Paddlin’ the Patuxent

By Lindsay Hollister

Unsure as to what we had gotten ourselves into, eight teens guided by four naturalists set out for a four-day canoe and camping trip along the mid-Patuxent in late July. To be fair, we modeled the trip after the successful Patuxent River Sojourn, and we had just spent the previous day practicing team building, paddling techniques, and boat safety. Led by Bart Merrick of the Chesapeake Bay National Estuarine Research Reserve and Sanctuary volunteer Diane Goebes, education intern Trekker Williams, and myself on staff, we began paddlin’ the Patuxent on July 29.

On the first day, we took a van from the Wetlands Center to our put-in at the Patuxent River 4H Center, a portion of the river that looks much more like a large creek than the broad, wetland-filled Jug Bay area. This was our most ambitious day of paddling, an eight-mile stretch to our camp site at Mount Calvert. The paddling was leisurely as we paused to take water quality samples, play in the cool water, and eat our lunch. By the time we got to the site, we were ready to call it a day. Each night the teens and staff prepared dinner. Our first night it was Mexican, with tacos, homemade salsa and guacamole. We wrapped up the day with an astronomy program from volunteer Dave Davis. He shared ancient stories of how the constellations got their names and concluded with a view through his telescope of Jupiter and its four moons.

Day Two began with scrambled eggs and blueberry pancakes. Well fueled, we set out to explore Western Branch and visit the river’s largest wastewater treatment plant, located a few miles upstream. We tested the water conditions at and near the outflow to add to our week of data. From there we paddled back for lunch, broke camp, and continued down the river to Jackson’s Landing to meet up with naturalist Greg Kearns. Dripping with sweat, everyone tied off their boats and walked up the hill to the air-conditioned building to listen to Greg’s talk, “Of the Rice and the Rails,” explaining the connection between sora rails (and other birds) and the wild rice growing in our wetlands. From there we climbed back in the canoes to head to our next camp site at the River Farm. After arriving, we met up with volunteer Jeff Campbell to conduct a fish survey. Many small, scaled beasts were captured, identified and released, except one that eluded identification. Progressing from fishes to farming, we walked to the South County Community Garden for a talk from organizer Mike Thompson about the benefits of cooperatives and local organic produce. Afterwards, Mike handed out bags for collecting, and the kids swarmed towards the ripe blackberries like yellow jackets on the attack. Dinner was held at the Wetlands Center, where we roasted skewers of freshly picked veggies and learned about our conservation project for the week, Purple Loosestrife removal. We concluded with a night hike back to camp.

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Day Three began with a bang for the few of us who got to see it. Around 5:45 that morning I stepped out of my tent to do a little reading. While sitting at a picnic table at Sweet Flag Point, the sudden splat of bird droppings at the far end of the table drew my gaze upwards—to a large, long-legged, long-necked bird with a downward-curved bill. The bird was calm, watching as we moved around below it, and took time to preen itself. I slowly crept back to get the camera, but the battery was dead. Okay, I just sat back and studied it—white belly, dark top, gray neck—legs and beak grayish. When Trekker got up, I asked him to get his camera, and we got pictures of the bird. Shortly thereafter the kids started getting up, and one of them said “Hey, there’s a big bird flying off.” The mystery bird featured a white rump patch as it flew across the river. I dashed to my field guide and learned that it was an immature White Ibis.

From River Farm, our next destination was Merkle Wildlife Sanctuary’s White Oak Landing on Mataponi Creek. Once at our destination, we had lunch and prepared for invasive Purple Loosestrife removal. We met up with Chesapeake Bay National Estuarine Research Reserve interns Kathy Elvin and Katrina Keller. Our target was a large, woody perennial with beautiful pinkish-purple spikes of flowers, easily identified during flowering that is very difficult to remove. The tall woody stem leads to branching woody roots that are firmly entrenched in the mucky mud of the high marsh. Knowing we’d have to motivate the kids, we told them there would be awards for the muddiest and for the group that removed the most bags of plants. This went over quite well, and we had mud-covered teens laughing and pulling weeds in no time. After several hours of removal, we paddled back to White Oak Landing to meet up with Greg Kearns. He loaded the truck bed twice with an estimated 1,000 pounds of loosestrife.

I asked him about white ibis sightings. He’s never seen one at Jug Bay—quite a statement from a naturalist who has worked the mid-Patuxent for over 20 years. Greg confirmed that the photo on Trekker’s camera resembled a white ibis in the pictures but would have to check to confirm it as a new record. In the meantime, Jeff Campbell told us that the mystery fish turned out to be a new record for the site, a menhaden. The week was shaping up well. With plans “evolving” up to the last minute, things were going smoothly so far, and our last night together would be no exception.

