Synthesizing our current understanding about the effectiveness of gear types for sampling fish populations

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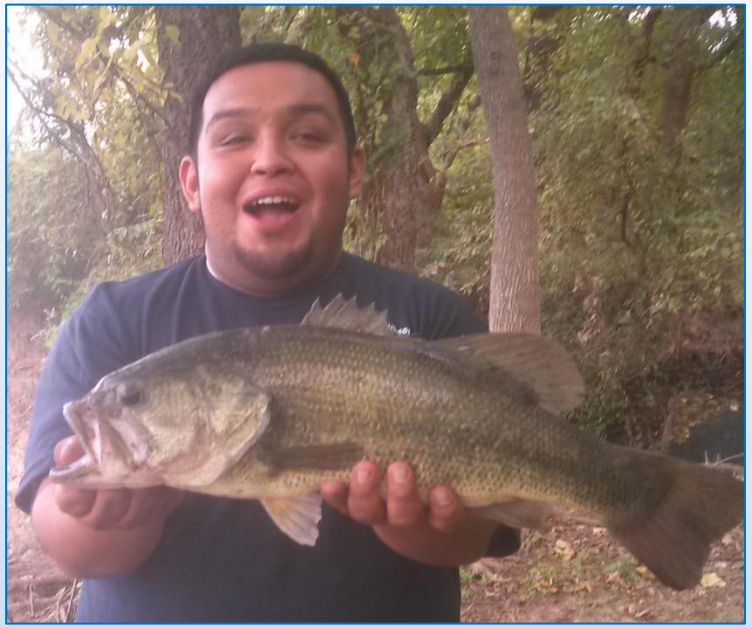
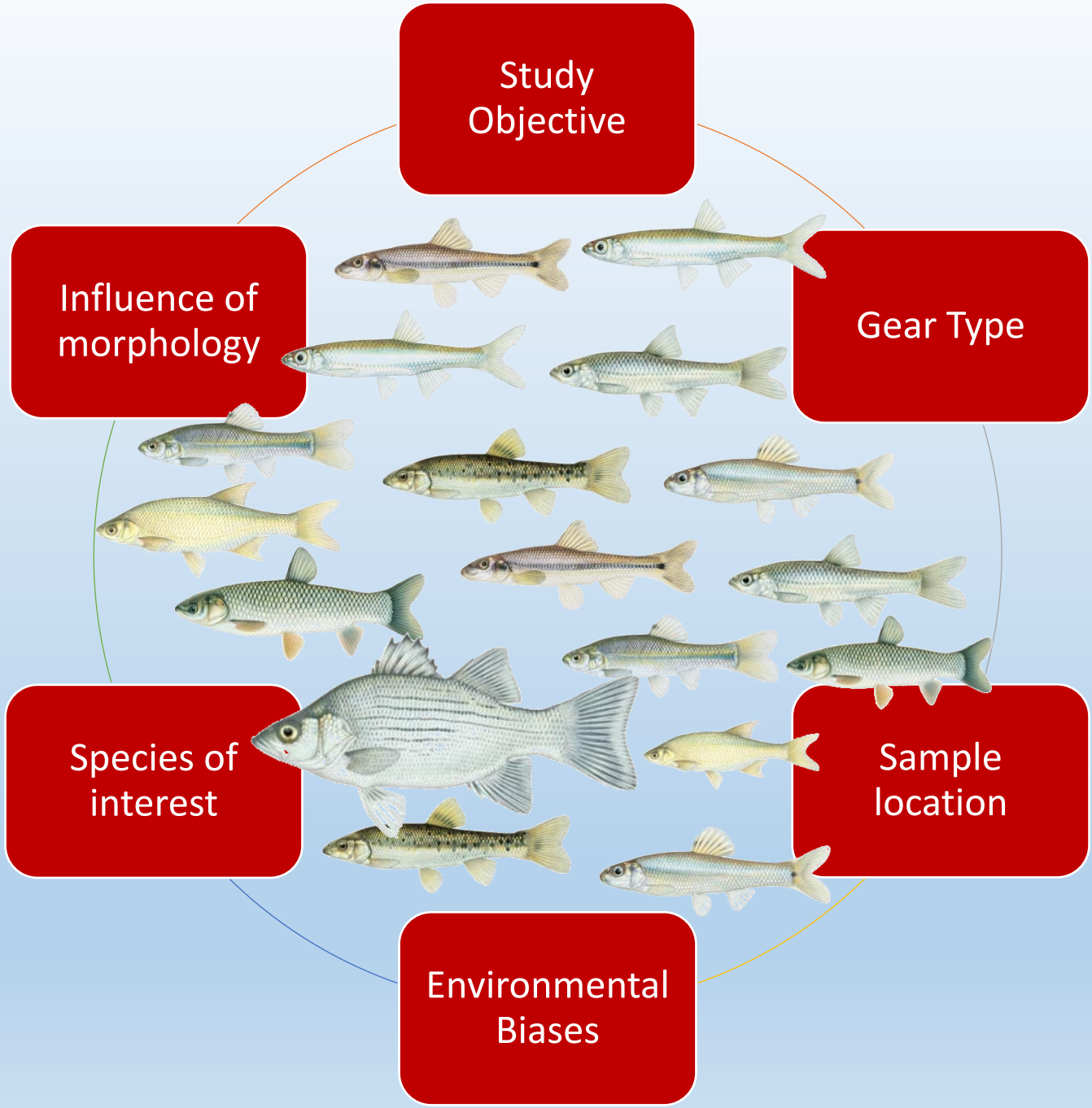
8THS
1
2
3/0
4/0
5/0




Study Objective
Influence of morphology
Gear Type
Species of interest
Sample location
Environmental Biases

Recognition of a problem…

General timeline

Our observations are limited by our gear!

