

Peter Euclide, Jenna Ruzich, Scott Hansen, David Rowe, Troy Zorn, Wes Larson

23andMe for smallmouth
bass: Using genetics to
identify genetic differences
among populations



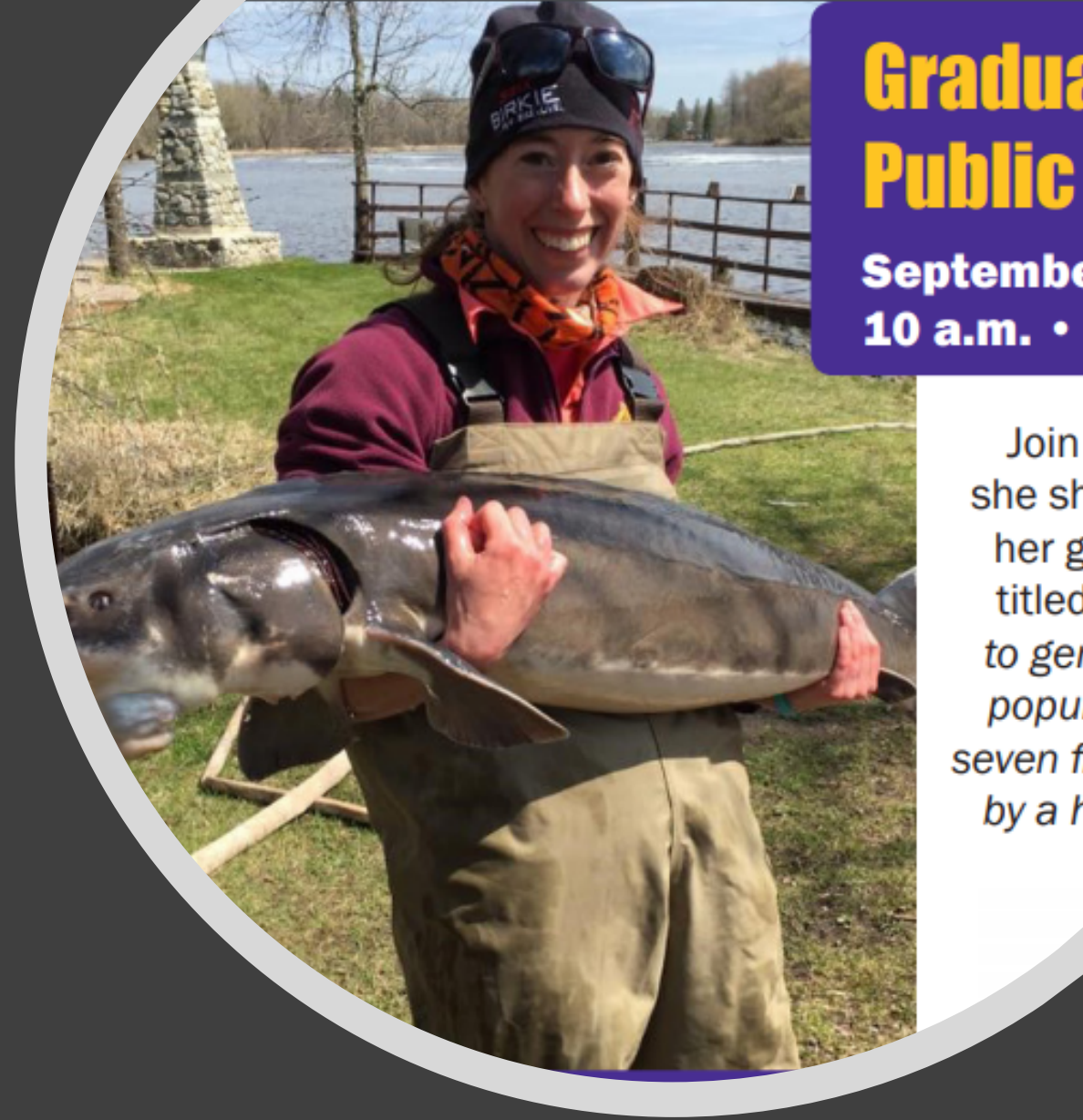
Peter Euclide

- Genetics research scientist with the USGS and Stevens Point
- Masters in natural resources
- PhD in biology
- Interested in fisheries and conservation



Jenna Ruzich

- Graduated with her Masters from UW Stevens Point this spring
- Now works for Minnesota Pollution Control



