MARSH NOTES

JUG BAY WETLANDS SANCTUARY NEWS VOLUME 21, NUMBER 1 SPRING 2007

Forest Diversity Influenced by Past Land Use

By Lisa Siciliano, Volunteer

For three years I have participated in the habitat survey, a program to document the Sanctuary's plant communities. From 2003 to 2005, two regular teams consisting of volunteers, staff members, and interns carried out the survey. We ventured out nearly every other week between mid-April and late October, completing our initial data collection in June of 2006. In all but dangerous weather we tramped through fields, forests, floodplains and ravines while braving ticks, chiggers, mosquitoes, and deer flies—all in the name of science. We hope these data will eventually enable researchers to identify areas where rarer species are located and expedite study site selection by showing which areas host habitat favored by target species. Our initial task was to sample upland habitats uniformly across the Sanctuary. Sampling techniques included identification of tree species, shrubs, and herbaceous plants; measurement of tree diameter; qualitative measures of slope, shape of terrain, surface water, and more. Sample locations were 10 x 10 meter plots centered on grid marker poles. We have recorded data at least once for each of 301 plots.

Although the survey involved much work, it also had an immediate reward—the privilege of exploring off the beaten path. The most interesting experience for me was discovering the astonishing variety in plant composition of the upland forests. Consider the tree populations of three neighboring plots at the Glendening Preserve. The first, centered at grid pole marker 533-S in a tract called the Pine Barrens, is comprised primarily of Eastern Red Cedar and Virginia Pine. The second (533-R) and third (533-Q) plots are 100 and 200 meters due west, respectively. The plot at 533-R is also in the Pine Barrens and contains some Virginia Pine and Eastern Red Cedar, as well as much thorny shrub growth. Yet, the plot at 533-Q is dominated by Tulip Tree, Black Locust, Hickory, and Black Walnut with some Eastern Red Cedar. One needn't bushwhack to the far corners of the Sanctuary to get a hint of forest succession. A casual stroll along Farm Trail provides a ready example. Where the path levels off above Upper Railroad Bed Trail, one walks among deciduous hardwoods such as Oak, Beech, Maple and Hickory. But several hundred meters southward, the trail passes quickly into a large stand of Virginia Pine interspersed with Sweet Gum.

Lisa Siciliano explains data recording to fellow volunteer during the habitat survey.

Change of character—sometimes obvious, sometimes subtle—is the rule among forests, rather than the exception. Ecologists have long recognized that not all parts of a forest may have the same makeup. Within the broad category of Beech-Oak-Hickory forest applied to this area of Maryland's Coastal Plain there are many variations, including additional species that often occur together consistently. Variations in tree composition may be due to differences in environmental conditions, but there may be other explanations. What might account for the changes in plant communities in the absence of obvious differences in conditions? At least part of the answer lies in the fact that the forests we see are not virgin stands. They result from hundreds of years of human disturbance and subsequent reclamation by nature in a process called succession. One definition of succession is: "an orderly progression of changes in the composition of a community from the initial development of vegetation to the establishment of a

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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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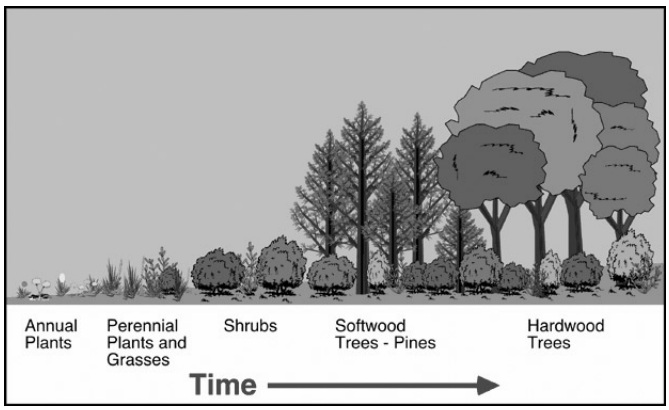
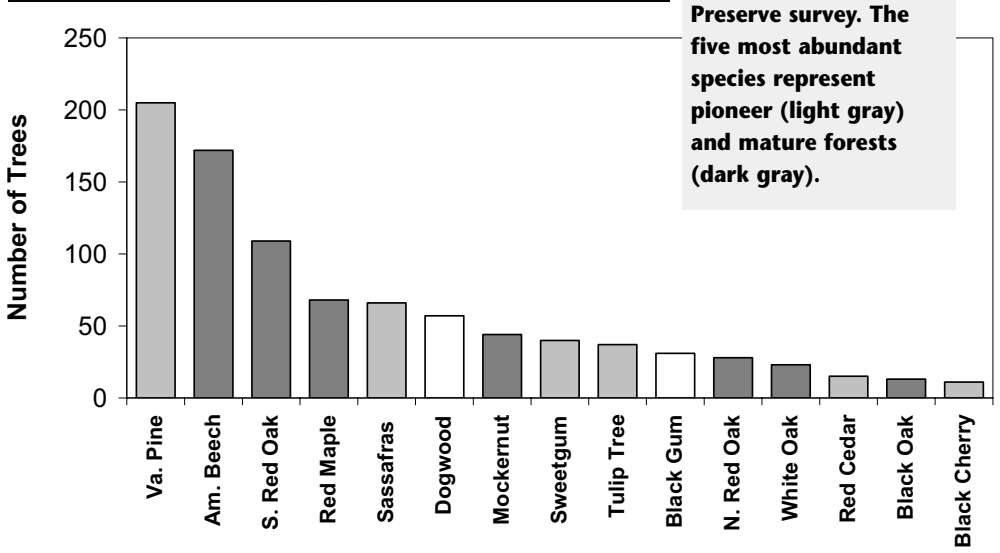