We were fortunate to have a connection through Patuxent River Park Superintendent Greg Lewis to a man who harvests Patuxent river blue crabs. As we walked back up to our campsite, thoroughly exhausted after our weed-pulling adventure, our prize awaited us: a bushel of lively crabs to feast on for dinner.
Dear Friends,

In my letters to you I have marveled at the ability of the wetlands to cleanse the river of nutrients and to sequester them along with CO₂ in the Jug Bay wetlands. I considered our role as the Friends of Jug Bay to counter threats to the wetlands whether caused directly by man or indirectly through the imbalance of nature. The real questions are, can we make a difference, and how do we accomplish it? As I said the direct threats are easiest, because we can identify someone to advocate a solution or pinpoint a problem to fix. I expect to discuss these topics more in the future as we examine the role the Friends of Jug Bay.

Since my last letter the Patuxent Riverkeeper and the Friends of Jug Bay hosted the Washington Suburban Sanitary Commission (WSSC) commissioners on a trip on the river up Western Branch to view the outfall of the sewer plant and to discuss solutions to address future overflow incidents. Senator Bernie Fowler, a long-time champion of the Patuxent River, also accompanied us and exhorted us to return the river to the protein factory of his youth, when it could supply the nation’s need for shellfish. The trip afforded a much broader opportunity to discuss many topics that directly affect the river and a chance to see many small and large efforts at habitat restoration. I say habitat restoration not in the sense of preservation but in the sense of maintaining the balance that stabilizes or improves the health of the river ecosystem.

The wetlands formed naturally from soil erosion caused by colonial, 19th and early 20th century agricultural practices. One might argue that although this activity significantly changed the waterscape of the river, it may have created new habitat. This non-point source of degradation was reduced with the advent of no-till farming practices in our area; however, it was replaced by more insidious non-point sources, suburban housing and commercial developments with large expanses of impervious surface.

The excursion took place after a recent storm so that the water was still cloudy with silt, and the plume of clear water at the outfall of the sewer plant provided a stark contrast, teeming with fish, water snakes, frogs and turtles attracted to the highly oxygenated water. In other words, the “man-made water” was cleaner and healthier than the “natural water.” The plant processes about 20 million gallons of water per day with maximum capacity of 30 million gallons. However, during a storm, leaks into the sewer system occur and on the day of the spill, over 91 million gallons entered the plant, overflowing the processing system and directly discharging sewerage into Western Branch.

The WSSC claims that they have a program to seal the system to prevent the intrusion of stormwater into the sewer system. Yet the realities of budget shortfalls for maintenance belie this statement. Meanwhile, growth of development continues to use up the margin capacity of existing sewer plants which inadvertently will contribute larger spills in the future. The imposition of Total Maximum Daily Load (TMDL) for the total amount of nutrients that can be put into the river, a single absolute number, implies nutrient removal technology will have to improve significantly, just to maintain the current level of quality. The cost of energy to handle the increased amount of sewerage and to process it to a cleaner condition will break the budget of large central sewer systems. The inevitable conclusion is that the present model to handle population growth is not sustainable and that we must rethink our current use or reuse of sewer water at the source in our homes. Stemming the flow there will significantly reduce the impact on our ecosystem.

Finally, a brief note on habitat restoration and whether we can make a difference. Greg Kearns, the naturalist at Patuxent River Park, has undertaken a massive project to restore the wild rice habitat in the wetlands. With funding from Chesapeake Bay National Research Reserve Program, Greg put over four miles of geese and swan exclusion fence around the wild rice paddies and, using a managed hunting program, he reduced the resident geese population from over 2,400 to less than 800. The result is that this year Jug Bay now has one of the largest stands of wild rice on the east coast as a primary food source for soras, ducks, and other aquatic life. Our hats are off to Greg for this fine result. Clearly, the answer to the question is a resounding “yes!” we can make a difference.

Al Tucker
FOJB President

To learn about the Friends of Jug Bay and their activities, visit their website: friendsofjugbay.org
Seven dedicated Friends of Jug Bay board members have retired in 2008. We thank each one for their many contributions of time, talent, sweat, and wisdom.

Betty Chaney was FOJB secretary for many years. Her meeting notes and minutes actually form the written history of the Friends for at least the last 12 years. Betty faithfully recorded the decisions, disagreements, minutia and major votes made at dozens of board meetings and many, many annual meetings. Her keen eye for detail and accuracy, as well as her deep knowledge of county politics were wonderful assets that she brought and freely shared with all of us at the Sanctuary.

