

FISH IBI SCORES AND TDS EFFECTS ON GAME VS. SENSITIVE FISH

Alison Anderson

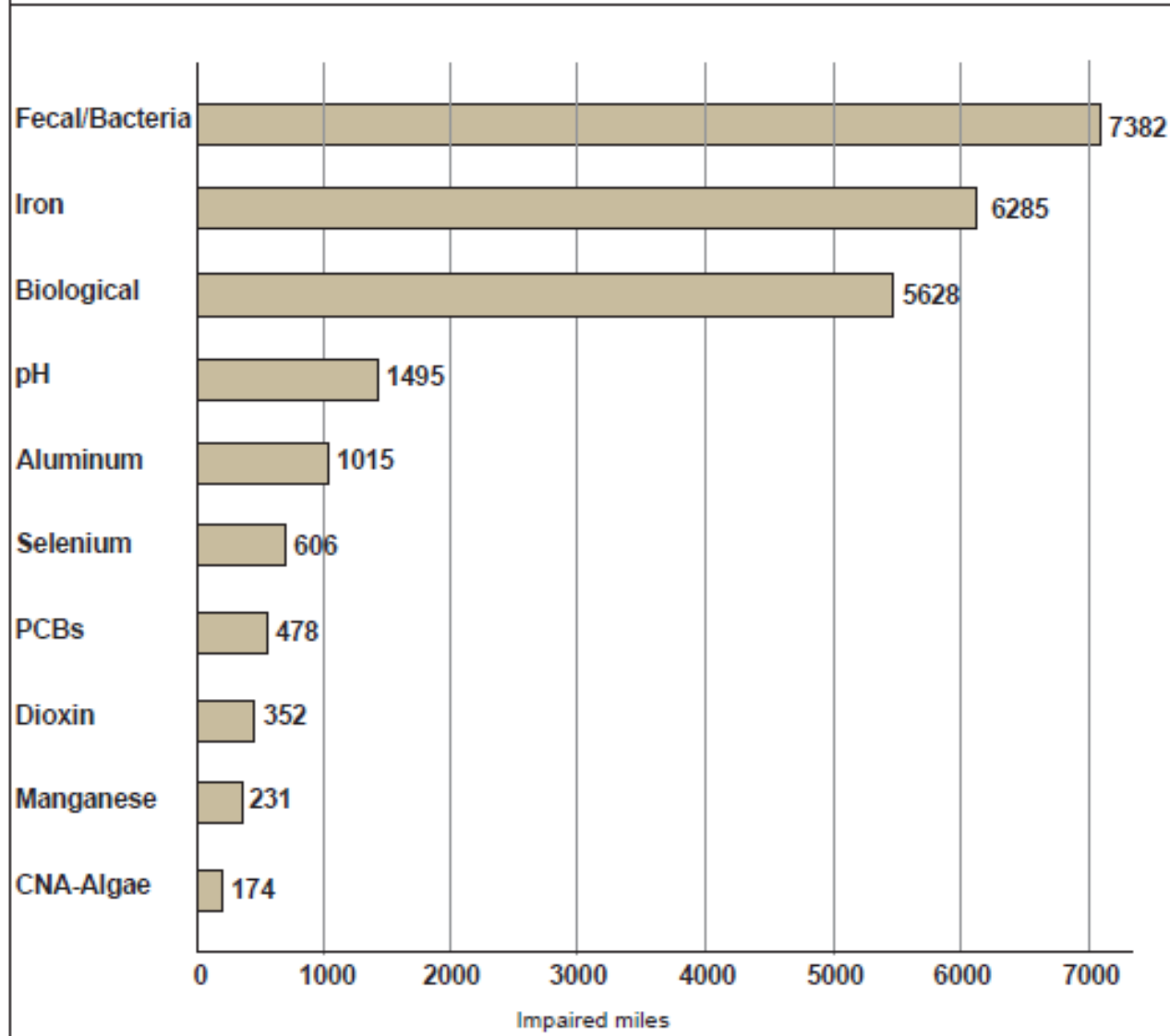
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STREAM IMPAIRMENT

Table 9 - Number of miles for the leading causes of West Virginia impaired streams
(shows causes with >100 miles impaired)



BIOTIC INTEGRITY

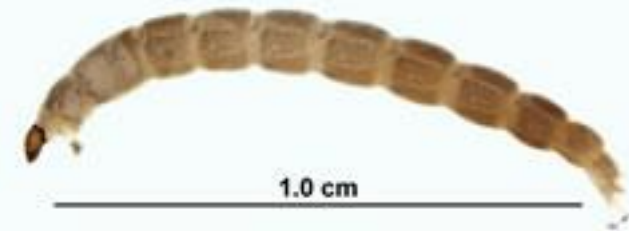
“the capability of supporting and maintaining a balanced, integrated, adaptive community of organisms having a species composition, diversity and functional organization comparable to that of the natural habitat of the regions” (Karr and Dudley 1981, Gibson et al. 1996)



WVSCI

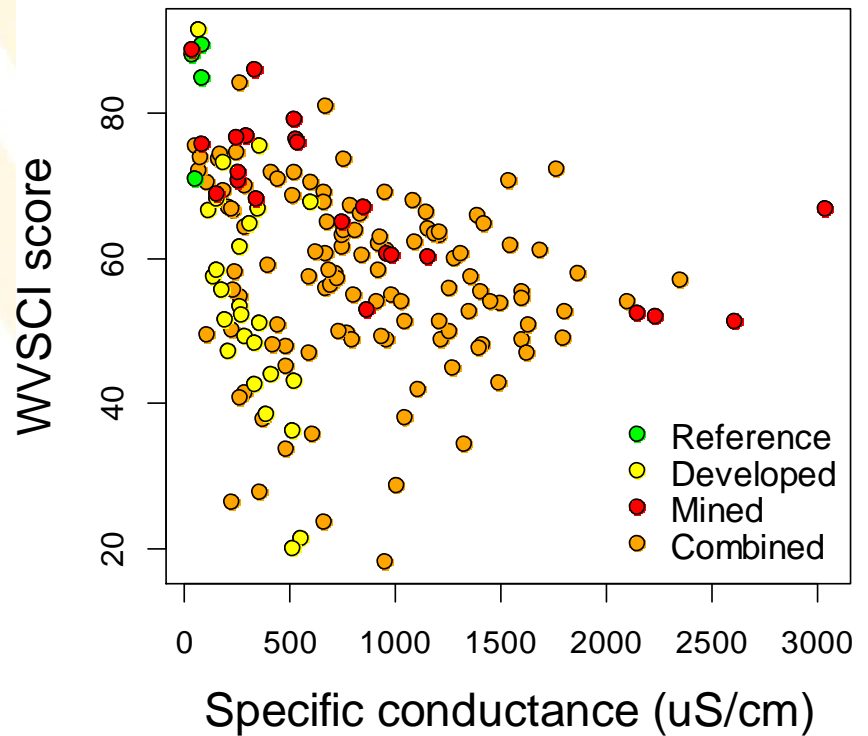
- Benefits

- Characterize existence/severity of pollution sources
- Targeting/prioritizing watersheds for remediation/prevention
- Evaluate effectiveness of nonpoint source BMP
- Screening ecosystems for use attainability
- Establishing biocriteria to relate to region water quality goals



WVSCI

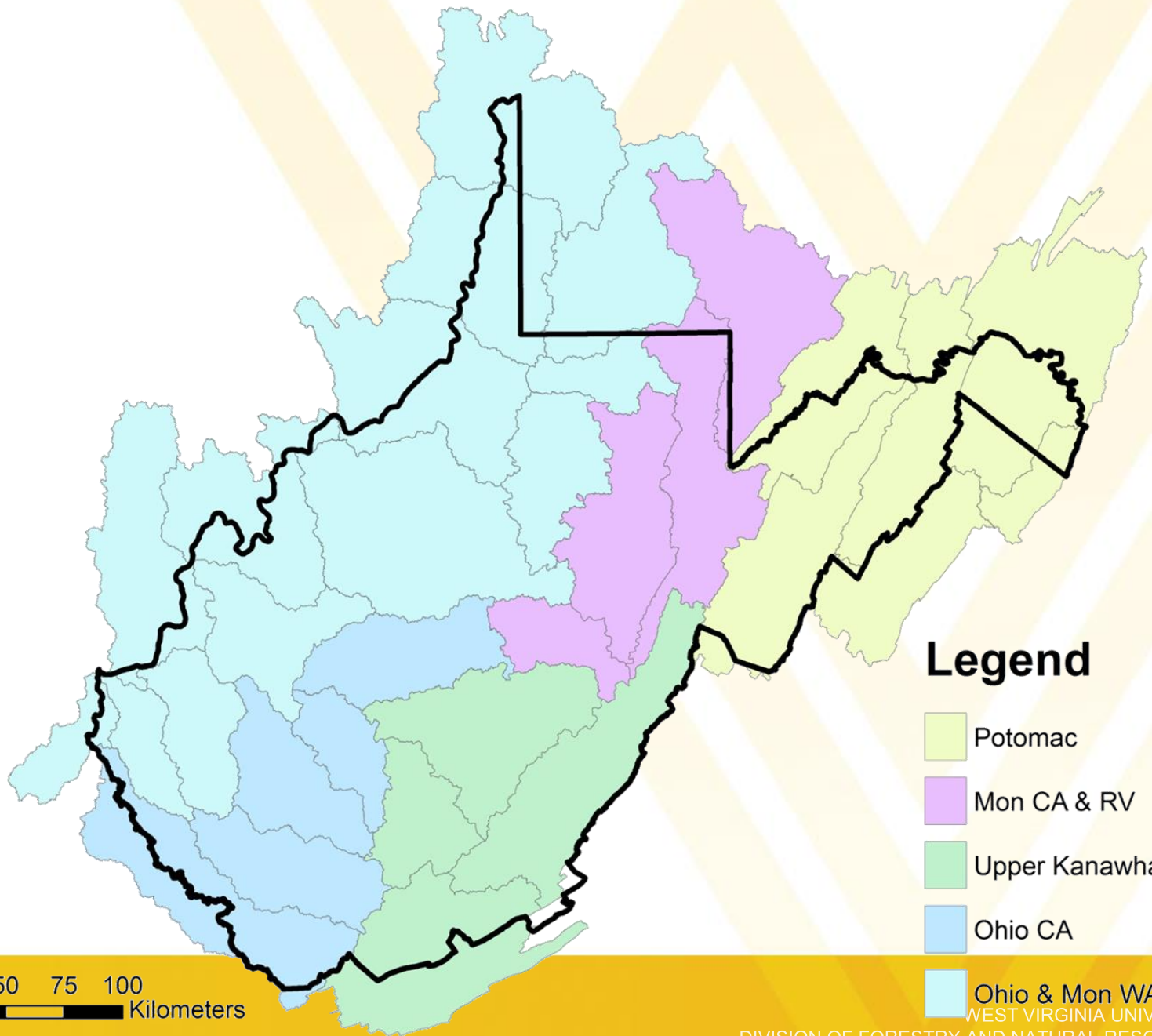
- Core Metrics
 - EPT Taxa
 - Total Taxa
 - % EPT
 - % Chironomidae
 - % Top 2 Dominant Taxa
 - HBI (Family Biotic Index)



