



Fifth Graders from Greenbriar West Elementary, Fairfax County, on board the Halfshell, learning about river and shad ecology.

Virginia Potomac/Rappahannock Rivers Shad Project - 2008 Report

By Jim Cummins, The Interstate Commission on the Potomac River Basin
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The project accomplished much in 2008 with over 500 elementary and middle school students and 14 teachers from nine northern Virginia schools hatching and raising American shad fry in their classrooms, releasing approximately 22,737 to help restore this important fish to the Potomac and Rappahannock rivers. Eighty-eight students spent a day on the Potomac River on board Living Classroom's educational vessel, the *Half Shell*, an historic Chesapeake Bay buy-boat, learning firsthand about the ecological, cultural and historic importance of shad and bay environments. This educational effort dovetails with a regionally managed shad restocking program undertaken with the Virginia Department of Game and Inland Fisheries. Under this program, a total of 5,716,000 American shad were stocked into the Rappahannock and Potomac rivers in 2008. Since 1995, over 43,175,000 shad fry have been stocked into the Potomac and Rappahannock rivers. The Atlantic States Marine Fisheries Commission's 2007 American Shad Stock Assessment notes that the shad population recoveries in the Potomac and Rappahannock rivers are among the few such recoveries in the east coast.

Reflecting the multi-jurisdictional nature of the Potomac River, Virginia students participated along with 18 schools from Maryland and Prince Georges County and five schools from Washington, DC, all working cooperatively on this initiative (Maryland and Prince Georges County schools participated through funding from Mirant Mid-Atlantic and the Chesapeake Bay Trust). In total, this year's collective educational program released 30,124 shad fry, reached over 2,019 students, trained 45 teachers, and involved over 100 volunteers! Those are great numbers, the best so far!

Support from the Virginia Chesapeake Bay Restoration Fund made it possible for these schools to participate in this nationally heralded program. Started in 1996, the “Schools-in-Schools” component of this project has again provided boat-loads of meaningful Chesapeake Bay experiences. This program is part of a partnership with the Interstate Commission on the Potomac River Basin (ICPRB), Living Classrooms of the National Capital Region (LC-NCR), Virginia Department of Game and Inland Fisheries, Maryland Department of Natural Resources, Chesapeake Bay Foundation, Mirant Mid-Atlantic, and the Anacostia Watershed Society.

THE PROGRAM

Training:

On March 8th, teachers and assistants from each school attended a regional training workshop at the Anacostia Resource Education Center (AREC) where they learned about the history and restoration of shad in the Potomac River and their role in the project. Along with in-depth instruction, each teacher received a shad curriculum binder with instructions on how to raise and care for shad. They also received reading materials, including a copy of an award winning book on the project entitled *Let the River Run Silver Again!*,¹ to learn about the history the program, to prepare their students and to serve as reference resources. At the end of the workshop each teacher received a shad tank, filters, a tank stand, chemicals, test kits, and other supplies to take back to their classroom. Fifteen student assistants from a variety of schools were also in attendance, which clearly added to the success of the training.



Training Day: Students learn how to set up the classroom shad hatchery.

Back at the classrooms after the workshop, teachers assigned students the responsibilities of setting up and monitoring the water quality of their shad tanks and preparing for the arrival of shad eggs to raise. Classes incorporated reading about shad and keeping journals about the progress of their tanks and later their shad eggs and fry, thus emphasizing the connection of literacy to science. While they prepared their tanks and waited for the arrival of the shad, each school was provided with an assembly presentation by Sandy Burk, author of “Let the River Run

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“Let the River Run Silver Again’ was awarded the Isaak Walton Leagues Conservation Book of the Year for 2005 and the Green Earth Book Award for 2006. It is part of the National Science Teachers Association’s “Recommends” program. NSTA’s panel of outstanding science educators recommends this book as “one of the best available supplements for science teaching.” It’s author, Sandy Burke, is one of the project’s cooperating environmental educators.

Silver Again.” They were given with an overview on the entire shad project, the student’s important role in the project, and answers to questions on shad biology, aquaculture and other related topics.



One of the shad set-ups with a camera and monitor to help students see the eggs developing.

Raising and Releasing the Fish:

During the evenings and into the nights of April and May, teachers and selected students went out on the fishing boats of the last remaining full-time commercial watermen in Fairfax County, Louis and Mike Harley, helping to net American shad from the Potomac River. Under the supervision of ICPRB biologist and project manager Jim Cummins, they traveled from Mason’s Neck to just offshore from Mount Vernon, where they collected shad for their eggs to use for Virginia Department of Game and Inland Fisheries Rappahannock River shad restoration efforts. While on board they learned the history of fishermen and the importance of American shad to the ecology and economy of the river. They helped setting the nets, removing shad and other fish, stripping eggs from ripe female shad and fertilizing them with milt from the male shad. They helped count and take measurements of the shad, important data for understanding the recovery of the fish.

Early Monday morning, April 28th, thousands of fertilized shad eggs, collected with students the previous Sunday night, were delivered to all of the schools. Over the course of the following week, students were responsible for maintaining the water quality of their tank as the chemistry changed due to the developing eggs, caring for the eggs, and removing any that were no longer viable. Students used math skills, learning to subsample and estimate the number of eggs they received and the percentage of eggs which survived to release. They used microscopes and television projections to learn about developmental biology. They created and performed their own presentations for other classes, spreading the word while developing public speaking skills, becoming teachers themselves. At the end of the week the excitement became almost explosive as they watched their baby shad hatch and swim around!

