

# Outdoor Classrooms Highlight Ecology, Biodiversity

By Karyn Molines

*Come forth unto the light of things,  
let Nature be your teacher. —Wordsworth*

**T**wenty years ago, Jug Bay Wetlands Sanctuary was created to protect the sensitive wetland ecosystem and the adjacent forests from development. The founders understood that to ensure the continued protection of these habitats, the Sanctuary's mission must be more than just land preservation. Increasing the public's appreciation and understanding of these ecosystems through ecological research and environmental education were also vital. Inviting people to explore the Sanctuary, learn about the flora and fauna, and take pleasure in the beauty and serenity increased the value of protecting and preserving these habitats.

What is environmental education? We are familiar with traditional education: an instructor at the head of a classroom with students sitting and listening. Formal education has its role in facilitating intellectual growth and understanding. Yet, more and more, nontraditional, or non-formal, education is seen as an equal player in developing minds. Most people learn a significant amount through experiences—such as the outdoor encounters of environmental education—that take place outside of the classroom. Some may learn skills while baking a batch of cookies (measuring, following directions, patience, and the enjoyment of your final product.) Others gain great insight wandering their neighborhood, a nearby stream or forest, or even the back yard. Many children have studied an industrious ant colony, or watched clouds drift by, changing shapes and portending the weather. Perhaps they enjoyed the cool shade of a tree or climbed it and scanned the distant horizon. These experiences are important to learn, integrate, and expand the knowledge imparted during formal situations. Our individual worldviews color our interpretation of facts and figures.



**Children at a 1987 summer science camp measure the diameter of a sweet gum tree.**

Scientists such as Rachel Carson, Stephen Jay Gould, Carl Sagan, and Anna Comstock, a naturalist, scientific illustrator, and a leader in the nature study movement, credited their experience with the natural world as the impetus for their love of science and the thrill of new discovery.

The educational goals at the Sanctuary combine outdoor experiences with direct observation of ecological concepts such as food webs, ecosystem functions, and biodiversity. We incorporate facts and figures within the context of field studies. This can be a challenge, yet the diversity of habitats, the abundance of plants and animals, and limited human disturbance contributes to our success. Educating people about the natural world is easy when the trees are bustling with birds, flowers abound with butterflies, and the wetlands are full of breeding frogs and toads. Take a short hike from the Wetlands Center, observe carefully, note all you hear, see, touch, and smell, and you'll realize you are in the best biology classroom around.

Our education programs facilitate learning about ecology. We engage students in activities that stimulate their curiosity. We encourage them to explore the various habitats. They can then describe the patterns they see, compare Jug Bay to other places they've been, and create relationships between their previous experiences and the newfound knowledge. These experiences help solidify their understanding of ecological concepts such as adaptations or succession.

## A Diverse Audience

The education mission is "to provide environmental education opportunities to the public." We define

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**Jug Bay Home page:**  
**www.jugbay.org**

Jug Bay Wetlands Sanctuary is operated by the Anne Arundel County Department of Recreation and Parks. It was established in 1985 with the goals of wetlands research and environmental education. The Sanctuary is a limited-use park. Visitors are requested to make a reservation by calling the office before planning a visit.

Jug Bay Wetlands Sanctuary is a member of the Chesapeake Bay - National Estuarine Research Reserve system, which promotes scientific research, public education, resource management and stewardship in estuarine reserves across the nation.

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“public” as a variety of audiences: families, adults, schools (kindergarten to high school to college), scientists, interns, and volunteers, who typically fall into at least one of the other categories. Each of these audiences has unique needs and challenges, yet can all be involved in learning by using the outdoors as a classroom.

Just as the Sanctuary has grown from 178 acres to 1,400 over 20 years, our education programs have expanded from 30 in 1991, to over 300 programs that now reach 5,000 people each year. Educational activities take place here on almost any day of the year.

What techniques do we use to teach ecology and environmental science? The school field trip program provides insight into our philosophy. Classrooms in the Field programs are tailored to each class and based on the students’ present curriculum. Teachers complete an application describing their field trip objectives and how the curriculum and field trip relate. During a planning session with teachers, Elaine Friebele and I develop field trip activities that expand and enhance the classroom lessons.

A popular field trip is based on animal classification. In a classroom setting, there are limited opportunities to showcase the diversity of vertebrates and invertebrates necessary to teach classification. At Jug Bay, the opportunity to touch a turtle, to see and feel its scales and claws creates a tangible experience of reptilian characteristics. Handling invertebrates and counting their legs and body parts provide a meaningful distinction between insects and spiders, as well as illustrating the diversity of these small creatures. Back at school, teachers incorporate the discoveries at Jug Bay into their lessons.



**Family discovers small creatures of the forest at a weekend program.**

While high school and college students benefit in similar ways from their jug Bay experiences, they are offered the bonus of participating in our ecological studies. Conducting scientific investigations in the field has been found to facilitate students’ advancing intellect and growing ability to grasp abstract concepts. Active participation in collecting data, such as identifying and measuring fish caught in the Patuxent River, goes beyond filling the students’ heads with names and numbers. We teach them the techniques that scientists use in the field. They learn to distinguish a white perch from a striped bass, but more importantly, they learned the skills required to identify almost any fish they see in the future.

**Research: an Educational Tool**

Ecological research is an important facet of our education programs. Through our research we have records on over 475 different box turtles, so when we encounter one during our hike, we can look up its history, and ponder where it has been between sightings. We have developed easy-to-use fish identification keys based on our knowledge of the fish species that live in the streams and shallow tidal marshes. When we

*Continued on page 4*

The FOJB is a nonprofit organization that supports and enhances Sanctuary activities. The next two board of directors meetings are at 7 p.m. on September 6 and November 15 at the Wetlands Center. Everyone is welcome.