OBJECTIVES

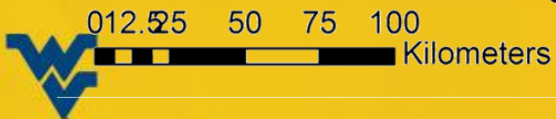
1. Describe IBI for different regions and how it is responsive to stress
2. Demonstrate the complexity of fish response to stressors

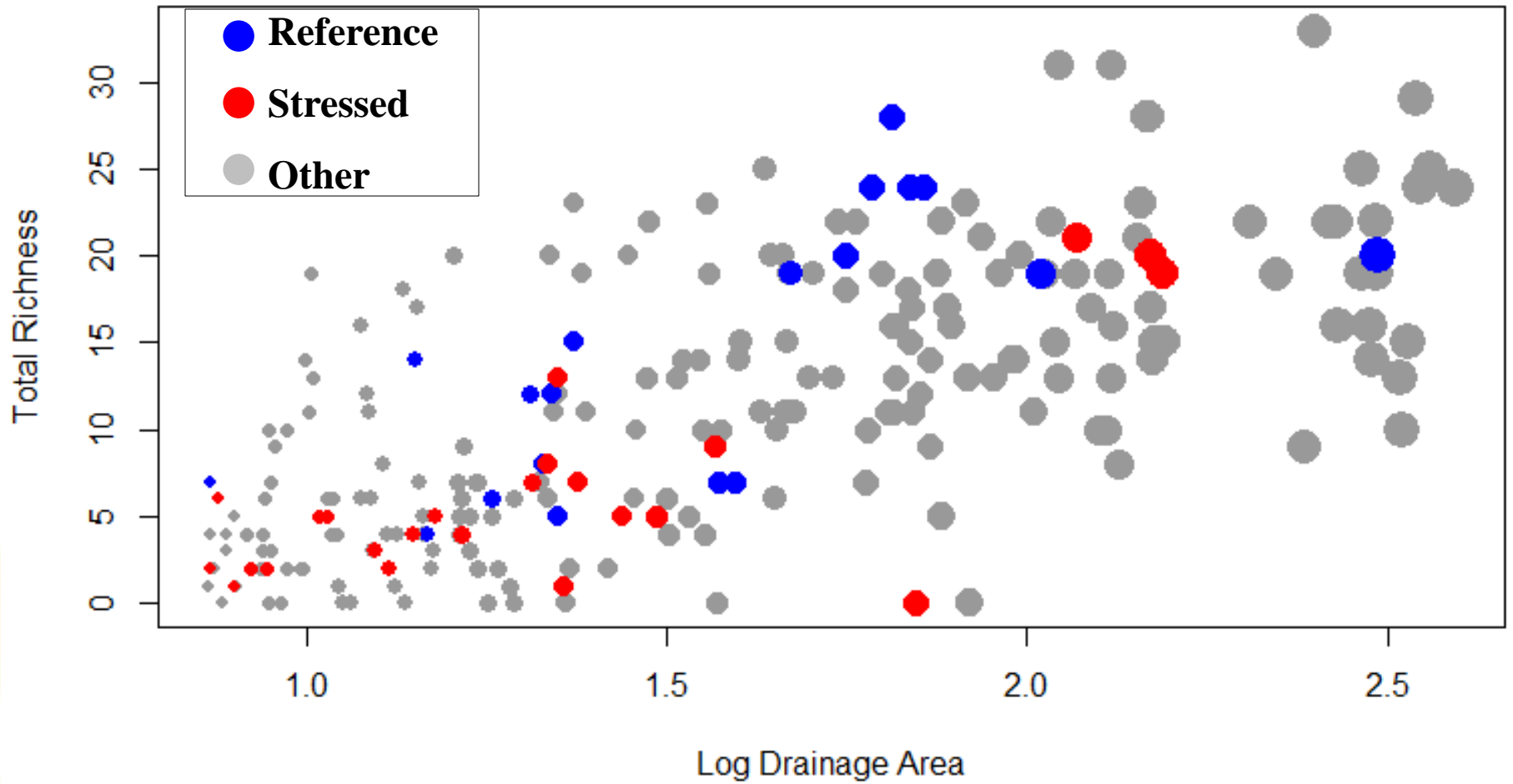




Legend

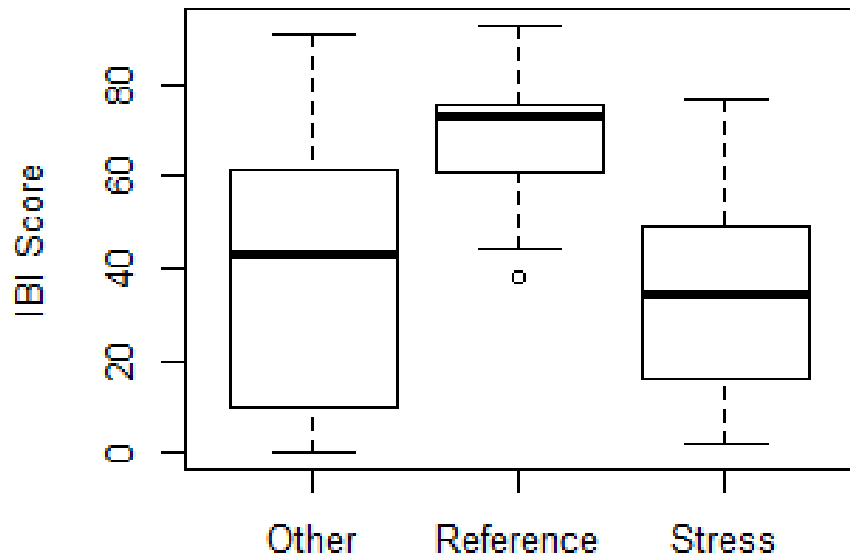
- Potomac
- Mon CA & RV
- Upper Kanawha
- Ohio CA
- Ohio & Mon WAP





Metrics

Mon CARV

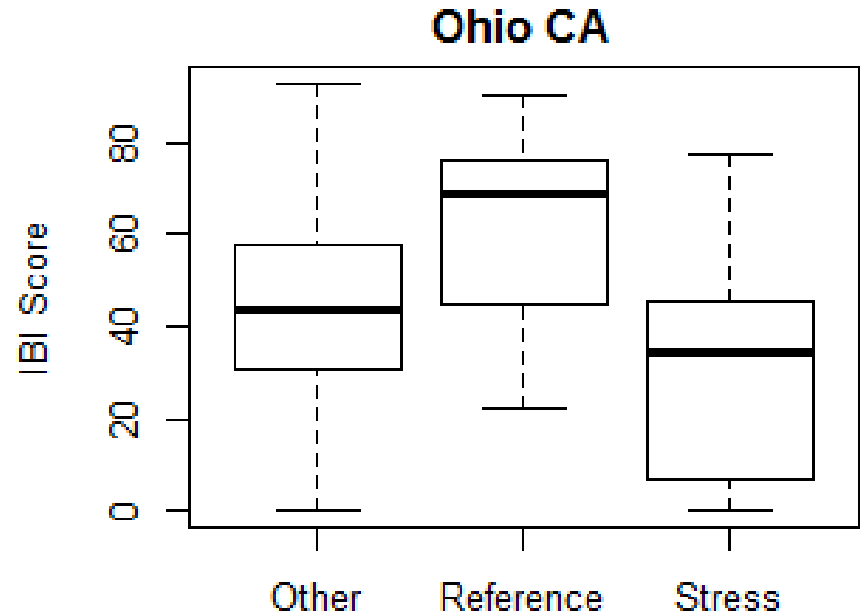


1. % Benthic Ind. (-Tolerant)
2. Richness (-Tolerant)*
3. Clean Gravel Spawner
Richness*
4. % Non-tolerant Ind.*
5. % Invertivore*
6. Benthic Species Richness*
7. Cyprinidae Richness*



Metrics

1. Richness (-Tol)*
2. % Invertivore*
3. Trophic Diversity Index
4. Darter-Madtom-Sculpin Richness*
5. % Tolerant Ind.*
6. Rock-Gravel Spawner Richness*
7. NG Litho. Richness (-Tol)*



Metrics



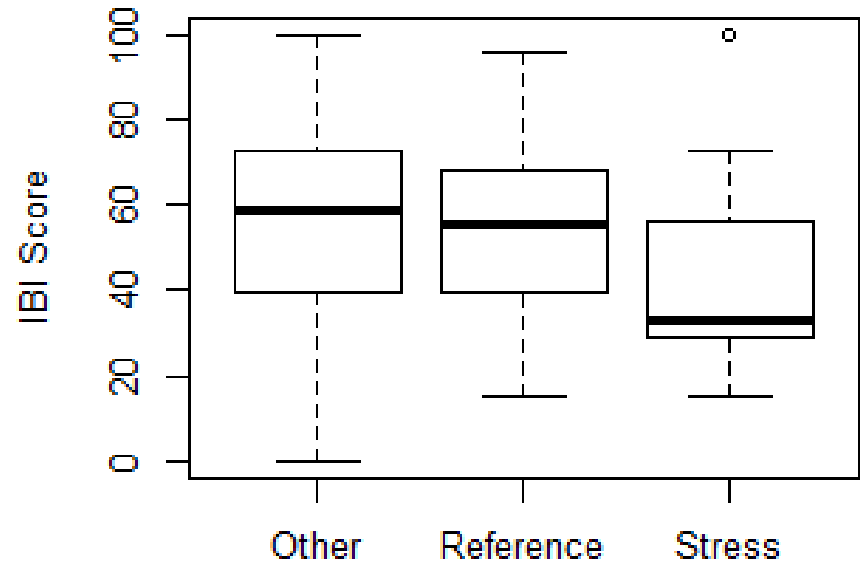
1. Richness (-Tolerant)*
2. Darter-Madtom-Sculpin Richness*
3. Intolerant Species Richness*
4. % Tolerant Ind.*
5. Rock-Gravel Spawner Richness*
6. NG Litho. Richness (-Tol)*
7. % Omnivore/herbivore (-Central Stoneroller)
8. Cyprinidae Richness (-Blacknose Dace and Creek Chub)