1980

1990

2000

2010

Inefficiency relates to bias in fish indices (IBIs)

What is efficiency?

- Capture efficiency :
  - Efficiency = catch / known population

- Catch per Unit Effort
  - More fish ≠ efficiency

Objective

- To document our current understanding of sampling gears and capture efficiency for freshwater fishes in a variety of aquatic ecosystems

- Main points covered today
  - Biases
  - Multiple gears
  - How we can improve

Methods

Literature search:

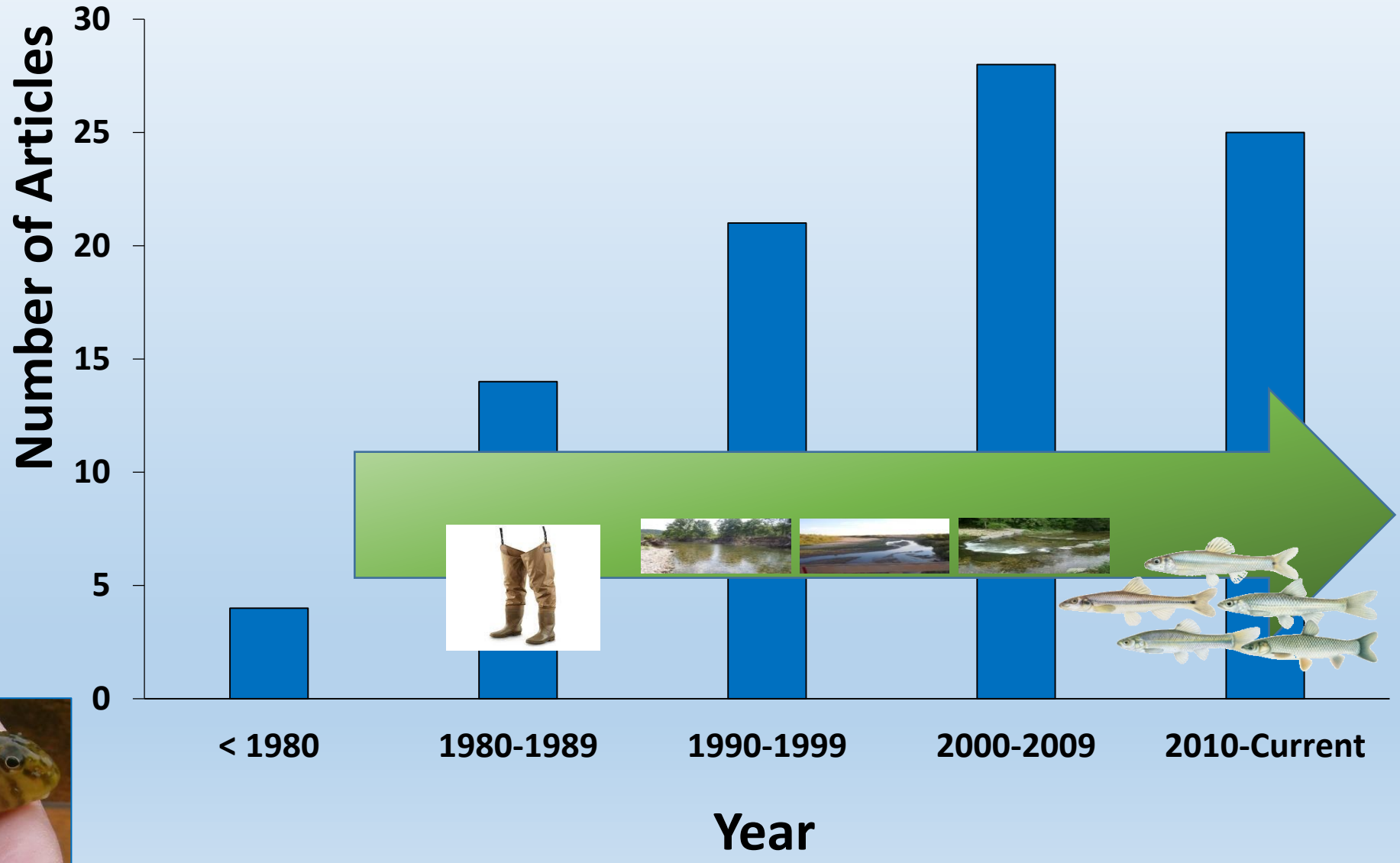
- Fish AND Sampling
- Gear OR Method
- Efficiency OR Comparison

