

Local and landscape-level effectiveness of aquatic invasive species prevention



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Background and Justification

Aquatic invasive species (AIS) are major drivers of ecological and economic harm. The best option for reducing future AIS impacts is to prevent the spread – an ounce of prevention is worth a pound of cure! Even though AIS prevention approaches have been widely implemented, few studies have quantified the effectiveness of various strategies or where best to place those interventions on the landscape. With this uncertainty, managers must make difficult decisions for allocating their limited AIS prevention resources.

Our goal is to quantify the effectiveness and cost of various AIS management practices, including boater and professional watercraft inspection, and outreach effort. We will incorporate effectiveness and cost data into a new interactive tool on the AIS Explorer dashboard to help assist with the decision-making process.

Methods

In the first part of this project, we will determine the effectiveness of boater and professional watercraft inspection, and outreach effort. More specifically, we will:

- A boat spiked with dead and preserved AIS will be placed at busy boat launches and at AIS inspector trainings during the Spring 2022.
- Boaters and AIS watercraft inspectors will be recruited to participate by visually inspecting and physically removing any items they find on the boat. Participant behavior (i.e., looking, touching boat) and AIS removals will be recorded by the research team.
- After the inspection is complete, the participant will fill out a questionnaire determining their level of boating experience or training in AIS watercraft inspection, AIS awareness, etc.
- By coupling the success of a participant's inspection with their level of experience or training, we can determine overall effectiveness of different AIS prevention strategies.

