

From Mud to Mummichogs

Kids learn Delaware marshes are worth their salt in the Division of Fish and Wildlife's exciting new Eco-Explorers program.

BY LAURA WESTHOFF

EARLY MORNINGS characterized by hand-numbing water, chilly winds and red noses are something the interns working on the Division of Fish and Wildlife's Eco-Explorer program grow to expect. We wake up prepared for a day that will be muddy, wet and cold – with extreme gratitude when it isn't. We pull on our knee boots and grab nets, searching the marsh for fish and macroinvertebrates for the class of the day to study. We fill observation tanks with water, and set up the educational displays. Our noses run, our fingers turn blue, our ears sting from the cold, but when that big yellow school bus turns into the Division's Aquatic Resource Education Center's parking lot, all those discomforts somehow are forgotten. We have a job to do. We are educators and 60 excited fifth graders have arrived at Woodland Beach for an experience we want them to remember. We invite you to share their experiences as they enter the world of the tidal salt marsh.

The kids scramble off the school bus and make a mad dash for the pavilion. They are excited to be out of the classroom. We begin with a brief orientation, arming the students with data sheets and preparing them to explore the mysteries of the salt marsh ecosystem. Once separated into small groups, the eco-guide interns escort them to the first of six eco-stations. Let the learning begin.

"Marsh and Pond Macros" (short for macroinvertebrates) is the first station in the Eco-Explorers program. Here the

students study the ecosystem's interesting assortment of aquatic insects and other common macroinvertebrates. They are divided into teams, provided with dip nets and several warnings about sinking in the mud, then given an opportunity to catch their own critters. The intern leading the station typically hears squeals of delight when a student catches a "creature from the black lagoon," as well as plenty of questions concerning the hazards of picking up a scary looking specimen: "Will this thing sting me?" or "Does he have teeth?" or "Why is he looking at me like that?"

Once they've had a chance to bag a

bug, the students are rounded up and set to work identifying the creature. They use the Eco-Explorers' Wall of Cards to match their insect with one of the picture cards, which also list interesting facts and features about the insects, and adaptations they might possess. The students record the data on the data forms. Before we know it, it is time to switch to the next station.

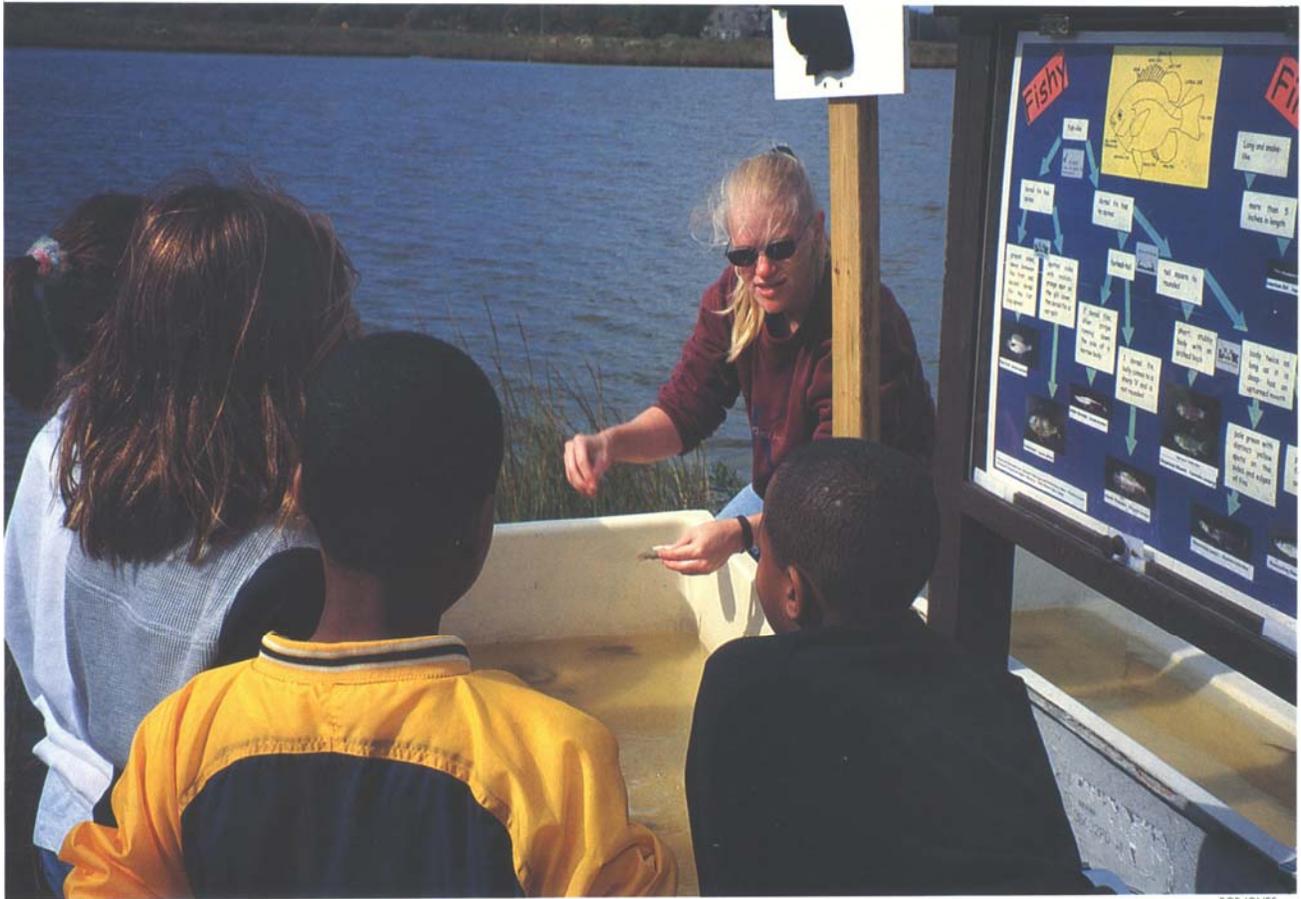
After their visit to the macro station the eco-explorers move on to "Wetland Plants" where they are introduced to wetland vegetation and learn how it is adapted to living in the salt marsh. They are given clue cards and assigned the task of finding their plant in a small area of the marsh. (Of course, many kids stray outside the small area and find mud and fiddler crabs.) The five common plants the eco-explorers are searching for are phragmites, salt marsh cordgrass, salt meadow hay, high tide bush and spearscale. When the youngsters successfully identify their plant, they are given supplemental information and instructed to answer a riddle on their data form that pertains to that plant. That accomplished, the partner groups give a short presentation about their plant and its special adaptations to life in the salt marsh for their "scientist" peers.

