

U.S. Fish & Wildlife Service

Winter 2009



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SANDY BURK

Students in the Schools in Schools program are helping restore American shad to the Potomac River—and learn the value of conservation.

By Sandy Burk

Students sample fish near Elizabeth Hartwell Mason Neck National Wildlife Refuge after their shad release.

river of hope

Painting of American shad by Andrea Barnes



This spring, hundreds of Virginia students traveled to Occoquan Bay National Wildlife Refuge part of the Potomac River NWR Complex near Washington, DC to release thousands of American shad and see bald eagles fishing. For more than 15 years students have hatched and restocked shad as part of the Potomac River American Shad Restoration Project's Schools in Schools program.

The program is coordinated by Living Classrooms of the National Capital Region in partnership with the U.S. Fish and Wildlife Service, Interstate Commission on the Potomac River Basin, Chesapeake Bay Foundation, Anacostia Watershed Society, Chesapeake Bay Restoration Fund, Chesapeake Bay Trust, and the Mirant Corporation, LLC.

American shad are the largest herring in the world and make up a critical part of the food webs of the coastal rivers of the United States. During the past century, shad numbers declined dramatically due to overharvesting, dams, and pollution. Schools in Schools students are helping bring them back.

Harrison Lake National Fish Hatchery has been a key partner in this effort since its inception, designing the student tanks with the Chesapeake Bay Foundation and offering technical assistance for hatching and raising the fish. Shad release sites on the Potomac River now include Occoquan Bay, adjacent to part of the historic spawning grounds for American shad on the Potomac River.

Getting kids outside to refuges, especially for school credit, can be a challenge for any school or refuge staff. Liability, standardized testing, limited time- all of these are hurdles teachers often face when trying to get their students outside to learn.

Schools in Schools is helping to change that by offering activities that help teachers reinforce the curriculum concepts they teach, as well as provide field experiences that give students credit toward graduation.

Understanding the effect of human activities on the local watershed has been a focal point for the science curriculum in many states, including Virginia, where teachers and students are encouraged to participate in a Meaningful Watershed Educational Experience (MWEE). Releasing fish, monitoring water quality, and doing bird surveys at a refuge allow students to participate in these MWEE experiences, which can then lead to service learning credit.

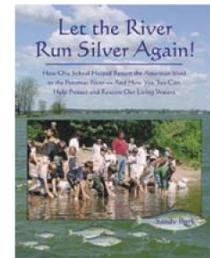
In Virginia, starting in the eighth grade, and Maryland, starting in the sixth grade, students can earn service learning credit for restoring shad, doing native plantings and monitoring wildlife as part of the Schools in Schools project. These activities support the Service's Connecting People with Nature initiative by getting kids outside and involved with nature for credits through working with a National Fish Hatchery and refuge complex.

During the Schools in Schools project, students join Service and River Commission biologists and watermen to fish for shad and to collect shad eggs. They get to bag eggs and help transport them to their schools. While collecting fish or releasing shad, they often see bald eagles and osprey fishing, too, observing the food web of the river first-hand.

Back in the classroom, students hatch the shad in tanks designed by Harrison Lake National Fish Hatchery staff. With guidance from Living Classrooms and hatchery staff, students monitor and treat the tanks to ensure successful shad hatching and growth until they are released by students.

After raising the shad for a week, students travel to release sites along the Potomac River including Occoquan Bay and Great Falls National Park. Occoquan Bay lies in the tidal section of the Potomac River, just downstream of Washington, DC. Great Falls is just upstream of Washington. Waters adjacent to the refuge are part of the historical spawning area for American shad.

Since 1996, more than 100 schools have raised and released hundreds of thousands of shad into the Potomac River. Shad students also helped get a fishway into the Little Falls dam, which was blocking their shad from returning upriver to spawn.



Shad are now returning to the Potomac in great numbers. The program has been featured on national TV and in an award winning book *Let the River Run Silver Again!*, which shad

students helped write. Schools from other river areas around the mid Atlantic — from North Carolina to New Jersey — have also started to raise shad.

Last year, Schools in Schools teachers received training in a new food web activity and how to use the eagle web cams at Blackwater National Wildlife Refuge and the Service's National Conservation Training Center. During the food web activity, students built the food web of their river with plant and animal cards including the bald eagle and shad. The food web activity illustrated how the entire ecosystem of a river — including the eagle — benefits directly from healthy fish populations, including shad.