Left: Over time, a natural succession of plant communities occurs, beginning with annuals and grasses and progressing to mature hardwood trees.

Below: Abundance of tree species measured in 93 plots during the 2004 Glendening Preserve survey. The five most abundant species represent pioneer (light gray) and mature forests (dark gray).



climax community." Succession in an old abandoned pasture, such as those at the old horse farm at the Glendening Preserve, begins with colonization by grasses and small herbaceous plants for the first few years.

"…we tramped through fields, forests, floodplains and ravines while braving ticks, chiggers, mosquitoes, and deer flies—all in the name of science."

During this period scattered, sun-loving species of woody plants sprout and take hold. "Pioneer" species such as Virginia Pine, Eastern Red Cedar, and Sweet Gum dominate. It may take another 20 years for species such as Tulip Tree, Red Maple, Dogwood, and Sassafras to develop in the shade of their sun-tolerant predecessors. The trees and shrubs of this young forest are characteristically fast growers but short-lived. As the forest matures, tree, shrub and herb communities diversify. Oaks, hickories and Beech become the dominant trees. Eventually, the pace of growth slows. Diversity in understory and herbaceous components decreases again as the forest reaches something of a steady state.

Does this mean that we can read the age of Sanctuary forests from tree data collected for the habitat survey? Yes, but in a limited fashion. Succession may be orderly, but it doesn't predict precisely what plant communities will develop. For example, we can say that plot 533-Q is a relatively young forest, while 533-R is in pioneer phase, and we could also estimate age ranges. Preliminary data analysis has focused on developing a general picture of the lesser-known Preserve property: the composition of tree species and their distribution and abundance. Eventually, we hope to draw an overall picture of the ages of Sanctuary forests, to determine what formal plant associations are present, and to detect specific effects of land use history on resulting habitat.

FRIENDS OF JUG BAY

PRESIDENT'S LETTER

Greetings Friends!

Another year has started, and I am looking forward to a fun and productive year at Jug Bay. This winter had a strange start with unusually warm weather until the end of January, but now a deep freeze has Jug Bay in an icy wonderland. Yesterday I watched three different Bald Eagles take turns scavenging on a frozen animal carcass on the shore, just below the old railroad bed. In between, there were occasional gulls and crows that also tried to eat, but the meat was too frozen, and they seemed frustrated. Two adult and one immature Eagle managed the carcass handily, each getting a great meal from it! Lately the two local pairs of eagles at Jug Bay have been spending time courting their mates along the river, hinting that the next season is coming. I've also seen them defending their territories, with the apparent boundary between the two adult pairs being the railroad bed. They have the place to themselves for now, but soon the first Ospreys will return, and by April Jug Bay will seem crowded with large fish-eating birds of prey!

