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Evaluation of Lampricide Treatment Deployment Strategies in an Operating Model of the
Control Program to Maximize Reductions in Sea Lamprey Abundance
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ABSTRACT:

Targeted lampricide treatments are lampricide treatments on Great Lakes streams above and beyond the base lampricide control effort. Targeted treatments began in 2008 to address increased lake trout marking rates and sea lamprey abundance. Different targeted treatment strategies have been completed within the Great Lakes and include a variety of tactics such as treating streams in consecutive years, treating contiguous geographic regions or a whole lake in the case of Lake Erie, or focusing on the largest sea lamprey producing streams (Symbal et al., 2021). Deployment of these strategies did not always result in reductions in sea lamprey abundance, and the joint Assessment and Lampricide Treatment Task Force recently debated whether to continue or delay sequential treatments, treat targeted streams on an every-other-year basis, or abandon the targeted treatment strategies altogether. To inform this decision we proposed to use an operating model (SLaMSE) to evaluate the expected performance of a variety of targeted treatment strategies. We hosted a 1-day workshop with task force members and other sea lamprey control agents to solicit their preferences on which targeted treatment deployment strategies to examine. We came up with seven strategies to evaluate on the upper Great Lakes (Superior, Michigan, and Huron), which allowed us to simulate treating some lakes or lake regions while also evaluating what the effect was on the other upper lakes. Our objective was to (1) rank the relative performance of targeted deployment strategies based on their forecasted effect on long-term parasitic sea lamprey abundance. We found that sea lamprey abundance did not differ substantially between deployment strategies, but increasing the dollars spent on additional treatments resulted in increased sea lamprey suppression. The extent of forecasted sea lamprey suppression was quite sensitive to an assumption about the size of the untreatable pool in the model, that is, areas not vulnerable to lampricide treatment.