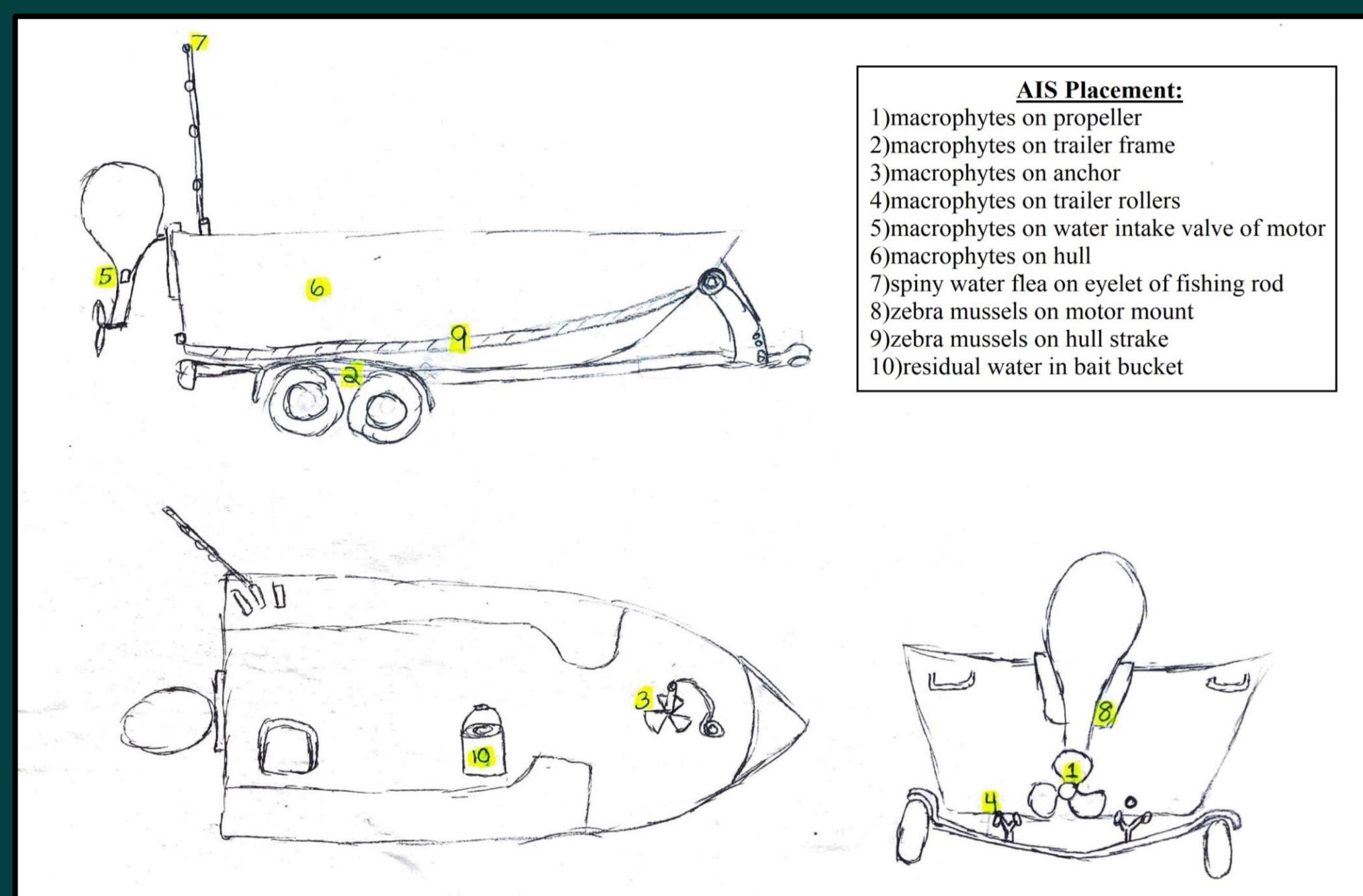


Fig. 1: Locations where AIS will be placed on the boat for experimental inspection trials.

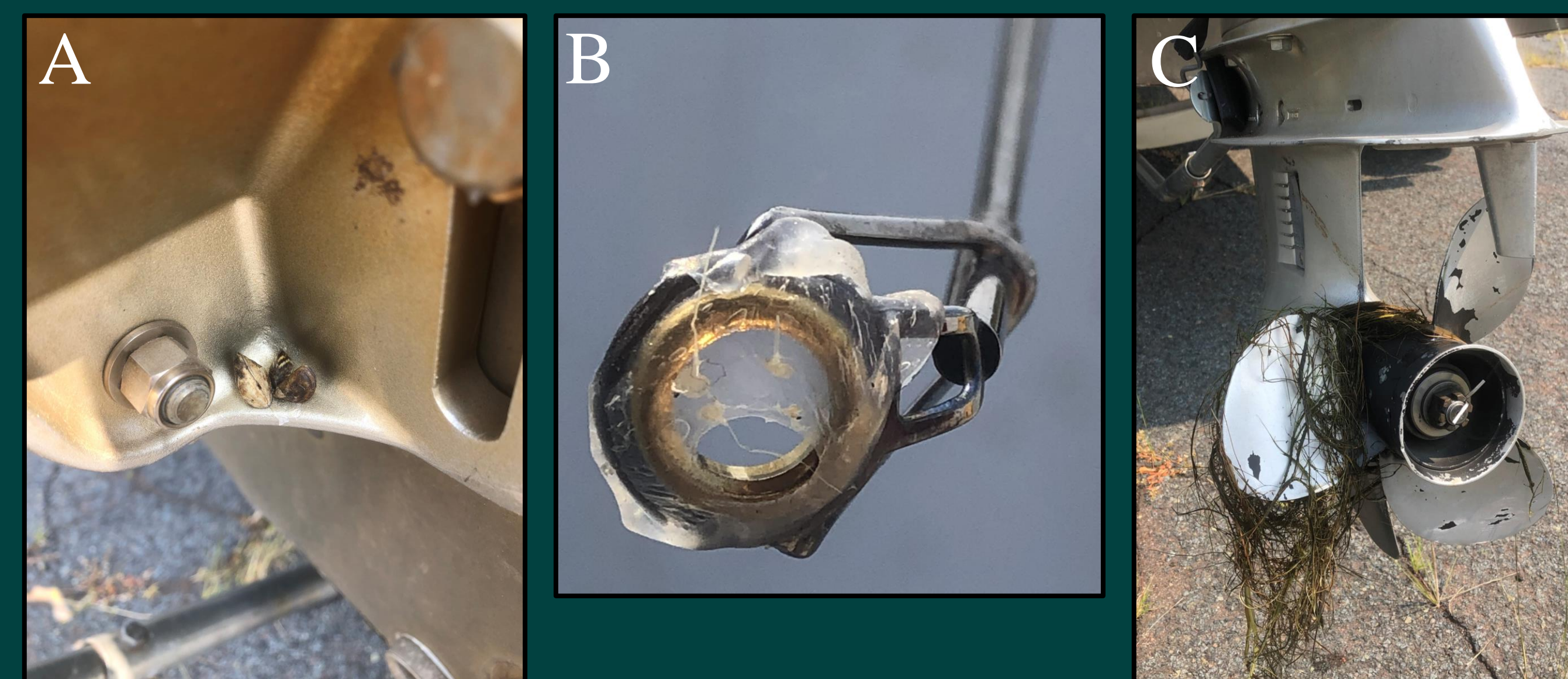


Fig. 2: Example locations of AIS placement for experimental trials, including: A) Zebra mussels on boat motor mount; B) Spiny water flea on fishing rod eyelet; C) Macrophytes on motor propeller.