The proposal submitted to the County last year by a developer at Wayson's Corner, directly across Route 4 from the Sanctuary, is now on hold. The plan included a shopping mall with an over-sized national franchise store as its anchor that would have drawn an estimated 1.7 million visits annually. This project would have obviously affected the Sanctuary with many direct and indirect negative impacts, which were carefully identified and evaluated by FOJB Board Members Al Tucker, Mike Quinlan, Sandy Teliak, and myself. For now, the developer is not renewing the request for permits because of major problems with traffic safety and congestion, and with water quality impacts to the Sanctuary. Our substantive input to the county and state agencies helped prevent immediate approval for such a proposal. As the Patuxent River Keeper, Fred Tutman was also invaluable in this effort, helping the Friends identify and clarify the issues and assisting them with coordinating the many persuasive written and oral communications that were needed to get the proposal put on hold. I hope that the overwhelming concerns raised about the proposal by the surrounding community may help limit future growth to a scale appropriate to South County's rural character and provide a beneficial outcome for present and future residents. Not to mention the Sanctuary, of course!

See you at the Sanctuary!
Jeff Shenot, President

The FOJB is a nonprofit organization that supports and enhances Sanctuary activities.

fojbws@yahoo.com

Staff News

Welcome to Our New Office Manager

Jean Manganello has begun work as the Sanctuary's new Office Manager. Formerly a health systems specialist at the National Naval Medical Center, Jean coordinated education programs for high school, military, and graduate school students. Jean lives in Edgewater near her daughter and three grandchildren, whom she greatly enjoys. She loves her new working environment and is excited to be here at the Sanctuary.

Come to the Friends Annual Meeting on March 18, from 3 to 5 pm.

We are looking forward to meeting and listening to our guest speaker, Secretary of the Maryland Department of Natural Resources John Griffin. As former secretary of DNR from 1995 to 1998, Mr. Griffin implemented the Rural Legacy program that preserved 250,000 acres from development and created the Green Infrastructure Program, an integrated natural resources assessment tool to guide statewide land acquisition and preservation efforts. He also initiated the Conservation Corps for youth, which has carried out many projects at Jug Bay.

At the meeting, we will also present the 2007 Jug Bay Award to Mr. Fred Tutman, the Patuxent Riverkeeper. The award goes to an individual whose involvement in the Jug Bay area has substantially contributed to a better understanding and recognition of its significance, fostering a greater appreciation of this unique ecosystem. Fred is a sixth generation resident of a family farm on the Patuxent River near Bowie. As Riverkeeper, Fred works full time as an advocate for Patuxent River water quality in all seven counties along the river, and he promotes better connection among many local groups that support preservation of our water resources. The Riverkeeper is also responsible for a variety of cleanups, restorations, and appreciation projects. You can read more about these activities and accomplishments at http://www.paxriverkeeper.org/main/home.html .

Fred Tutman, Patuxent River Keeper

Doug Kuzmiak Honored with 2006 FOJB Award

By Peggy Brosnan, Volunteer

This past December, Doug Kuzmiak was honored with the 2006 Friends of Jug Bay Award. The Jug Bay Award is given to individuals who have done outstanding environmental work for the Patuxent River environment or for Jug Bay in particular. Doug was President of the Friends of Jug Bay from 1996 - 2002, which is the longest president's term in the Friends history, and that he won the State of Maryland Governor's Award for Volunteerism and Service in 2002. Doug led a drive that raised $50,000 for the wonderful wetlands exhibit in the wetlands center. He is also secured funding for three interns for three years through a competitive grant with the Raush Foundation. Doug was also instrumental in the land purchase for the Paris N. Glendening preserve. In addition, he won a British award for environmental writing sometime in the 1990s and has been a Fellow of the Royal Geographical Society for years. Always modest, Doug doesn't like to talk about these accomplishments.

After a wonderful potluck dinner and presentation of the "Jug," Doug treated us to an evening of slides. The slide show chronicled Doug's involvement in the saving, rehabilitation, and final placement of a snow leopard cub into a United States breeding program. Those who know Doug are not surprised that he ended up saving a magnificent endangered animal from near certain death in northern Pakistan. Doug seems to take these types of things as a challenge and throw himself in headfirst.

Doug is currently in Pakistan with his wife, Dr. Humaira Khan, a scientist who did her PhD research at Jug Bay. He has been working on initiatives involving sustainable land use management and environmental integrity. His projects have ranged from sub-tropical forests in the south to of course saving an orphaned snow leopard cub in the north. His immediate focus is the creation of a displaced wildlife facility and the prevention of human-animal conflict, with special emphasis on snow leopards. The facility will draw from American expertise in wildlife management and combine it with needs of the local community. Doug is very quick to point out that the lessons he learned while on the Friends board proved to be invaluable for tackling his current projects.

Doug Kuzmiak thanks FOJB after receiving the Jug Bay award.

We miss Doug and Humaira and wish them well in Pakistan. It is of great comfort to know that people like these are working in far-flung corners of the world to protect the environment.