Metrics

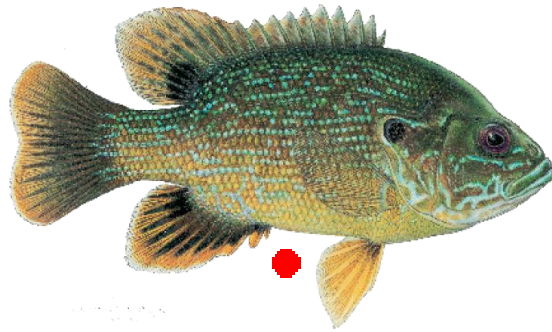
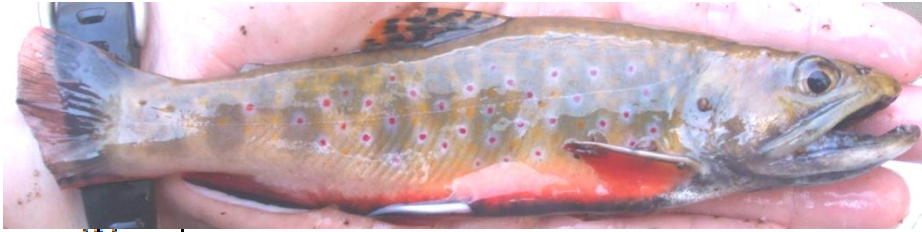
1. % Invertivore*
2. Intolerant Species Richness*
3. % Tolerant Ind.*
4. Benthic Species Richness*
5. Total Richness*
6. Clean Gravel Spawner Richness*
7. Cyprinidae Richness*



Upper Kanawha



Mon CARV



IBI SCORE

40
20
0

2

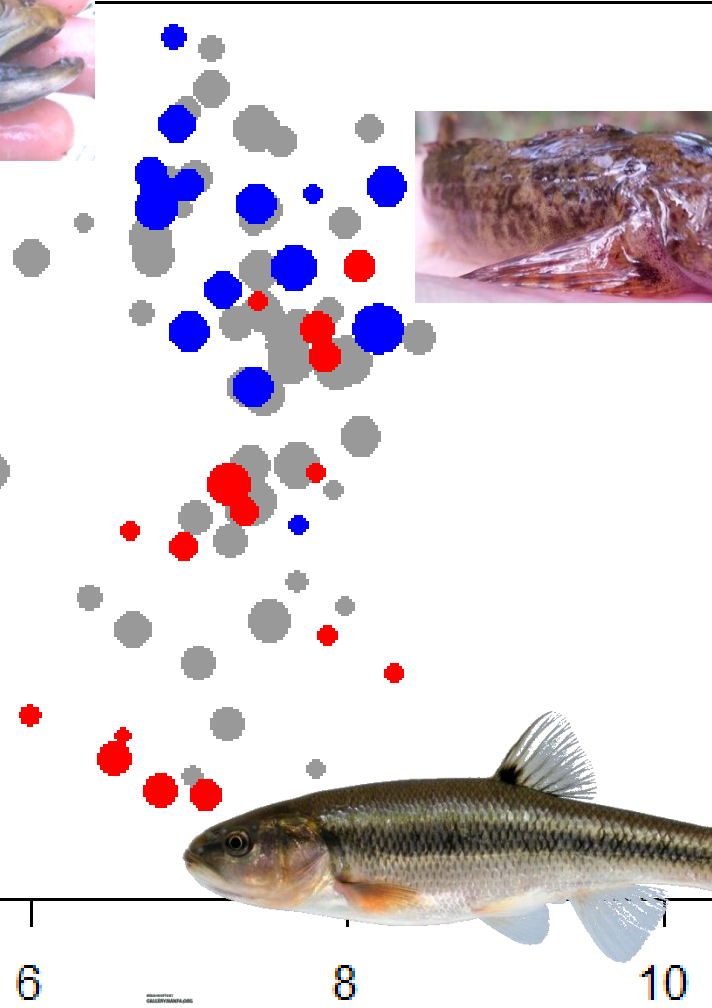
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6

8

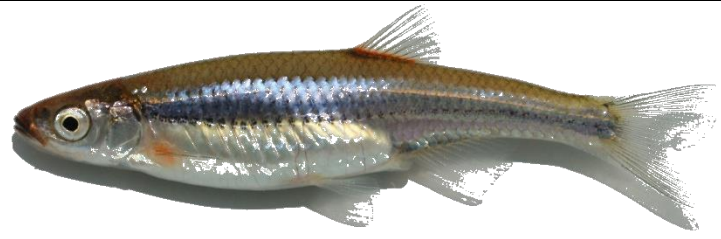
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pH

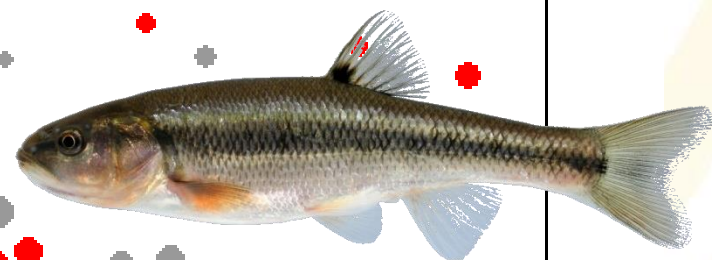
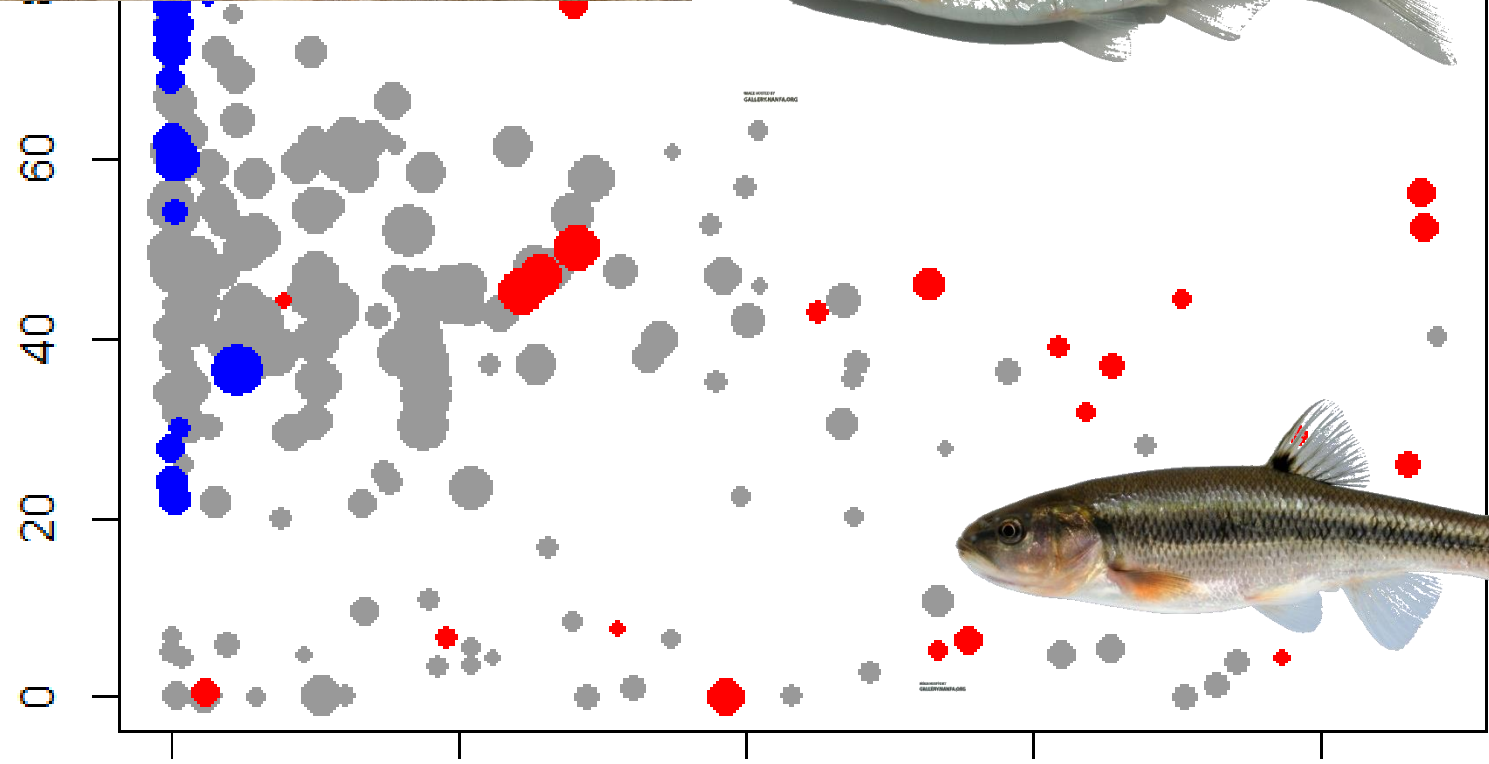




Ohio CA



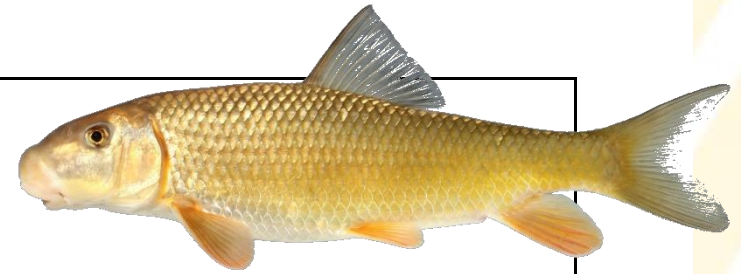
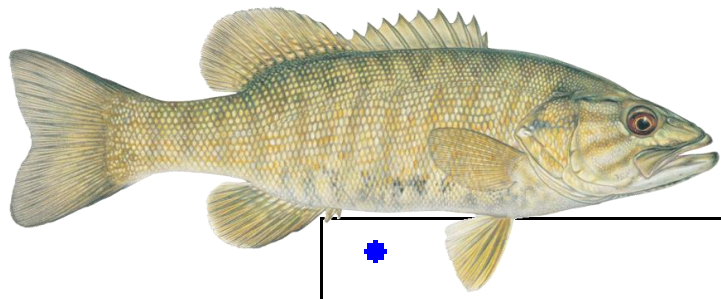
IBI SCORE



