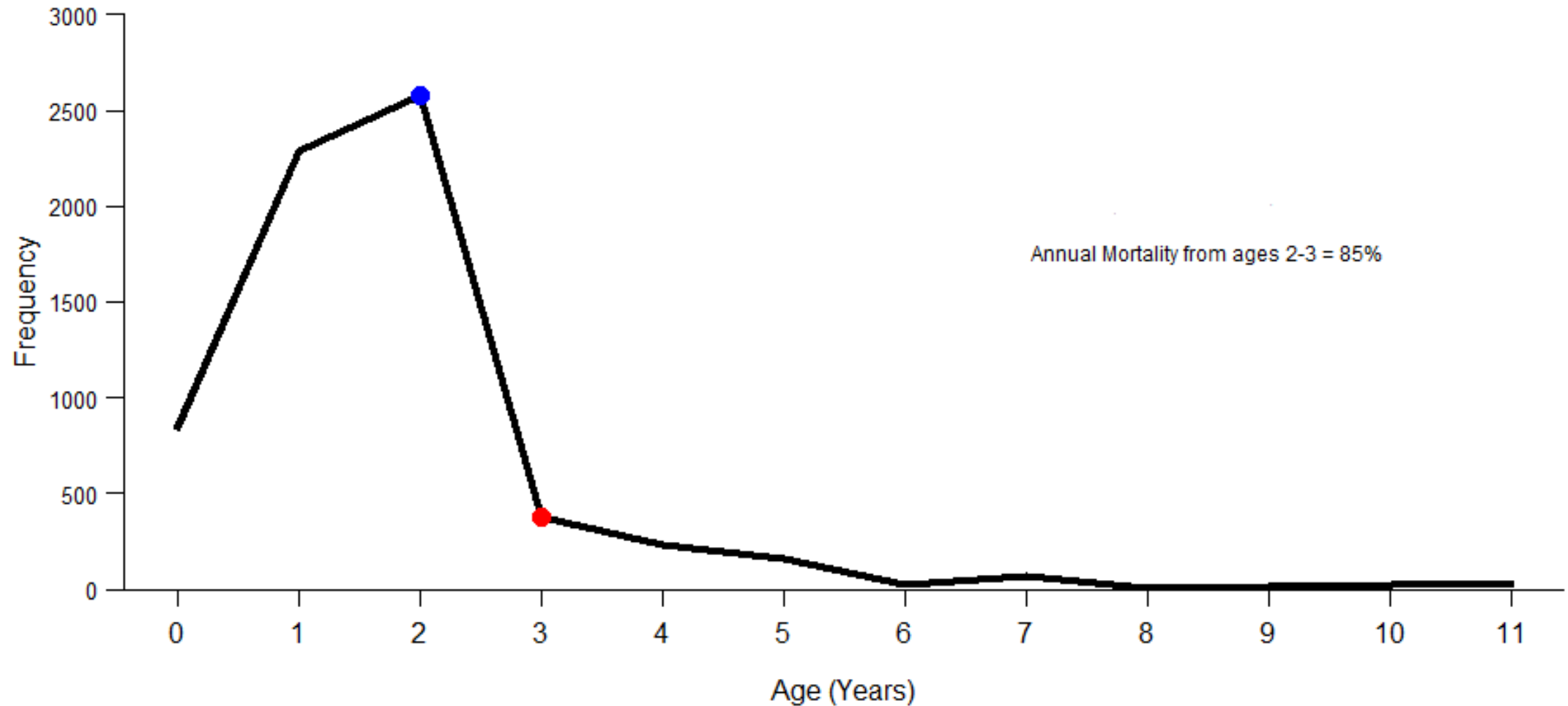
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