Eagle Scout Mitchell Young (left) and a fellow scout carry posts for labeling trees on the new tree trail.

Self-Guided Tree Hike Adds Fun on the Trails

Did you know that the roots and bark of the Sassafras tree produce an oil that is used to perfume soap, make tea, and flavor root beer? Did you know early settlers used Devil's Walking Stick as a toothache remedy? Learn more fun facts like these by going on our new Self-Guided Tree Hike. If you've ever wished you knew *something* about all those trees you walk past while strolling our trails, look no further. Eagle scout candidate Mitchell Young has given us the gift of knowledge wrapped in a fun, friendly trail guide.

Mitchell, of Troop 429 in Owings, and his parents were already familiar with Jug Bay, as they are members of the Friends of Jug Bay. Last summer, Mitchell worked with staff to select the tree trail and the tree species where the new posts for identification plaques would be set. Then he installed 26 new posts and easy-to-read tree plaques along the Utility Road, Middle Trail, and the meadow, and also created an accompanying pamphlet to take along on the hike.

Before Mitchell began his project, Southern High School student Nicole Preti spent part of last year developing a field guide to our common trees. The guide, which includes descriptions of the leaves, bark, twigs, and seeds of the trees, complements the new tree hike brochure. If you'd like to delve even deeper into tree identification, you can use the booklet and brochure together to learn to identify our common trees. Ask for copies of both the next time you're in the nature center, or download them from our web site www.jugbay.org/jugbay/treeguide.pdf.

Thanks to both Nikki and Mitchell for enhancing our knowledge of Jug Bay's trees.

Spring 2007 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
- 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.

The Glendening Nature Preserve is open to hiking every day from 9 am - 5 pm.

Story Tellers

Friday, March 30; 10:30 am - 11:30 am
Friday, April 20; 10:30 am - 11:30 am
Tuesday, May 1; 10:30 am - 11:30 am
Come listen to a tale while enjoying a light snack. We'll take a short nature hike and make a nature craft. Theme will change with each program. All ages welcome.

Nocturnal Animals of Jug Bay Series

Thursday, March 8; 6 - 8 pm
Thursday, April 12; 7:30 - 9 pm
Thursday, May 17; 8 - 10 pm
Thursday, June 14; 8 - 10 pm
Join us for an evening under the stars with our nighttime critters. Each program will focus on a different nocturnal animal that resides at Jug Bay. We'll learn about their lifestyle and special adaptations, then take a sensory hike to search for signs of their presence. In addition, we will hike past one of our amphibian hot spots to look and listen for the active frogs, toads and salamanders of the season. In case of a weather cancellation, the program will be held the next evening.

Tree-iffic

Saturday, March 17; 10 am-noon
Explore trees and the stories they tell us. We'll learn different types of trees, how they grow, and how important they are for people and wildlife. Come dressed for the weather and ready to hike. All ages welcome.

Nature Journal Workshop

Sunday, March 18; 1 - 3 pm
Come walk in the woods watching for the first signs of spring. We'll learn how to sense and record our insights to nature using words, images, and color. Bring a notebook or journal. For adults and teens.

Vernal Equinox Hike

Friday, March 23; 4:15-6:15 pm
The Vernal Equinox marks the first day of spring. 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.

Bringing Back Bluebirds

Sunday, March 25; 1 - 3 pm
Come learn about bluebirds and how they live. Each participant will assemble a nest box to take home and put up to welcome bluebirds into your yard. We'll provide all the materials. Bring hammers and rechargeable drills and screwdrivers, if you have them. To reserve a space, mail the program fee of $10.00 per box (including FOJB members), in advance, to the Sanctuary. All ages welcome.

Birding at Jug Bay

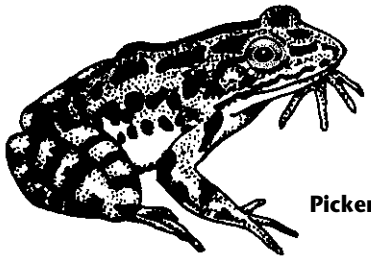
Saturday, April 7; 8-11 am
Saturday, May 5; 8-11 am
Saturday, June 2; 8-11 am
Learn the skills of identifying birds by sight and sound. Binoculars and field guides will be available to borrow. Not appropriate for children under 12.

Marsh Mammals

Saturday, April 7; 2 - 4 pm
Join us to learn about the specialized mammals that make our wetlands their home. Through hands-on activities and a hike, we'll explore the adaptations that have made them so successful, and discover some of their fascinating behaviors. For families with children over 10 years old.