Susan Blackstone headed up the education committee for 14 years, working closely with Sanctuary staff to bring disadvantaged school children here for field trips. Susan visited with teachers and parents and acted as the go-between when it came time to hire bus drivers. She arranged for scholarships for summer campers and even drove kids back and forth from Jug Bay to Annapolis. Transportation is crucial and Susan knew this! Like Betty, her years of service and institutional knowledge made her a stabilizing and valuable force on the board.

Bill Steiner took the reins of the presidency in 2003 and has served on the board since 2004. Bill’s career working in a leadership role for state government meant that he had the patience and experience to steer the board in productive directions. We enjoyed his optimistic outlook, sense of humor, can-do attitude and willingness to tackle contentious issues head-on. Bill took special delight in the children who visited the Sanctuary and when he wasn’t carrying out board duties he could be found on the water in a canoe teaching about the human and natural history that he found so fascinating.

Judy Burke served as co-President with Peggy Brosnan and she partnered with Susan on the education committee. She organized a series of summer canoe excursions for kids in the Annapolis Recreation Department. Judy worked with Brian Woodward to develop the environmental covenant which County Executive Janet Owens signed to provide additional protections over Sanctuary lands, and she was a staunch supporter of efforts to convince the State of Maryland to preserve the Jacoby Property (aka Parris Glendening Nature Preserve at Jug Bay).

Ami Hazell brought culinary and merchandising skills to the board. Her beautiful cakes bearing scenes of wildlife and wetlands, graced many an annual meeting. She also tracked sales of shirts, hats, maps and other materials the Friends provide to the public.

Sandy Teliak did a lot of his board work with sleeves rolled up and a hammer in his hand. Sandy lent his skill and muscle to two major FOJB stewardship efforts: building the footbridge across Two-run Creek and renovating Plummer House. Like many board members, he also participates in our research studies and is hard at work summarizing years of bird banding data.

Joe Browder, an expert on the global environmental scene, brought a broad vision to the regional issues that occupy the board. In the 1970s he led the fight to protect the Everglades; in 2005 he helped us formulate new ideas for protecting a relatively tiny wetland—Jug Bay. Joe is one of many local professionals who, as board member emeriti, serve as advisors to the staff and FOJB if serious issues threaten our local environment.
began my adventures at Jug Bay during the summer of 2004; all I knew then was that I had an interest in zoology, with turtles being one of my favorite groups. As I left this year’s volunteer picnic, where I presented my summer research on the movement and home range size of the Eastern Mud Turtle, I began to think about how much I have grown in four years.

I came to the Sanctuary with a great desire to learn, and in return received encouragement from other volunteers and the staff. Participating in the volunteer research programs at the Sanctuary reaffirmed my decision to pursue a career in science. So after a few years of overcoming the rigors associated with school and my personal life, I returned to Jug Bay as the 2008 Summer Research Fellow. I recognized that the opportunity would offer a unique experience, including flexibility to choose a research topic, interactions with local scientists, and even field trips. Most importantly, my interest in turtle biology and the resources available at the Sanctuary made this summer an unforgettable one.

For my research project, I decided to study a common but overlooked turtle species, the Eastern Mud Turtle (*Kinosternon subrubrum*). Volunteers and staff members had collected observational data on this species since the early 1990s, but no formal study had been conducted. Based on these records, I was able to recognize a clear seasonal movement pattern involving the marsh and forested uplands. Mud turtles overwinter in the forests, migrate to the wetlands in April, and return to the overwintering sites in the fall. I decided to take a chance by affixing 10 radio transmitters on five adult males and five adult females under the supervision of Chris Swarth. We were the first to radio track mud turtles in an estuarine environment. Naturally, we felt some anxiety early on when our telemetered turtles could not be picked up by our radio receiver. After wading through the mud, canoeing, kayaking, and power boating, I was shocked to find out that some of our turtles swam across the Patuxent River and Western Branch! I figured that I would have to spend a lot of time wading through the mud, but having to paddle up and down the Patuxent and its tributaries was a pleasant surprise.