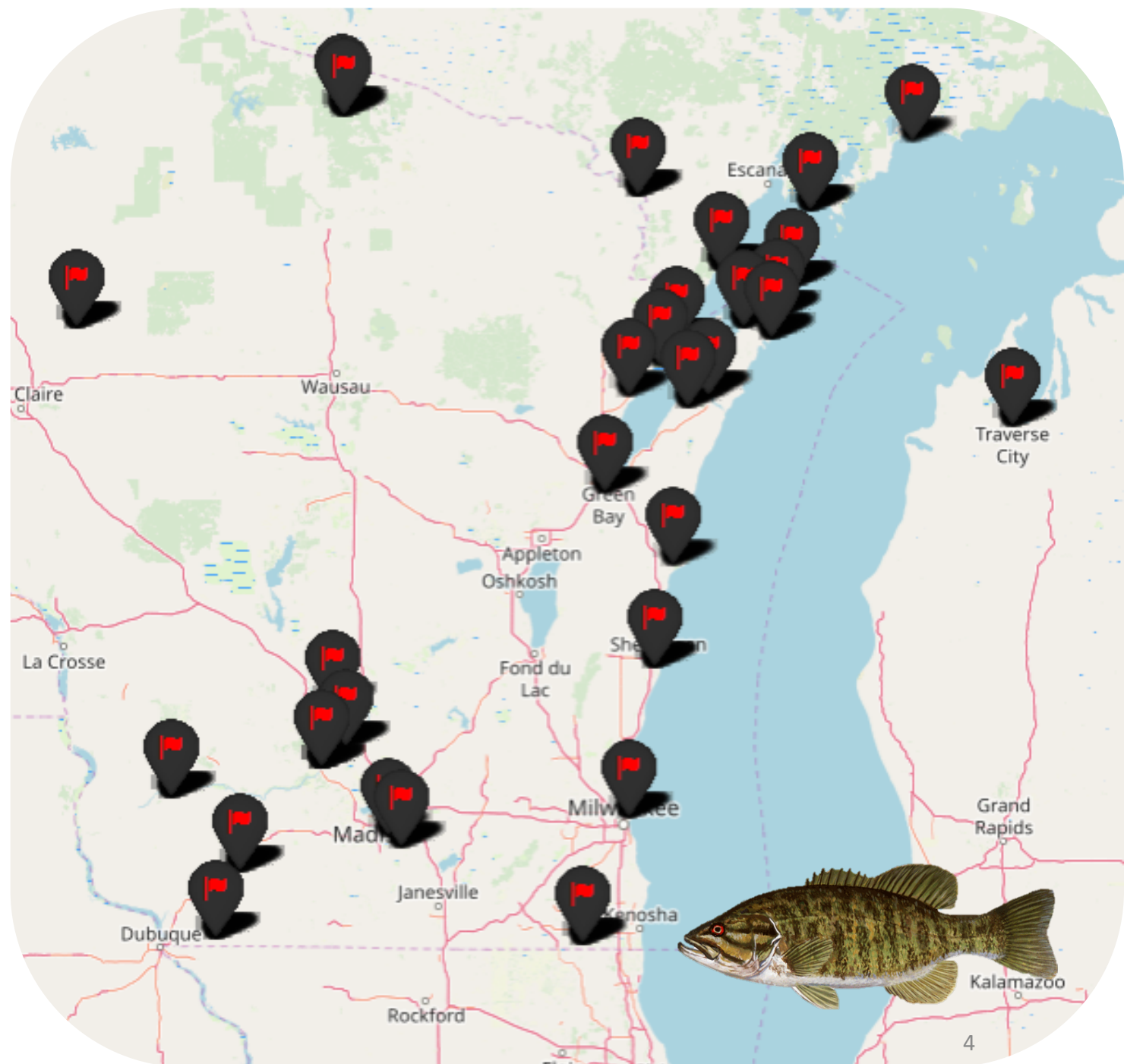
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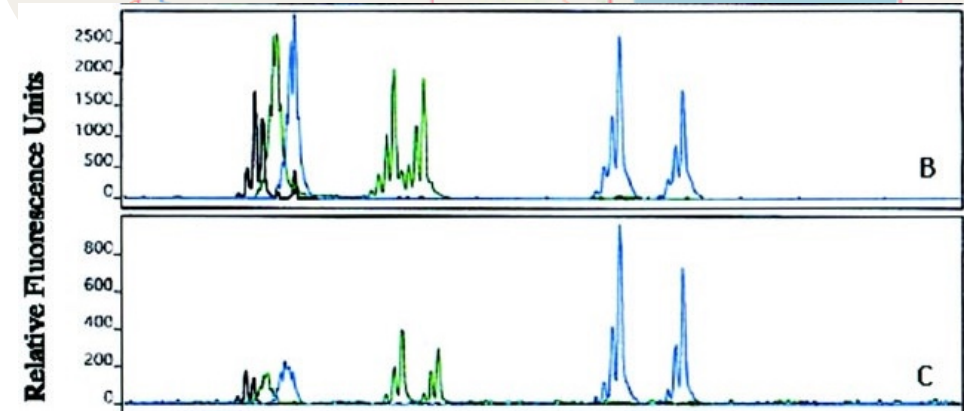
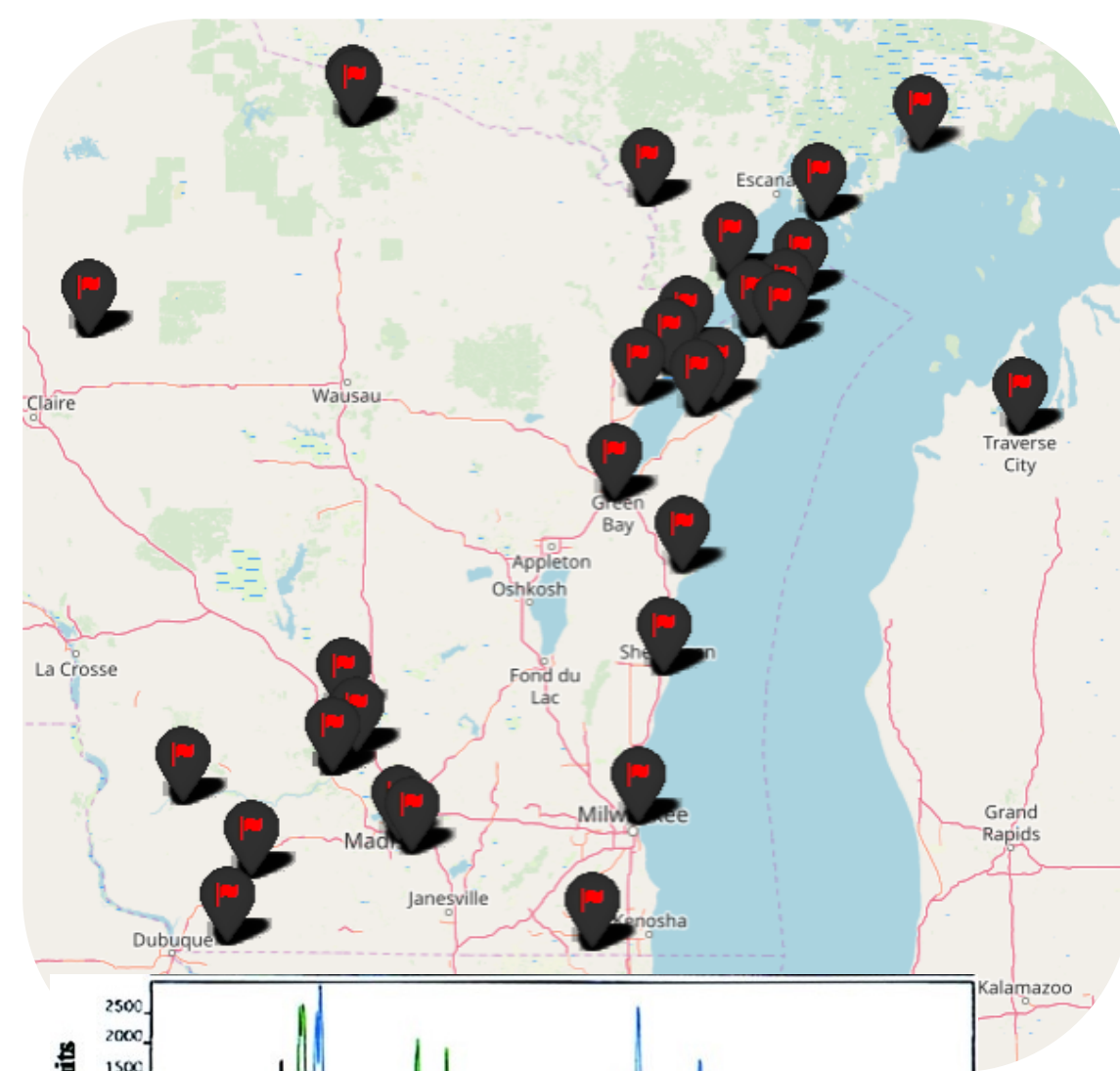
Smallmouth bass form many genetically distinct groups across Wisconsin

- Large division between Mississippi and Lake Michigan watersheds
- Smaller divisions among lakes and streams within each watershed



How do we know this?

- Collected smallmouth bass from drainages throughout Wisconsin and Lake Michigan
- Collected fin clips from 1,215 individuals
- 16 microsatellite loci
- ~30 sites
- Looked for differences in allele frequencies at these sites



What can genetics tell us?