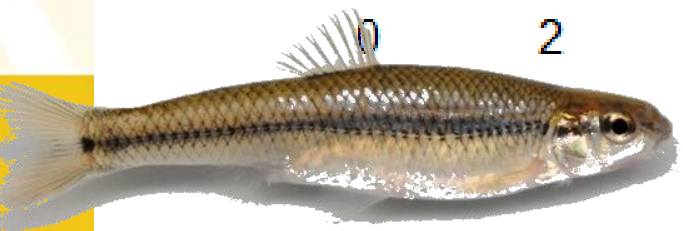
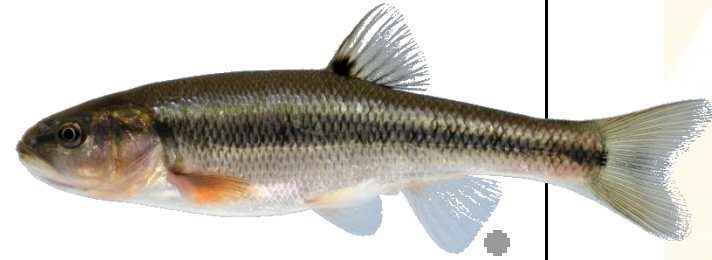
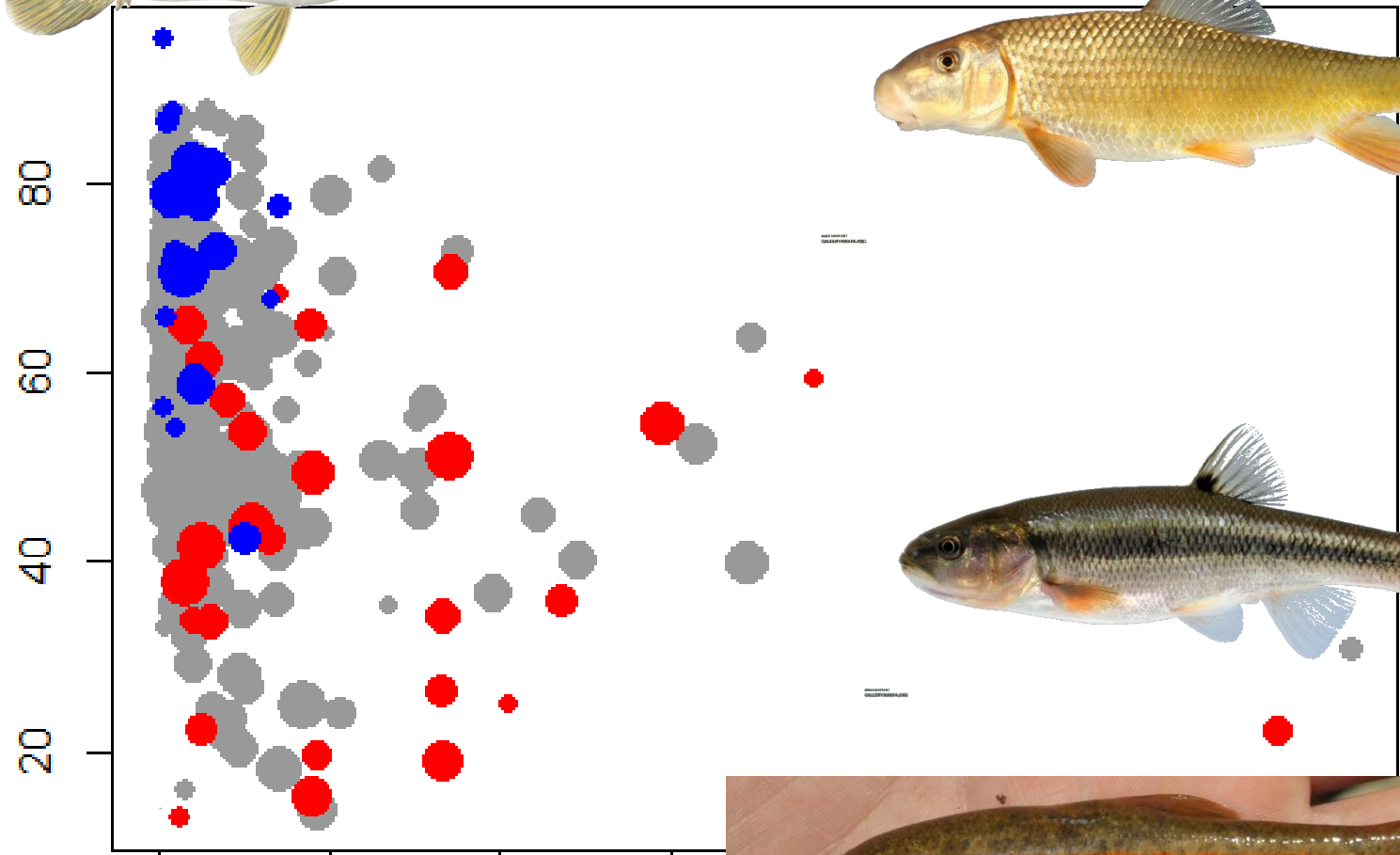
Cumulative