Friday Ramble

Friday, April 13; 3 - 6 pm
Friday, May 18; 3 - 6 pm
Celebrate spring by exploring the further reaches of the Sanctuary trails. Bring water and a snack to carry on the trail. Wear sturdy hiking shoes and dress for the weather. For adults and teens.



Pickerel Frog

Reptiles and Amphibians

Saturday, April 14; 1-3 pm
Snakes, turtles, lizards, frogs, toads and salamanders will be the stars of this program. We'll explore the forest and ponds to learn more about the similarities and differences between reptiles and amphibians. Wear waterproof boots or shoes that can get wet. All ages welcome.

Earth Day Stewardship

Saturday, April 21; 10 am - 12:30 pm
Tired of the run-of-the-mill Earth Day event? Celebrate Earth Day 2007 by taking ACTION! The activities will focus on teaching you about the invasive plant invaders common to our area. You'll receive information on how to identify them and how to remove them. Then we'll put your new knowledge to work by conducting our own invasive plant removal here at the Sanctuary. Bring clothes that can get dirty, work gloves, and an appetite, because following the removal work we will feast on dishes made using the edible parts of these plant invaders. In addition, for all your hard work, we will send you home with a native plant adapted to thrive at your house!

Mystery Hike

Saturday, April 21; 1-3 pm
Join a volunteer naturalist on a difficult hike through never-before-visited sections of the Sanctuary. You will see a Beaver dam and lodge "up close and personal" and visit four of the largest trees in the Sanctuary. You'll also have a chance to learn how proposed developments adjacent to the Sanctuary could harm our natural resources. The route will require traversing rough terrain, steep hillsides, a flood plain and small streams. Bring your binoculars, cameras, and walking sticks. Sturdy, preferably waterproof footgear recommended. For adults and teens.

Planting Moon

Friday, May 4, 8-10 pm
May's full moon is known as the "Planting Moon" since this is the time to sow many seeds. We'll take a stroll at sunset through the forests and end as the moon rises over the marsh. In anticipation of Mother's Day, each mother attending will receive a free kiss (Hershey's, of course!) All ages invited.

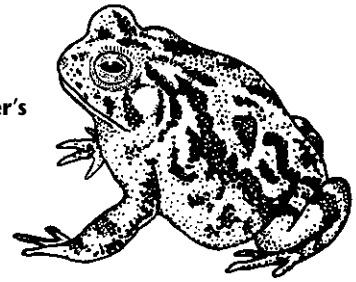
Flower Power

Saturday, May 5; 1-3 pm
Come explore our meadow and learn about pollination and the important role butterflies and bees play in making new flowers. Also learn how to attract butterflies to your own backyard! All ages welcome.

Blue Heron Biology

Saturday, May 12; 10 am - 12 noon

Described in field guides as uncommon but abundant, these majestic waders can be seen in the shallows of our wetlands. Learn about their history and special adaptations, then join us for a hike to catch a glimpse of them in their habitat. For adults and children over 10 years old.



Fowler's Toad

Toad Abodes

Saturday, May 19; 2 - 4 pm

Did you know that one little toad can consume up to 1000 insects in just one day! So put down the pesticide and come learn about the many beneficial attributes of our small amphibian friends. You'll learn about the toads that live in this area, and then we'll make a Toad Abode for you to take home and welcome these animals into your yard. For adults and families with children over 6.

Ospreys Along the Patuxent

Sunday, May 20; 1-3 pm

One of the largest local populations of Ospreys is right here at Jug Bay, although they are only summer residents. Learn about their migration and their life history during a brief lecture, and then head outdoors to observe their behavior. For adults.

Identification of Frogs and Toads by Sight and Sound:

Friday, May 25; 7-9 pm

April showers bring May flowers, as well as initiate an annual mating ritual: male frogs and toads sing to females in peeps, snores, trills and quacks. We will review both visual and vocal identification techniques and discuss amphibian biology. We'll head to the ponds to listen and look for Spring Peepers, Pickerel Frogs, Wood Frogs, and Spotted Salamanders. Children should be at least 10 years old.

Nature Detectives

Sunday, June 3; 2 - 4 pm

Come be a Jug Bay detective! We will look for clues with our magnifying glasses, listen for signs of animals, feel the different textures of plants and animal furs, and sniff out whatever scents pass by our noses. This scavenger-hunt style program is for all ages.

