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Do Artificial Floating Wetlands Improve Habitat Quality for Aquatic Macroinvertebrates in Urbanized Rivers?

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DO ARTIFICIAL FLOATING WETLANDS IMPROVE HABITAT QUALITY FOR AQUATIC MACROINVERTEBRATES IN URBANIZED RIVERS?

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Artificial floating wetlands (AFWs) have been used for beautification of urban, aquatic landscapes and may provide additional and higher quality habitat for water-dwelling wildlife. Assessing habitat quality can be achieved by identifying the presence of organisms that are bioindicators, like benthic macroinvertebrates such as insects, mollusks, and crustaceans that live in freshwater. Presence or absence of different taxa may be indicative of different water quality conditions. To determine if AFWs deployed in the Chicago River provide higher quality habitats compared to sections of the river without AFWs, we compared the identity and abundance of macroinvertebrate taxa at both sites during the summer of 2020. Our experimental design included 2 treatments, the AFW site and a control site that lacked AFWs, with 9 replicates per treatment. Macroinvertebrates were collected using Hester-Dendy samplers that were submerged for 7 weeks and later preserved in 80% ethanol. We predicted that macroinvertebrate taxa richness and diversity would be higher for the AFW site, indicating that the AFWs provide a higher quality habitat than controls. Additionally, we predicted the macroinvertebrate tolerance index of the control site would indicate poor water quality and the tolerance index of the AFW site would indicate moderately higher water quality conditions than at the control site. Our preliminary data analysis based on counts for a third of the replicates suggests there were, on average, ~1.5 times the number of macroinvertebrates at the control sites compared to the AFW sites. However, we found a higher number of taxa indicative of higher water quality at the AFW sites compared to the control sites. For example, we found damselflies, a taxonomic group relatively intolerant to poor water quality, were ~6 times more abundant at the AFW site than at the control site. This study will allow us to determine if AFWs are a feasible way to improve habitat quality for wildlife in urbanized rivers.