ProQuest
Water Resources Abstracts

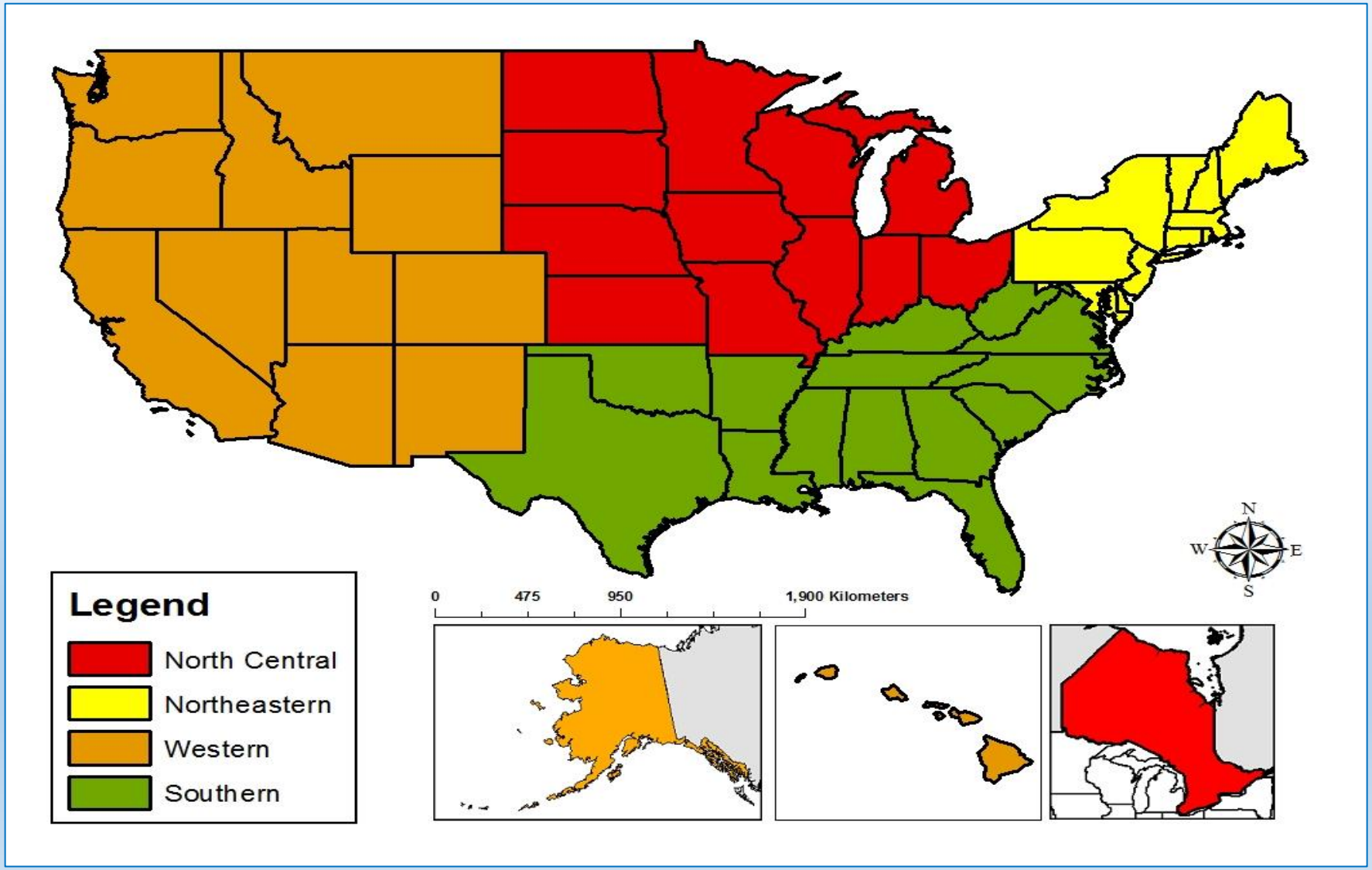
Taylor & Francis Online

THOMSON REUTERS
Web of Science