After a season of heat, wind, floods, hail storms, and tornadoes I was pleased with the results. Mud turtles have larger home ranges and can travel longer distances in water than previously thought. One male traveled a straight line distance of about a mile and a half! We also learned that female mud turtles like to use the river farm to nest and can spend up three weeks in that habitat in June. Though I am now at Oregon State University where I am scheduled to complete my BS in Environmental Science in the winter of 2009, I will continue to support the Jug Bay mud turtle research efforts as staff and volunteers prepare to study the fall migration. I feel fortunate to have participated in a research opportunity that has contributed greatly to my personal, professional, and academic development. I am very grateful to the Jug Bay Wetlands Sanctuary staff and volunteers, as well as the Friends of Jug Bay for supporting this wonderful opportunity.
Fall 2008 Public Programs at Jug Bay

Reservations and entrance fees are required for all events, unless noted. Call 410-741-9330 or e-mail programs@jugbay.org

Check out www.jugbay.org for information, directions and updates to our schedule.

Open to the public 9 am–5 pm Wednesday, Saturday, and Sunday (Closed Sundays December through February)

Programs are open to families and individuals. An adult must accompany children under 13. Scouts and other groups must call to arrange a separate program.

Please note age limits for each program.

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

Birding at Jug Bay
Saturday, October 4; 8-11 am
Saturday, November 1; 8-11 am
Saturday, December 6; 8-11 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.

Snakes of Jug Bay
Thursday, September 11; 6-8 pm

Come find out about the habitats and life histories of the snakes of Jug Bay, including those common, rare, and not yet recorded from the three properties that now make up the protected area. Teens and Adults.

Nature Detectives
Saturday, September 13; 2-4 pm

Where do animals go and what do they do? Become a Jug Bay Detective and search for clues like animal tracks and scat to learn how to unravel nature’s mysteries. Appropriate for children over 10 and adults who are beginning birders.

Patuxent Paddling Potpourri
Saturday, October 20, 1-5:30 pm

For Experienced paddlers; minimum age: 14

We’ll enjoy a longer canoe trip down the Patuxent River for experienced paddlers. We’ll see what’s out & about on Jug Bay on an autumn afternoon. If time permits, we’ll explore the Mataponi Creek. Bring water, sunscreen, sturdy shoes and clothes that can get dirty.

Canoe instruction and all equipment provided. Participants will hike about one mile to canoe launch. To reserve a space, mail your payment ($5.00 per person) in advance to the Sanctuary. Please include your names, address, daytime phone number, number of people in your party and the ages of children. Canceled in case of rain or high winds.

September Equinox Hike
Sunday, September 21; 5-7 pm

The Autumn Equinox, when the sun is directly over the equator, officially marks the transition from summer to fall. In early evening, we’ll search woods and field for signs of deer, foxes, rabbits and owls, then end the hike watching the sun set over the Patuxent River. Be prepared to hike a few miles. Children should be at least 10 years old.

If Trees Could Talk
Saturday, October 4; 2-4 pm

Though trees can’t talk many have a story to tell. Join us for a hike around the Sanctuary to visit the biggest, knurliest, and most unusual trees on the property to see and hear the tales their bark holds. All ages are welcome but take into consideration that we will be walking several miles.

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October Equinox Hike
Sunday, September 21; 5-7 pm

The Autumn Equinox, when the sun is directly over the equator, officially marks the transition from summer to fall. In early evening, we’ll search woods and field for signs of deer, foxes, rabbits and owls, then end the hike watching the sun set over the Patuxent River. Be prepared to hike a few miles. Children should be at least 10 years old.

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Owl Prowl
Saturday, Oct 25; 6-8 pm

Come and learn about owl adaptations and go on a short night hike. We will bring along a tape to play owl calls and see if owls respond! We’ll return in time to enjoy a campfire and marshmallows. Please bring a flashlight and dress for the weather. For all ages.

Full Moon Hike
Saturday, Dec 13; 4-6:30 pm

Enjoy a brisk evening hike under the “Moon before Yule”. We’ll see the sun set and explore the trails around the Sanctuary’s River Farm. Meet at the Wetlands Center and drive to the River Farm. Be prepared to hike three to four miles. Children should be at least 10 years old.

Beginning Birds
Saturday, Dec 13; 9-11 am

Learn about our native songbirds and their habitats. Bring a field guide and binoculars if you have them. Appropriate for children over 10 and adults who are beginning birders.

December Solstice Hike
Sunday, Dec 20; 3:30-5:30 pm

Greet the arrival of winter on the shortest day of the year. We’ll look for signs of the new season at the Sanctuary’s Glendening Nature Preserve and hopefully catch a glimpse of the setting sun. We’ll finish with some light refreshments. Meet at the Plummer House. Be prepared to hike two to three miles. Children should be at least 10 years old.