**E-mail account**  
 Have a question? A suggestion?  
 FOJB is easy to reach by E-mail:  
 fojbws@yahoo.com.

## 20 Candles—and One to Grow on

At noon on October 29, a throng of Friends will gather by the old oak tree at the Wetlands Center to bring in a unique autumn harvest: the 20th anniversary of the Sanctuary. State and county leaders will be there, celebrating a quarter century of enjoying, studying and protecting Jug Bay. FOJB will present a special award to former Maryland Gov. Parris Glendening, for whom the Sanctuary's Glendening Preserve is named. We will also unveil a new painting of Jug Bay by John "Bud" Taylor, which the Friends commissioned in honor of this anniversary. Prints of the painting will be available for purchase. And the Friends will provide an array of delicacies to eat, catered by Herrington on the Bay.

## Learning to Love the Snake

A big mission of the Friends is to welcome new people to the Sanctuary. We have two good motives for this. One, we want to share the delights of a beautiful place. Two, we know that people who get acquainted with the Sanctuary will help protect it. The more friends it has, the more likely it is to remain as we know it: a place of peace, study and reflection. So part of our job is to provide opportunities for visits. We particularly want to welcome young people, children who have never have visited a wildlife sanctuary and cannot come to the Sanctuary on their own. That's why we dedicate a large part of the budget to the school field trip program. Many schools that would like to bring their students on class trips can't, because the transportation is too costly. We make it possible for them to participate by paying for their school buses.

This spring, our fund brought more than 200 students to the Sanctuary. This included several schools, but we concentrated on three in Anne Arundel County: Mills-Parole Elementary School and Bates Middle School in Annapolis and Meade Middle School in Odenton. Many of the children were afraid of the outdoors when they arrived, on the lookout for snakes and not too wild about toads. But all



Written by Judy Burke  
Co-president, FOJB

of the classes loved their adventures and went home with tales to tell. One student paid the Sanctuary the ultimate compliment, saying as he left, "I would like to work here when I grow up."



**Susan Blackstone, head of the FOJB education committee, helps students from Mills-Parole Elementary explore the forest.**

The Rotary Club of Parole helped us greatly, providing a \$1,000 grant for the Mills-Parole and Bates bus bills. And none of the trips would have occurred without the work of longtime FOJB board member Susan Blackstone. As the chair of the education committee, she acts as liaison between teachers and Sanctuary staff, choosing scholarship schools, getting applications filled out, and finding chaperones to help. She attends the field trips herself to make sure that everything goes well. What's the personal payoff? "Hearing those kids so excited about what they did today—that's what makes it all worth it." Many, many thanks to Susan for her years of devotion.

## Celebrity Turtles

The Sanctuary's studies of Box Turtles reached a wider audience this summer, as two former Jug Bay interns presented information at a national conference in Florida. Anna Moyer and Jennifer Lentz, who held research fellowships in the summer of 2004, discussed the diet and home ranges of Box Turtles at the meeting of the Society for the Study of Amphibians and Reptiles. The Friends provided \$610 for their registration fees.

At the same time, the Friends supported two interns for 2005. Lisa Thurston, a 2004 graduate from Frostburg State University, worked with telemetry of Box Turtles, while Peggy Preusch, a doctoral candidate at the University of Maryland, was evaluating the educational effectiveness of the Sanctuary's field trips.

## Caution: Bridge Ahead

A new footbridge and walkway are coming to the Two-run Creek, with lumber and hardware bought by the Friends. Volunteer Mickey Taylor drew up the plans and is supervising a volunteer construction crew. The goal is to improve and protect the creek site, which is heavily used by school groups. A slightly higher footbridge will reduce logjams after storms, and a walkway will reduce trampling of the creek's edge. The cost for materials was \$2,080.

## Rest Home for Reptiles

Longtime members of FOJB will recall the birds that used to live in outdoor pens at the Sanctuary—the Eastern Screech Owl that had been hit by a car, the Red-Tailed Hawk that couldn't fly. Those birds are gone, but new tenants are arriving this fall: wounded Box Turtles that need a safe home. Two or three turtles that cannot survive in the wild will live in a low enclosure near the visitor center. Their pen, heavily fenced to keep out raccoons and other predators, is being built by volunteers from the Mid-Atlantic Turtle and Tortoise Society. The Friends authorized \$1,000 to purchase materials.

# Interns Now and Then

Continued from page 2

## Former Interns Find Success

### Pat Crumrine

In 1997, Pat Crumrine, a college student at SUNY at Plattsburgh, New York came to Jug Bay as a summer intern to study the diversity of pond turtles and the effect of the tidal cycle on the feeding habits of mummichogs. In August this year, he returned and treated the folks attending the Volunteer Picnic to a presentation of his ecological research as a doctoral student and more recently, as a faculty member in the Department of Natural Sciences at Longwood University in Virginia.

It was at Jug Bay, as Pat was dissecting multitudes of mummichogs to study their stomach contents, that he met Dr. Kathy Szlavecz, a professor at Johns Hopkins University and member of our Scientific Advisory Board. Her officemate at

Hopkins eventually became Pat's mentor at the University of Kentucky, where he received a PhD. There, he studied predation patterns of insects such as dragonflies in ponds. After completing his degree in 2003, he moved to Longwood University, where he and his wife, Melissa, are professors in biology. Working with students at the 800-acre Blandly Experimental Farm, Pat studies the effects of pesticides on pond communities. Within these communities, he is finding that pesticides have complex effects on pond organisms.