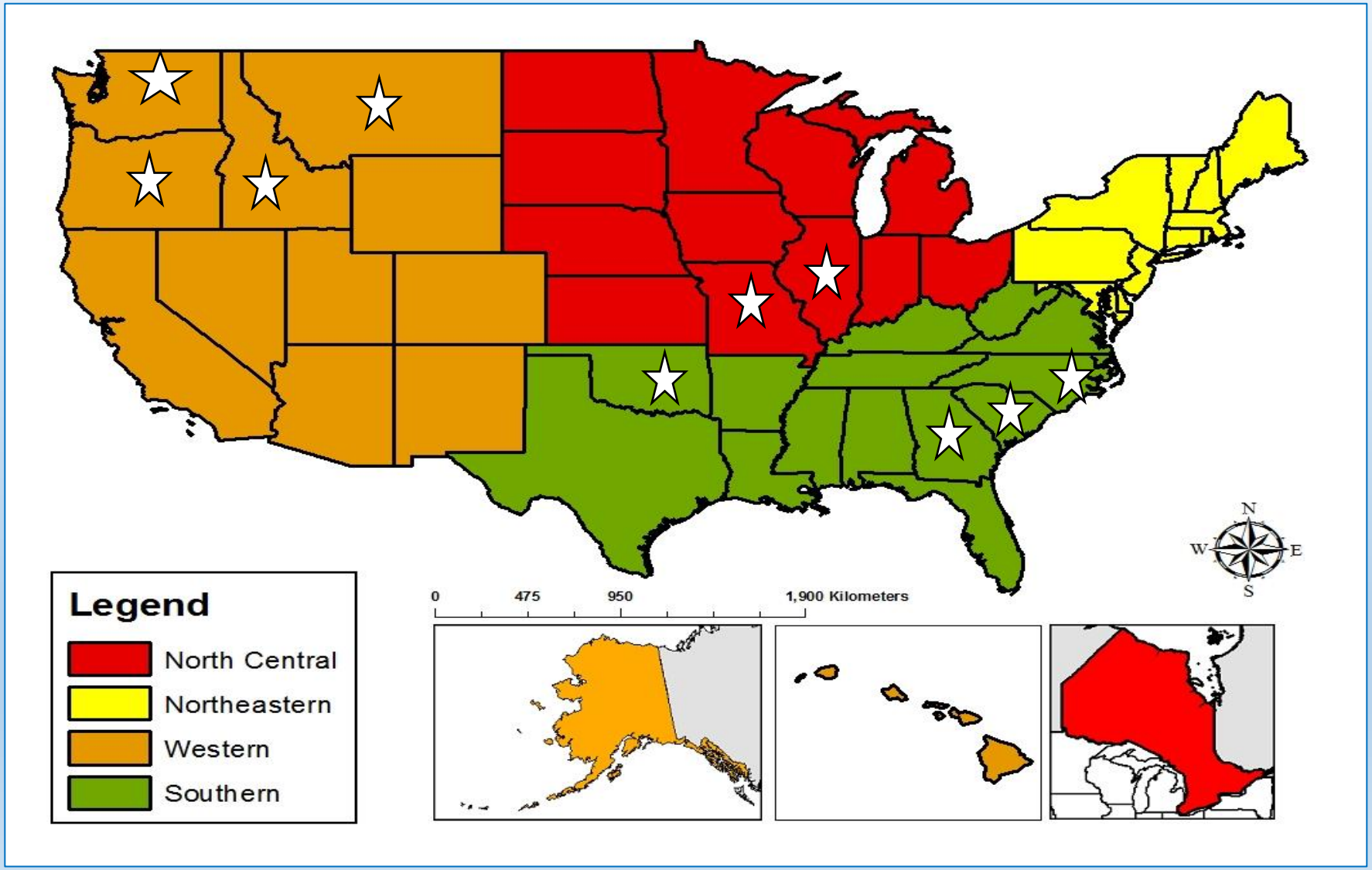
Results


Number of Articles
30
25
20
15
10
5
0
< 1980
1980-1989
1990-1999
2000-2009
2010-Current
Year