Programs at Wooton’s Landing

Woodton’s Landing is a 140-acre park located at the edge of the Patuxent, off Sands Road, a few miles from the Sanctuary. In the 1990s, agencies restored this former sand and gravel mine and installed 72 acres of reconstructed wetlands. For directions, contact the Sanctuary NOTE: There are no facilities at Wooton’s Landing, so we recommend you carry water and use the restroom before you arrive.

Beginning Birdwatching
Saturday, September 13; 9-11 am

Learn about our native songbirds and their habitats. Bring a field guide and binoculars if you have them. Appropriate for children over 10 and adults who are beginning birders. Meet at Wooton’s Landing. Appropriate for children over 10 and adults who are beginning birders. Free.

Walk Around Wooton’s Landing
Saturday, October 25; 9-11 am

Visit one of the lesser known and infrequently visited parts of the Sanctuary. We’ll see what’s out and about as Mother Nature prepares for winter. Participants should wear sturdy shoes and be prepared for moderately difficult walking. Meet at Wooton’s Landing. Children should be at least 10 years old. Free.
For Adults and Teens

**Introduction to Geographic Information Systems (GIS) at Jug Bay**
Saturday, November 1; 1-4 pm
Come learn about Geographic Information Systems using Map Window, free GIS software, to view and analyze Jug Bay data. UMBC scientist Jeff Campbell will cover some essential GIS introductory material, but will focus mostly on using GIS data available from a number of Web sources. We will take a short hike to “ground truth” some of our results and collect some GPS (global positioning system) data to add to our map. This program is for adults involved in field work at Jug Bay.

**Life in Extreme Environments: Is There (or was there) Life on Mars?**
Thursday, November 13; 7-9 pm
Biogeochemist Marilyn Fogel will use photographic slides to describe her research on the remote islands of Svalbard in northern Norway. Marilyn works with a team of “astrobiologists” funded by NASA who use high-tech sampling equipment to search for microbes, biomolecules and other traces of life amidst the cold, windswept rocks, ice and glaciers. Svalbard is a “Mars analog” site, one of the places on our planet with environmental conditions similar to those on Mars. Results of these discoveries are used on the unmanned explorations of Mars. Polar bears, walruses, arctic foxes, skuas, and arctic terns share the habitats where her studies take place.

**Taking Natural History Field Notes**
Cost $25
Chris Swarth
Thursday, December 4; 7-9 pm and Saturday, December 6; 8 am-4 pm
This short course will introduce participants to a method for recording natural history observations in a field notebook and journal. The “Grinnell Method,” where field notes are recorded in a standardized fashion in a field notebook, will be explained and illustrated. We’ll learn how to describe locations, habitats, weather, to estimate numbers of species observed, and how to describe behavior or other observations. Each participant will keep a field notebook and a journal. Thursday night we’ll discuss how field notes are made, their value and how to strive for clarity and completeness. We’ll review examples of field journals. On Saturday we’ll head into the field at the Sanctuary to observe animals and to record observations.

**Diving Ducks and their Invertebrate Prey**
Cost $5 per person
Chris Swarth
Tuesday, December 16; 7-9 pm
Chris Swarth will describe the results of his ongoing study of the wintering waterbirds on the Patuxent River estuary and the invertebrate prey that sustains them. Dozens of volunteers help with this long-term study that takes place annually in February. A key finding is that duck species segregate along the 55-mile length of the estuary where they find just the right mix of food items that they require.

**Stream Monitoring**
Saturday, September 27; 9:30 am-noon
Volunteers are needed to help collect, identify, and count stream invertebrates that are used to evaluate stream health. Please bring waterproof shoes or boots and dress for the weather. Free admission to the Sanctuary. For teens and adults.

**Become a Volunteer**
Saturday, October 11; 10 am-noon
The success of Jug Bay is dependent on numerous volunteers. People, young and old, help with education programs, conservation projects, and ecological research. Spring research projects include stream monitoring, bird studies, water testing, and fish surveys. Volunteers help with our education programs and they assist with the Wetland Center on weekends. Trail maintenance and clean-ups are done throughout the year. Learn how you can participate in volunteer opportunities. For adults and teens.

**Naturalist Training: Tips & Tricks**
Saturday, October 11; 1-3:30 pm
Voluteers are needed to lead a variety of weekend programs for families. Join veteran naturalist Stephanie Mason from Audubon Naturalist Society to learn the “fun”damentals of creating programs that introduce families to the wonders of nature. Educational and engaging activities along with tips for creating successful field trips will enable volunteers to lead a variety of hands-on programs. Some natural history knowledge is useful but not necessary.