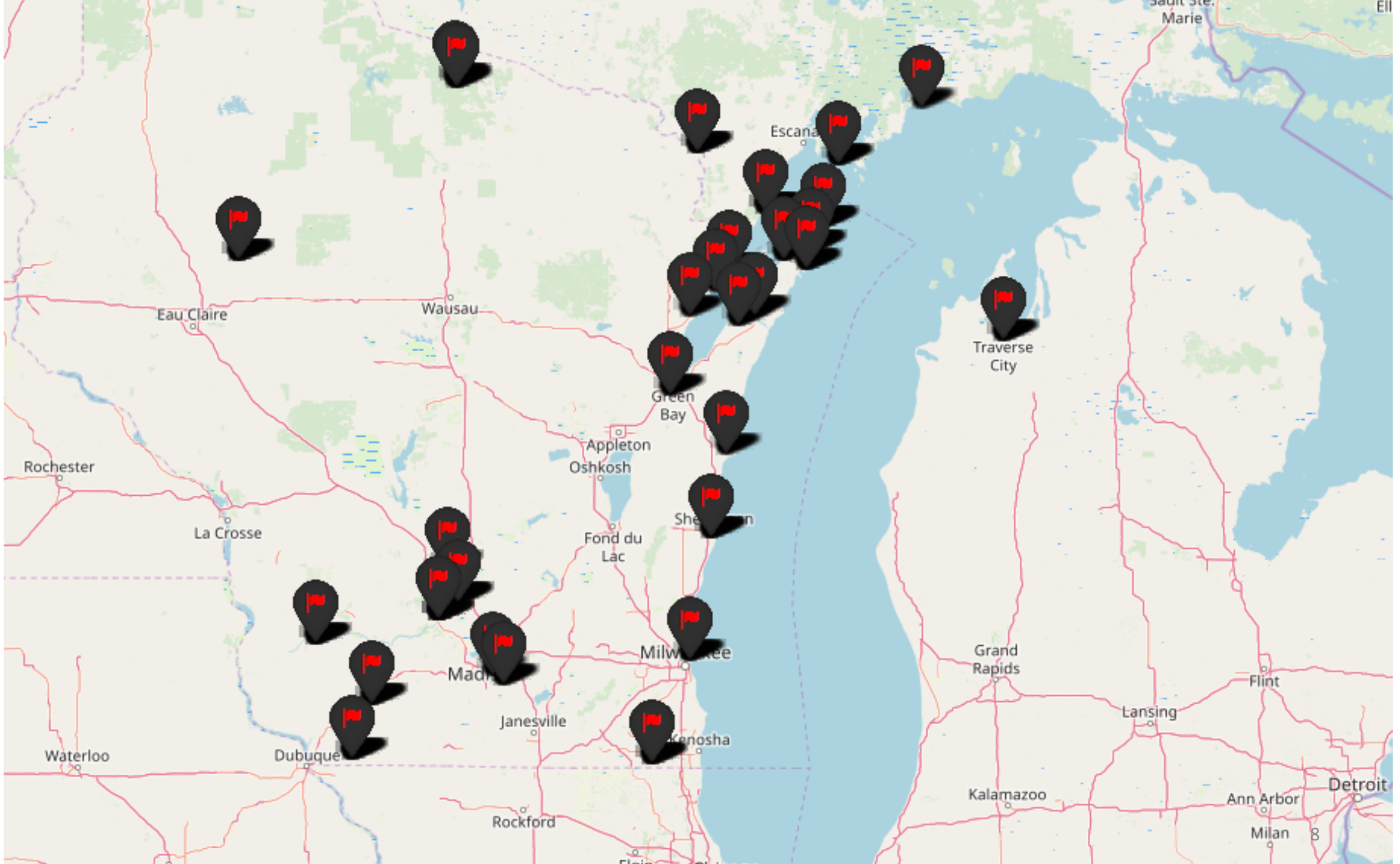


Local scale

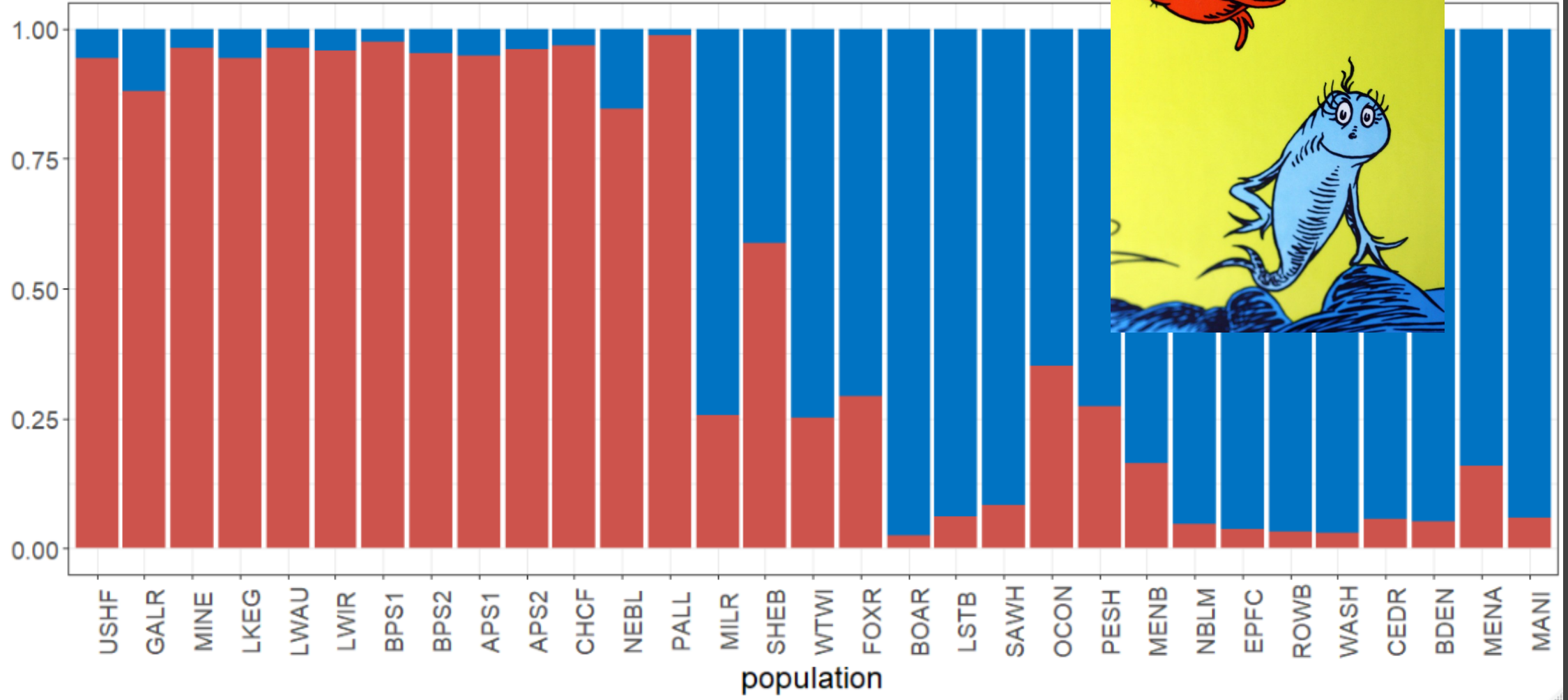
- Potential for smallmouth bass to adapt
- Migration – who spawns with who?
- Barriers to smallmouth movement