Friday Night at the Movies: "Microcosmos"

Friday, June 15; 6 - 8 pm

Join us for a fun evening in the Wetlands Center watching this fascinating film about insects. Afterwards we can discuss the movie. Join us on Saturday for a hike to search for insects in the field and forest. Free and all ages are welcome.

Insects Everywhere!

Saturday, June 16; 10 am-noon

Insects come in all shapes and sizes and can be found in every environment. Come explore the Sanctuary to learn more about the day in the life of an insect. All ages are invited.

Beavers and Otters and Muskrats — Oh My!

Saturday, June 16; 4:30-6:30 pm

Join us to learn more about these three wetland mammals. Through hands-on activities and a hike, we'll explore the adaptations that have made them so successful, and discover some of their fascinating behaviors. All ages.

Summer Solstice Hike

Friday, June 22; 6:30-8:30 pm

The Summer Solstice marks the longest day of the year and the start of summer. Celebrate the season while hiking the summerwoods. We'll end the day watching sunset with a light snack. All ages are invited.

Canoe Trips

Fee: $5.00 per person Canoe instruction and all equipment provided. Pre-registration is necessary; no phone or fax reservations are taken. To reserve a space, mail your payment of $5 per person (including FOJB) in advance to the Sanctuary. Please include your names, address, daytime phone number, number of people in your party and the ages of children, as well as a first and second choice of dates. Children must be at least 7 years old, unless noted otherwise.

Chesapeake Beach Railway by Water and Land

Saturday, May 12; 12-4 pm

For more agile canoeist, we will have a combination canoe trip and hike to the upper Charles Branch, a Bald Eagle nest and Chews Lake. We will hike along the rarely visited causeway in Prince George*s County, part of the passenger train service that ran along what is now the Sanctuary*s Railroad Bed Trail. All equipment is provided. Approximately 3 miles canoeing and 2 miles hiking. Participants must be at least 14 years old and have canoeing experience.

10,000 years on the Patuxent

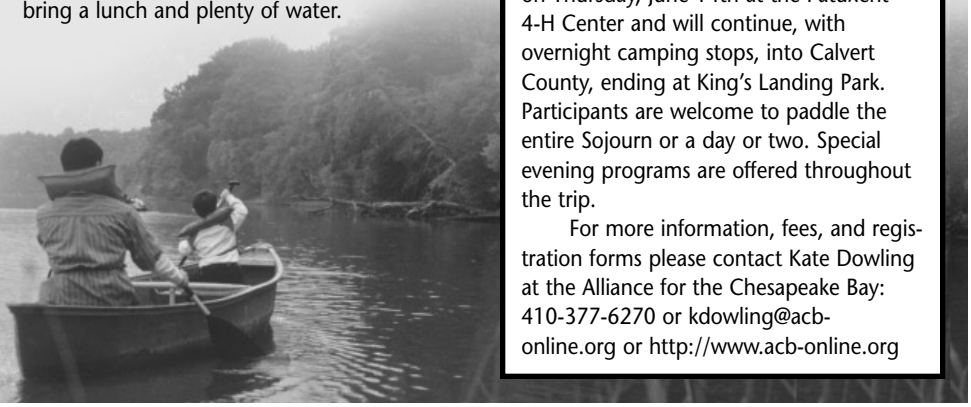
Saturday, May 26; 12-4 pm

The Patuxent River is rich in history, from Indian settlements, colonial towns, war battles, and a 20th century railroad. We will take a short leisurely canoe trip across the river to Mt. Calvert to learn about the archaeology and history of the site. Children must be at least 12.

Discover Wetlands by Canoe

Saturday, June 2; 4-8 pm (Adults only)
Sunday, June 10; 10 am-2 pm
Saturday, June 16; 4-8 pm (Adults only)
Saturday, June 23; 10 am-2 pm

Enjoy a leisurely paddle through the Patuxent River wetlands and open a new window into the natural history of Jug Bay. Experienced volunteers or staff naturalists lead trips. Please bring a lunch and plenty of water.



Annual Patuxent Sojourn

Thursday, June 14-Tuesday June 19

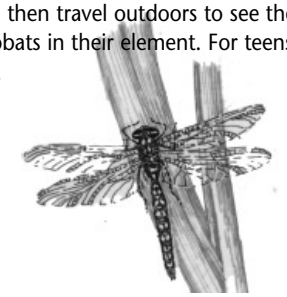
The Patuxent Sojourn is a weeklong canoeing and kayaking expedition that features educational programming, riverside camping, restoration projects, festive meals, meetings with elected officials, and much more. Novice and experienced paddlers alike enjoy a unique, on-the-water experience that builds a strong environmental ethic, while having a lot of fun in the process. The Sojourn aims to elevate awareness of the Patuxent River's importance to the region and to encourage local residents to play an active role in its restoration.