The third station, "Fishy Findings," gives the students a chance to learn about the fish most common in the salt marsh – white perch, mummichogs, sheepshead minnows and inland silversides. Eco-guides describe some of the characteris-



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An eco-explorer is intent on recording data, one aspect of the program that fulfills criteria of Delaware's school science standards.



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Intern Laura Westhoff turns a tidal marsh into an outdoor classroom.

tics they are going to be looking for on their fish. We discuss dorsal fins, mouth structure, body shape and other fishy parts. Then students use a simplified visual key to identify their fish. The next step is to record the name of their fish, but some of the kids have a momentary lapse from science into slapstick and name their mummichog after their Uncle Ned or call it Fatso the White Perch. (A little humor is a good thing.) They also record something interesting they learned about their fish while following the key. Next the students gather around one of the fish tubs and the intern teaches them about fish adaptations and the role these common fish play in the salt marsh food chain.

Time's up, the horn blows and the students move on down the Eco-Trail. Located on the center's 940-foot salt marsh boardwalk, the trail is divided into five mini-stations. At the first two stations students learn more about how a

salt marsh ecosystem functions. We discuss how the combination of abundant water, sun and nutrients make the salt marsh one of the most biologically productive ecosystems on the planet. We discuss how energy is constantly recycled through the food web, much like a giant storage battery.

The third mini-station may present the hardest task of the entire field trip - the students actually have to sit quietly and listen to the numerous sounds of the living salt marsh. After a few minutes of giggling, they calm down and actually hear the marsh wrens in the cordgrass, the snow geese flying overhead, and, if they listen carefully, the unmistakable crackling sound of the fiddler crabs dining on detritus below their feet.

The fourth and fifth mini-stations of the Eco-Trail allow the students to observe the salt marsh from the boardwalk's observation deck. We discuss where the water in the ecosystem originates and



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A youthful eco-explorer from one of 40 participating schools checks a net full of marsh mud for signs of life.

what effect that has on the ecosystem. We discuss how wetlands are important, and what makes them so unique. The students love to watch the fiddler crabs

scurry on the muddy banks, while minnows school in the currents of the tidal stream, and the occasional granddaddy-size blue crab wanders the stream edges in search of unsuspecting prey.

"Testing the Waters" is the fifth stop of the day for the explorers. At this station the students study the non-living components of the salt marsh ecosystem, with an emphasis on the qualities of the water. They measure dissolved oxygen, assess pH, determine salinity with a hydrometer, and record observations of turbidity. We teach the students how important the water is to the salt marsh, and why changes to any of the water

quality levels could prove dangerous to the organisms in the ecosystem. This station is conducted on a lower section of the boardwalk, designed to provide students with a place to study the salt marsh upclose.

The last stop on our eco-explorers trip is "Wildlife Detectives," where students learn about animal signs such as tracks and scat. They are then put to the test as detectives who must solve scenarios built around the salt marsh food web. Sometimes shattered blue crab claws are lying along a trail littered with raccoon scat, and sometimes feathers are strewn about an area where fox tracks are found.

The students draw pictures of their clues and write down what they believe their findings mean.

The small eco-groups gather together at the end of the day to talk about the interesting things they learned that day. The interns secretly keep tally of how many remarks come from the station we lead. We take great pride in hearing our own lessons being accurately recalled by these fifth graders.

As they return to their bus, the kids are a little dirtier, but a lot wiser about how the natural world works. As we clean the equipment for the next program we feel a sense of satisfaction knowing that we encouraged that increase in wisdom, that we went to any length to teach those students - even if it meant sticking our fingers into a fish's mouth, or struggling with that water sampler that always closes too soon. We are outdoor educators. It's what we love to do. **OD**

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Fifth grade eco-explorers search for aquatic insects and other common marsh macroinvertebrates.

Eco-Explorer field trips are made possible through a grant from the Delaware Department of Education.

The field trip provides a real-life curriculum extension to a classroom unit on ecosystems. For further

information, contact Kathy Tidball, Gary Kreamer or Bob Jones at the Aquatics

Resources Education

Center, (302) 653-2882.