Ohio Mon WAP



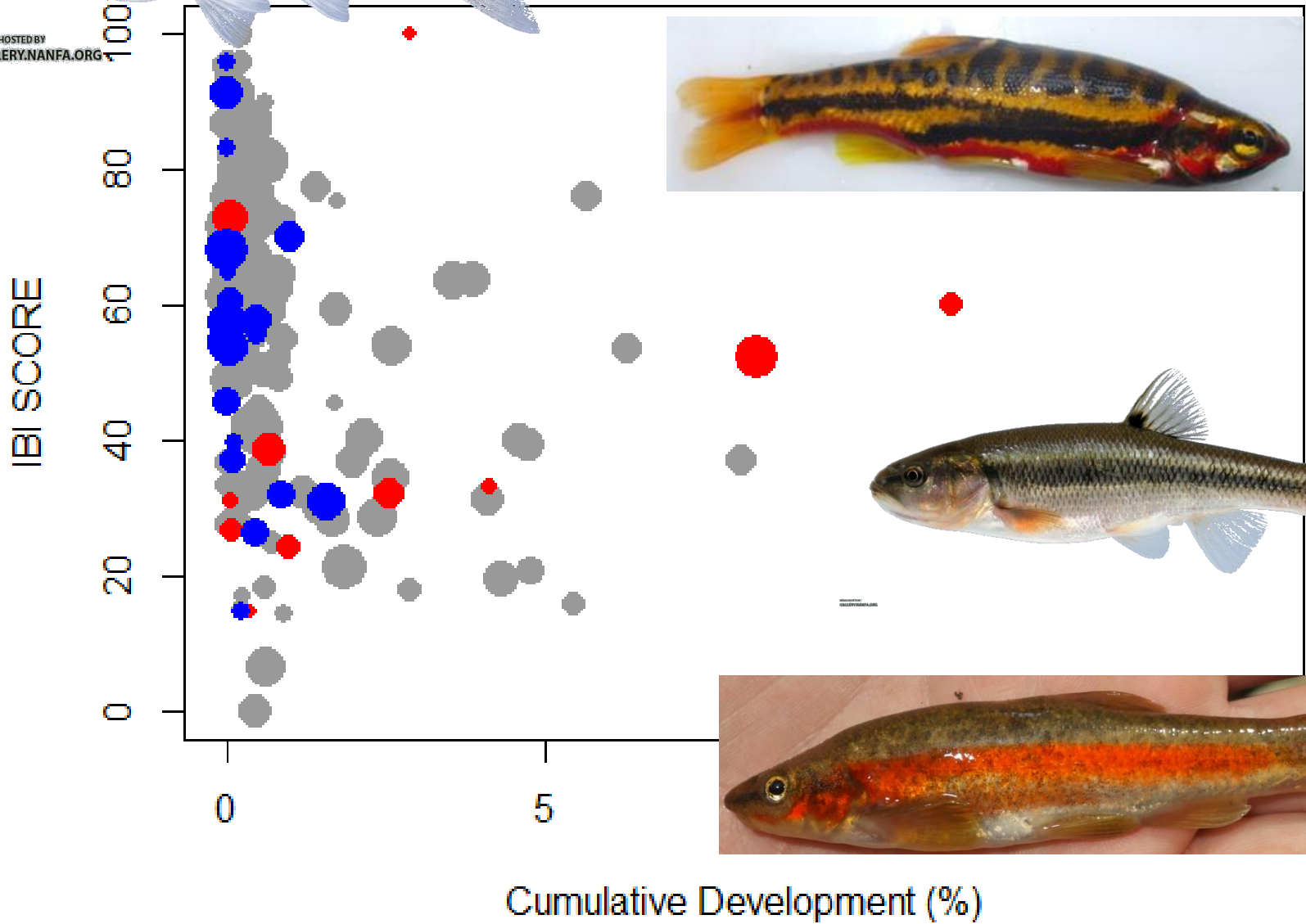
IBI SCORE



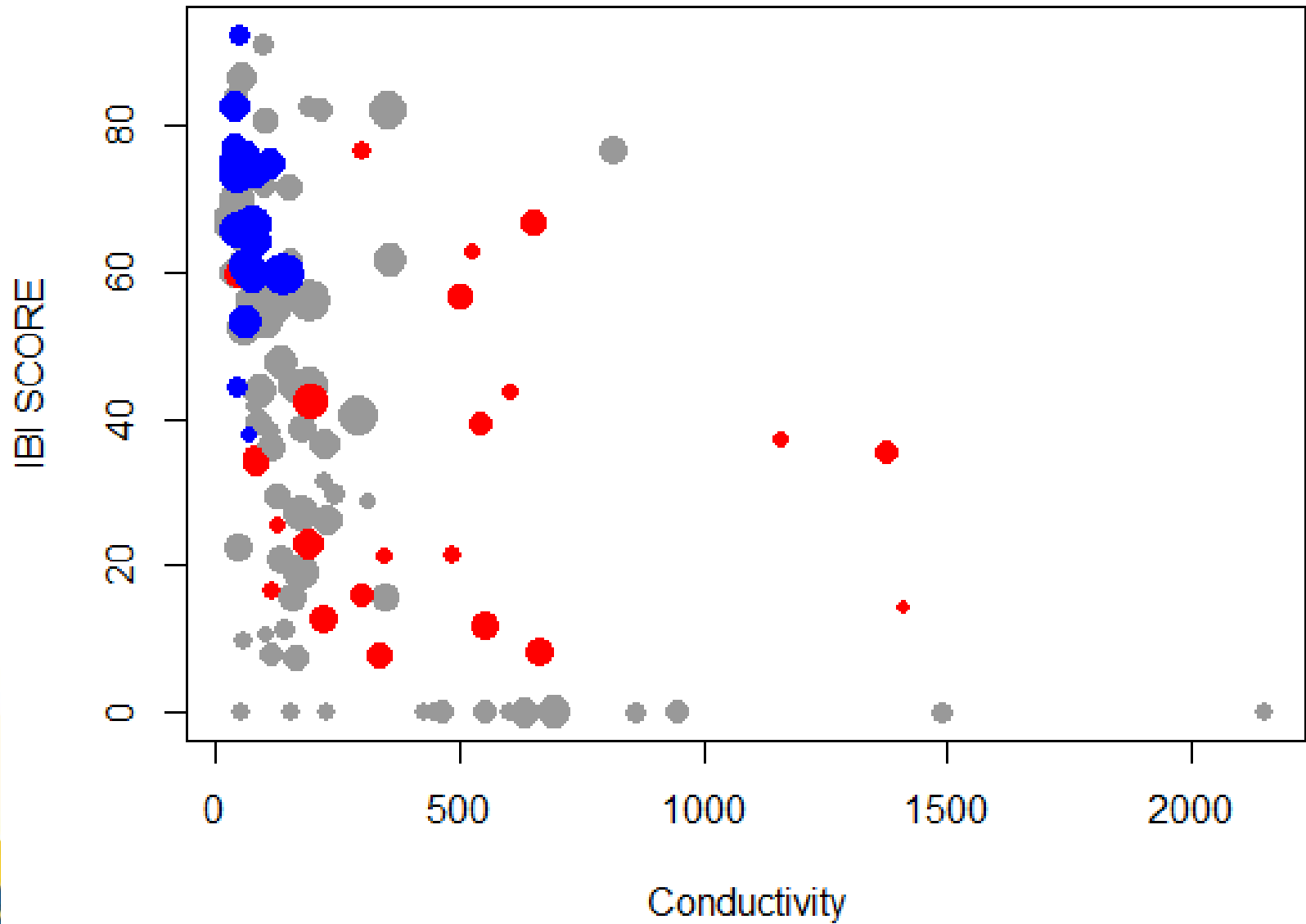
Cumulative Development (%)

Upper Kanawha

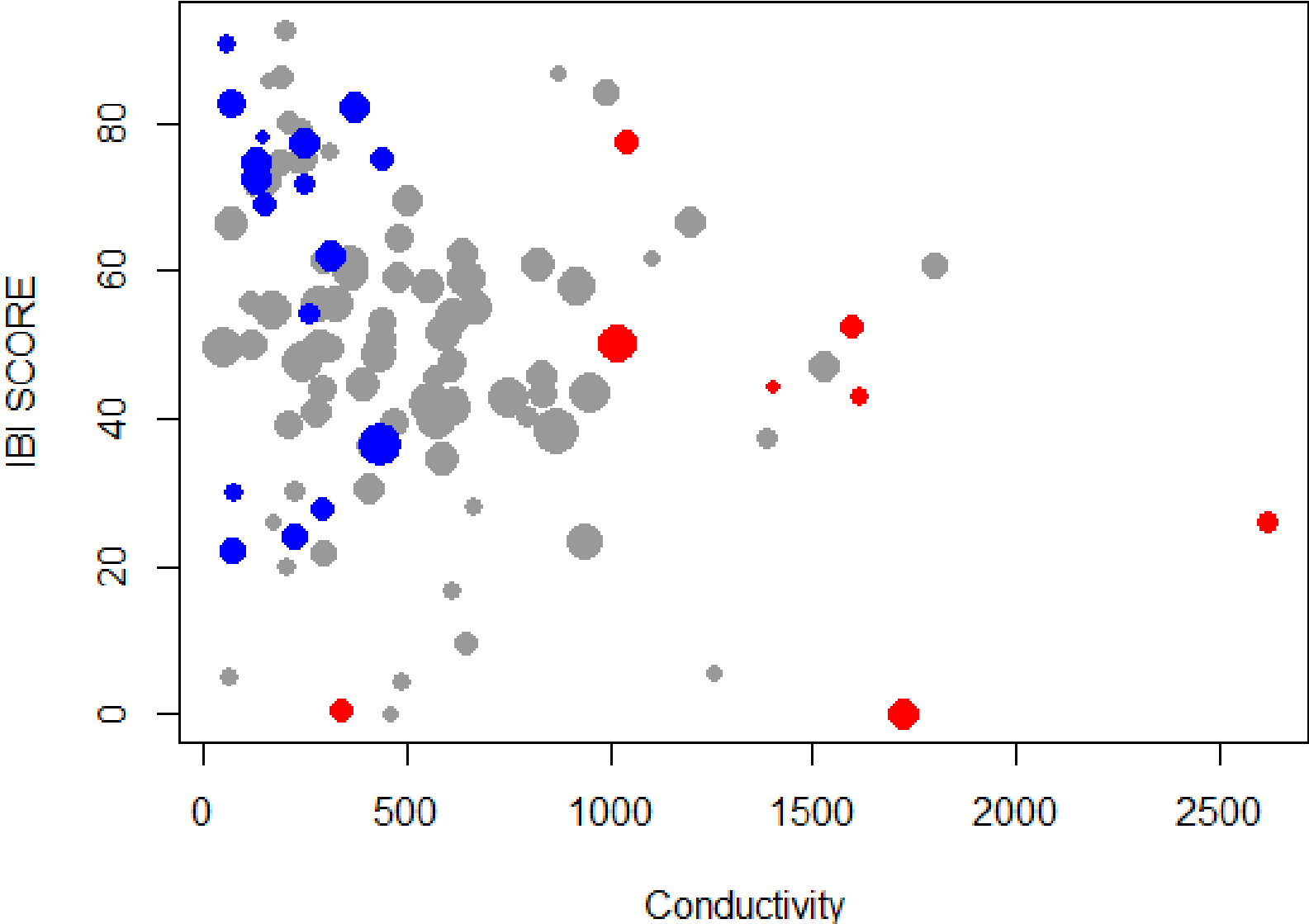
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GALLERY.NANFA.ORG