**Water Quality In-Field Training**
Saturday, Nov 8; 12 - 2 pm
Since the Sanctuary’s founding in 1985 we have been tracking the conditions of the water coursing along the river and through our wetlands. This year-round study gives volunteers a chance to encounter our wetland habitats through all seasons, record data, conduct field work and lab analysis. Brush up on your water quality skills, or come learn about the study for the first time. This in-field training session will walk volunteers through a monitoring session. Free admission to the Sanctuary. For teens and adults.

**Trail Monitors Annual Meeting**
Saturday, December 13; 1-3 pm
With 12 miles of trails to maintain, we can use all the help we can get! This workshop is for existing Trail Monitors and new volunteers interested in the program. Existing Trail Monitors will have a chance to share their experiences, and renew their adopted trail for another year. New volunteers will have a chance to learn about the program and adopt available trails of their own. For adults.

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For Volunteers

**Fish Survey (Patuxent River)**
Saturday, September 20; 9:30 am-noon
Using a large seine net, 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. Wear old shoes that tie tightly (not Crocs or sandals) and clothes that can get wet and muddy. Bring a change of clothes, shoes and a towel. Survey will be canceled if it rains. For teens and adults.

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**Train Monitors Annual Meeting**
Saturday, December 13; 1-3 pm
With 12 miles of trails to maintain, we can use all the help we can get! This workshop is for existing Train Monitors and new volunteers interested in the program. Existing Trail Monitors will have a chance to share their experiences, and renew their adopted trail for another year. New volunteers will have a chance to learn about the program and adopt available trails of their own. For adults.
Marsh Plants: the Environmental Engineers of Jug Bay

By Keala Cummings

It was a bright July morning at the height of the growing season, the marsh a sprawling sea of unrelieved green stretching towards a streak of glare that on other days might be recognizable as the Patuxent. Osprey wheeled in the sky above and red-winged black birds speckled the bay like poppy seeds. At least this is what I imagined the scene might look like from the boardwalk, where my advisor waited with field notebook and collection bags at the ready. From where I was standing, thigh deep in marsh mud with cattail tickling my ears, the only view I was enjoying was a wall of vegetation, thick as concrete and just as impenetrable. The sun had turned the marsh into a sauna and you could almost hear the spatterdock and arrow arum panting in the heat. With sweat rolling down my arms and my skin complaining of one hundred little stings, courtesy of the patch of cutting grass I had fallen into, I took a moment to reflect (with absolutely no irony) how lucky I was to be conducting my summer research in this amazing place.

It was this work that had brought me from the West Coast all the way to Jug Bay, specifically to study plant shapes and the way they affect accretion rates, or the rate that sediment in the water settles to the marsh floor. In salt marshes, such as those bordering the Chesapeake Bay, it has been found that this process of sediment settling actually contributes to an increase in marsh elevation over time, thereby keeping rising sea levels from flooding and drowning plant communities and the lands beyond them. With new threats from global warming becoming a major concern, people are especially interested in this ability of a marsh to preserve itself.

Until now, most of the research has been done in salt marshes, which have nowhere near the plant diversity that can be found in their freshwater counterparts such as Jug Bay. Here you can find all manner of plant species with shapes ranging from the large fan of the spatterdock to the thin reed of the cattail. Plants are largely the driving force behind accretion. They capture sediment from the water, much like a catcher’s mitt, and drop it to the marsh floor where the sediment slowly builds over time. This summer we investigated whether plant shape and size might influence the rate at which marsh elevation changes and so by extension its ability to keep pace with rising seas and tides. What we found was fascinating.

To answer our research question we set up two study sites: one off the boardwalk at Observation Creek (near the bird blind) in a diverse plant community, and a control plot at Otter Point, which is dominated by spatterdock. We measured the amount of sediment collected off of plants, plant morphology (such as surface area and biomass), the composition of the plant communities and the distance of our sites from the creek.

We expected plants with larger surface area to catch more sediment (as a larger sail catches more wind) but surprisingly this was not the case. All plants within a species captured around the same amount of sediment, whether they were larger or smaller than their fellows. Yet between species there was a notable difference in the amount of sediment captured. For example, all the cattails we measured, whether they were tall or short, captured the same amount of sediment, as did all the spatterdock plants. However, the spatterdock as individuals captured more sediment than did the cattail individuals, even though the cattail technically had more surface area per plant. This
“With new threats from global warming becoming a major concern, people are especially interested in the ability of a marsh to preserve itself.”

would be akin to a small, 5-square-foot sail catching more wind than one three times that size! Obviously, plant surface area didn’t tell the whole story.