**Former intern and now biology professor Pat Crumrine and his wife, Melissa Zwick.**

- Elaine Friebele



**Teens inspect stream macroinvertebrates to assess water quality.**

catch fish, children (and adults) can successfully identify them. Our knowledge of the location of various trees and their distribution helps us teach about land use and forest succession.

Through our research studies, volunteers learn about ecology, the scientific process, the joy of discovery, and the infinite number of questions yet to be asked about how the natural world works. Volunteers who conduct the water quality tests learn about tidal variations in dissolved oxygen. Volunteers checking our amphibian traps discover how a small amount of rain triggers a mass migration of marbled salamanders into breeding ponds. Our early morning bird banding volunteers become skilled at determining the presence of a brood patch to distinguish a male red-eyed vireo from a female.

On weekends, visitors enjoy exploring the interactive wetland exhibits and hiking trails, yet most value having a skilled naturalist available to join them on a hike. We all love helping people to learn about and appreciate the beauty and diversity that surrounds us. We could use more volunteers to lead our education programs, especially to less frequented areas of the Sanctuary, like the River Farm and the Glendening Preserve.

Our combination of education, stewardship, and ecological research has proven to be a successful recipe for introducing people to the joy of nature. It also demonstrates that protected areas are important resources for providing authentic hands-on experiences with the natural world.

### Marie Brady

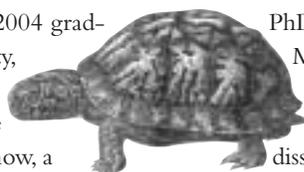
Every summer for the past four years, Smithsonian Environmental Research Center (SERC) scientists have been visiting my yard, banding "my" birds as part of the Neighborhood Nestwatch study on backyard birds. They came visiting this past July, and who should be standing there but Marie Brady. While in elementary and high school, Marie came to the Sanctuary on several school field trips. In high school, she had the opportunity to be involved in a career internship. She chose Jug Bay as her site, and I was her mentor. She helped monitor our "Wet Forest"

vernal pool to track the process of marbled salamander larval metamorphosis. We also traveled to about 20 local streams to collect macroinvertebrates to evaluate stream health through the Maryland Department of Natural Resources Stream Waders program. Then, we hired her for the summer to assist with volunteer coordination. Since then, she has graduated from college (in biology), trained in the MAPS bird banding study, and now is working with SERC's backyard bird study. I like to think that her experiences at Jug Bay helped focus her interest in science and her enthusiasm for field research.

- Karyn Molines

## Interns, 2005

The lives of box turtles remain elusive enough for two interns to have spent this past summer probing their habits and behavior. Lisa Thurston, a 2004 graduate of Frostburg University, studied the environmental characteristics of box turtle nesting sites, and Kathy Chow, a Southern High School biology teacher, tracked turtles that are rarely found within the Sanctuary to learn what areas they



frequent. Funding for Kathy's internship was provided by an NSF grant through Dr. Pete Marra at the Smithsonian Environmental Research Center.

Education intern Peggy Preusch, a PhD student at the University of Maryland, spent the summer observing education programs at Jug Bay as part of her dissertation work determining ways to evaluate non-formal education. FOJB supported the internships for Lisa and Peggy.

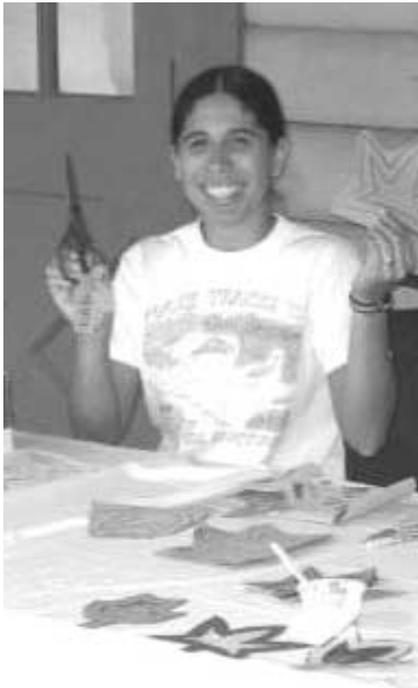
# Family Fun Day 2005



I love hot dogs!



Children capture aquatic insects in the SAV tanks.



Volunteer Jennifer Muro at a craft table



Volunteer Frances Johnson helps Emma Banko create a caterpillar.



A boy studies a large beetle.

Observation blind in winter.



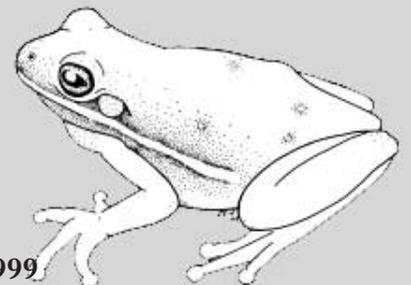
## Timeline: the Third Five Years

1996

- Sanctuary staff organizes Wetland Plant Conference

1997

- River Farm boundaries expanded by 137 acres
- Sanctuary sponsors Amphibian Conference



1999

- Green Treefrog makes its debut in Jug Bay wetlands
- Sanctuary sponsors Turtle Conference
- Interactive Wetland Exhibit Installed

2000

- Oil spill pollutes the Patuxent River
- Strategic plan created

# Fall 2005 Education Programs

- Reservations and entrance fees are required for all events, unless noted. Call 410-741-9330 or e-mail jugbay@toad.net
- Check www.jugbay.org for information, directions and updates to our schedule. We now have a new on-line calendar.
- Open to the public 9 am-5 pm Wed, Sat and Sun (closed on Sundays in Dec-Feb)
- Programs are open to families and individuals. Scouts and other groups must call to arrange a separate program.
- Please note age limits for each program. An adult must accompany children under 13.
- Scouts and other groups must call to arrange a separate program.

