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ABSTRACTS

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**Recovery of the Riffle Community in the Boardman River as a Consequence
of Reestablishment of a Swift River Channel Following Reservoir Drawdown
at the Boardman River, Traverse City, MI**

**Nathan Sather, Bethel University
Mentor: Dr. David Mahan, Au Sable Institute**

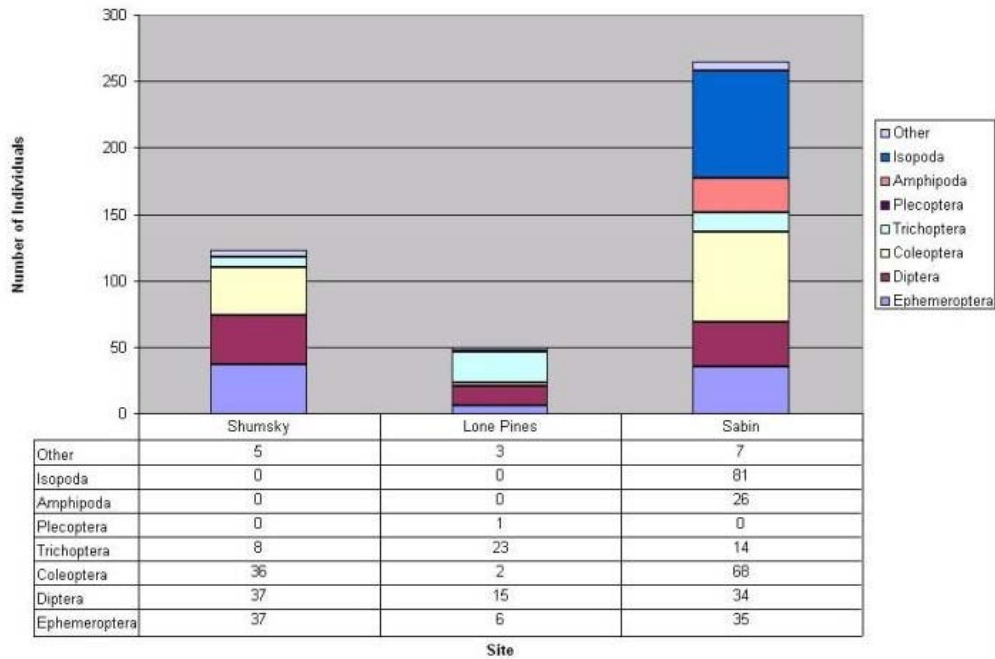
The Boardman River is a groundwater fed stream that meanders through Michigan's Grand Traverse and Kalkaska Counties. The Boardman and Sabin dams are two of four dams that impede the Boardman's flow and due to safety concerns are in the process of removal. The Boardman Dam Reservoir was lowered 17 feet in 2007, resulting in the reestablishment of river channel upstream. Research has indicated that dams negatively affect stream ecosystems by increased sedimentation and alteration of natural habitat.



The purpose of this study was to characterize the macroinvertebrate community and observe differences between an undisturbed riffle (Shumsky Site), a newly developed riffle at the head of the old reservoir (Lone Pine Site) and at a riffle below a dam (Sabin Dam Site). Additionally, samples were compared with those taken in a similar 2008 study to determine the amount of recovery in the reestablished river channel at the Lone Pine Site. Macroinvertebrates were identified to lowest possible taxonomic level and distinguished by morphospecies.



Each of the three sites were found to be taxonomically distinct in their macroinvertebrate community composition. Shumsky had 35 observed morphospecies, Lone Pines had 25 morphospecies, and Sabin Dam had 43 morphospecies. A comparison of the recovering site with the undisturbed, natural site using Sørensen's Quotient of Similarity indicated that the Lone Pine Site has not fully recovered, but showed a considerable increase in similarity (40%) in contrast to the 2008 analysis (17.8%). Additionally, an improvement in richness of indicator species was observed.