So if surface area doesn’t explain plant sediment capture rates, what does? The answer became clear once we took a step back from looking at individual plants to looking at entire plant communities. The key appeared to be density, specifically the amount of individual plant stems found in a square meter of marshland. The denser the vegetation, the more sediment the area captured. But even this was too simple an explanation. Spatterdock communities were capturing more sediment, even though they often occurred at lower densities than those of mixed plant composition, including cattail and arrow arum. In the end we found that projected area, a measure that takes into account plant density, volume and surface area combined, was the most accurate predictor for the amount of sediment an area captured.

Put in simpler terms, one can think of projected area as the area of a shadow cast by shining a beam of light through a thick screen of plants. The sediment particles are like the light beam being obstructed by the plant stems, and the total area of that obstruction is the projected area. Using this and other measures, we estimated that our mixed plant sites were accreting about 3 to 4 millimeters of sediment a year, and the spatterdock communities almost twice that amount. Since current numbers for Jug Bay put rising sea level rates at 2 to 4 millimeters a year, it would seem that our study sites are not in any immediate danger from flooding. Finally, because spatterdock not only captures the most sediment but also tends to grow farther away from shore—where danger from flooding is greatest—one final implication of our study is that the marsh has evolved in such a way to best protect the plant communities most at risk from sea level rise.

Much still remains to be done in answering these and other questions about sedimentation rates in Jug Bay, but until then it is nice to know that despite everything, Mother Nature can still look out for her own.

Keala Cummings is a student at Scripps College in Claremont, California. This summer, she participated in the Research Experience for Undergrads program funded by the National Science Foundation, working under the supervision of Dr. Lora Harris of the Chesapeake Biological Laboratory.

Thanks for your Donations

Arin Shortz, Zoe Black, Patrick McConachie, Kyle Maduro, Sara Becks, and Diane Goebes for the time they donated as volunteer counselors for our summer camps.

Cynthia Bravo for the “Field List of Birds,” and for composing an educational mammal notebook for the exhibit room.

Bert Friedeman of Northeast Electric Company for donating electrical equipment and supplies

Errata

We thank Harry Coulombe for pointing out that the Flying Squirrel observed here was a Southern Flying Squirrel and not a Northern Flying Squirrel (northerns do not occur in our area). He also suggested that the jumping mouse we captured was probably a Meadow Jumping Mouse rather than a Woodland Jumping Mouse.
Academy Midshipmen Invade Jug Bay

It’s been almost 200 years since a major naval incursion on the shores of Jug Bay. At the tail end of the War of 1812, Commodore Joshua Barney and his sailors outmaneuvered the British right here in the central Patuxent River. The 2008 naval exercises, however, involved no shots and no British war ships. Instead hammers, drills, saws, sledge hammers and ropes were the implements in use. Every Tuesday a dozen midshipmen from the Naval Academy arrived to work on important stewardship and repair projects at the Sanctuary. The mids were participating in a new community service program designed to help the Academy become more involved in giving back to their local community. Under the able supervision of Lt. Matt Walters, the mids performed a number of critical tasks. The mids were eager, willing and capable. Whether it was lifting 200 pound logs, swinging an 80-pound “post pounder”, or jumping into knee-deep mud, the tasks were approached with a positive, “can do” attitude. From the brief summary below, you can see that we owe a huge debt of gratitude to the Naval Academy and to the hardworking young officers.

Projects completed this summer:
• Cleaned up the water-borne debris, trash and logs that accumulated at River Pier after the May 8-10 flood
• Removed the large floating boat dock that crashed onto Doris’ Pier during the May 8-10 flood and repaired the resulting damage to the pier
• Cleaned up the huge logs from the Red Oak tree that had fallen on the Wetlands Center during a June thunderstorm
• Trimmed branches along the length of the Railroad Bed Trail
• Tightened canoe thwarts and seats, and tied new rope throw lines fore and aft
• Repaired and rebuilt the Otter Point pier and boardwalk
• Removed broken fences at Glendening Preserve
• Built new benches at Mark’s Pond and on the upper Railroad Bed Trail
• Removed a large tree that fell across the Two-run Creek footbridge
Conservation Work by National Aquarium Minority Summer Students

By Beth Ebersole

Through a partnership with the Chesapeake Bay National Estuarine Research Reserve System in Maryland (CBNERR-MD), the National Aquarium in Baltimore brought five minority college students to Jug Bay and Otter Point Creek this summer to experience first hand the joys of being a conservation scientist. The Aquarium’s program promotes career development in the conservation sciences through unique education opportunities for undergraduate students. The students must compete for the coveted slots, and five top-notch students are selected each year for the Aquarium’s eight-week program.