Entrance Fees: Adults \$3; Children under 18 \$2; Over 60 \$2; FOJB family membership \$25.

## Birding at Jug Bay

*Saturday, September 3; 8:00-11:00 am*

*Saturday, October 1; 8:00-11:00 am*

*Saturday, November 5; 8:00-11:00 am*

*Saturday, December 3; 8:00-11:00 am*

Learn the skills of identifying birds by sight and sound. Binoculars and field guides will be available to borrow. Not appropriate for children under 12.

## Sensory Stroll

*Saturday, September 10; 10:00 am-noon*

Observe nature in a whole new way! Discover how animals use their senses to survive. We will also test our senses by going on a Sensory Scavenger Hunt. Designed for families with children ages 3-5.

## Beginning Birdwatching

*Saturday, September 17; 9:00-11:30 am*

Learn about our native songbirds and their habitats. Try to identify the birds we see exploring the different habitats at the Sanctuary. Bring a field guide and binoculars if you have them. Appropriate for children over 10 and adults who are beginning birders.

## Map Reading

*Saturday, September 17; 9:00 am-noon*

Come learn how to find your way around Jug Bay. We'll review basic map reading skills, learn how to use a compass, and take a hike using our newly honed skills. Designed for families with children at least 8 years old.

## Marsh Ecology by Canoe

*Sunday, September 18; 13:30-4:30 pm*

*Saturday, September 24; 9:30 am-1:30 pm*

Fee: \$5.00 per person

Come learn about wetland ecology through our popular canoe explorations of the wetlands along the Patuxent River. Canoe instruction and equipment is provided; please bring a lunch or snack, water, sunscreen and hat. To reserve a space, mail your payment of \$5 per person (including FOJB) in advance to the Sanctuary. Please include your names, the ages of any children, address, and daytime phone number, as well as a first and second choice of dates. Children must be at least 7 years old.

## Autumnal Equinox

*Friday, September 23; 5:00-7:00 pm*

The Autumnal Equinox marks the first day of autumn. Hike the Sanctuary's trails to look for signs of the new season. We'll end by watching sunset from the marsh boardwalk, followed by a snack in the Wetlands Center. All ages welcome.

## Fall Flowers

*Saturday, September 24; 9:30 am-noon*

Asters, goldenrods, and bonesets should be plentiful in our open meadows. These "confusing composites" can be a challenge to identify. Learn some field identification techniques while enjoying the beauty of the fall fields. Co-sponsored with the Maryland Native Plant Society. For adults and children over 12 years old.

## Farewell to Summer Hike

*Saturday, September 24; 1:00-3:00 pm*

Say goodbye to summer and absorb the colors of fall. We'll look for late wildflowers and insects as we walk through the Glendening Nature Preserve. Participants should wear sturdy footwear and be prepared to walk at least two miles on natural surface trails. For adults and children over 10 years old. Free. Meet at the Preserve entrance on Plummer Lane.

## Nature Crafts

*Sunday, October 2; 1:00-3:00 pm*

All sorts of things can be made from materials found in a forest. We'll go on a hike to gather our supplies, then come back inside to make crafts. For families with children ages 8-12 years old.

## Hike the Preserve

*Saturday, October 15; 9:00 am-noon*

*Sunday, November 13; 1:00-3:00 pm*

*Saturday, January 14; 3:30-5:30 pm*

Enjoy the changing seasons and explore the fields and forests of the Glendening Preserve. Wear study footwear and be prepared to hike several miles on natural surface trails. Meet at the Preserve entrance on Plummer Lane. Designed for adults and children over 10 years old. No entrance fee.

## Woolly Bears

*Sunday, October 16; 1:00-3:00 pm*

Woolly Bears are not large furry mammals, but small furry caterpillars that spend the fall preparing to hibernate for the winter. We'll learn about the lives of these and other insects preparing for winter. Designed for families with children 4 to 6 years old.

## Create a Nature Journal

*Sunday, October 23; 12:30-2:30 pm*

Interested in learning ways to tune closely in to the world around you? This workshop may be for you! Come with a pencil and a nature journal or just some pieces of blank paper folded and stapled together. We will have fun exploring a variety of things to do in a nature journal. We'll take a Nature hike, taking time to look and sharpen our observations skills. For adults and children over 8 years old.

## Special Event:

### 20th Anniversary Ceremony

*Saturday, October 29*

*noon-3:00 pm*

Enjoy light refreshments and mingle with the Friends of Jug Bay board and local officials. We will unveil the special 20th Anniversary painting by renowned wildlife artist John "Bud" Taylor. Former Governor Parris N. Glendening will receive a special award.



**Jug Bay Wetlands  
Sanctuary**  
410-741-9330  
www.jugbay.org



### Halloween Hike

*Sunday, October 30; 2:00-4:00 pm*

Join Jug Bay in celebrating this devilishly fun time of year. We'll read Halloween themed stories as well as take a short hike to enjoy the wetland's wonder of mid-Autumn. Afterwards we'll enjoy snacks and hot cocoa as we make a Halloween craft. This event is for families with children 4 to 12 years old.

### Map Making for Children

*Saturday, November 12; 9:00 am-noon*

Ever wonder how maps are made? We'll explore the skills of map-making through hands-on activities. Using simple surveying tools, participants will collect field data, afterwards using this data to produce their very own maps of a portion of Jug Bay. Designed for families with children 8 to 12 years old.