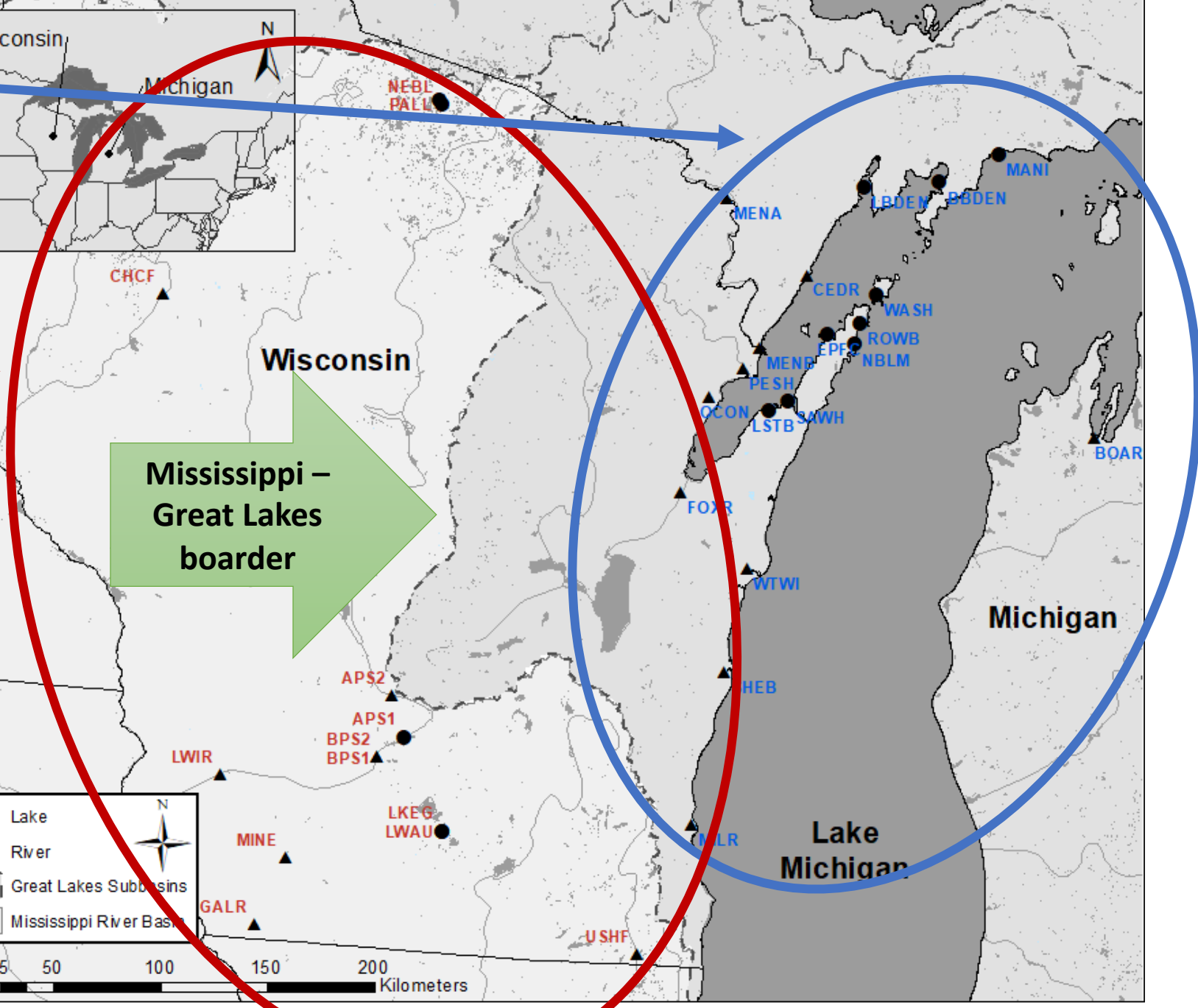
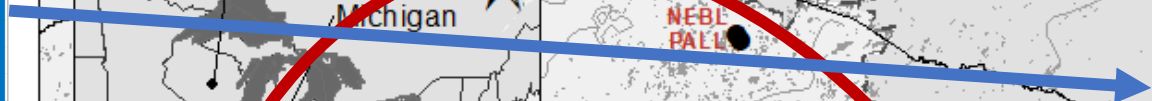
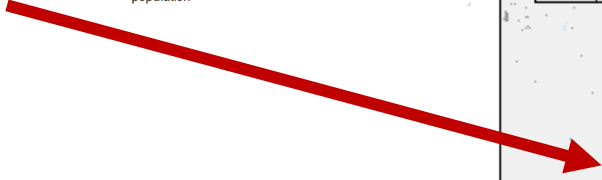
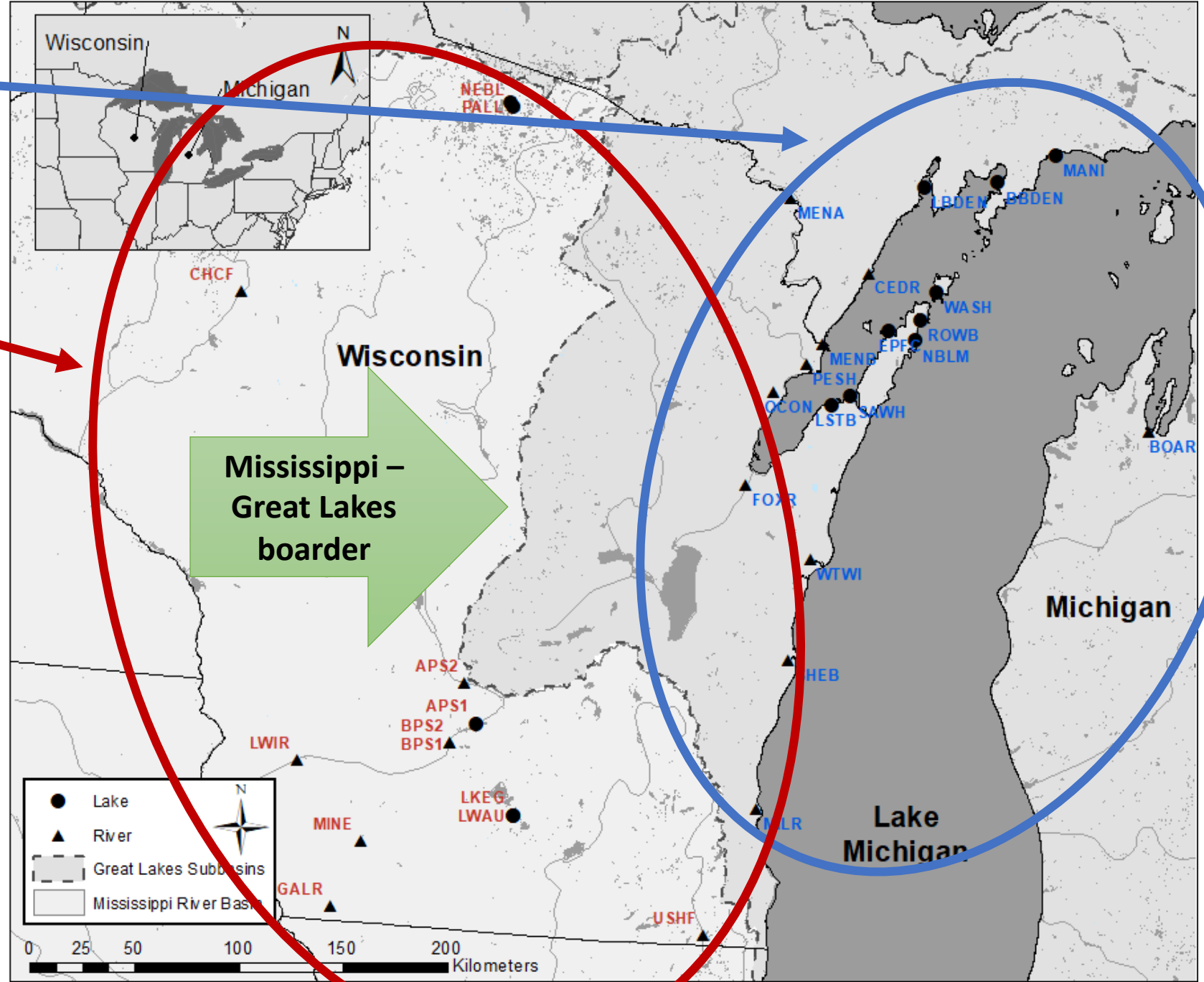
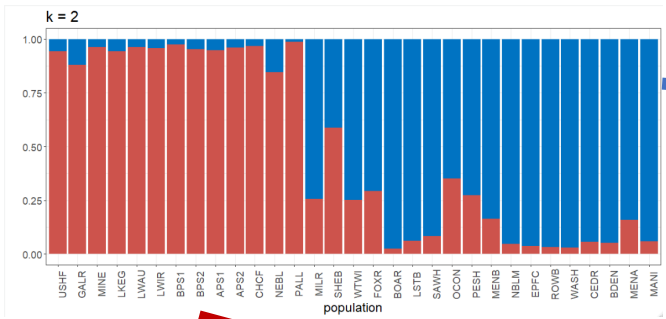
How can we best help smallmouth bass thrive?



