Survey of Food Chain Macro-Invertebrates: Torch Lake & Lake Bellaire 2009

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9/14/09

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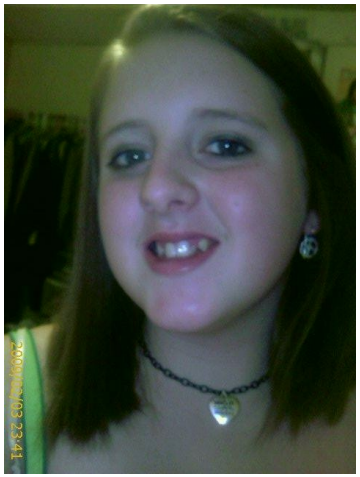

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Invasive Mussels

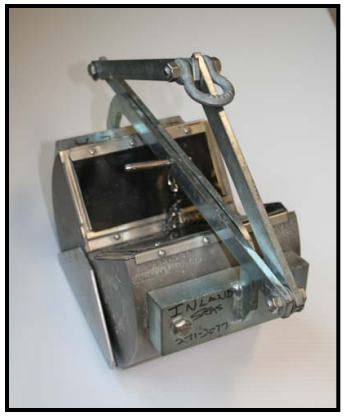
- Zebra Mussels – have already invaded the Elk River Chain of Lakes and have changed the food chain
- Quagga Mussels – have replaced zebra mussels in Lake Michigan and inhabit a larger portion of the lake
- It is feared that quagga mussels will invade the Chain of Lakes and make similar changes

Plan

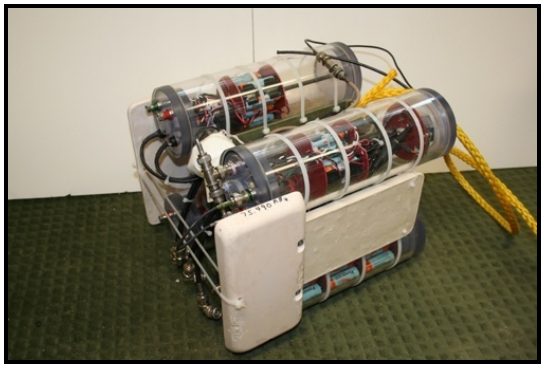
- Make a survey and create records of invasive species populations
- Two organisms were surveyed, one native (diporeia) and one invasive (zebra mussels), which compete for the same food resources
- This is a snapshot of the Torch Lake and Lake Bellaire before the invasion of quagga mussels

Method

To collect data, we used a variety of tools:



- PONAR Dredge- collected 0.022 m^2 of bottom sediment



- Submarine-Remote controlled camera platform
- Hydrolab- Collected depth and temperature profiles

Macro-Invertebrate Depth Distribution

- Zebra mussels do not live below ~40 ft.
- Diporeia mainly live below ~40 ft.
- This is true in both Torch Lake and Lake Bellaire
- Torch Lake appears to have less zebra mussels than Bellaire
- There were similar densities of Diporeia in both lakes but more zebra mussels in Lake Bellaire