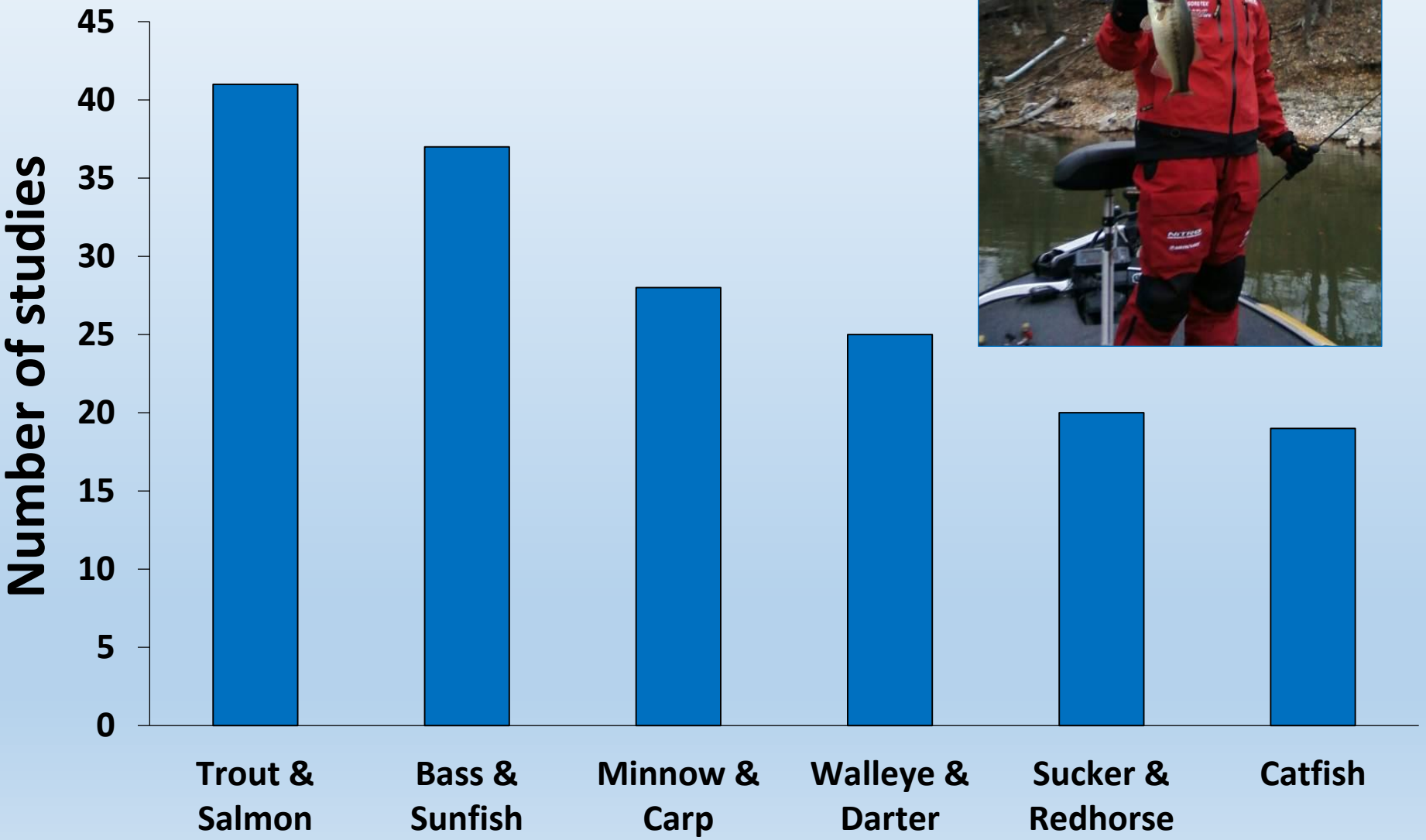
Regional bias



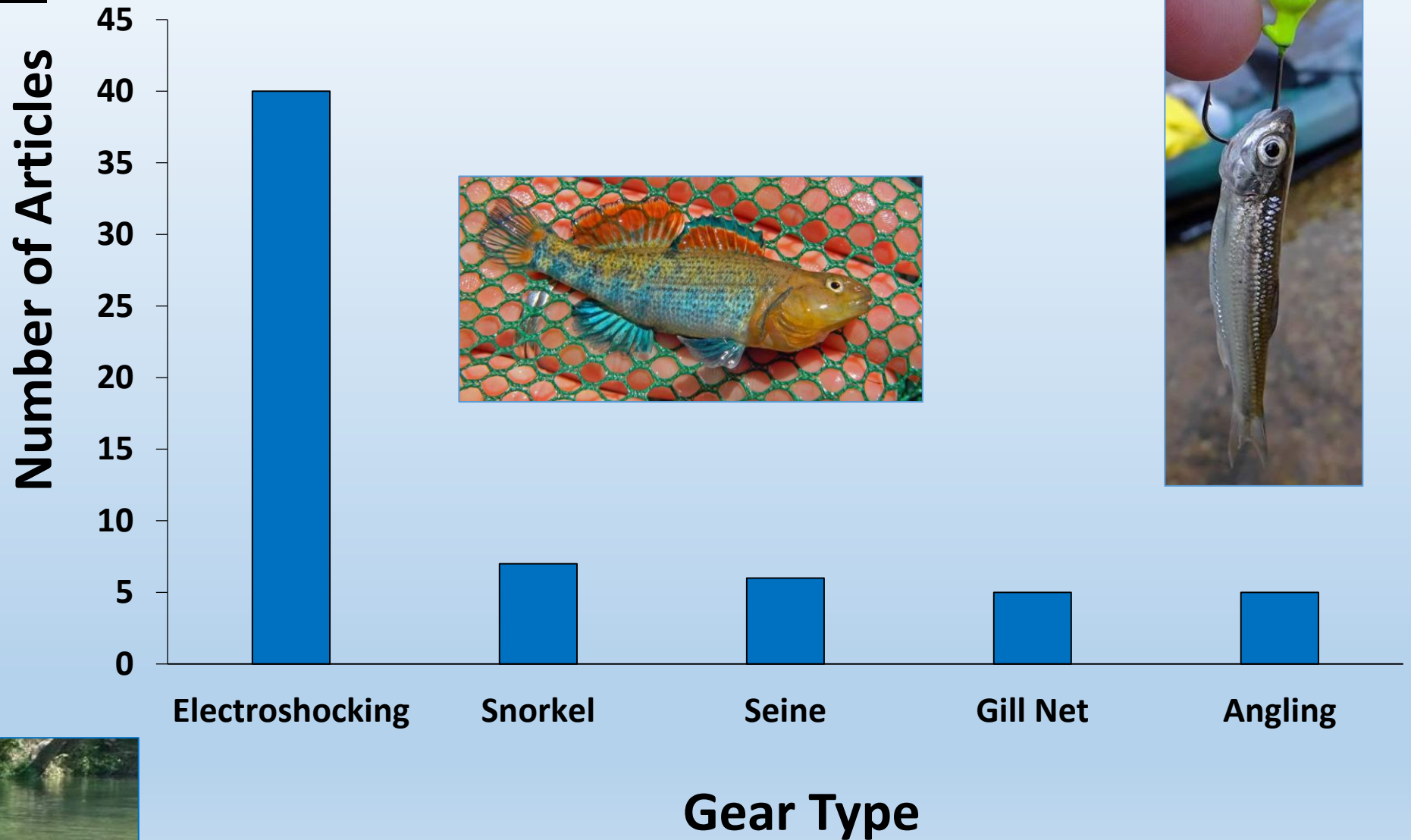
Regional bias



Regional bias

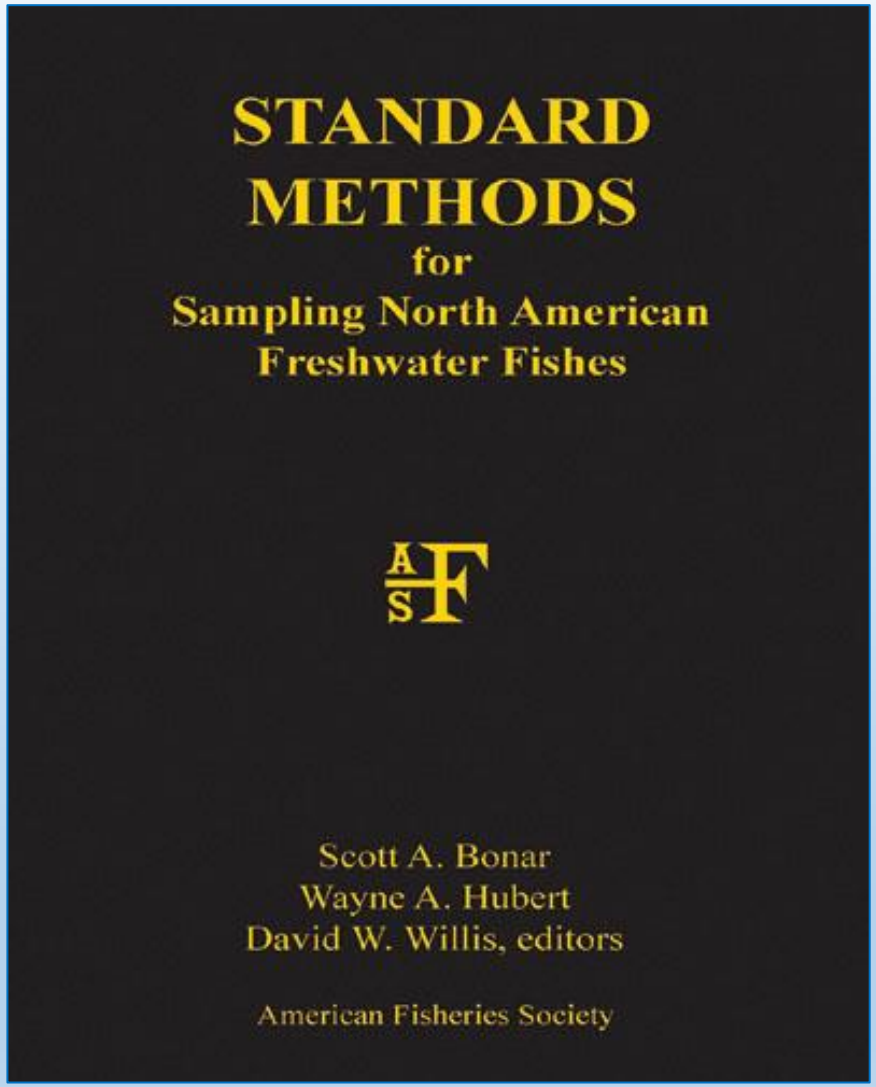


Gear bias


Number of Articles
45
40
35
30
25
20
15
10
5
0
Electroshocking
Snorkel
Seine
Gill Net
Angling
Gear Type

Gear bias

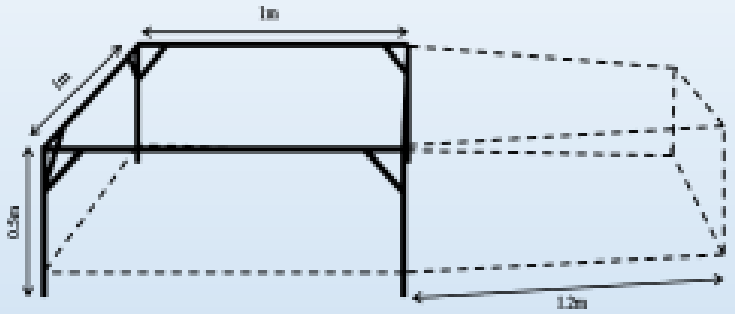
- Efficiency ranges 0-98% depending on species and environmental conditions
- Many other appropriate gears are available beyond this common collection