### Nature Detectives

*Saturday, November 19; 1:00-3:00 pm*

Learn to look for clues to find out about our animals and what they do. We'll record our finding in our Detective Journals. We'll spend most of the time hiking the trails, so wear sturdy, comfortable shoes. Designed for families with children 7 to 11 years old.

### Make a Honeysuckle Wreath

*Saturday, November 26; 2:00-4:00 pm*

Join us as we gather bundles of this invasive plant and turn it into beautiful wreaths for the holidays. All material will be supplied. For adults and families with children at least 8 years old.

### Scrapbook Making

*Saturday, December 10; 1:00-3:30 pm*

New to scrapbooks? This event is for you! Come create lasting memories at Jug Bay while enjoying the sites and sounds of the late autumn season. We'll take a short hike outside to draw inspiration, afterwards returning to enjoy snacks and to create our scrapbooks. You

bring the personal mementos to include and we'll provide the rest. For adults and families. Children should be at least 4 years old.

### Insects in Winter

*Thursday, December 15; 10:00 am-noon*

Find out what insects do during the cold months of winter. We'll take a hike to look for insects, and then make a craft while sipping hot chocolate. For families with children 3 to 6 years old.

### Winter Solstice Hike

*Wednesday, December 21; 3:00-5:00 pm*

The Winter Solstice marks the longest night of the year and the start of winter. Celebrate the season while hiking the winter woods. We'll end the day watching sunset with a light snack. All ages welcome.

### Birds in Winter

*Friday, January 13; 10:00 am-noon*

Many birds migrate to warmer climates in winter, but many stay to tough it out here. We'll take a hike to see who spends the winter in our woods. We'll end the program warming up with hot chocolate. For families with children 3 to 6 years old.

### In a Nutshell

*Saturday, January 14; 10:00 am-noon*

Join us for a story about the amazing life of a tree. We will take a hike and then make a craft about what we saw. For families with children 5 to 9 years old.

### Nighttime Navigation

*Saturday, January 21; 4:30-6:30 pm*

We'll explore the concepts of navigating at night. Participants will build star finders, afterwards trekking outside to try and determine their position using the stars. Dress for the outdoors. For families with children at least 6 years old.

### Plants in Winter

*Saturday, January 28; 1:00-3:30 pm*

Different plants have different adaptations for surviving the cold winter months. We'll explore our meadows and forests to see these adaptations. We'll make leaf and bark rubbings in our journals, then create weavings for dried plants. For families with children 8 to 12 years old.

## Volunteer Opportunities

### SAV Monitoring

*September and October*

check website or call for schedule  
Volunteers are needed to help us establish our new monitoring protocol. Cruise the waters of the mid-Patuxent by boat while determining species composition and abundance. No experience necessary.

### Stream Monitoring

*Friday, September 9; 9:30 am-noon*

Volunteers are needed to help collect, identify, and count stream invertebrates that are used to evaluate stream health. Not appropriate for children under 12.

### Weed Warriors

*Saturday, Sep 10, Sep 24, Oct 8, Oct 22;*

*1:00-4:00 pm*

Join our team of Weed Warriors to remove the non-native invasive plants from our forests. Let's nip these NIPs in the bud before they spread and threaten the special habitats and rare plants found on the Sanctuary. Wear long sleeves, long pants, and sturdy work shoes. Bring water, and if you have them, work gloves and pruners or loppers. We'll provide the snacks. Scouts and community groups are encouraged to participate. Students can get community service learning hours. Children should be at least 8 years old.

### Fish Survey

*Saturday, September 17; 12:30-3:30 pm*

*Saturday, October 1; 1:30-4:30 pm*

Once a month we monitor the fish populations living in shallow water and wetlands. Volunteers willing to get wet are needed to help catch, identify and measure (and then release) fish. Old sneakers are the recommended footwear-no open toe (or heel) shoes. Bring a complete change of clothes, extra shoes and socks, and a towel. Not appropriate for children under 12.

### Water Chemistry and Nutrient Dynamics Training Workshop

*Saturday, October 15; 1:00-4:00 pm*

Since 1988, volunteers have monitored nutrient pollution, dissolved oxygen levels, pH and water clarity in Jug Bay's waters. We will refresh those skills and train new volunteers. Additional training is provided during the sampling dates. The workshop is recommended for all volunteers, new and experienced. For adults or teens.

### Volunteer Appreciation Dinner and Social

*Sunday, December 4; 3:00-6:00 pm*

Join other volunteers for a social time, dinner, and awards.

**Caption about winter at Jug Bay here?**

# Jug Bay says Goodbye to a Devoted Water Quality Volunteer

By Lindsay D. Funk

In late July, Rod Perry's son called to let us know that Rod had passed away. His son knew how much Rod enjoyed coming to Jug Bay and wanted to make sure we heard the news from family. Rod first learned about Jug Bay while flipping through a newspaper and came to us with an interest in our stewardship projects, stream monitoring, and water quality. Last year he received his five-year volunteer certificate at the annual Volunteer Social.