The following Friday, May 2, participating classes traveled to Occoquan National Wildlife Refuge, Theodore Roosevelt Island, Great Falls National Park, or Mason Neck State Park to release the fry they had helped hatch in their classroom. 302 students arrived by bus, car, and vans to carry their young shad to the banks of the Potomac River where they could begin their great journey to the sea. Parents, volunteers and interested citizens came to help and view the release. Through on-site presentations by the Interstate Commission on the Potomac River

Basin, Fish and Wildlife Service, and Living Classrooms staff, all assembled learned how the early Americans once fished for shad in the very area they were releasing their shad. They learned how they used the blooming shadbushes as a spring harbinger of the shad's return, just as they can now do themselves with the new shad bushes they planted at their schools. Students hiked the river bank to observe some of the animals that will benefit from the return of the shad, from osprey and bald eagles to rockfish and largemouth bass. They learned more about how the shad mature into adults over the next 3-6 years, swimming up and down the coast from Florida to the Bay of Fundy in Canada each year before they return to spawn the next generation. They learned about the many oceanic species, such as the cod and bottlenose dolphin, that also rely on shad, and that when we help shad we are also helping them.



Gathering at the river to release their shad fry.



Waples Mills Elementary School raised shad bushes for other schools to plant. They are pictured here planting a shad bush on their school ground.

Exciting Boat Trips Show Students the Shad's Environment on the River

Thanks to the funding from the Chesapeake Bay Restoration Fund, students from several schools were able to spend a day on the river as part of the LC-NCR's shipboard experiences. On board the *Half Shell*, a restored historic Chesapeake Bay buy-boat, students participated in hands-on activities including clam dissections, plankton pulls, water quality testing, trawling for fish and other aquatic life, and lessons about the cultural history of the Bay. They used dichotomous keys to identify the fish they were captured and were instructed in navigation techniques. This trip was a great way to tie the entire program together with first-hand experiences on the river and bay ecosystems they had just studied and helped restore. Many teachers reported that the boat trip was "one of the best field trips we have ever taken."

List of 2008 Virginia Shad Schools

School

Drew Model Montessori
Waples Mill Elementary School
Greenbriar West Elementary School
Burke School
South County Secondary
Key Middle School
Taylor Elementary School
Springhill Elementary School
West Springfield High School

Lead Teacher

Jill Meyer
Sean Duffy
Mary Margaret Wetterhahn
Betsy Gross
Eileen Hart
Bruce Hollinger
Wendy Wilson
Alison Bauer
Beth Jewel

All of the schools involved last year have asked to enroll in the program again this coming spring (2009). Additionally, eight more Virginia schools have requested to join the program and are currently on a waiting list until we know about funding for the program.

List of Prospective Virginia Shad Schools for 2009 (in addition to the above list)

Robinson Middle School
Union Mill Elementary School
Irving Middle School
Luther Jackson Middle School
Mark Twain Middle School
Lanier Middle School
Glasgow Middle School
Carl Sandburg Middle School

2008 Teacher testimonials:

"The shad program has been an enriching program for my students. Because of this program, my students are now acutely aware of the impact humans have had on their ecosystem. They are actively engaged in caring for the fish hatchery by personally maintaining the water quality. They have been fascinated by watching the eggs hatch. Finally they are connected to their community through the release of the shad eggs into our own Occoquan River. Our unit on ecosystems has become more personal because of the opportunities to make connections in our own backyard through this endearing and enduring program. Thank you for providing us this opportunity. I look forward to continuing this outreach in the years to come!"

Eileen Hart
South County Secondary

"Our students who participated in the shad recovery program were very excited to view the shad embryos as they developed in their egg cases. They were completely fixated and quite literally marveled to see something so small when they observed the hatched shad larva moving and swimming around and then showing pictures of what these little guys will actually grow into!! It was a great experience and teaching tool to show them where the eyes were, the developing backbone, and the egg sac. We all enjoyed actually participating in doing something very positive for the recovery of these shad in our watershed here in Northern Virginia and to the overall health and well being of the watershed ecology. From Sandy Burke's visit to our classroom and the time when we observed and monitored the shad and then released them, a better appreciation of wildlife was experienced."

Bruce Hollinger
Life Science Teacher
Francis Scott Key Middle School

"As a demonstration site for children's conservation science, we do lots of fun environmental things. But the few weeks we have the shad tanks are the most exciting of the school year for 5th grade. The care and concern the kids show with the pH readings and the chemicals, even before we get the eggs, is fun to witness, and once we have the eggs, the whole school is abuzz with noise about what the 5th graders are doing. One of the more interesting things is you never know which of the kids will be absolutely smitten with the whole thing, it's not always the "smart" kid or some other obvious choice, instead it frequently is the quietest kid in the class who never gets to shine in other ways. And this is real science for a great purpose, right here in our backyard. And of course the few kids who get to go out and catch fish never stop talking about it, too bad the whole grade can't do that."

"In short, this program has quickly become a cornerstone of what we do to make science special in our school, and is a great example of how children can be positively engaged in an enterprise that taps into their altruism and enthusiasm and values their contributions to the greater good of society. I wouldn't want to teach 5th grade Ocean Science (a Virginia Standards of Learning requirement) without the program, and hope I never do!"

Sean Duffy
5th grade Science Teacher
Waples Mill Elementary School