Other gear options

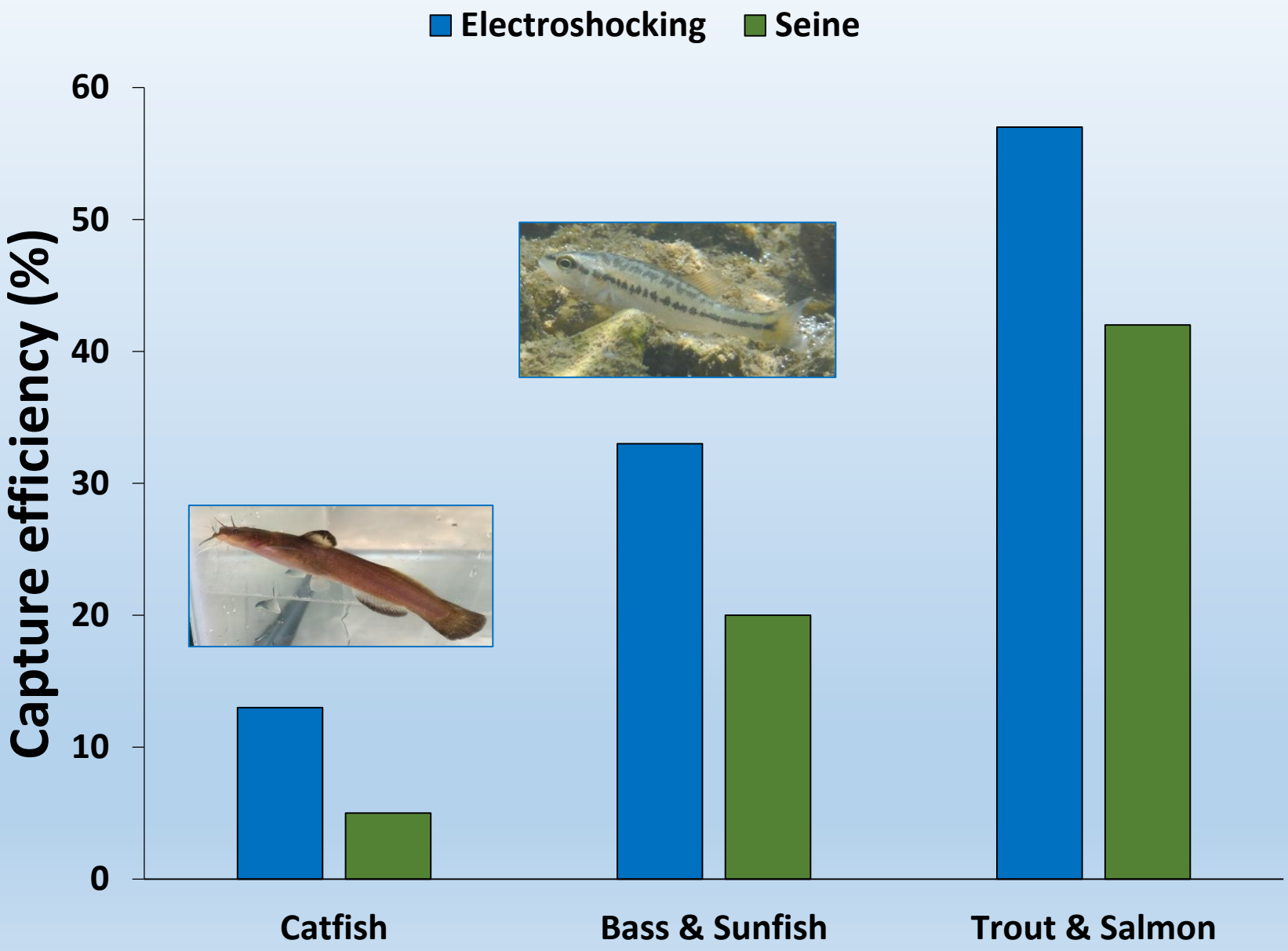
- Electric seine
- Warmwater snorkeling
- Electric Barrier, Weir, Visual observations
- Visual assessments
- Acoustics
- Pop (Lift)/ Drop nets
- Pit Antennae
- Tow nets
- Moore egg collector