I met Rod last spring, shortly after I started working here. My instructions were to join a volunteer for water quality testing so I could learn how we conducted the sampling. The first water quality volunteer I encountered was Mr. Rod Perry. I must admit, at first, I was slightly intimidated. As we gathered the equipment, I could tell



Photo by Russell Cosner

**Rod and wife Doris take a moment to pose for a photograph while enjoying the 2004 Volunteer Social.**

finished blooming he would bring me some seeds. And as a man true to his word, he did. Owner of a strong personality, and what Rod himself described a gruff exterior, was a man who gave me flowers. We will miss you, Rod.

that he was a no nonsense kind of guy, very blunt as he explained the instructions. After we got into the field, and traveled from site to site, we chatted and he began cracking jokes, all the while being very attentive, making sure I did everything properly. We got back to the lab and while filtering our samples, Rod told me of the beautiful hibiscus bushes he had at his home. "Flowers the size of dinner plates, just gorgeous," he said. I told him they sounded spectacular. The next time Rod came in to collect water samples, he proudly showed me photos of his hibiscus. I oohed and aahed over them, so he told me after they

## CBNERR Funds Staff Conference Trip

In early July, three staff members traveled to Tampa, Florida, to give presentations and posters at the Joint Meeting of Ichthyologists and Herpetologists. Karyn Molines presented a poster on using digital photography to identify individual Marbled Salamanders. Elaine Friebele gave a presentation on factors that might lead to overwintering of

Red-bellied Turtle hatchlings, and Chris Swarth spoke on gender differences in habitat use by Box Turtles. The five-day meeting proved to be an excellent opportunity to exchange information with other herpetologists, broaden knowledge, and learn new field techniques. Many thanks to CBNERR for providing funding for conference registration and travel.

## New Maintenance Worker Hired

This spring, John Evans, the Sanctuary's new maintenance worker, replaced Doug Willis, who had worked here since 1998. Doug moved on to another job with the county. We wish him well on his transfer!

John began working for Anne Arundel County in 1988, and in 1996, became maintenance supervisor for the B and A Trail. He also worked on the Rapid Response Team, troubleshooting maintenance problems for parks all over the county.

The Sanctuary, he says, is different than other county parks where he's worked. "Jug Bay is a unique place with its own character," says John. "There are so many animals here because of the wetlands and Patuxent River. It's a tranquil place that gives you a peaceful feeling."

The father of a six-year-old daughter, he appreciates how the education programs benefit children. "Kids who come here—especially city kids—can learn about something they've never seen before and have a hands-on experience."

Welcome, John!

## Summer Volunteers May - July

Lindsey Alvis	Helen Cosner	Woody Martin	Dave Perry	Mary-Stuart Sierra
Morgan Angus	David Davis	Louise Miles	Michael Quinlan	Bob Smith
Ramona Sampsell	Fae Davis	David Mozurkewich	Kathryn Reis	Bill Steiner
Marty Barron	Eric Duce	Dotty Mumford	Marge Richman	Mickey Taylor
Rick Bartoldus	Dennis Duke	Jennifer Muro	Arlene Ripley	Sandy Teliak
Peg Benton	Lindsay Duke	Keri O'Neil	Rogard Ross	Peter Uimonen
Susan Blackstone	Kathy Ellett	Jan Owings	Terri Sazama	Bob Williams III
Cynthia Bravo	Kim Elliott	Gary Pendleton	Lisa Siciliano	
Peggy Brosnan	Tom Englar			
Judy Burke	Shalom Fisher			
Jon Burns	Robert Frezza			
Gordon Burton	Rosemary Frezza			
Mary Burton	Lynette Fullerton			
Danny Bystrak	Carolyn Fulton			
Lynn Cassell	Susan Gunnell			
Betty Chaney	Billy Heinbuch Jr.			
Ginger Chaney	Frannie Johnson			
Bob Churi	Elizabeth Kurgansky			
Antonio Cordero	David Linthicum			
Clint Cosner	Rick Malmgren			

### Thanks for Your Donations

**Jean and Carlton Hershner** for a \$500 donation to FOJB for summer camps

**The Greentree Tree Company** for grinding a tree stump

**Stephen J. Bailey**, Boy Scout Cubmaster in Millersville, for Scout handbooks

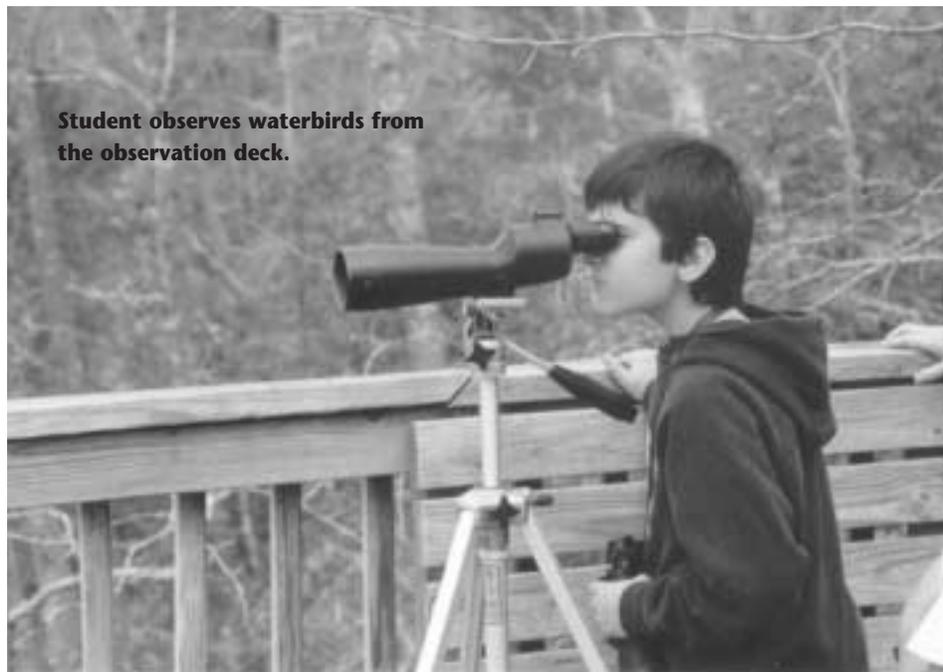
# How Do Jug Bay Field Trips Complement Classroom Learning?