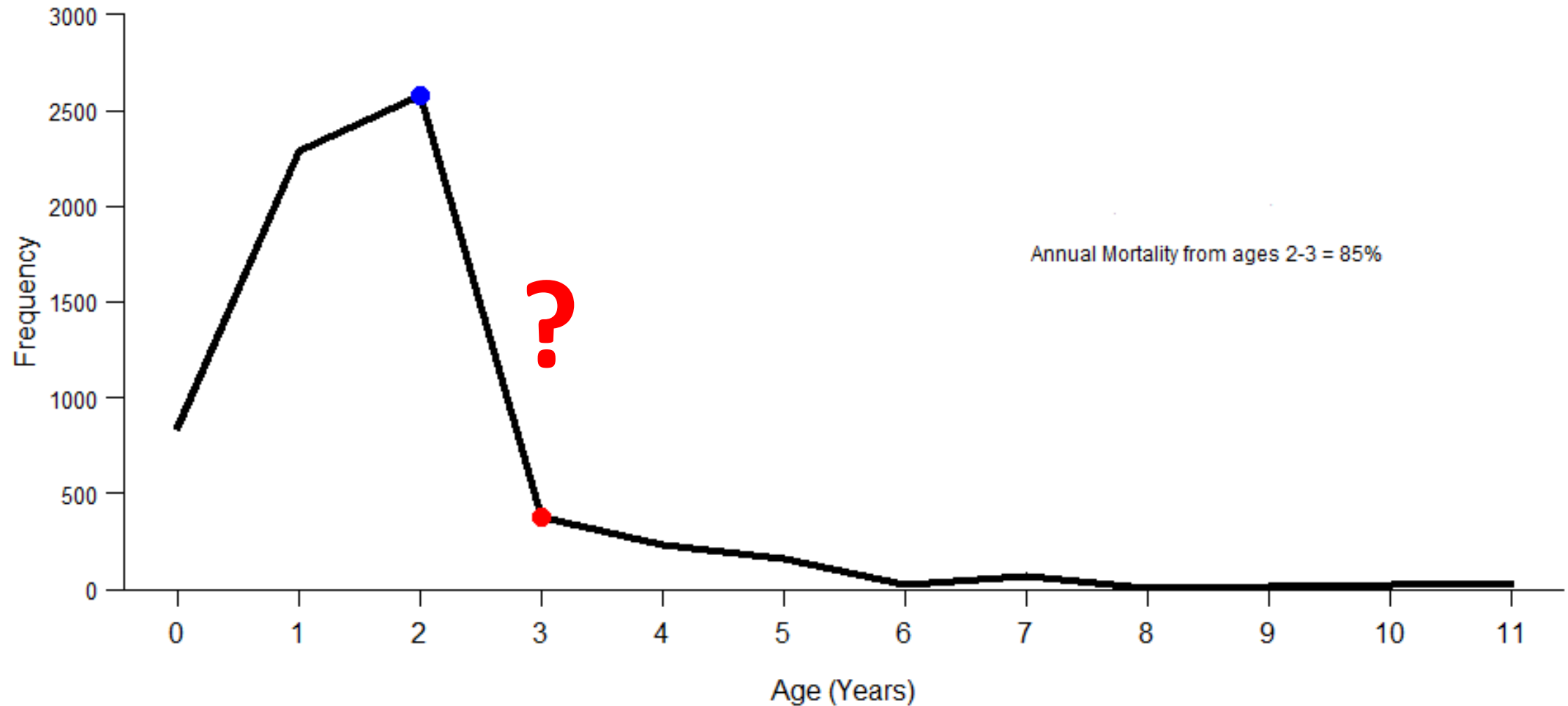
# Mortality Trends ('05 – '17)