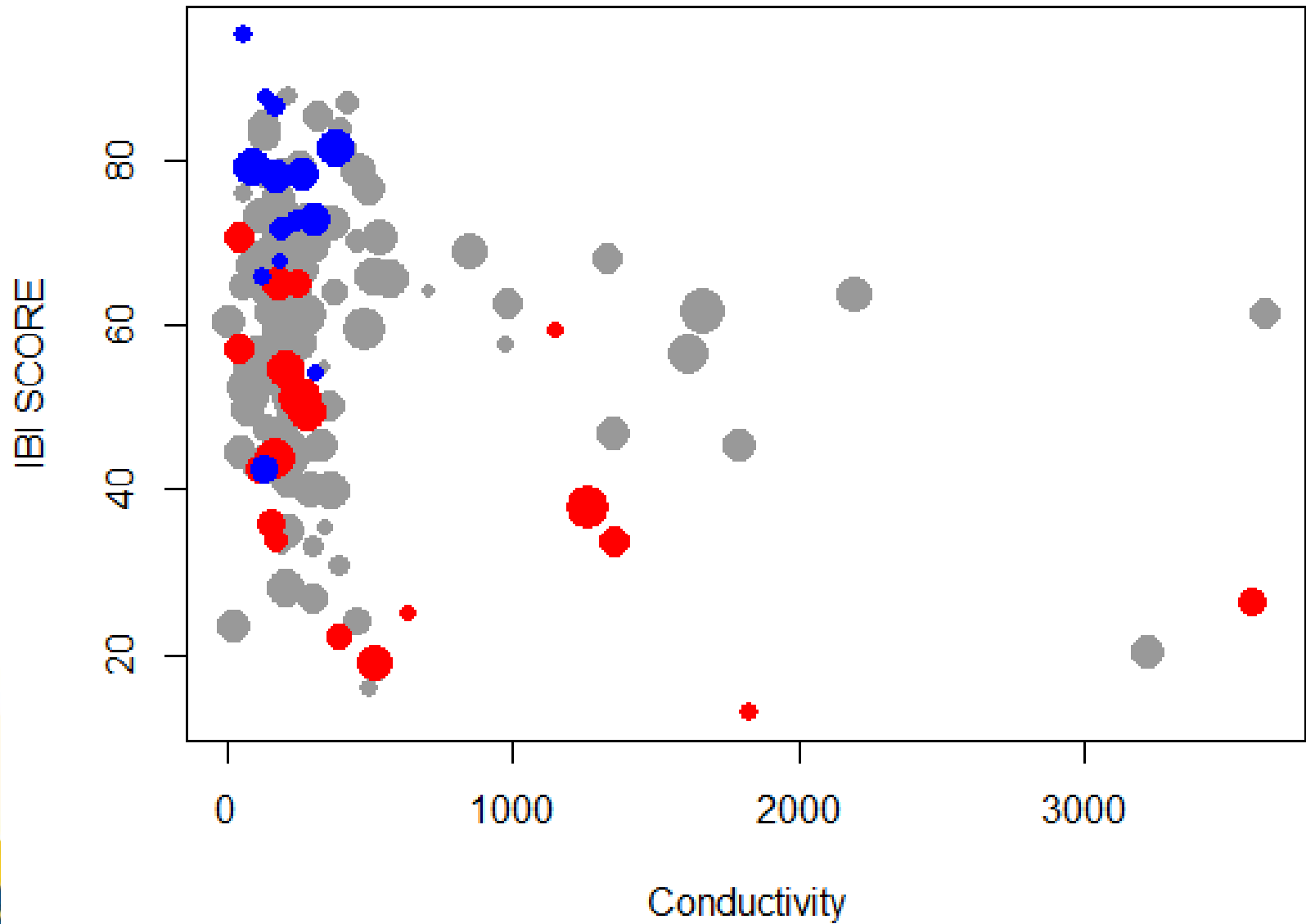
Mon CARV



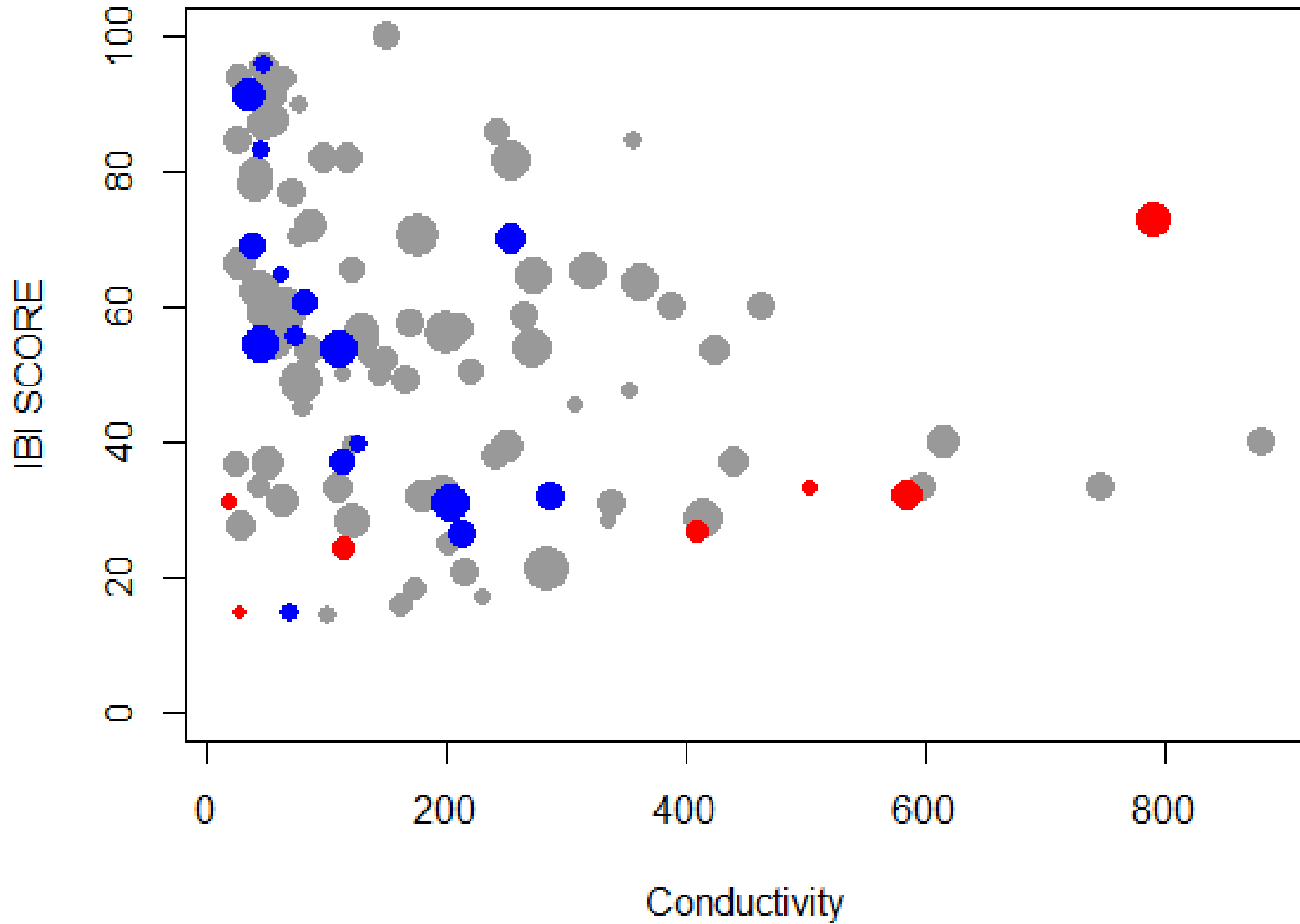
Ohio CA



Ohio Mon WAP

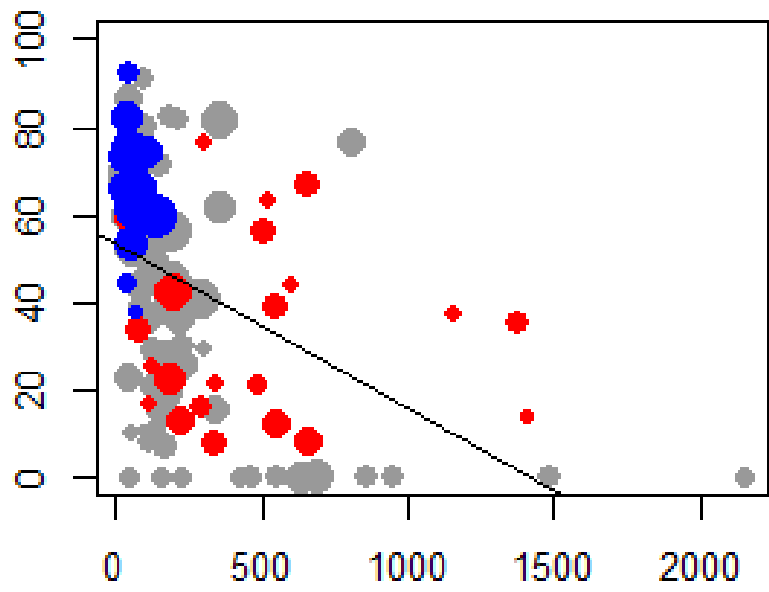


Upper Kanawha

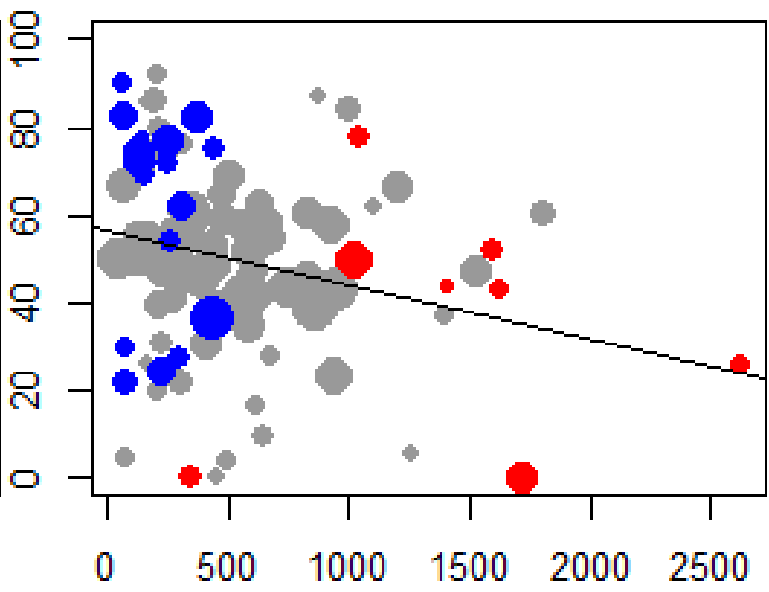


IBI SCORE

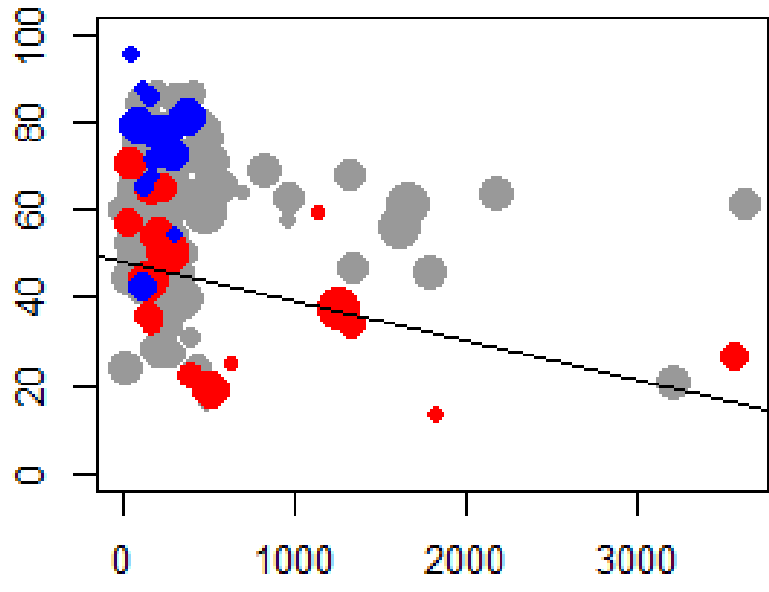
Mon CARV



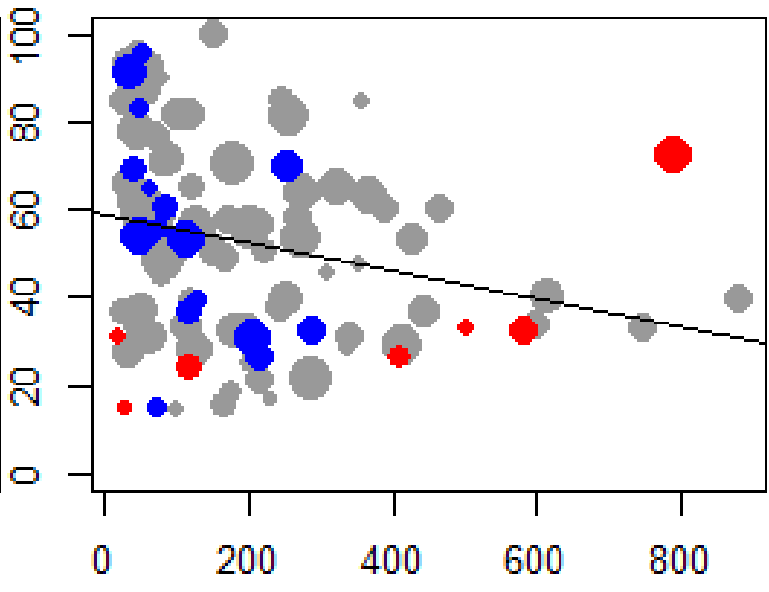
Ohio CA



Ohio Mon WAP

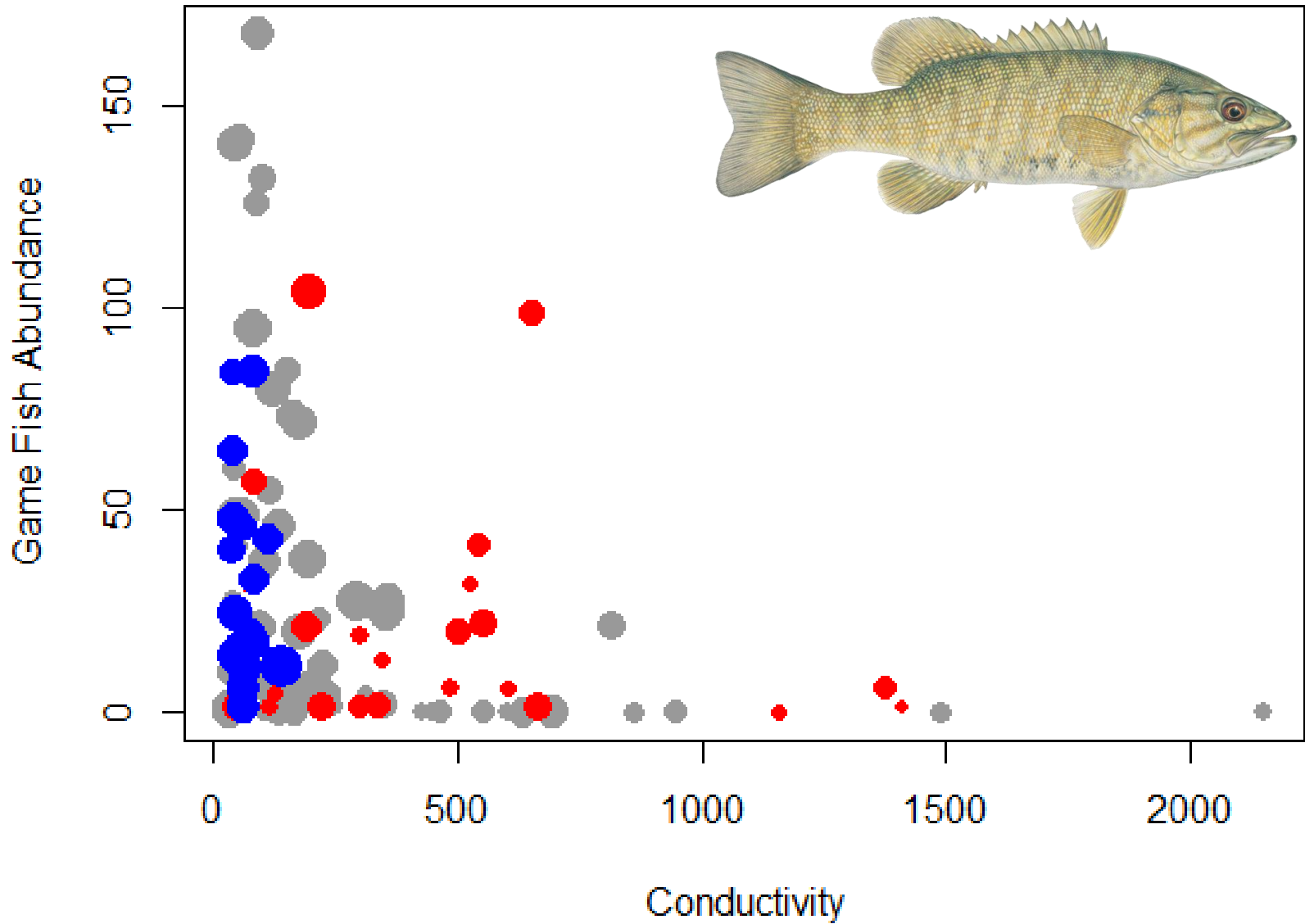


Upper Kanawha

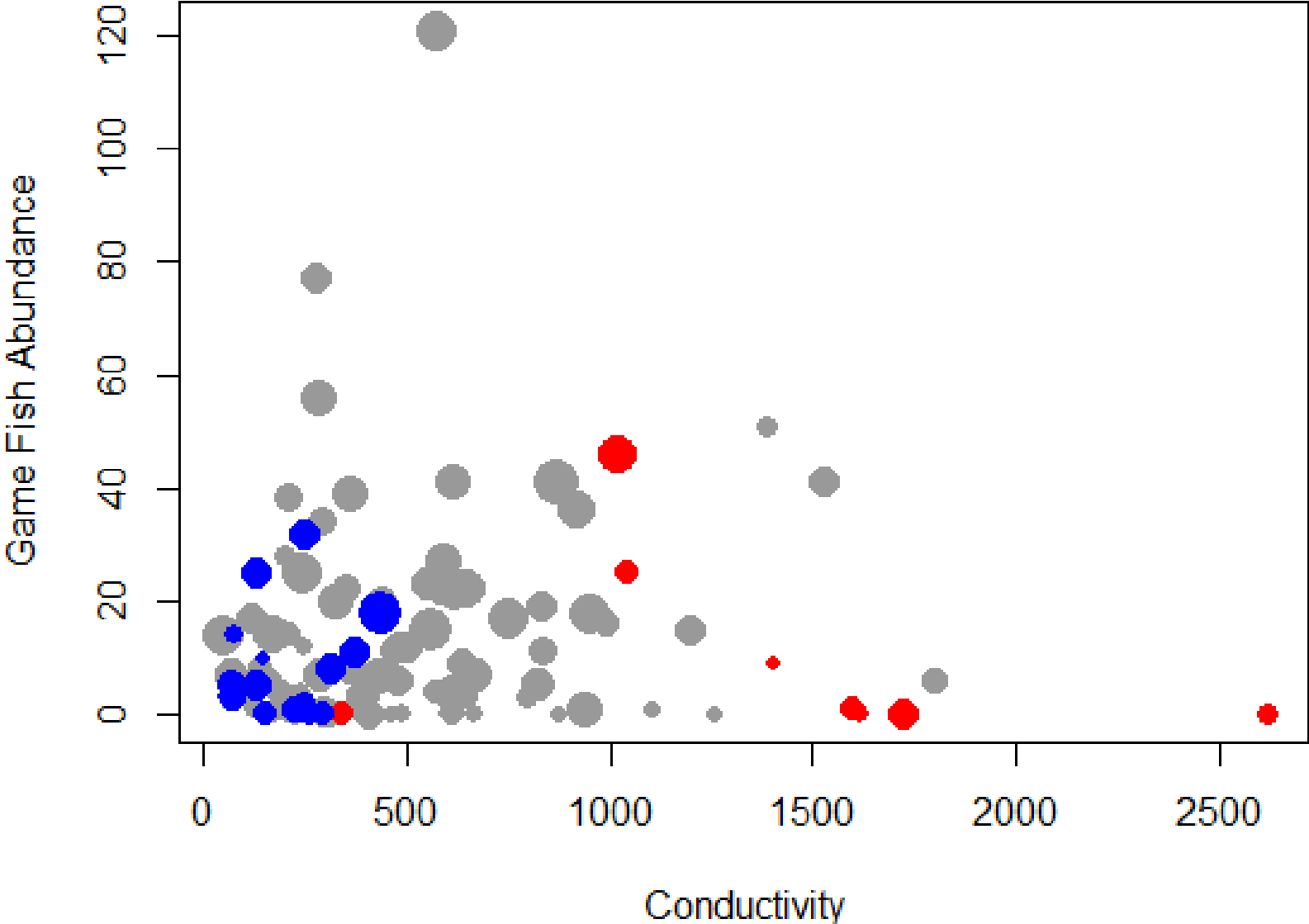


Conductivity

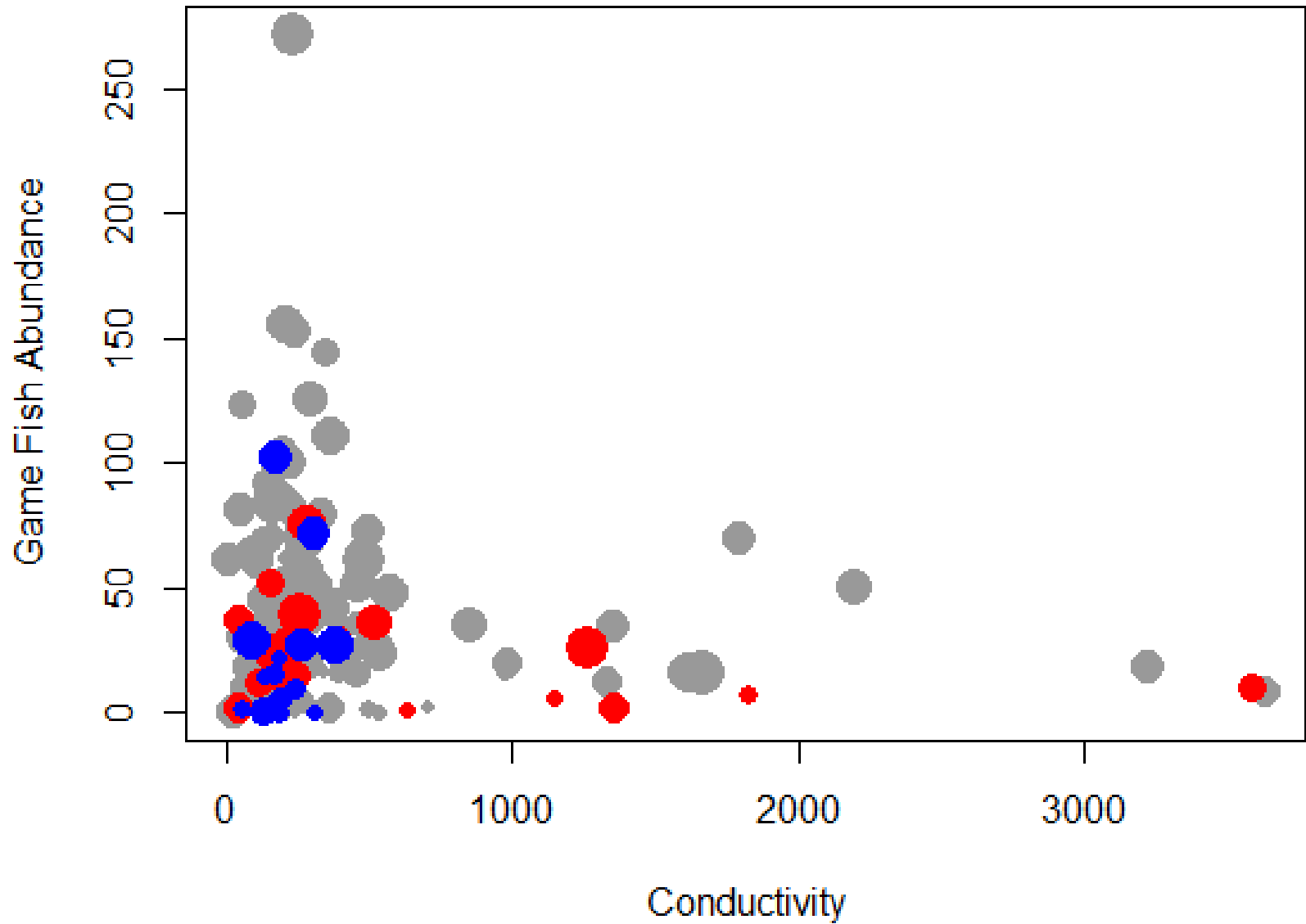