By Peggy L. Preusch,  
University of Maryland  
Education Intern

From the spring classroom field trips (and leaping toads and frogs) to the hot days of a summer camp mucking through the marsh, working at Jug Bay on my research has been quite an experience! The setting provides a dynamic, ever-changing context within which diverse educational programs operate. From my observations the programs are unique in terms of breadth of topics offered to students and teachers, providing an unusual environmental science-related field trip opportunity. On the field trip, students make observations that extend their knowledge and awareness of a natural environment beyond the classroom.

My interest in doing research at the interface between non-formal science education—such as the environmental education programs here—and formal education programs in the school classroom provided the impetus for beginning my dissertation research here at Jug Bay. (Non-formal education programs are defined as “structured” educational programs that occur outside of the classroom.) This interest coincides with the need within the field of science education research for documenting the value of non-formal education programs to student learning. We know that students enjoy a field trip experience, and we assume that teachers value it for different reasons. The field trip may be relevant to science classroom learning, increase student interest in science and care for the environment, increase cognitive knowledge, and increase student retention of knowledge. But we need more documentation to confirm the function of non-formal environmental science education programs in relationship to formal education.

Preliminary work on my dissertation has included observations of field trips during the spring, 2005 and interviews of teachers. The focus of these school field trips varied from a pond exploration, to water



quality testing, to an exploration of forest ecology, to a canoe trip, and wetland walk. Students observed animals in their habitats and participated in discussions designed to encourage curiosity about their surroundings.

*On the field trip, students make observations that extend their knowledge and awareness of a natural environment beyond the classroom.*

The fact that scientific research is actively conducted at Jug Bay provides a unique context within which the educational programs are developed. From my perspective, this is one of the most important aspects of the Sanctuary educational programs. It provides the opportunity for students to see and hear about the results of experiments (from staff and information available in the display room); to learn how animals and plants are

monitored and studied; to observe scientists at work in the field (turtle trackers can be found everywhere); and to participate in on-going research studies (through special programs).

In June, I conducted interviews with teachers to examine teacher motivation in bringing students on field trips and any potential connections between this motivation and student learning outcomes. I've drawn three conclusions from interviews with three teachers: 1) teacher personality, interests and experience are factors in the decision to have the class participate in a field trip; 2) experienced teachers connect the field trip more broadly to curriculum than do teachers with fewer years experience; and 3) collaboration among teachers gives those with less experience the opportunity to participate and to learn the value of the field trip experience.

Understanding teacher motivation is the first step in my study. The next steps will include an analysis of the field trip experience itself, explorations of student learning outcomes, and development of an in-depth characterization of the wetlands site as the context within which learning occurs during field trips to the Sanctuary.

# Beauty is in the Eye of the Beholder

By Elaine Friebele

They exist in many forms: fleshy, fuzzy, tufted, horned, hairy, spiked, bristly, knobby, or spined. Caterpillars, those unassuming, unglamorous grubs, come out in force each summer at the Sanctuary, crawling on vegetation and munching on leaves, leaving lacy skeletons behind.



**Fall Webworm caterpillar**

Some are not completely unglamorous. The Banded Tussock Moth caterpillar resembles a very small Pekinese dog. The yellow body of the fall webworm is studded with black spots and long white hairs-like a woman in a golden evening dress wrapped in an angora fur. In a reverse



**Banded Tussock Moth Caterpillar**

of the Ugly Duckling, this beautiful caterpillar grows up to be a small, drab white moth with brown spots. The amazing



**Crowned Slug**

Crowned Slug looks like some kind of delicate sea creature (beware the stinging spines!) but after metamorphosis becomes a very dull-looking moth.

Sometimes “beautiful” caterpillars can also grow into attractive moths or butterflies. The large, bright green Polyphemus Moth caterpillar, found



**Polyphemus Moth caterpillar**



**Polyphemus Moth**

frequently by children at summer camp, becomes a lovely black and brown patterned adult.

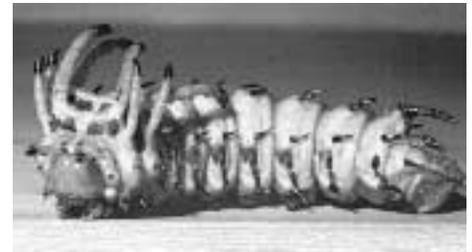
Since caterpillars make a delectable meal for birds or other animals, they’ve come up with a variety of tricks to avoid being eaten. The Spicebush Swallowtail larva, with huge “eyespots” on its back, mimics a scarier animal, frightening away approaching birds. Some caterpillars strike fearsome poses. The Laurel Sphinx Moth caterpillar is large and green with single blue tail horn. This harmless horn may make the caterpillar look frightening to predators, especially when it rears up its front end in the “sphinxlike” pose. The Hickory Horned Devil, which becomes the lovely Regal Moth, has fierce-looking horns and barbs. Birds have learned to avoid caterpillars covered with spines because they contain painful toxins. Other caterpillars emit a



**The Spicebush Swallowtail caterpillar’s “eyes” intimidate predators.**



**Laurel Sphinx Moth caterpillar instills fear when it “rears up” like a sphinx.**



**The fearsome Hickory Horned Devil, larval stage of the Regal Moth**

foul odor from a forked scent gland.

Some caterpillars are experts in disguise, looking for all the world like something inedible. The Red-Spotted Purple Butterfly caterpillar resembles bird droppings. The monkey slug or Hag Worm Moth caterpillar, found this summer in the bird banders’ equipment box, resembles a leaf fragment; the Large Maple Spanworm is indistinguishable from a small brown twig.