Catch-Curve for SBR SMB 2005-2017



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Catch-Curve for SBR SMB 2005-2017





# Where do they go?

- They?

- Fish aging from 2 – 3 years old are, on average, growing from 9” to 11”

- Harvest?

- Extremely unlikely. Angler reward tag return indicates
  - Only 10% of anglers reported harvesting fish
  - Only 8.5% (of 2,765 tagged fish) were returned!
    - Likely because another factor is removing fish from the population
  - Lack of visual evidence of any harvest at this magnitude

# Where do they go?

- Emigration? Moving out of the system to the Potomac?
  - Conversations with Maryland DNR seem to suggest that mortality curves look similar to what we see
  - It is unlikely that movement of fish out of the SBR is enhancing quantities of age 3 fish in the Potomac
- Post-release mortality?
  - Although angler harvest isn't high, efforts and catch rates often ARE!
  - Very high usage from small watercraft anglers
  - Any given fish throughout the South Branch has a comparatively high likelihood of being caught in a season





# Moorefield, WV - May 25, 2019

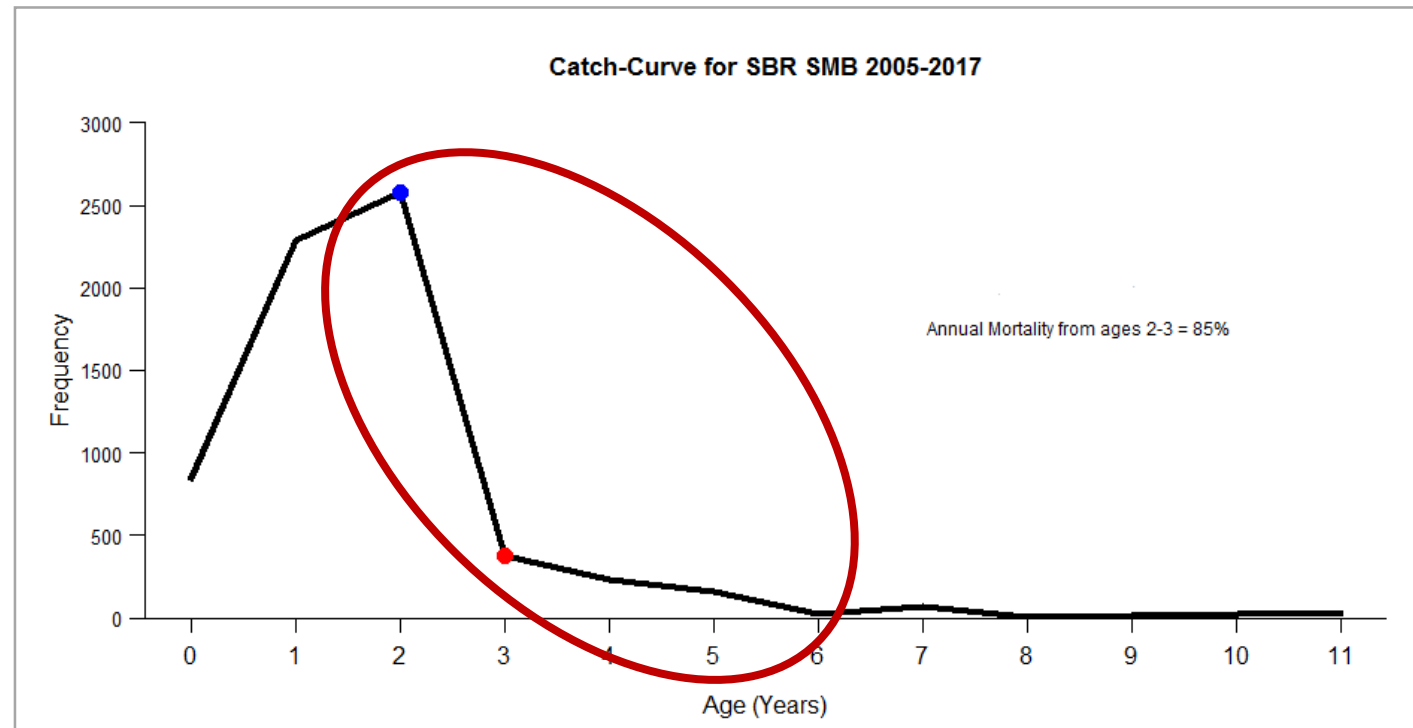




# Fish Health? Most depressed in our adult fish.

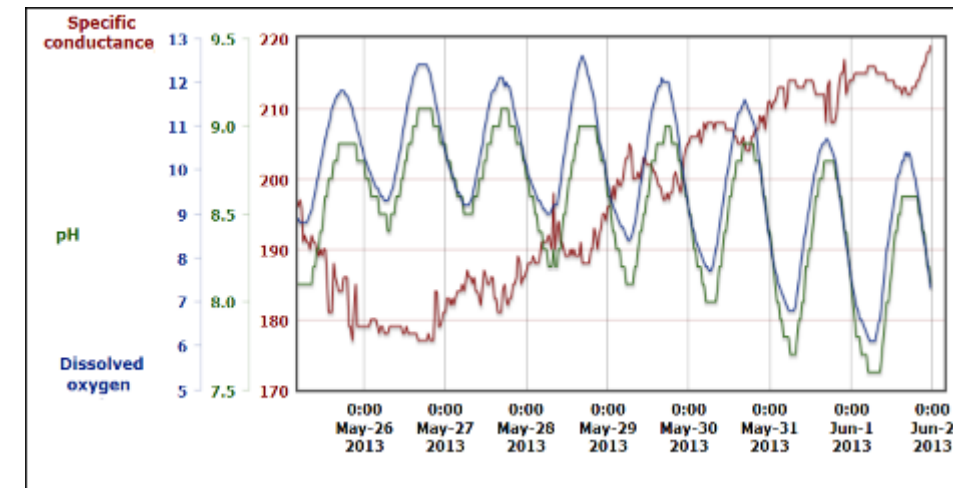
- Smallmouth mature at about age 2, or 8" in length