Mon CARV



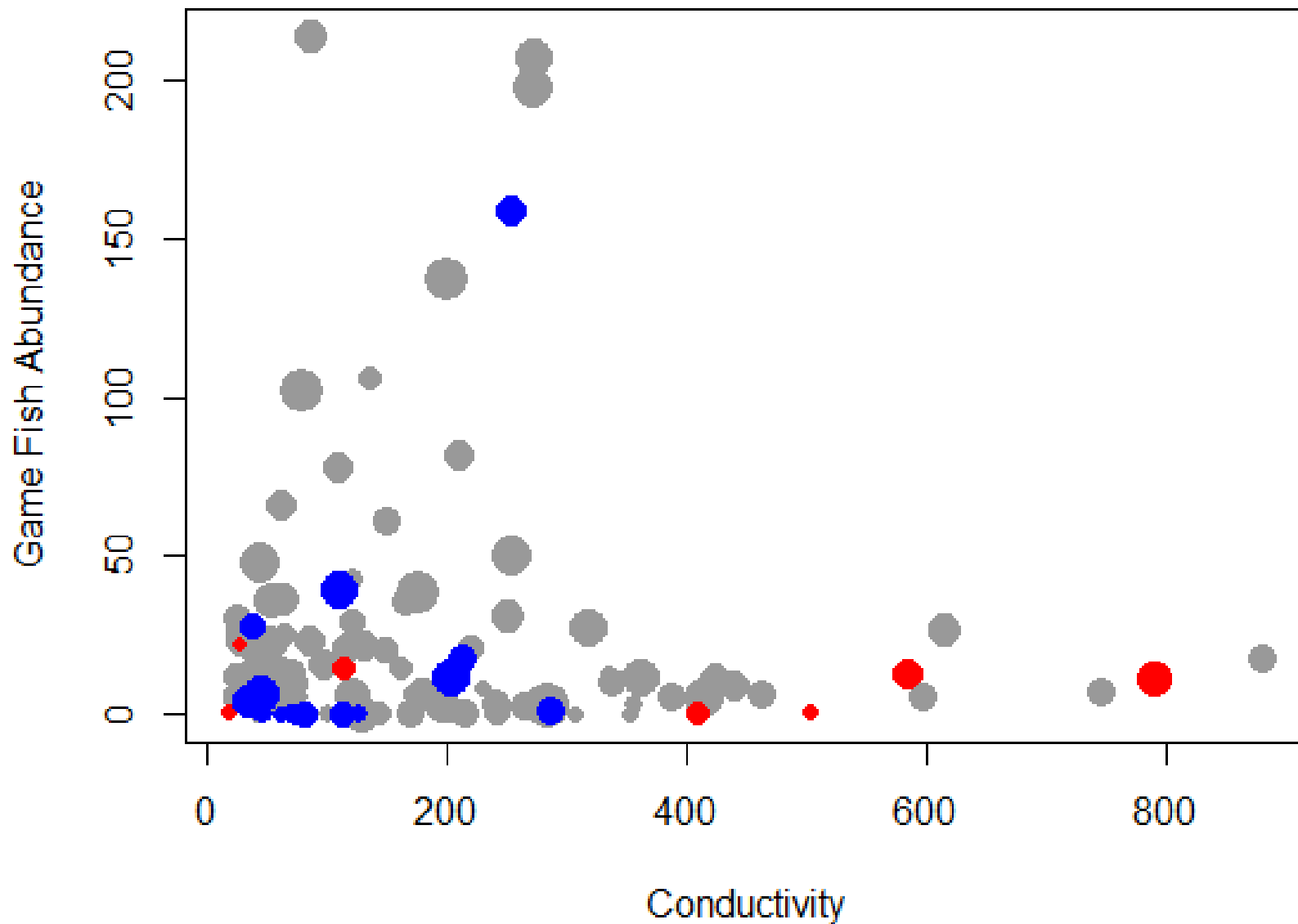
Ohio CA



Ohio Mon WAP

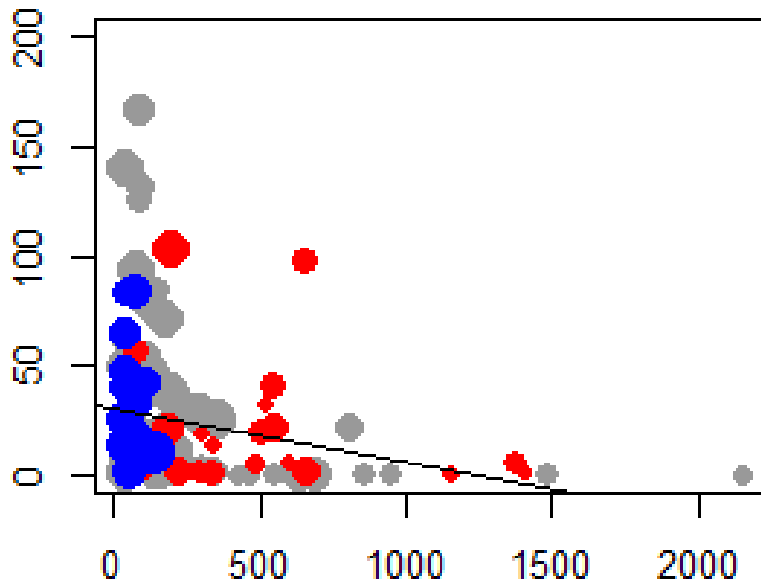


Upper Kanawha

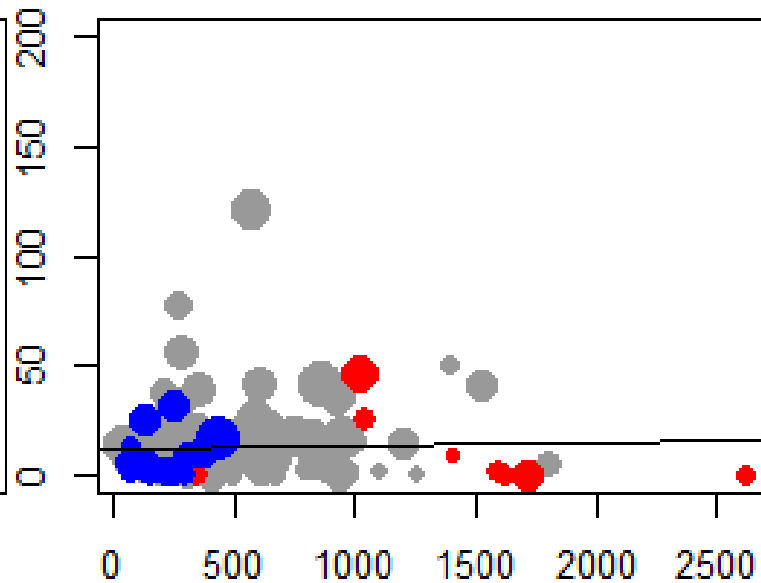


Game Fish Abundance

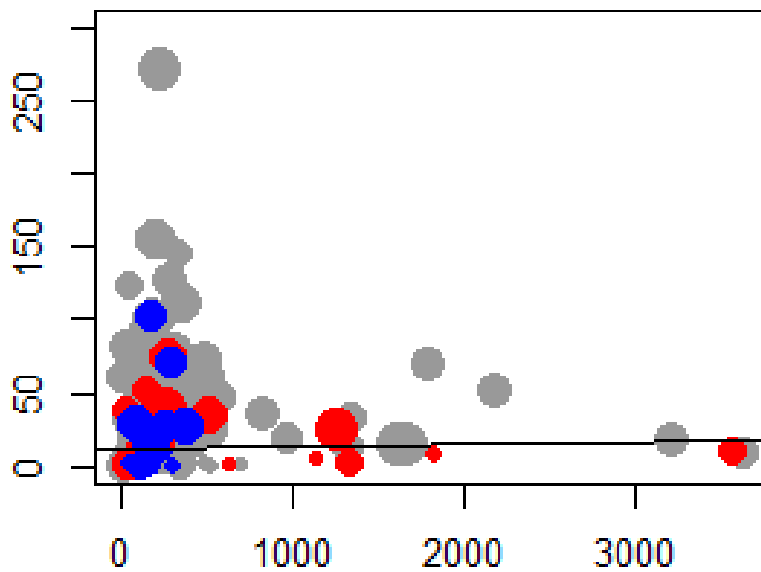
Mon CARV



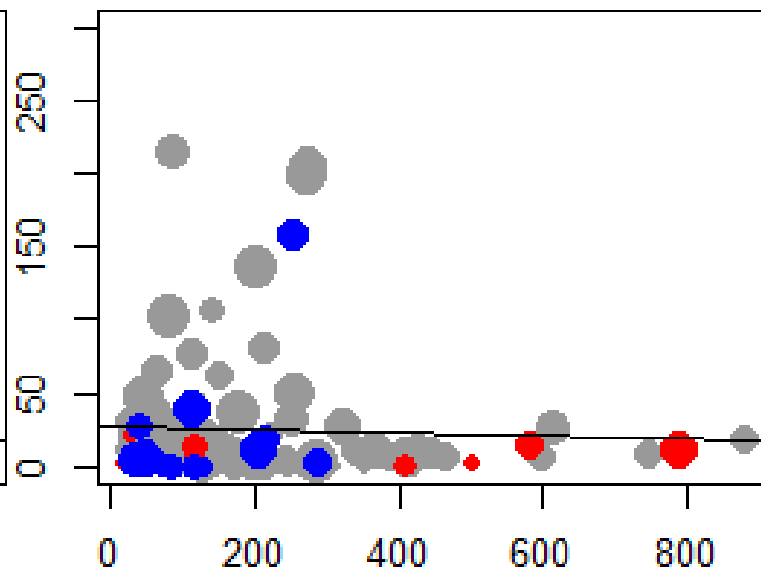
Ohio CA



Ohio Mon WAP



Upper Kanawha



Conductivity

WV INDEX OF BIOTIC INTEGRITY

- Regionalized
- Responds to stressors
- “Stressed” sites may not represent major stressors for each region
 - Mon CARV: pH/Conductivity
 - Ohio CA: Cumulative Surface Mining (%)
 - Ohio Mon WAP: Development (%)
 - Upper Kanawha: Development (%)



CONDUCTIVITY

- WV IBI:
 - Negative response in Mon CARV
 - Variable negative response in other regions
- Game fish abundance:
 - Negative response in Mon CARV
 - Variable response in other regions
 - More “tolerant” species
 - Larger stream/river systems dilute stressors



ACKNOWLEDGEMENTS

- West Virginia University
- West Virginia DEP