The 2007 Patuxent Sojourn will begin on Thursday, June 14th at the Patuxent 4-H Center and will continue, with overnight camping stops, into Calvert County, ending at King's Landing Park. Participants are welcome to paddle the entire Sojourn or a day or two. Special evening programs are offered throughout the trip.

For more information, fees, and registration forms please contact Kate Dowling at the Alliance for the Chesapeake Bay: 410-377-6270 or kdowling@acb-online.org or http://www.acb-online.org

Lectures in the Field

Odonate (Dragonflies & Damselflies)
Saturday, June 30; 2 - 4 pm
Join entomologist Dr. Benedict Hollister for his ongoing insect lecture series. Participants will see specimens to learn some of the basics, then travel outdoors to see these aerial acrobats in their element. For teens and adults.



Wonderful Wetlands
Saturday, June 23; 10:30 am-12:30 pm
Join us for an exploration of freshwater tidal wetlands. Ospreys can be seen overhead, and spatterdock underfoot. We'll stay on our boardwalks and trails so boots are not needed. All ages

Blue Moon Hike
Saturday, June 30, 2007, 8 - 10 pm
Moon, June, Spoon, Croon - This is an opportunity which happens only "once in a blue moon." Come out and enjoy a summertime evening hike and learn what that saying is all about. We'll see the sun set and the full moon rise. We should hear some frogs and toads courting, and maybe even see a beaver or hear an owl. Bring flashlights, just in case. All ages.

HOME SCHOOL SERIES

Wednesdays, 10 am - 1 pm
Ages 8 and up

March 21—Vernal Pools
April 11—On the Wing: Birds
May 9—Trees
June 13—Insect Safari
Cost: $1.00 per student
(payment on arrival)

For full class descriptions, registration, and further information, please visit our website, www.jugbay.org.

Pre-registration required. To register, please call (410) 741-9330 or fill out registration form on our website and send it to the Sanctuary.

Please bring a lunch.

Parents are not required to stay with their children, but they are welcome if they choose to do so.

Jug Bay Summer Science Camps

1361 Wrighton Road • Lothian, MD 20711
Office: 410-741-9330; Fax: 410-741 -9346 • programs@jugbay.org

Give your child a natural adventure this summer at Jug Bay Wetlands Sanctuary's Summer Science Day Camp! Our camps are designed to introduce campers to wetlands, ecology, and scientific investigations. During these outdoor, all-day programs, campers explore the natural world and conduct ecological studies through hands-on student-centered activities. Group size is limited, with a staff to camper ratio of 1:5. The cost is $130 per session ($120 for FOJB members)

Registration Information

- To register your child, you may download a registration form from our web site (www.jugbay.org) or call for a registration form. Registration is on a first-come, first serve basis, by mail or walk-in (Wed, Sat, or Sun, 9am-5pm).
- Mail the registration form directly to the Jug Bay Wetlands Sanctuary.
- Children must be entering the grade specified.
- Registration fee must be paid at time of registration, by check or cash only.
- Camp size is limited. You will be notified of your registration for camp, if a camp is filled, or is rescheduled.
- Individuals with disabilities will be accommodated if JBWS is given at least 2 weeks notice.

Wetlands are Wonderful
For 5th or 6th grades in Fall 2007
Monday, June 18-Friday, June 22 • 9:30 am-3:30 pm
Join us for a natural adventure in the marshes of Jug Bay. Children will be involved in seining for fish, testing water quality, canoeing, and camping out under the stars. Each day we will be exploring the wetlands, learning what makes them work and why they are important. This camp includes a canoe trip, Thursday overnight campout, and a Night Hike. Art projects, games, and experiments will enhance our daily activities.

Down to the Bay
For 7th or 8th grades in Fall 2007
Monday, July 9-Friday, July 13 • 9:30 am-3:30 pm
Follow the Patuxent River as it flows from its headwaters to the Chesapeake Bay. We'll explore the tidal marshes and non-tidal creeks to learn about the Patuxent River and the Chesapeake Bay watershed. The Marsh Walk, canoe trip, Thursday night campout, and Night Hike are all highlights of the camp.