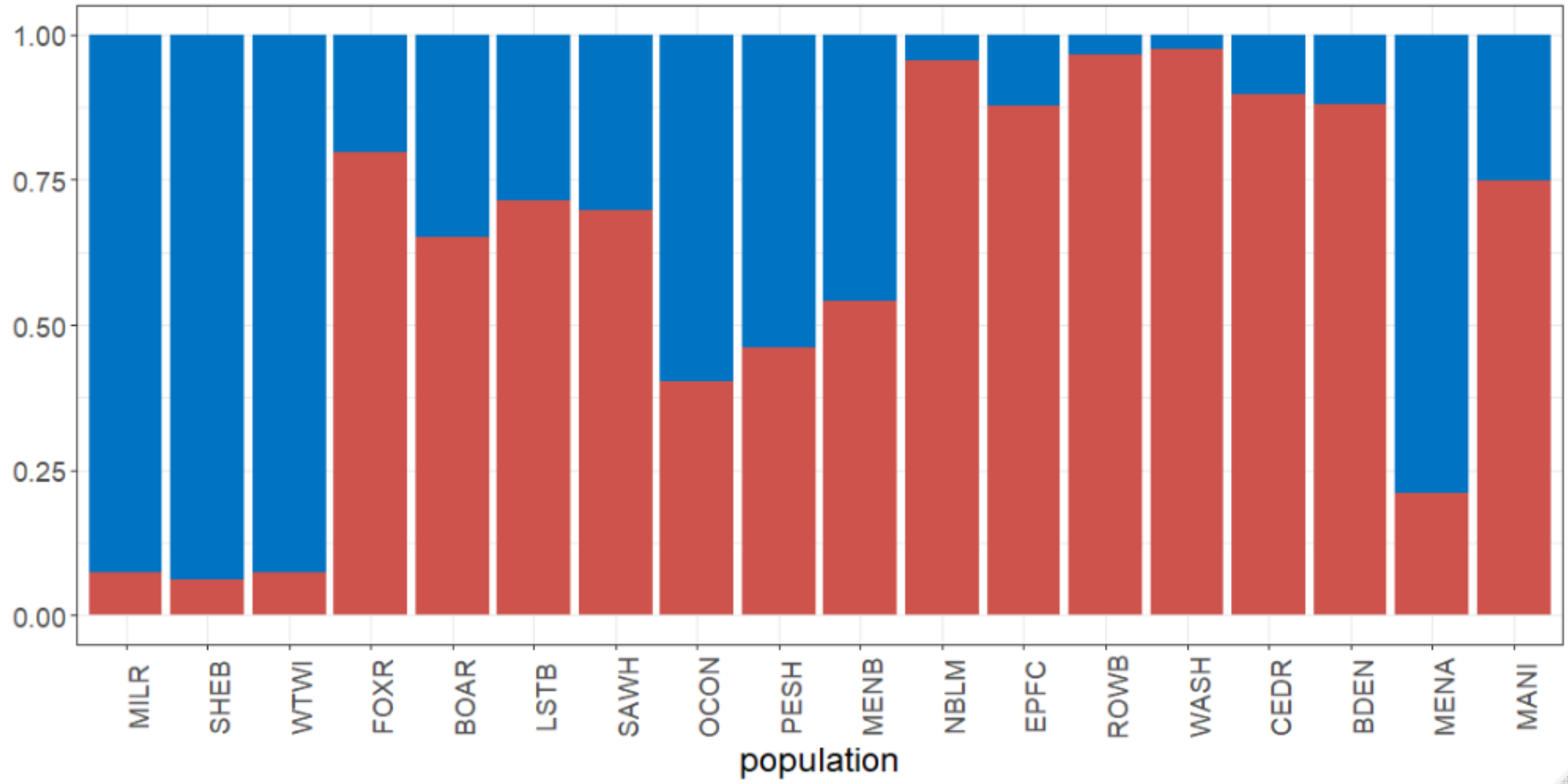


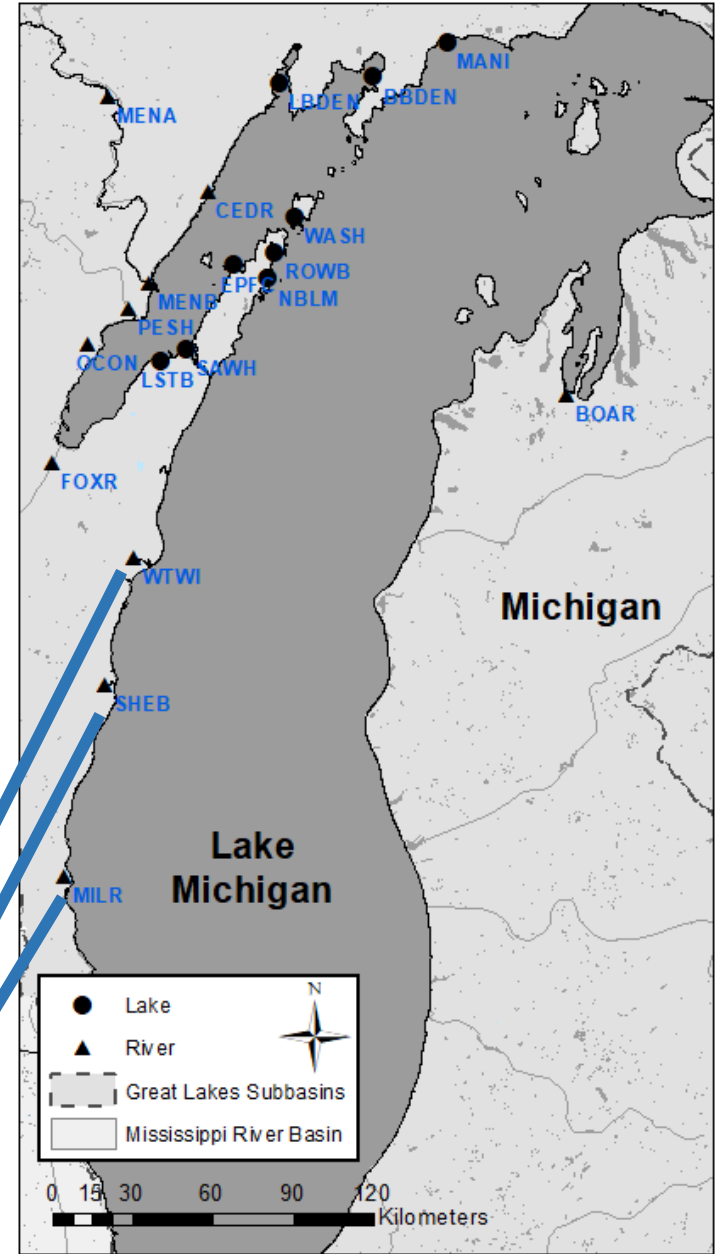
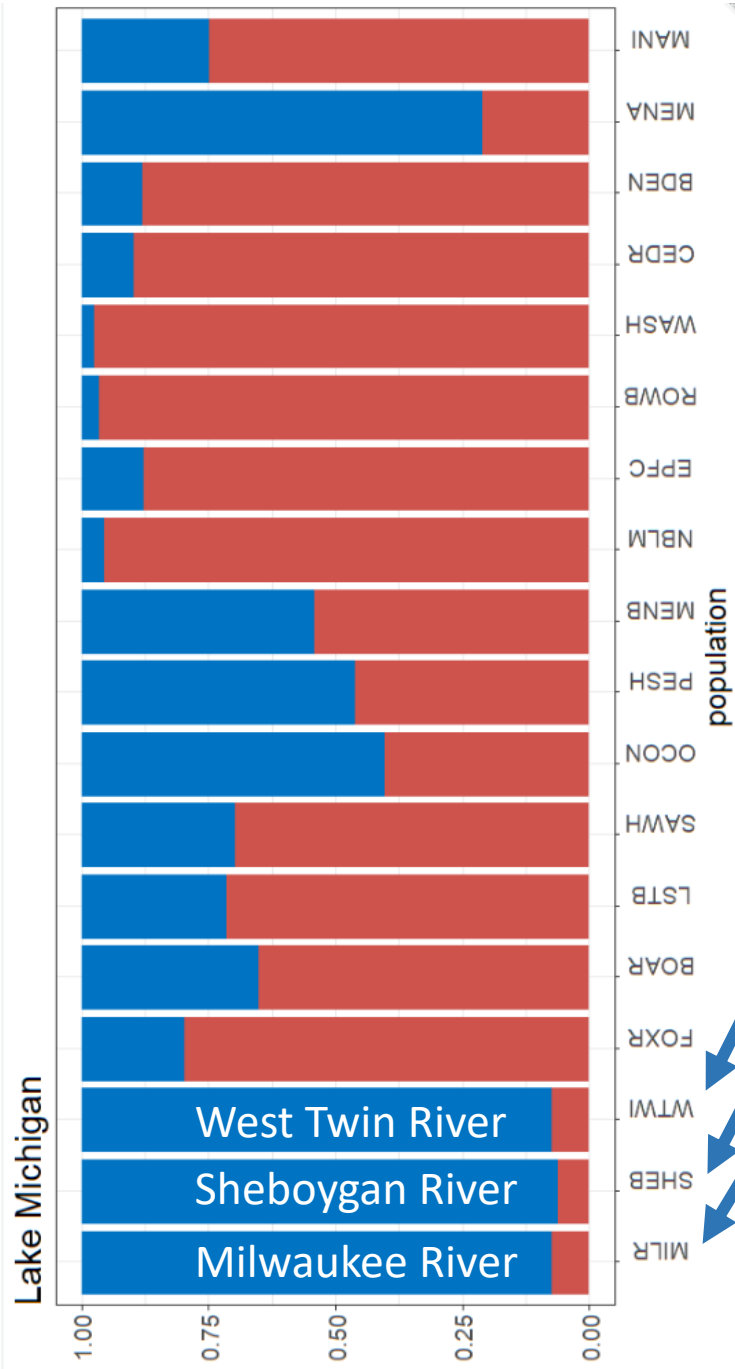