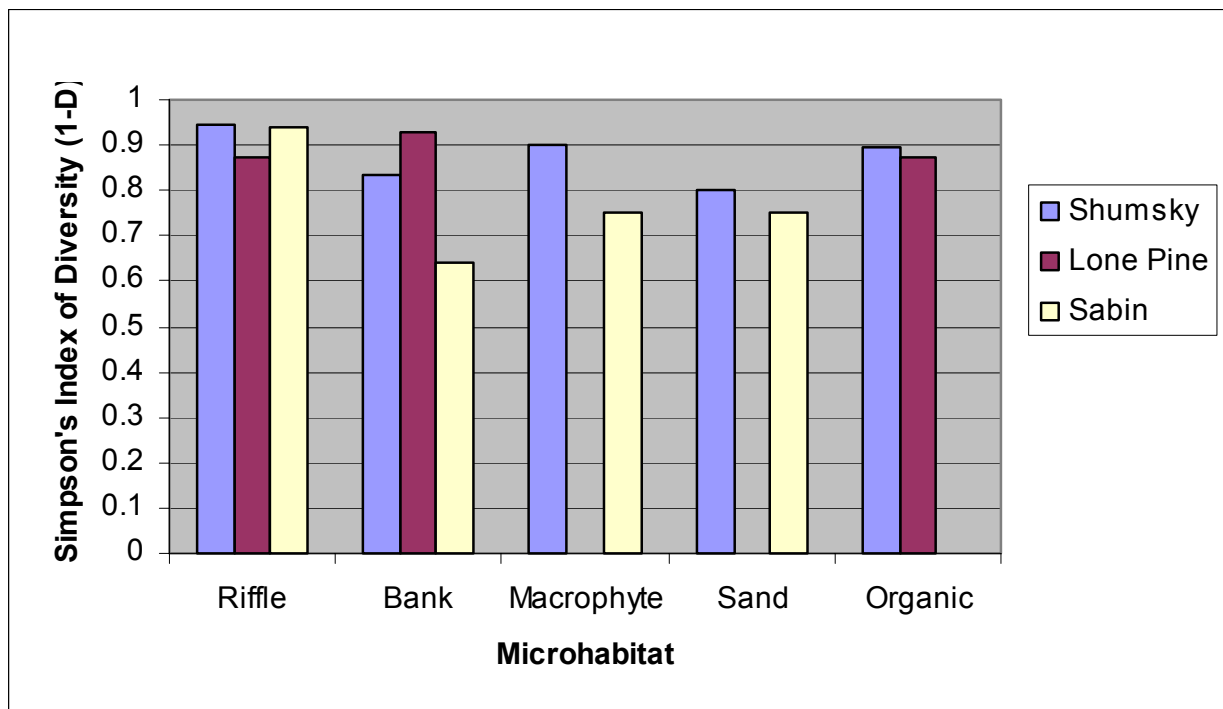
Diversity of Macroinvertebrates in Differing Substratum Types at Three Sites in the Lower Boardman River, Michigan

Jacob Meier, Calvin College
Mentor: Dr. David Mahan, Au Sable Institute

The diversity of the macroinvertebrate communities of different microhabitat types was characterized at three different sites along the Lower Boardman River, Michigan. Three sites along the Boardman River including an undisturbed site, a naturally recovering site, and a site just below an impoundment were sampled.



Samples were taken from up to five habitat types, depending on availability, at each site; the habitat types included a riffle area, sand, macrophyte bed, bank margin, and organic area. A biodiversity inventory of all macroinvertebrate taxa collected was compiled, which consisted of 377 individuals representing 108 different taxa. As demonstrated by other studies, the undisturbed and dam sites showed the riffle microhabitats to be the most diverse, but this was not true within the recovering site. A χ^2 test for independence also showed that microhabitats at the recovering site were not significantly independent, suggesting that macroinvertebrate communities in unstable streams such as the naturally recovering stream site in this study, may be made up of species that are less habitat specific than those in more stable streams.



An Assessment of a Small Mixed Northern Hardwood-Conifer Forest Restoration Project in Northern Lower Michigan

Meghan Rorick, Hardin-Simmons University
Mentor: Dr. David Warners, Calvin College

At present, forest loss continues at an alarming rate all over the world. Therefore, it is very important to not only protect the remaining forest, but also restore the forest ecosystems that have been degraded or destroyed. This study evaluated the condition of a small forest restoration project in northern Lower Michigan one year after implementation in 2008 by measuring the percent herbaceous cover, the species diversity, the percent of native and non-native/invasive species, the average percent decrease of non-native species per soil treatment, and the growth/survival of transplanted trees and shrubs.



A complete inventory of the entire site was also compiled as baseline for future studies. The study found an increase in percent herbaceous cover, total number of individual plants, and species diversity since 2008. It also found a decrease in percent non-native species. Plots that received “raked” and “tilled” soil treatments also showed a decrease in average percent of non-native species relative to the control. A positive effect has been seen in just one year from establishment of the restoration project at this site. Future studies should be conducted to further monitor the process of restoration.

