

A Quantitative Survey of Mussel Communities Below Four Dams on Three Wisconsin Tributaries of the St. Croix River



Students Gather, Identify, and Measure Mussels



Mussel Vouchers and Tagged Young Mussels

Our results indicate that many dams on small tributaries of the St. Croix River have large and diverse mussel communities below them. These sites, such as the Memory Lake Dam on the Wood River in Burnett Co., can serve as important refugia for rare, threatened, and endangered mussels such as elktoe (*Alasmodonta marginata*) and purple wartback (*Cyclonaias tuberculata*). We also found that widely held beliefs about what makes for poor mussel habitat, such as a pure sand bottom being unfavorable, may not hold true in certain areas such as the Clam Lakes Dam. Previous studies have also indicated that high mussel populations below dams may have low reproductive rates. We found this to be the case in Spooner where only one juvenile mussel was found. However, the mussel community below the Memory Lake Dam was dominated by juveniles. This could be explained by the anoxic environment in the Yellow River substrate below the Spooner Dam potentially resulting in low juvenile survival.

A fifth dam site on the Trade River was not surveyed due to low mussel numbers. This may correspond to the high e. coli levels in this part of the Trade River where cows from numerous farms are allowed to wade in the river. Mussels at all sites below dams showed large growth rings. By tagging these mussels, we hope to learn more about growth rates in mussels below dams, and how they differ from mussel communities elsewhere in rivers.

During the summer of 2005, students from Grantsburg High School and their instructor quantitatively analyzed the mussel communities below four dams on the Yellow, Clam and Wood Rivers in northwestern Wisconsin. An additional high density site on the Yellow River was sampled as a comparison control. At each site, mussels and substrate were collected from 100 quadrats (0.25m²). Substrate was separated into five size classes and weighed, and all mussels were identified, measured and aged using annular rings. A numbered vinyl tag was attached to the first 200 mussels at each site for future growth analysis. The Wood River below the Memory Lake Dam had the highest diversity with 20 species while the Yellow River below the Spooner Dam had the lowest diversity with only 7 species. The highest densities occurred at the control site on the Yellow River with 27.5 mussels/m², and on the Clam River at the Clam Lakes Dam with 26.9 mussels/m² and the Clam Falls Dam with 19.0 mussels/m². The Memory Lake Dam site had the lowest density with only 9.2 mussels/m². The oldest mussel community occurred at the Yellow River control site with a mean of 17.3 annular rings/mussel while the youngest site was the Memory Lake Dam site with a mean of 8.2 annular rings/mussel.