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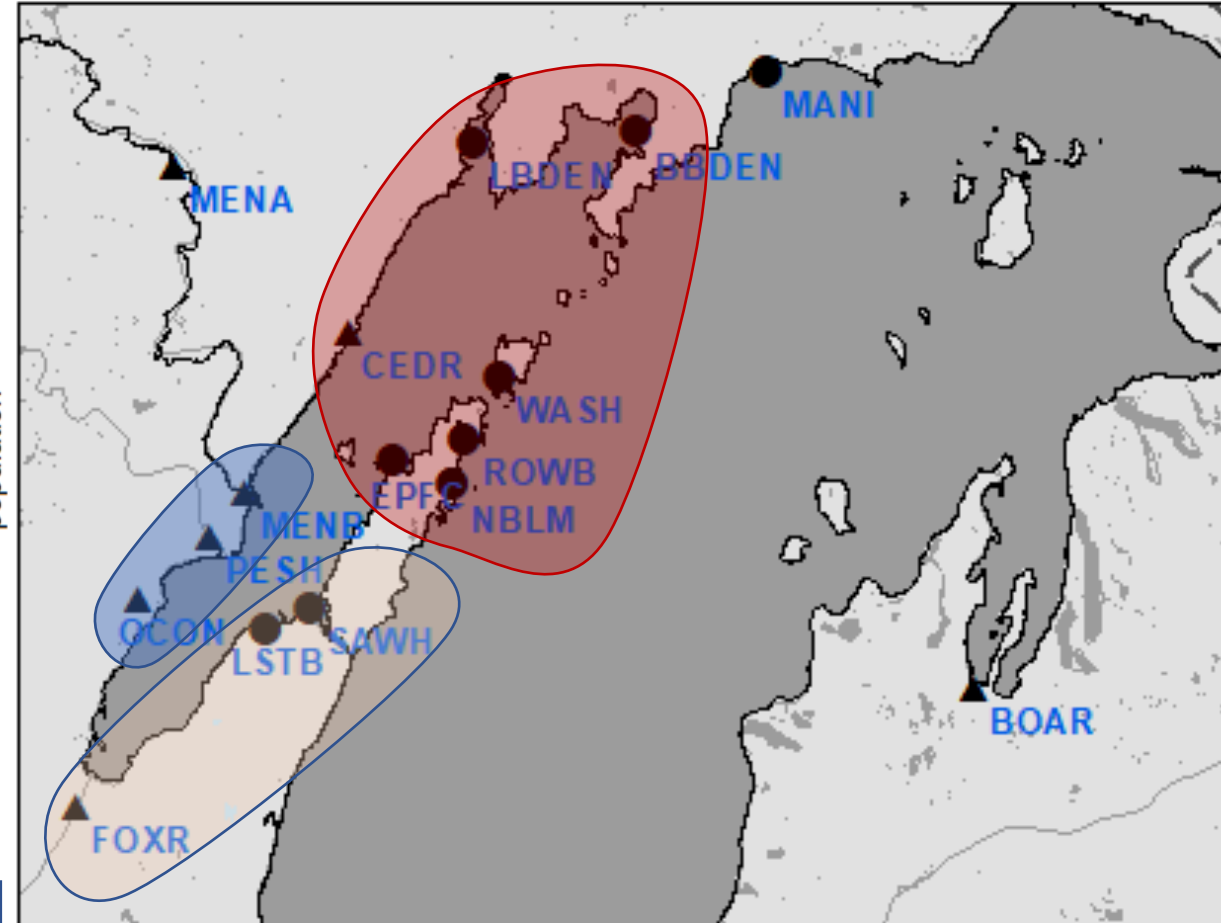
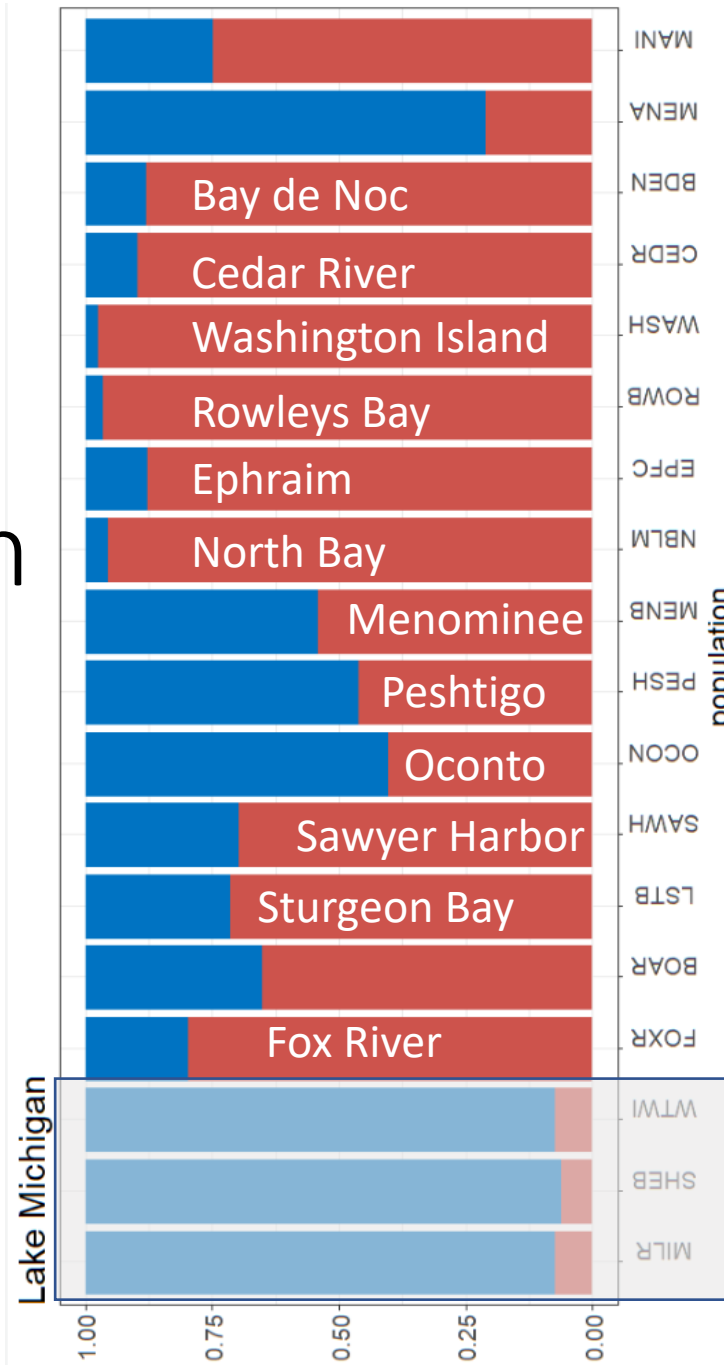


