

ENV Report 17 - *Ecological risk assessment of the effects of the incremental increase of commercial navigation traffic on submerged aquatic plants* by Steve Bartell and Kym Rouse-Campbell

ABSTRACT

This report describes the implementation of hydrodynamic forces screening models and plant growth models used to estimate the potential impacts on submerged aquatic vegetation associated with commercial vessels operating on the Upper Mississippi River and Illinois Waterway (UMR-IW) System. The assessments addressed potential navigation impacts on SAV in the main channel and channel border. The screening models were used to identify the combinations of vessel characteristics, pool stage height, and sailing line that might produce waves or changes in current velocities that could result in physical damage to aquatic plants. The plant growth models were used to assess impacts of the commercial vessels on sediment resuspension that might reduce light availability for photosynthesis. Plant growth models were developed for wild celery and Sago pondweed, two species selected as representative growth forms of SAV in the UMR. The models were used to estimate decreases in plant growth and energy allocated to vegetative reproduction in relation to passing commercial vessels. Potential impacts were assessed for UMR pools 4, 8, and 13 using 1992 commercial traffic data. Potential plant growth habitat was defined as any area with a depth of 1.5 m or less in the main channel or channel border, regardless of the presence of SAV. The assessment addressed all areas of potential plant growth in the selected pools. Additional assessments were performed for alternative traffic scenarios that were developed as 25, 50, 75, and 100% increases over the 1992 data.

The report summarizes the magnitude of potential impacts of commercial vessels on plant breakage and reduced growth and reproduction as incremental differences between the 1992 baseline traffic and the four traffic alternatives.