A Preliminary Analysis of Freshwater Mussel Population Dynamics in Texas

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Introduction

- Freshwater mussels are the most abundant riverine fauna in North America
  - Keystone species
- They provide ecosystem functions and services
  - Stabilize stream banks, filtration
- They are parasites
  - Glochidia (larvae) encyst on fish gills

Examples of mussel species with different shell morphology.

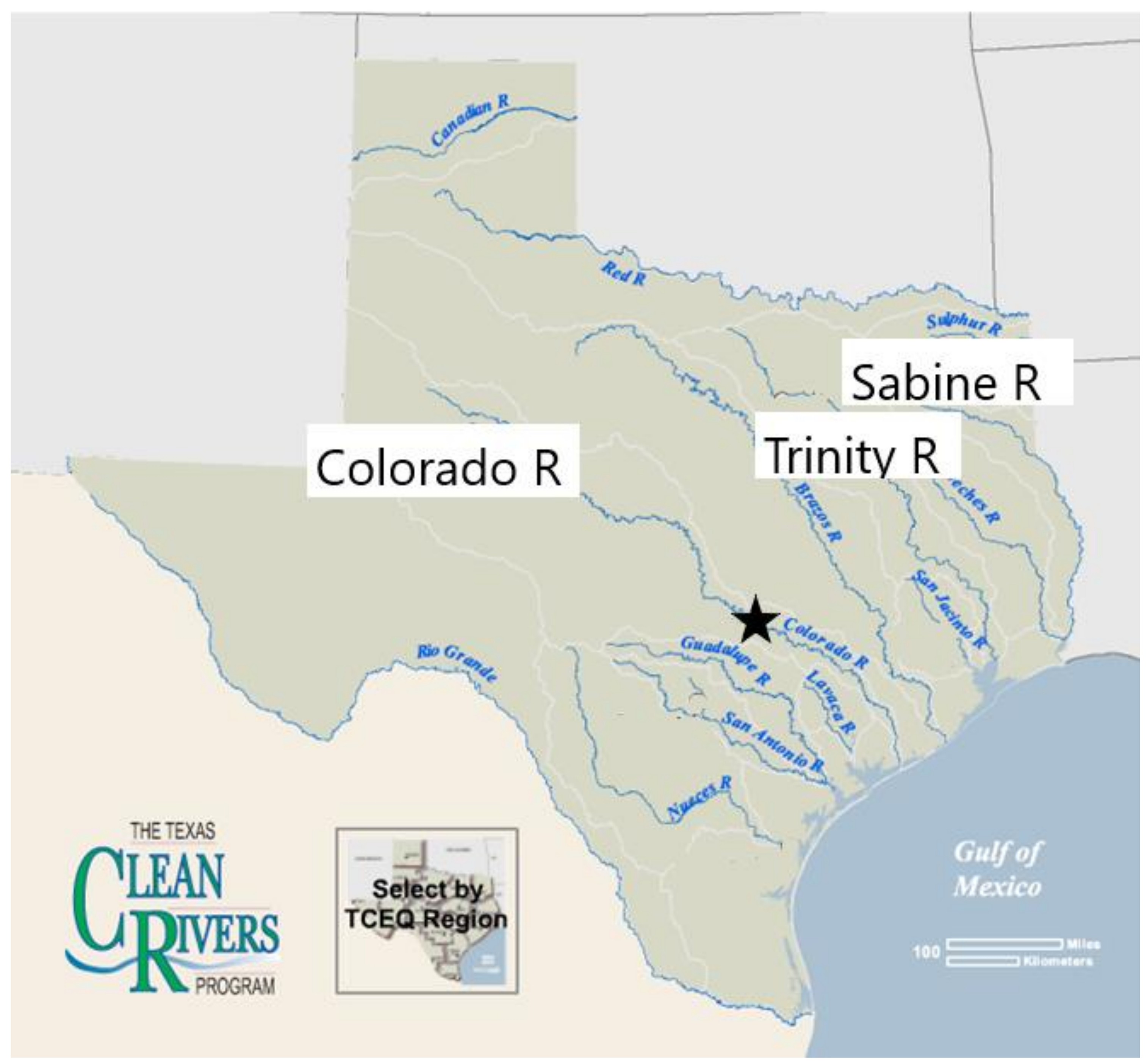
Close up of fish lure used by fine lined pocketbook (*Hamiota altiis*) to attract fish host.