Lake Michigan





Smallmouth bass from Green Bay are NOT all the same



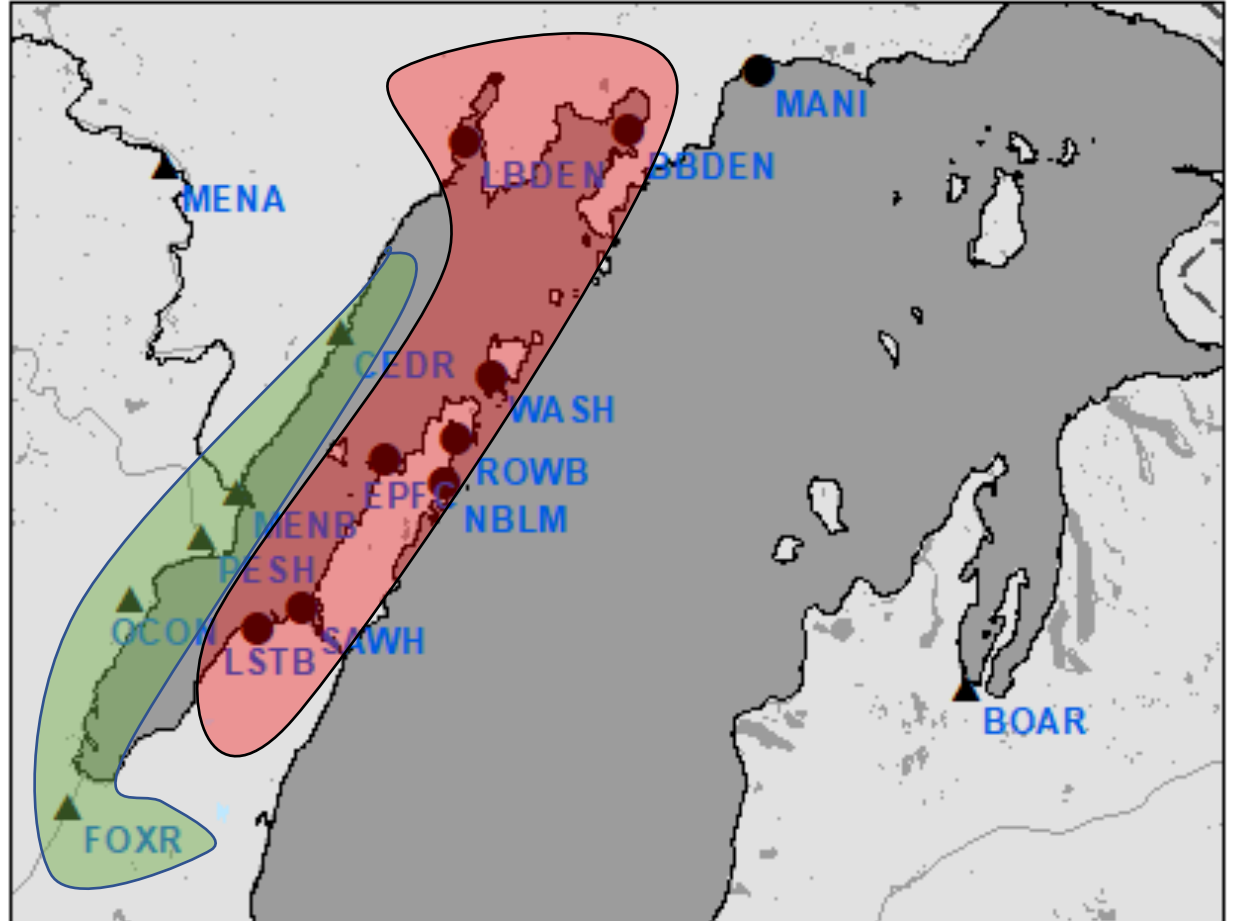
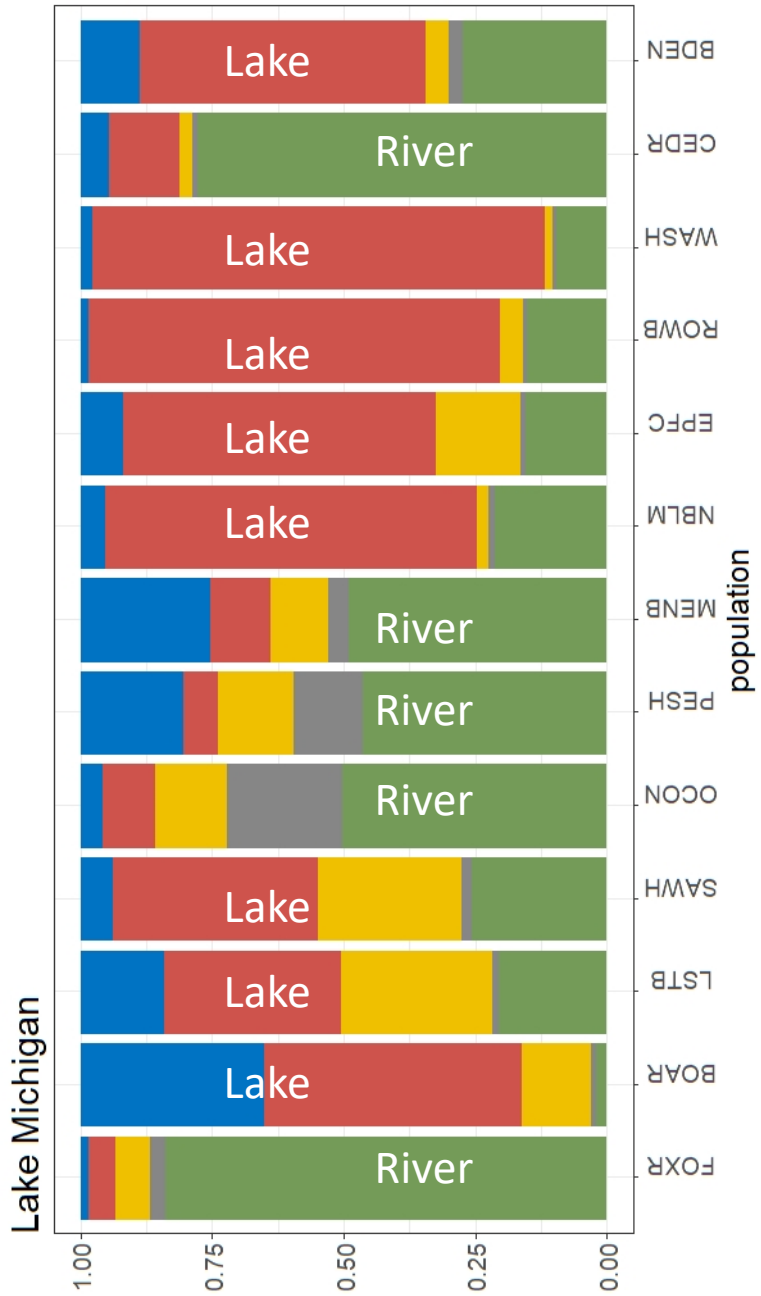
River bass are different than lake bass