Indicator of Health	P-value for tests Among life stage	Life stage with Greatest severity
<b>Golden Redhorse</b>		
Body erosions	< 0.001	Adult
Body raised lesions	0.764	-
Body parasites	< 0.001	Adult
Dermal healing	< 0.001	Adult
<b>Smallmouth Bass</b>		
Gill lamellae margination	< 0.001	Adult
Gill lamellae fraying	< 0.001	Adult
Gill lamellae erosion	< 0.001	Adult
Pale gill lamellae	0.255	-
Gill Parasites	0.013	Adult



# Fish Health?

- Spawning effort is a very stressful natural process that likely compounds effects from other stressors
  - Historic fish kills during or directly after spawning time frames
  - Landscape runoff and inputs of nutrients, pesticides, and wastewater during spring flows?
  - Effects of nutrient and degrading streamside habitats on Bluegreen Algae growth, water quality and habitat?
- Peak dermal erosions in the summer months, many colonized by pathogens (bacteria) considered to be harmless to healthy fish
  - Smallmouth Bass largely considered immune system compromised at this time
- Very low prevalence of LMBv
  - None of our “sick” fish that we have necropsied have come back positive



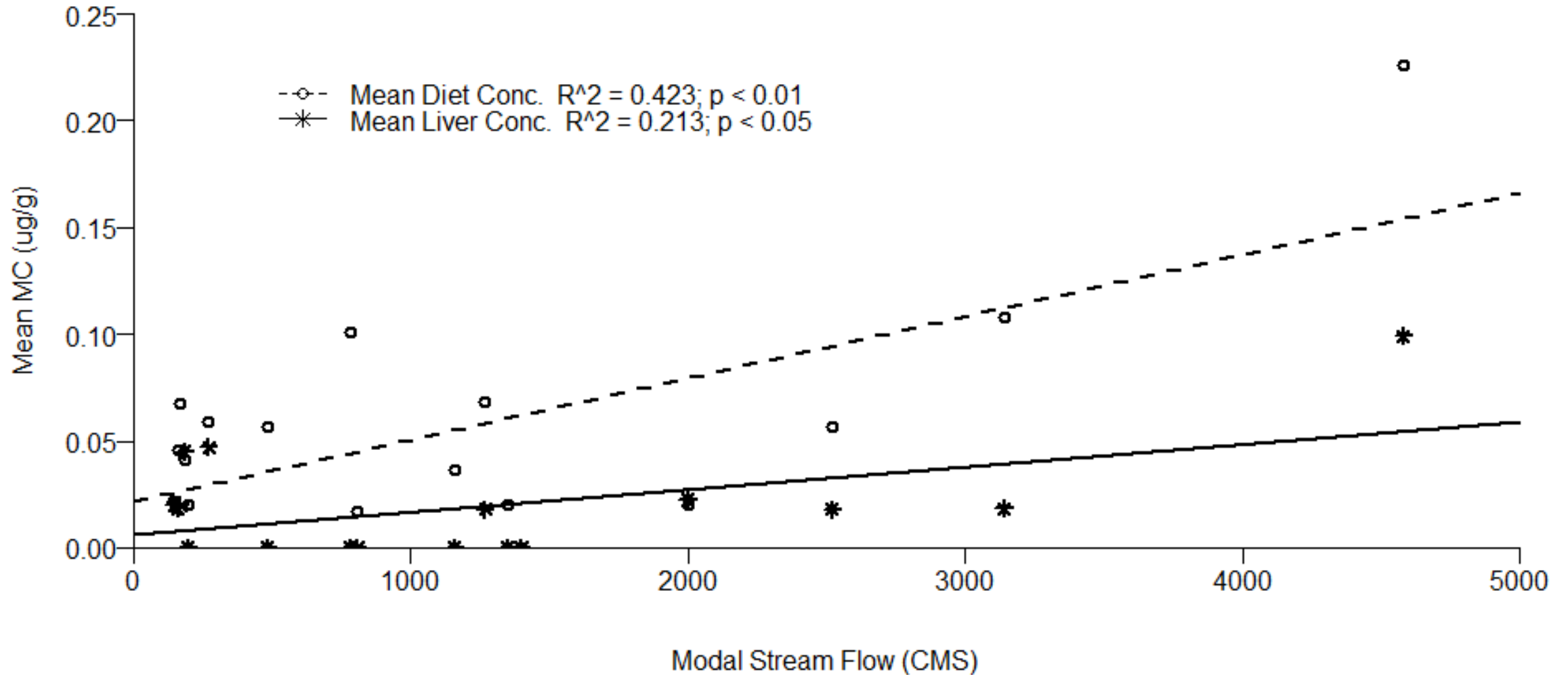