**Regal Moth**

“Imagine living a good share of life in a form that many people mistake for a grub or worm,” wrote Roger Tory Peterson, “then going into a sarcophagus or coffin for a while, and finally emerging as a butterfly and dancing like an angel for brief period before being recycled again.”

The next time you spot a caterpillar, whether it’s hairy, horned, or smooth, appreciate its appearance as an adaptation to avoiding being eaten; then contemplate the possible winged creature it will become.



**Hag Moth Caterpillar**

# “As Time Goes By” with apologies to *Casablanca*

By Bob Finton, former CBNERR Education Coordinator

Jug Bay Wetlands Sanctuary, one of the Maryland Reserve's partners, is celebrating its 20th anniversary. Since this will be my last submission as the Education Coordinator for the Reserve, I take this opportunity to reflect. Twenty years ago, I was hip-deep in biology courses at Towson State University, President Reagan was starting his second term and *Back to the Future* was the summer box office hit. Although NOAA had created the National Estuarine Research Reserve System (NERRS) in 1972, as part of the Coastal Zone Management Act, there were only eleven established Reserves prior 1985. The very first Reserve to be designated was South Slough, Oregon in 1974. Eleven years later, in the same year that JBWS was established, NOAA designated two additional Research Reserves: North Carolina and Maryland.

Both JBWS and the Maryland Reserve share humble beginnings during a pretty significant time period. The year 1985 marked the introduction of the Asian tiger mosquito in Texas, Dian Fossey was found murdered in Rwanda, and Christa McAuliffe was selected to be the first teacher in space. The Maryland Reserve entered a period of rocky beginnings and an unpredictable future as well. Initial discussions and plans considered the possibilities of including the Smithsonian Environmental Research Center in Edgewater, and even some areas in Calvert County, as potential Reserve components. As circumstances would have it, the Monie Bay area (overseen by Maryland DNR) became the first component in 1985, with Jug Bay and Otter Point Creek being brought into the Reserve fold in 1990. It's been a pretty remarkable twenty years for the reserve. NERRS began expansion of the system in earnest, and some exciting and noteworthy accomplishments have taken place within the Maryland Reserve. Land acquisitions, habitat restoration, information sharing, data collection and a host of other partnered ventures have marked the growth of the Reserve and its partner components.

However, I believe that the most notable accomplishment within the Maryland Reserve and its partner components is the firm foundation of the people involved. The staff and crew at Jug Bay Wetlands Sanctuary (Jug Bay), Patuxent River Park (Jug Bay), the Anita C. Leight Estuary Center (Otter Point Creek), and the Wellington Wildlife Management Area (Monie Bay) continue to do amazing things. The volunteers involved at the sites are even more amazing. I have been privileged to work with both staff and volunteers on some truly outstanding scientific projects and absolutely fun educational experiences. SAV grow-out tanks, wild rice plantings, turtle tracking, Wetlands & Wildlife Field Days, stream surveys, pontoon boat programs, Wade-In events, decision maker workshops, water quality monitoring, EstuaryLive, and scores of other projects, programs and events have marked two decades of successful partnership. I have thoroughly enjoyed my interactions with the Maryland Reserve and its partner components.

The year 1985 also recorded some losses. Rock Hudson, Orson Welles and Ricky Nelson died. The Dukes of Hazard went off the air and into syndication. Okay. . . maybe not so many losses to mourn. But since that time there have been many accomplishments and many aspects of which to be proud. The Hubble Space Telescope expanded our view of the universe, genomes have been sequenced, the world-wide-web brought us all closer, a new order of insect and a new genus of deep sea worm have been discovered, and Jug Bay Wetlands Sanctuary and the other partner components of the Maryland Reserve have thrived. Although I leave the mantle of Education Coordinator for the Maryland Reserve behind, I will continue my relationship as I take up the position of Park Naturalist with the Otter Point Creek component. It's been a blast and “. . . I think this is the beginning of a beautiful friendship.”



**Jug Bay is one of the three components in the Chesapeake Bay National Estuarine Research Reserve, Maryland. The purpose of CB-NERR is to manage protected estuarine areas as natural field laboratories and to develop a coordinated program of research and education as part of a national program administered by National Oceanic and Atmospheric Administration (NOAA).**

#### STAFF

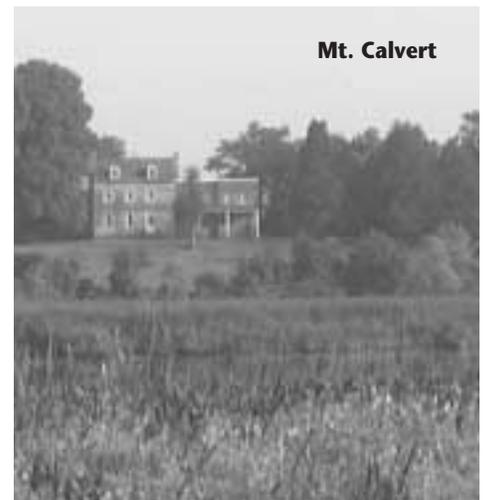
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**Mt. Calvert**





DEPARTMENT OF RECREATION AND PARKS

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**Lothian, MD 20711**  
**410-741-9330**

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## 20th Anniversary Ceremony

Saturday, October 29  
12 - 3 pm

Enjoy light refreshments and mingle with the Friends of Jug Bay board, local officials, and volunteers. A 20th Anniversary painting by renowned wildlife artist John "Bud" Taylor will be unveiled. We will honor former Governor Parris N. Glendening with a special award.