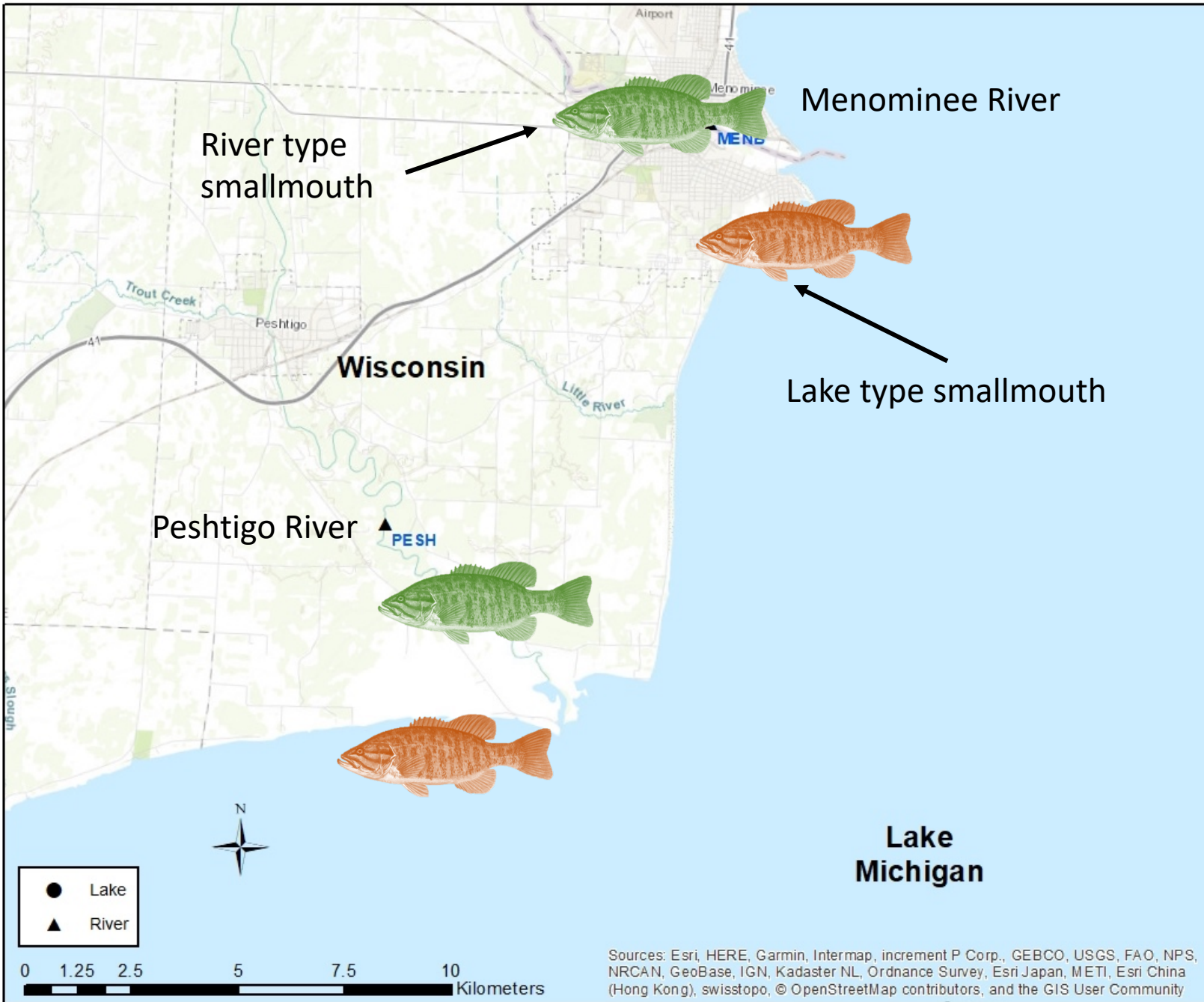
- River spawning populations



- Lake spawning populations







Menominee River

River type
smallmouth

Lake type smallmouth

Peshtigo River

PESH

Lake
Michigan

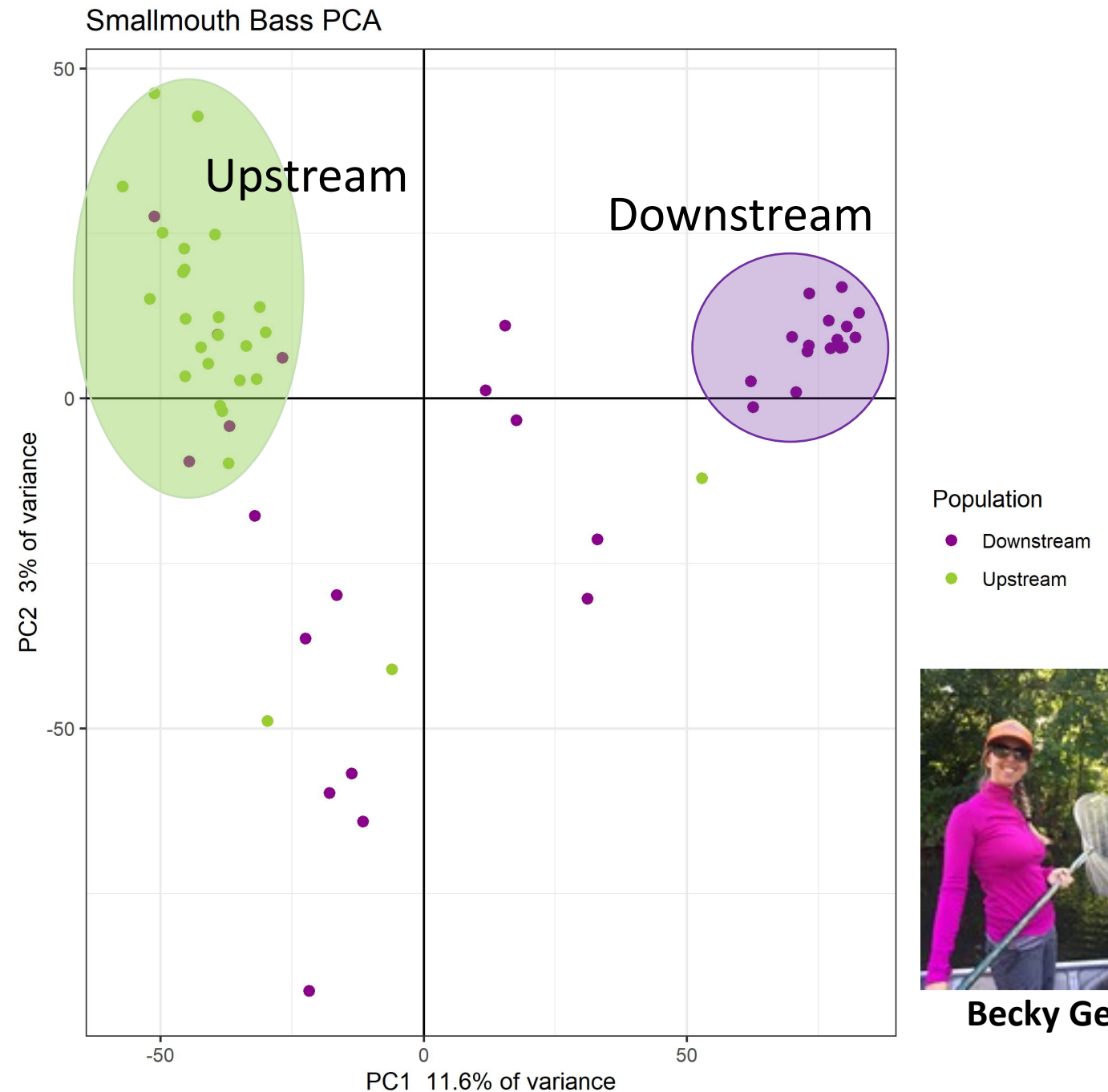
- Lake
- ▲ River

0 1.25 2.5 5 7.5 10 Kilometers

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

River – Lake sub-
populations exist in
other rivers

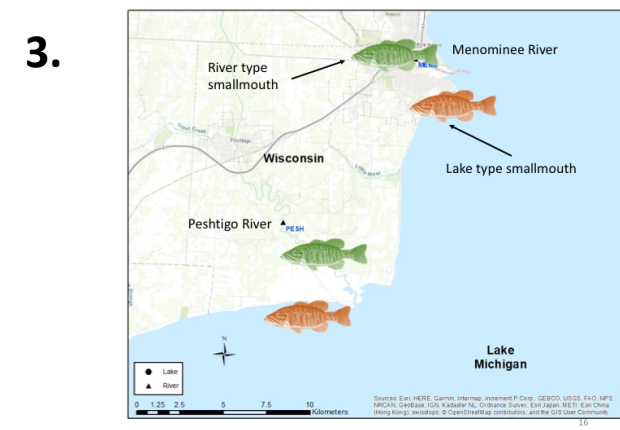
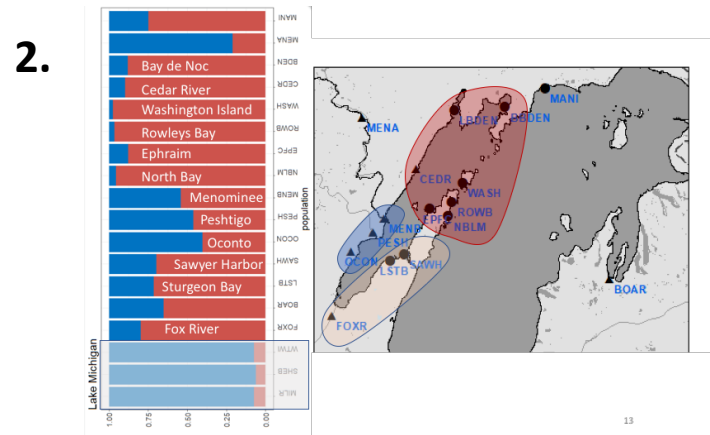
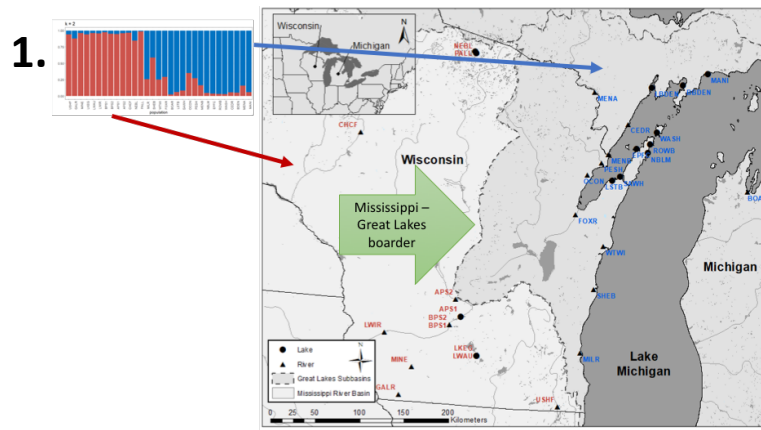
- Boardman River in Michigan has genetically distinct up and downstream smallmouth bass populations
- Populations seem to overlap, but maybe not interbreed



Becky Gehri

Take-homes:

1. Lake Michigan smallmouth are different from Mississippi River smallmouth
2. Green Bay smallmouth are not genetically homogenous
3. Spawning habitat may partially explain genetic differences



What does
this mean for
your next
fishing trip?

1. We need to be careful where we release fish

2. We need to think about habitat, especially rivers and nearshore spawning habitat in the lake

3. When you go fishing in Green Bay, you are really fishing multiple populations

Acknowledgements

Smallmouth bass tissue collection

- Scott Hansen, Bradd Simms, Nate Nye, Dave Rowe, Greg Sass, Steph Shaw, Steve Hogler, Tammie Paoli, Chip Long, Mike Donofrio, Cheryl Masterson, Addie Dutton, Troy Zorn, and probably more

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Questions?

SS RIVER ROCK
Port Of Ashland, Wi