Study Objectives

- Survey imperiled mussels in Gulf States
  - Little information on mussel populations
- Estimate detection & survival probabilities
  - Determine experimental design for good surveys

Methods

- Existing survey data
  - Sabine, Trinity, Colorado Rivers
- PIT tags & FLOY tags
  - Repeated mark-recapture surveys
  - Some ongoing, some in development
- Running simulations to evaluate minimum monitoring requirements



Three rivers surveyed and other potential rivers in blue.

Summary

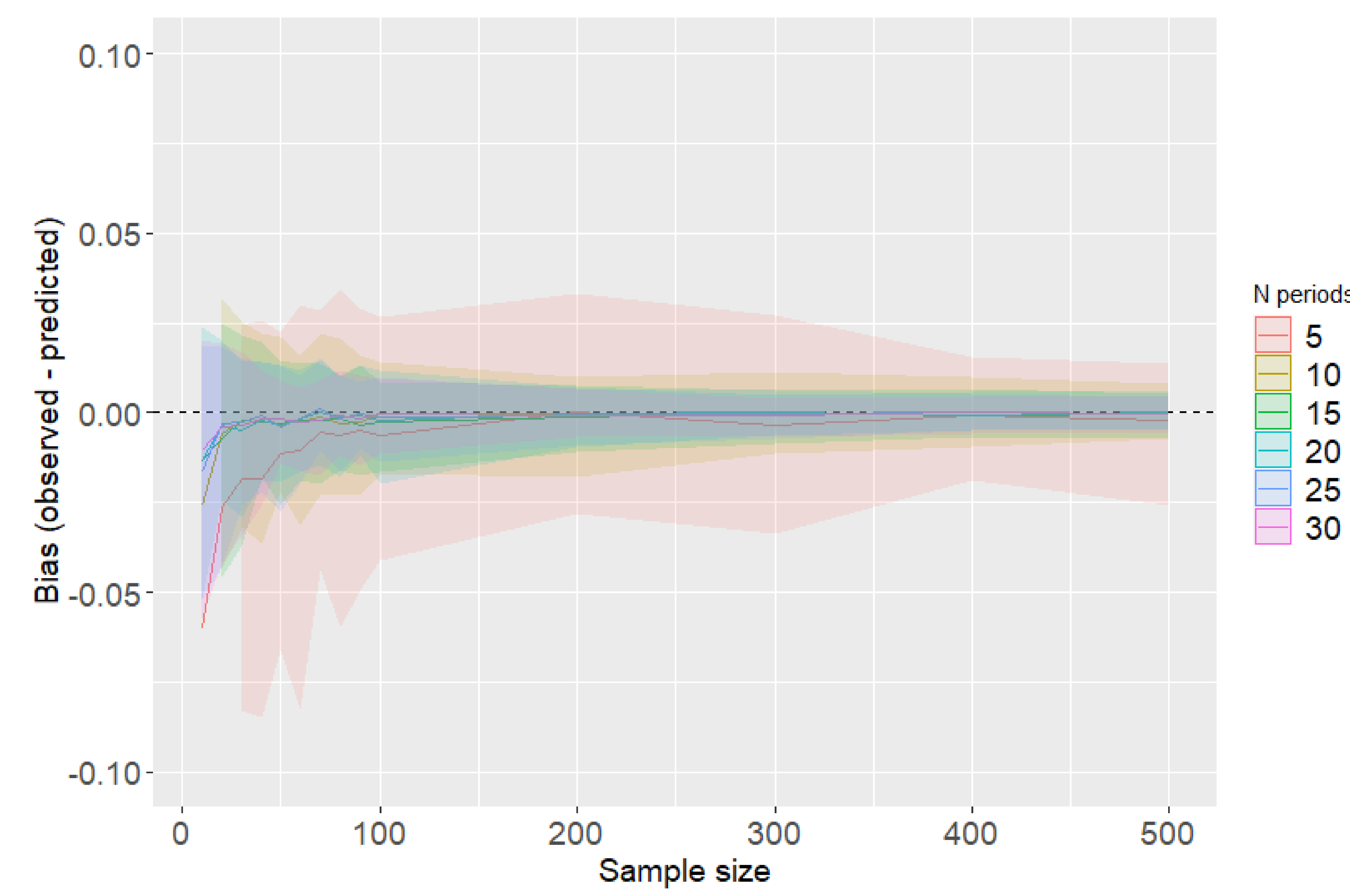
- We are losing freshwater mussels
  - Not enough information
- Statistically robust & efficient sampling needed for management efforts