Students also watched the eagle cams, observing eagle behavior in the nest. Both eagle cams vividly showed the eagle parents feeding their eaglets fish, with the Blackwater eagle cam on the Chesapeake Bay showing the eagles feeding shad to >>



Jim Cummins, a biologist with the Interstate Commission on the Potomac River Basin, harvests eggs with elementary school students.

American shad make up a critical part of the food webs of the coastal rivers of the United States. During the past century, shad numbers declined dramatically due to overharvesting, dams, and pollution.

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their eaglets. Such visual reinforcement of their food web lesson was exciting for the students and dramatically reinforced their understanding of food webs.

Students learned that eagles need to feed their young every two hours or so until they fledge, and that their primary food is fish, including shad and other herrings for coastal eagles. They also learned that the Elizabeth Hartwell Mason Neck National Wildlife Refuge, across from where they release their shad, was the first refuge to be specifically established for the protection of the bald eagle. According to Deputy Refuge manager Daffny Hoskie, this area of the Potomac River is now home to one of the largest concentrations of bald eagles in the mid Atlantic.

Watching the eagle cams at school led many shad students and teachers to want to visit Elizabeth Hartwell Mason Neck NWR and Occoquan NWR, two of the three refuges within the Potomac River NWR Complex, to see the eagles first-hand. So Refuge Ranger Marty McLevy and shad project staff from Living Classrooms planned their field experience at Occoquan NWR to include releasing the student-raised shad, monitoring water quality and bird watching for eagles and other birds.

On the shad release day, students from Virginia's South County Middle School in Fairfax County lined the Occoquan Bay beach to release their fish. Service fishery biologist Lisa Moss explained to the students how their shad would migrate to the Atlantic Ocean and return in three to four years to lay their eggs near the refuge. She also told how the Service helps restore fish such as American shad through the hatchery program.

NCTC Distance Learning Coordinator Randy Robinson followed with a talk on the history of the bald eagle and how proper management by the Service and the banning of the pesticide DDT had resulted in the bald eagle's recovery. The eagle was removed from the endangered species list in June 2007.

Robinson pointed out that the eagles continued success depends on healthy fish populations in our nations rivers, and that eagles on the eagle cams and those they were about to see on the refuge may someday feed on the very shad that they were releasing when those shad returned to the river to spawn.

After releasing their shad, the seventh graders walked the refuge to do a bird survey with McLevy. Spotting a bald eagle nest and eagles fishing across the river at Elizabeth Hartwell Mason Neck NWR, the students were thrilled. Having watched eagles hatch and grow on the Service eagle cams, the students were excited to see some active eagle nesting and hunting grounds at the refuge.



Fisheries biologist and author Sandy Burk shows students how to care for American shad hatching in the shad tank built by the students.

Viewing the distant eagle nests across the bay from their shad release site and seeing the eagles hunting overhead, the students made the connection first-hand on how the bald eagle was a beneficiary of their shad restoration work. In three to four years, the shad that they had just released could return to feed the refuge's eagles.

To complete their field experiences, Schools in Schools students got a chance to participate in the first annual Nation's River Bass Tournament held in May at National Harbor on the Potomac River. The event was coordinated by Living Classrooms and featured fishing guides and dignitaries such as Service Director H. Dale Hall, and Tim Keeney, Deputy Secretary at the National Oceanic and Atmospheric Administration. South County Middle School teacher Jeanine Carter and her students won the tournament's first prize, catching the largest largemouth bass—another important part of river's ecosystem and

prey of the bald eagle. And underneath their boats, baby shad were swimming down the Potomac River to begin their great journey to the sea. □

Sandy Burk is a fisheries biologist and educational consultant currently working at the National Conservation Training Center. She has developed environmental education outreach materials with the Service for more than 15 years.

Students are taught the connection between their shad restoration efforts and how it has helped recovery of the bald eagle.

Online Resources

To view the NCTC eagle cam, visit <www.fws.gov/nctc/cam>

To view the Friends of Blackwater eagle cam, visit <www.friendsofblackwater.org/faq.html>

Watch for the new "Be an Eagle Biologist For A Day" Student activity under the Student and Teacher section of both eagle cams.

To learn more about the Schools in Schools program, visit <www.livingclassroomsdc.org/ShadRestoration.htm>

To learn more about the Potomac River shad restoration project, visit <www.potomacriver.org>

To see the free food web activity listed in this article, visit <Growingnative.org> and click on Educational Resources, Growing Native Curriculum, Lesson 3.3.5.