Quadrat sampler

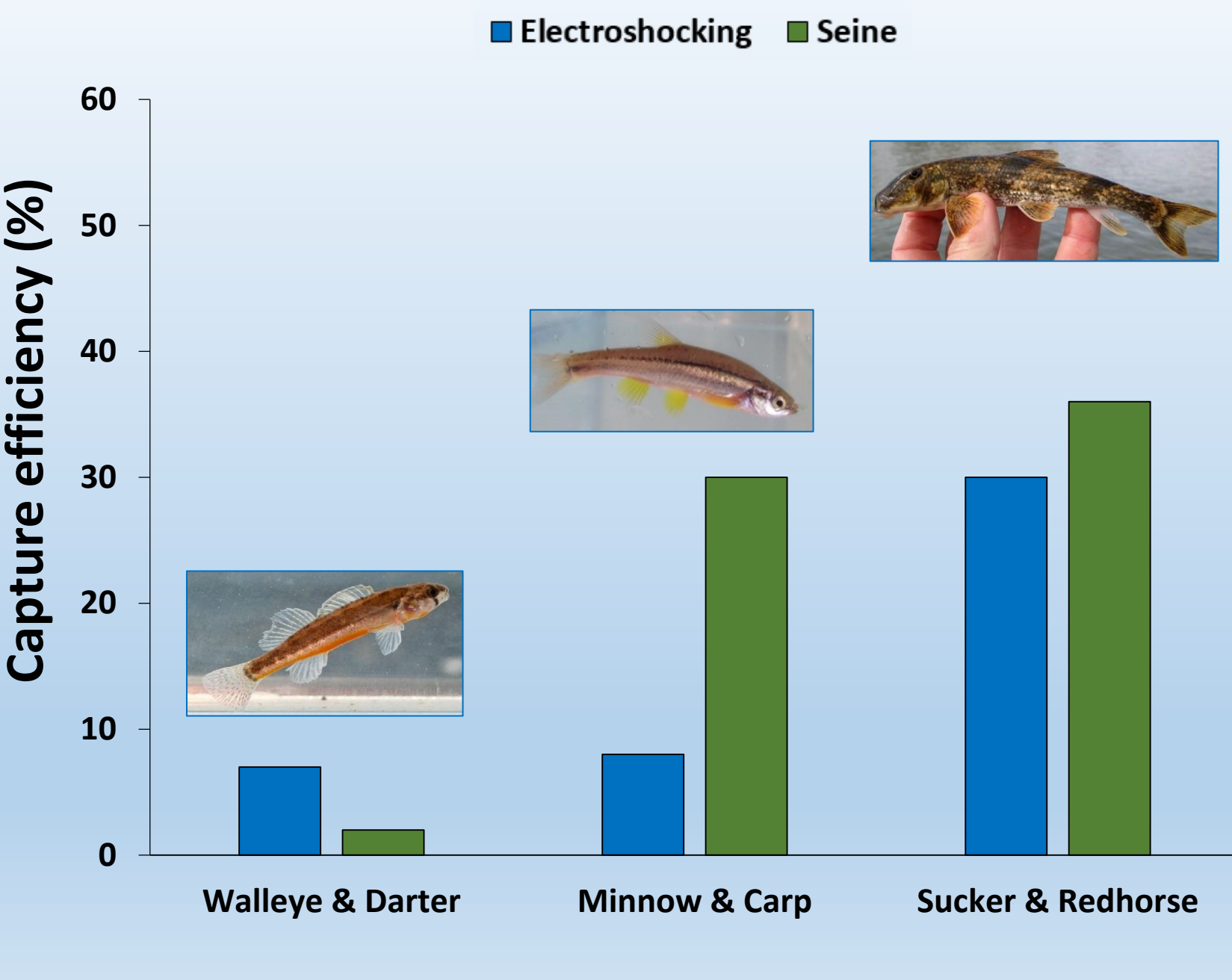


Ditch net

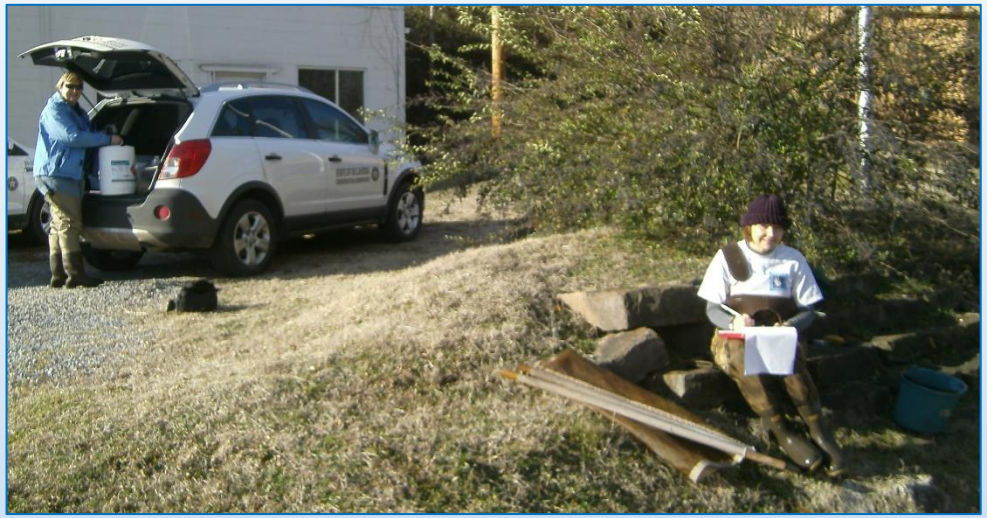
Species bias



Species bias

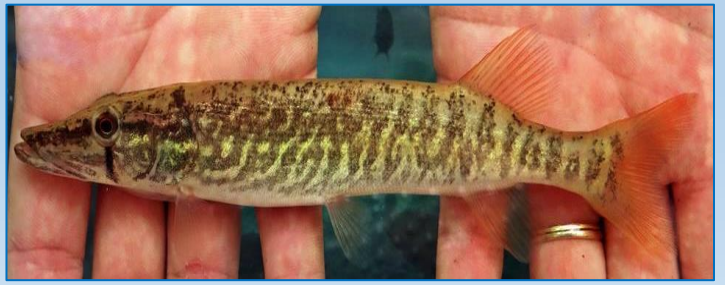


Multiple gears



Conclusion

- Using multiple gears gives managers a better assessment of the fish community
- More consideration should be given to efficiency in lentic environments
- Efficient sampling methods could reduce variability between samples over time



Conclusion

- Many less commonly studied gears with known efficiency could provide better population estimates depending on the research question and habitat sampled

- Alternative sampling gears should be evaluated for efficiency

Acknowledgments

- Shannon Brewer
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  - Donnie King
  - Wes Shockley
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Questions?