Next steps

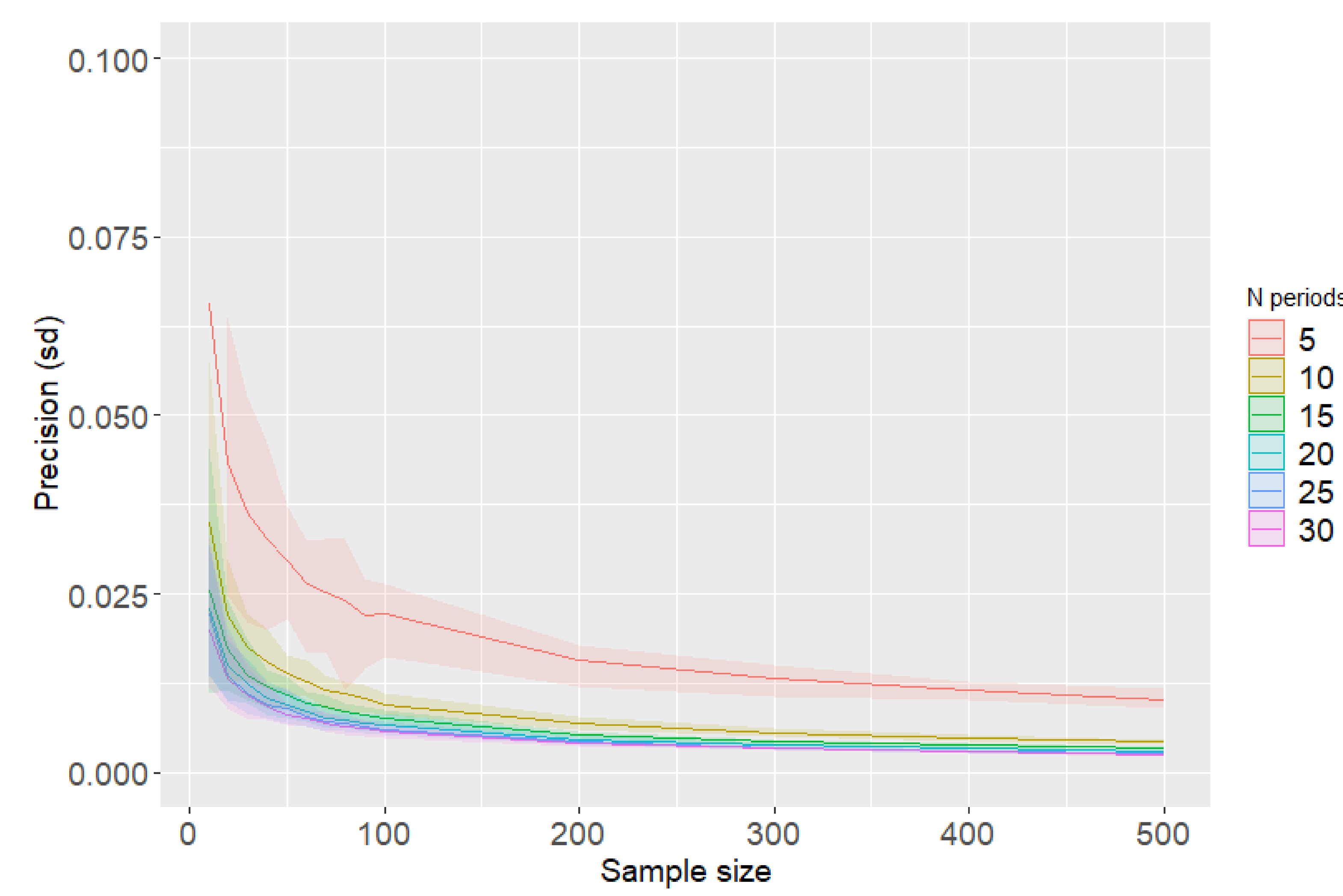
- Incorporate complexities
  - Habitat associations
  - Species specific

Results

- For small sample sizes, after 10 periods accuracy and precision level off and after 100 individuals, accuracy and precision level off



Bias decreased with increasing periods and sample size.



Precision increased the greater the sample size and periods.

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