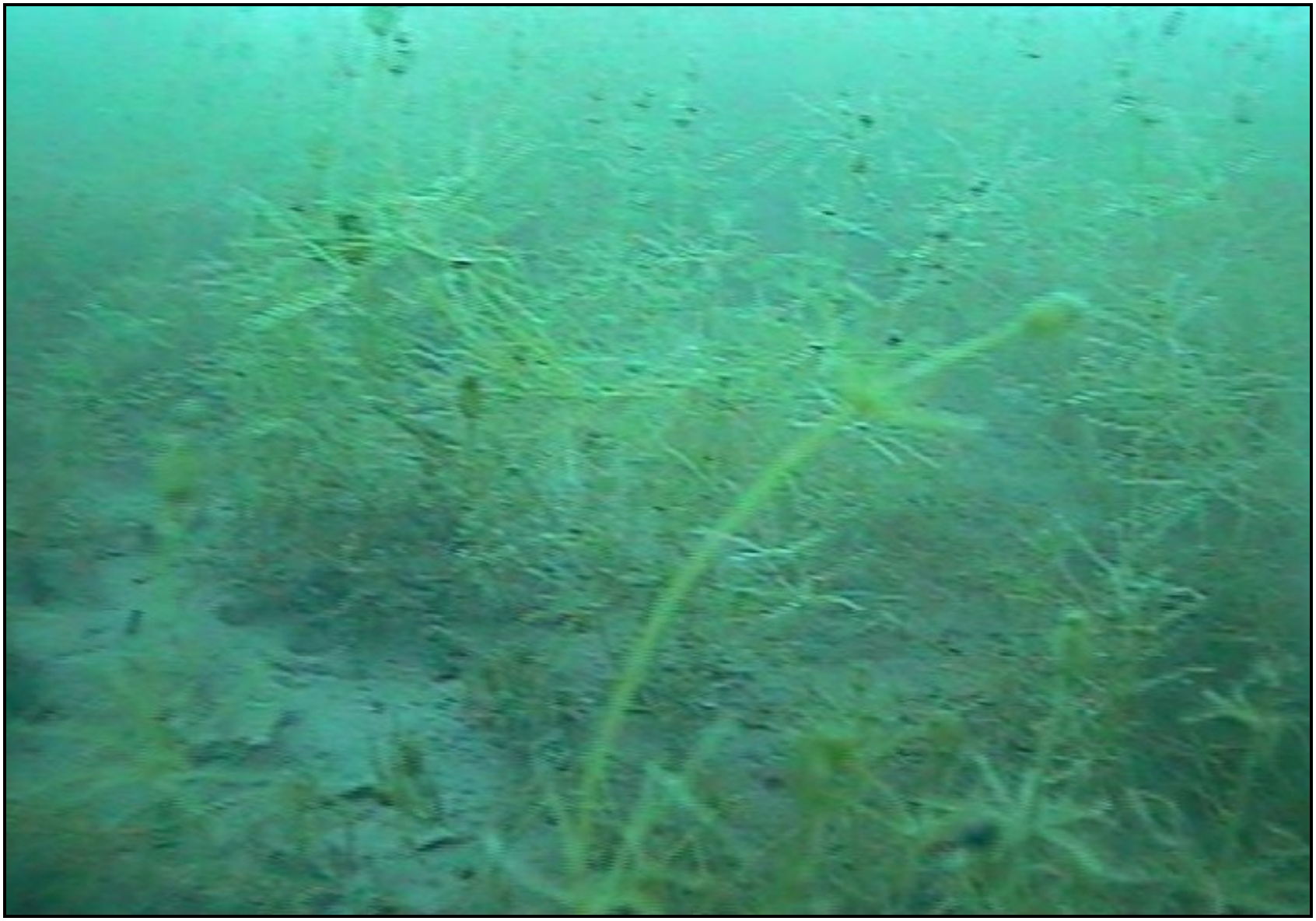
Survey Macro-Invertebrates

|◄1 cm►|

Zebra Mussels

|◄-3 mm-►|

Diporeia



Torch Bottom at 30 ft showing seagrass on sand

Torch Lake Perch Video

Conclusions

- Bottom-dwelling fish consume Diporeia, making them an important part in food chain
- 2007 Diporeia densities were about 100 samples per square meter in Bellaire, Torch, and Elk Lakes
- 2009 Diporeia densities were 500-1500 per square meter in Bellaire and Torch Lakes
- 2009 Zebra densities were 100-1,000 per square meter, less in Torch than Bellaire
- No quagga mussels found

Acknowledgements

- The 2009 interns would like to thank TLA volunteers Norton Bretz, Trisha Narwold, Dean Branson, and Bob Kollin
- The Inland Seas Association let us use their PONAR dredge for sampling
- The Antrim County Conservation District let us use their meeting room for writing and analyzing data

2009 TLA Student Interns