Future Research Steps Coming Soon!

- 1) Through a mix of literature reviews and interviews with managers, the implementation costs of various AIS prevention practices will be established.
- 2) Implementation costs will be coupled with the effectiveness of each prevention technique to broaden our overall understanding of AIS prevention.
- 3) These data will be incorporated into an online interactive tool that can be used to visualize different scenarios and help managers place their AIS prevention resources in the most effective and economical locations throughout the state.

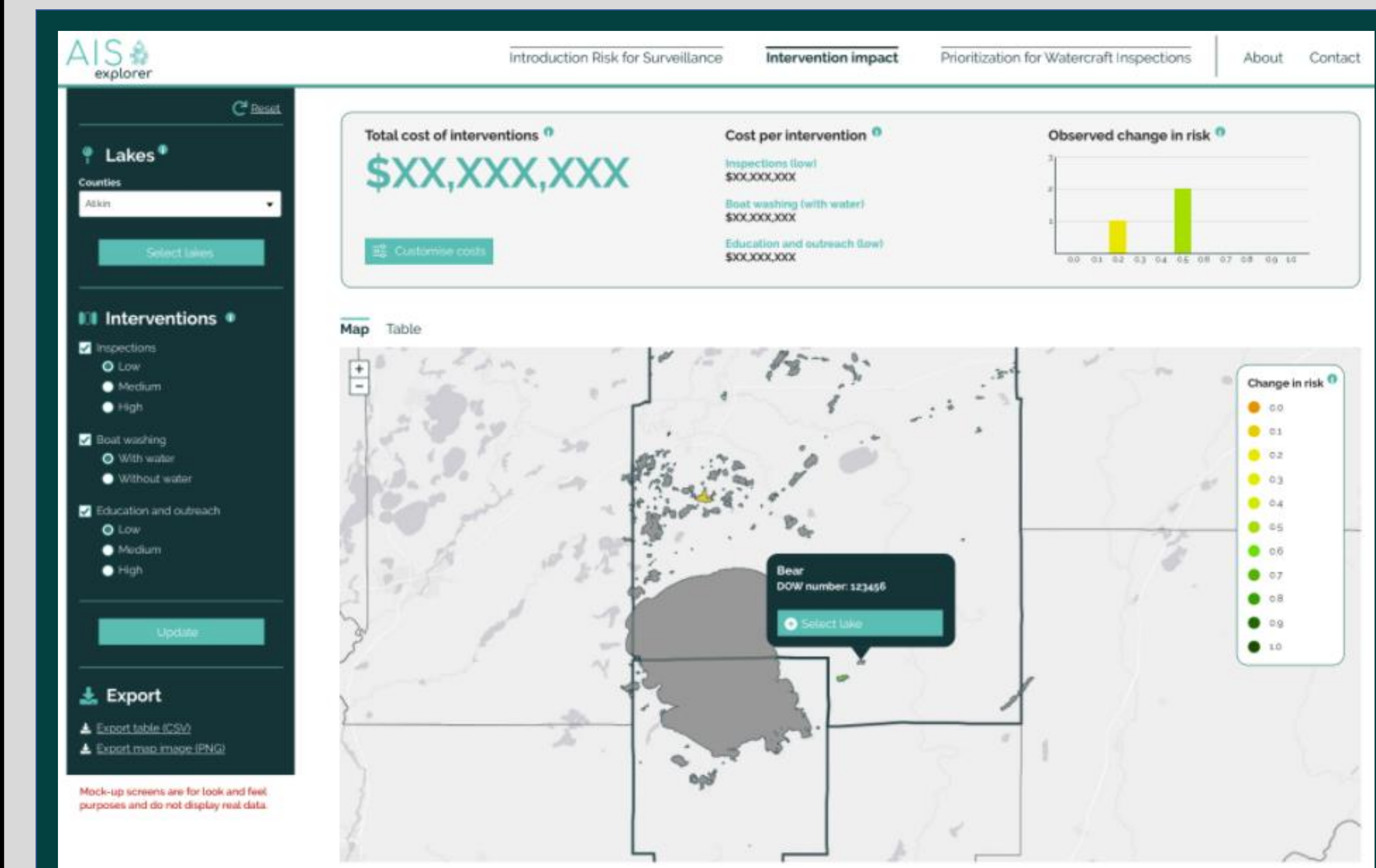
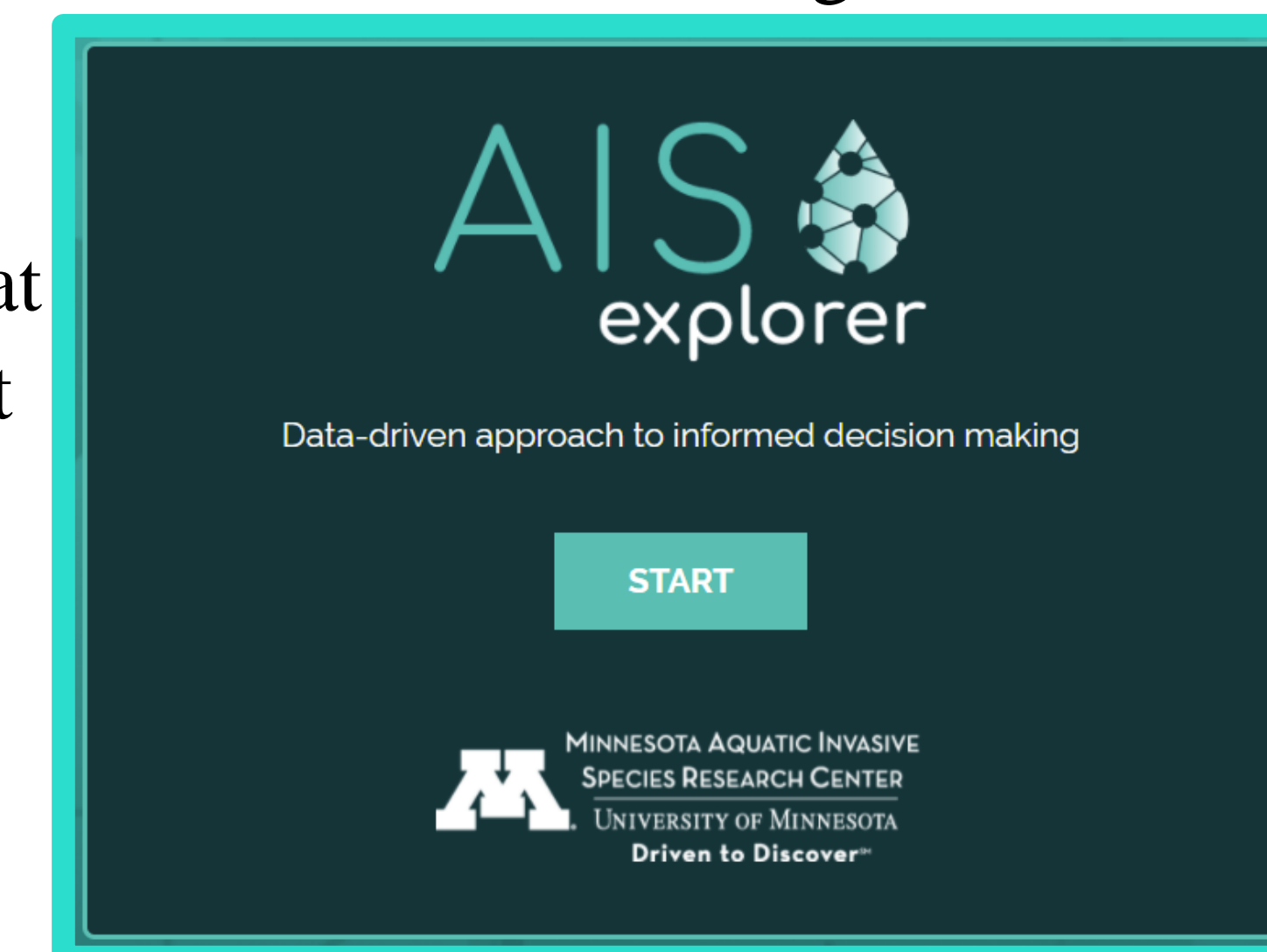


Fig. 3: AIS explorer interface displaying potential management scenarios, allowing for user customization of intervention as well as expected changes in risk and economic costs. Visual is provided as an example, format likely to change following stakeholder feedback during development.

Expected Results and Application

This research will quantify the effectiveness of different AIS prevention strategies including hand removal by boaters with varying boating experience, hand removal by trained level 1 watercraft inspectors, and hot water decontamination completed by level 2 watercraft inspectors. By incorporating these empirical data into existing AIS Explorer risk models, we can help managers to better understand the outcome of various intervention scenarios. The data collected as part of this project will be shared with tribal, state and local managers as part of workshops and other outreach efforts.

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