# WV DNR Bluegreen Algae Toxin Study

- Electrofished and sacrificed Smallmouth from 2014 – 2017 during all seasons
- Analyzed DIETS and LIVERS for liver toxin (Microcystins and Nodularin)
- About a 71% chance of having low levels of liver toxin in diets
- About a 31% chance of having low levels of liver toxin in liver
- Interested in what other BGA compounds they could be frequently contacting
  - Known and unknown compounds that could compromise the immune system

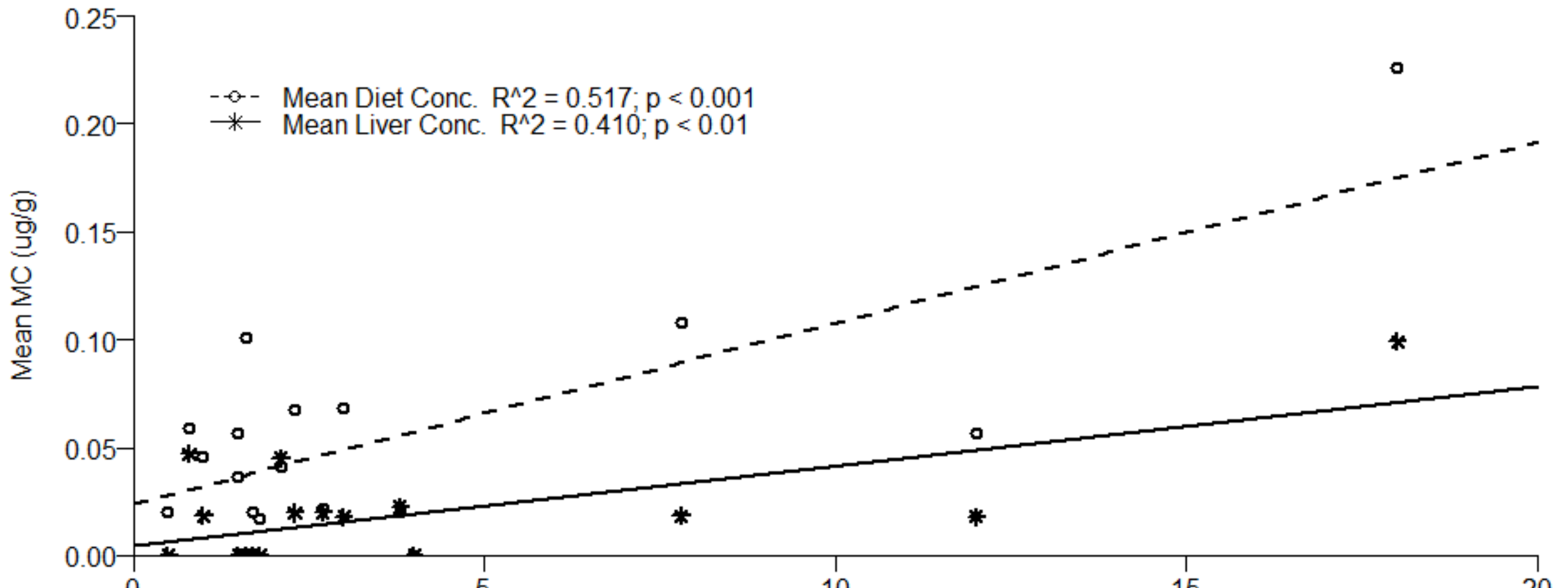




# BGA Liver Toxins in Tissues Positively Correlated with Flow



# BGA Liver Toxins in Tissues Positively Correlated with Turbidity



# Conclusions?

- Angler perception has been VARIED!
  - Very difficult fishing conditions, a lot of available food, and more flow filling out habitats
- Cautiously observant, but not alarmed
- Reasonable numbers of quality-sized fish
- Poor numbers of smaller fish, but high rate of mortality prior to quality-size either way
- Very good individual bass condition right now. Should positively influence:
  - Growth
  - Survival
  - Length + Weight
- We are seeing really good numbers of 2019 spawned fish in all WV waters to the Potomac this summer

