

Students to the rescue of freshwater mussels at St. Croix National Scenic Riverway

By Jean Van Tatenhove



MATTHEW S. BERG

Students catch potential mussel host fish on the St. Croix River.

AS I LISTENED TO THE PRESENTATION, I had to keep reminding myself that these were high school students. The room full of biologists, teachers, students, and community members of Solon Springs, Wisconsin, are engaged as Aimee, a junior at Grantsburg High School, describes the life cycle of a freshwater mussel. Senior Ben takes over and describes the methods used to conduct a freshwater mussel survey on the upper St. Croix River. The Friends of the St. Croix Headwaters and Macalester College in St. Paul, Minnesota, funded the project.

Nearly 30 biology students conducted qualitative and quantitative surveys last summer. Then eight research biology students analyzed the data and produced a complete research paper with quality GIS maps, graphs, and diagrams describing their results. They were now presenting their findings in a PowerPoint format to their funding sponsors. The students worked hard—several earned a certificate in scuba diving in order to conduct the research.

They moved several tons of river sediment searching for mussels and quantifying sediment composition.

Their teacher, Matt Berg, was disappointed that all the research students were not able to attend this presentation because of basketball games. “They really nailed this presentation when we were at Macalester. I didn’t have to say a word. We missed Tyler tonight—he is the statistician of the group.” When I asked Matt how he got high school students to do such professional presentations, he said, “They don’t know they’re not supposed to be able to.”

Unlikely partners

Matt and his students have been working on the St. Croix River since 2002, conducting studies on freshwater mussels and dragonflies for the National Park Service (NPS), the University of Minnesota, Macalester College, the Wisconsin and Minnesota

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Students and Research Fellow Mark Hove (far right) pose with a seine net.

departments of natural resources, and the U.S. Fish and Wildlife Service as part of their research biology class. So how did high school students come to work with these organizations?

As the new high school biology teacher in Grantsburg, Wisconsin, a town of 1,369 people, Matt Berg contacted riverway staff in 2001 to let them know he had a great interest in getting students involved in area resources. He wanted his students to understand that they live in a very special place and should get involved in its protection.

Mark Hove, research fellow at Macalester College and the University of Minnesota, contacted riverway staff in 2002 with an idea for helping a highly endangered group of organisms: freshwater mussels. “I had some straightforward projects and not enough people power to get the science done quickly.” He wondered if he could get a team of trained help to triple the output of his research.

St. Croix National Scenic Riverway is home to—and in some cases, the last stronghold for—40 species of freshwater mussels. Mussels have a remarkable life cycle that includes a short period of time when they attach to the gills or fins of fish, using nutrients from the fish blood to grow their internal organs. Some mussels can utilize a wide variety of fish as hosts, but some require specific species. Host fish for several state and federally protected mussels

in the river were unknown—essential information required in managing their recovery.

Riverway education staff met with Mark Hove to identify his research needs and what volunteer possibilities could fulfill his request. As Mark was describing his work, I thought high school students would best accomplish his tasks. I called Matt Berg, who was able to join the meeting, and we all began brainstorming. We quickly determined that Grantsburg High School students would come to the research rescue. Students would also become aware of the importance and plight of freshwater mussels in a river very near to them.

Mussels and more

The first study was titled “Fish Host Suitability Assessment of the WI/MN State Endangered Snuffbox Mussel (*Epioblasma triquetra*) from the St. Croix River.” Students, along with Matt and Mark, captured potential host fish from the St. Croix River and separated them into species-specific tanks in the classroom. The students siphoned the tank bottoms to capture any glochidia (mussel babies) that fell from the fish over the next few weeks. As glochidia were identified, suitable host fish were recorded.

Both Mark and Matt were concerned about data quality. Matt worked out some classroom techniques. “We have a checklist of things. We save a raw data set just in case. I have the students work in pairs. If the two students come up with differing answers, they have to tell me why. I have student project managers. We involve other school staff such as math teachers to check formulas.” Mark says that the transparency of research papers naturally allows others to review the work.

Once the high school operation was established and word started getting out, researchers began contacting the school and proposing projects. After a brief stint as an NPS seasonal biotech, Matt started his own company to handle the research grants and employ past students home from college for the summer. He also learned the National Park Service research permit system. Projects are already under way for this summer: a continuation of the mussel survey on the upper St. Croix, a river survey for

Students snorkel at the confluence of a tributary.



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exotic aquatic macrophytes, and a proposal for an aquatic macroinvertebrate survey. At least 10 new student scuba divers have just been certified.

Master motivators

I wondered how the partners got teenagers really interested in mussels. When you listen to Mark describe his work, it is hard not to get excited. Enthusiasm is contagious. He tells me a story about the federally endangered winged mapleleaf mussel. “I knew these channel cats had to be host fish, but we couldn’t catch one with glochidia attached. So we decided to have a fishing tournament. The grandfather of one student ended up catching the only cat with winged mapleleaf glochidia, but it was enough to confirm outside the lab that channel catfish are a host fish. Adding the field information made the study more realistic.”

I witness Matt giving a student some well-deserved respect. He tells me as the student is listening, “Aimee is the map expert. I taught her everything I know and now I go to her with questions.” She is beaming. I am thinking about how he just gave her a big dose of motivation. Teacher and student just finished an online GIS class together through the University of Montana. Recognizing the students’ work goes a long way.

Park resource managers appreciate the information that these students contribute. Robin Maercklein, resource manager at St. Croix National Scenic Riverway, uses the survey data generated from several student studies when working on compli-

ance documents such as environmental assessments and impact statements. “Even if the information is just in the back of my mind, their studies help me to identify mussel-sensitive areas when the park management is in planning mode. The student work is regularly incorporated into population ranges for each species of mussel, especially on the upper portion of the Riverway.”

As a riverway educator, I am confronted every day by headlines about how teenagers are consumed by technology and how they don’t interact with nature anymore. I hear people lamenting the absence of the next generation of scientists. I see answers in the model this group provides.

Engaging the next generation

Parks are overwhelmed with inventory and monitoring needs and understaffed with people to conduct the projects. Many monitoring protocols are in place and easily replicated. The National Park Service 2008 Director’s Report states that “reaching out to the next generation to engage their intellect . . . to inspire their leadership in caring for the environment” is a goal. By providing quality teacher training and supervision, high school students could come to the rescue again, providing ways of multiplying research output. Everyone I interviewed for this article listed student engagement as the number one benefit of the work conducted with students of Mark Hove and Matt Berg. Students list the opportunity to work on real science as motivation.

I am able to observe the benefits firsthand, as Aimee is my daughter. She is not unique in her response to this research experience. Many other Grantsburg students share her newfound interest. They are the faces of the next generation of environmental leaders, scientists, and riverway stewards.

About the author

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