CBNERR-MD provided six days of educational conservation activities for the students, including bird banding, invasive species removal, and invasive species mapping.

On June 24, the five Aquarium students spent a fun and educational day on the water at Jug Bay (in Prince George’s and Anne Arundel Counties) banding juvenile osprey with award-winning naturalist and conservationist Greg Kearns of Patuxent River Park. As the boat approached each osprey platform, the adult birds flew off and circled overhead, and the young brown and white osprey flattened their bodies and wings down in an effort to camouflage themselves against the stick nests. The students carefully grasped the juveniles by their wings and legs, trying to keep them still and calm, while Kearns attached a metal identification band to each osprey’s leg.

On June 20, the Aquarium students ventured into the marsh to survey Jug Bay for the invasive species Purple Loosestrife. Prior to setting out, Patricia Delgado (CBNERR-MD Research Coordinator) and Jeff Campbell (JBWS volunteer) taught the Aquarium students how to identify the invasive species and why it is a problem. Forming dense, homogenous stands, it outcompetes and replaces native marsh plants, such as wild rice, that provide better food and habitat for migrating birds, waterfowl, and other wildlife. A single plant produces as many as three million seeds a year, and spreads underground via an extensive root system. Despite its highly invasive nature, it is still legal for nurseries to sell purple loosestrife in Maryland, and the average citizen knows nothing about its deleterious impacts.

The students’ reconnaissance mission found that although last year’s loosestrife removal efforts knocked back the number of plants in the Jug Bay marshes, some large stands remained in the marsh on the Prince George’s County side of the river.

Removing the plant is arduous and involves digging about one foot down into the mucky marsh sediment to pull out the entire root ball, generally getting oneself largely covered in muck in the process. For three days, the students worked tirelessly, getting into a rhythm and gaining efficiency with every plant—dig, push, pull, dig, push, pull. During these days Beth Ebersole (CBNERR-MD Manager) and Bart Merrick (CBNERR-MD Education Coordinator) joined the students in the efforts. At the end of three days, hundreds of the invasive plants had been removed. Throughout the days, Merrick let the students learn how to drive the boats, giving them informal driving lessons and plenty of tips on how to show finicky John-boat motors who’s the boss. It was a highly satisfying experience for the students who felt they were “really accomplishing something” to help the Chesapeake Bay.

On July 22, the students headed to CBNERR’s Otter Point Creek component in Harford County where they mapped stands of another invasive species, Phragmites. Delgado and Campbell trained all of the students to operate handheld Global Positioning System (GPS) devices to map and locate all the Phragmites stands in the area. Subsequently, Campbell demonstrated in the lab how to incorporate the information collected into a data layer using a Geographic Information System.

CBNERR-MD staff had a great experience working with the National Aquarium and praises the hard work and interest of the students and staff who participated in all the field activities.
Summer Volunteers

May- July 2008

Kevin Arrington
Lawrence Ash
Sandy Barnett
Marty Barron
Sara Beck
Zoe Black
Susan Blackstone
Jess Boesch
Anna Baum
Cynthia Bravo
Kelly Buethe
Jennifer Burroughs
Mary Burton
Jeff Campbell
Karen Caruso
Harry Coulombe
Mark Delfs
Eric Duce
Ric Foster
Joyce Gillespie
Diane Goebes
Brandon Greene
Kathy Grow
Jim Harle
Peter Kenny
Matthew Larabee
David Laughlin
David Linthicum
Kyle Maduro
Woody Martin
Patrick McConachie
Anne Muecke
Diana Ogilvie
Thomas O’Shea
Dave Perry
Willely Persaud
Val Pfeiffer
Carol Quinlan
Michael Quinlan
Megan Reiser
Tim Reiser
Gordon Reynolds
Mark Richardson
Cathy Rickards
Frank Rickards
Rogard Ross
Jason Seaton
Arin Shortz
Les Silva
Alex Smith
Bob Smith
Al Sutherland
Mickey Taylor
Sandy Teliai
Renee Touse
Nancy Weber
Bruce Weidele
Bob Williams III

Thanks!

Five college students removed invasive plants from the marsh as part of a career development and conservation program sponsored by the National Aquarium.