Stream Ecology
For 9th through 12th grades in Fall 2007
Monday, July 23-Friday, July 27 • 9:30 am-3:30 pm
Four different streams run through the Sanctuary. Each day we will search for fish, amphibians, reptiles and insects, while measuring water quality. We'll compare the streams to understand their ecology. On Friday, we'll head out in canoes to learn how streams influence the water quality of the Patuxent River. There will not be an overnight for this camp.

Teen Adventure *(Entering at least 9th grade in Fall 2007)*
Are you ready for adventure? We have many opportunities for you to become involved in the exciting things happening at Jug Bay. Sign up for one day or many: you will participate in the ongoing research projects, interpret data collected, and work on a service project. You can use the hours to fulfill your community service requirements. $5 for the series, no matter how many days you attend (free for volunteers.)
Thursday, June 28; 9:30 am-3:30 pm: Herp Search
Thursday, July 5; 9:30 am-3:30 pm: Stream Monitoring
Thursday, July 19; 9:30 am-3:30 pm: Fish Survey
Thursday, August 2; 9:30 am-3:30 pm: Aquatic Ecology
Thursday, August 16; 9:30 am-3:30 pm: SAV
Tuesday, August 21; 9:30 am-3:30 pm: Wild Rice

Volunteer Activities

Volunteer activities are free (unless noted) and new volunteers are always welcome.

Non-native Plants: The Green Invasion!

Saturday, March 17; 1-3 pm

This indoor slide lecture will focus on the problems non-native invasive plants cause in natural ecosystems and identification of native and non-native species of concern. Come learn about our "Adopt-a-Plot" initiative to help control the invasives at the Sanctuary. Individuals, families, and groups adopt their very own plot to monitor, map and manage the invasives. Leaders (adults and teens) of scouts, schools and community groups who would like to participate in Adopt-a-Plot workdays are encouraged to attend.

Water Chemistry and Nutrient Dynamics In-Field Training

Saturday, March 24; 9 am-12 noon

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 by participating in the research. Additional training is provided during the sampling dates. The workshop is recommended for all volunteers, new and experienced. For adults or teens.

Thanks for Your Donations

- **Bill Miles** for two boot scrubbers, to clean our boots and keep the Nature Center clean.
- **Mike Quinlan** for supplying seed and keeping the bird feeders full.
- **Bill Steiner** for handcrafted birdcalls to be used in Cub Scout programs.
- **Cynthia Bravo** for the *Handbook on Insect Enemies of Flowers and Shrubs* from USDA.
- **FOJB** for purchasing 6 copies of the new "Underwater Grasses in Chesapeake Bay & Mid-Atlantic Coastal Waters. Guide to Identifying Submerged Aquatic Vegetation," produced cooperatively by Maryland Sea Grant College, NOAA, ACB, and DNR.
- **Jane Fallon** for small bumblebee models.

Vernal Pool Census

Thursday, March 15; 2:30-4:30 pm
Thursday, April 5; 10 am - noon
Saturday, April 28; 2-4 pm
Sunday, May 6; 10 - noon

Don a pair of hip waders and walk the vernal pool at the Glendening Preserve to document the eggs and larvae of spring-breeding amphibians. For adults and children over 12.

Marsh Clean Up

Saturday, March 31; 10 am - 3 pm
Saturday, April 14; 10 am - 3 pm

Volunteers will pick up trash that has floated in the marsh. Please dress in work clothes (long sleeves and long pants), including boots or shoes that can get wet, and bring work gloves, a bag lunch, a change of clothes and a towel. Children should be at least 6 years old. Scout troops and community groups are encouraged to participate.

Canoe Guide Orientation

Saturday, April 14; 2-4 pm

We need experienced canoeists interested in leading groups on nature and history tours. This land-based training will cover volunteer responsibilities. Free. Adults.

Canoe Trips for Volunteers

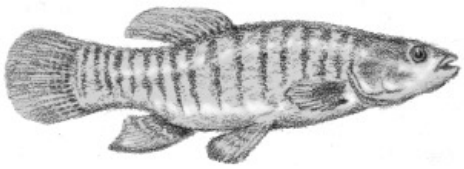
Saturday, April 28; 9:30 am-1:30 pm
Sunday, April 22; 9:30 am-1:30 pm

These trips allow of volunteers to refresh their canoeing skills and learn more about the Patuxent River and wetland ecology. Canoe leaders get priority, but all volunteers are welcome along for the ride.

Stream Monitoring

Tuesday, May 1; 9:30 am-noon

Volunteers are needed to help collect, identify, and count stream invertebrates that are used to evaluate stream health. Dress for the weather and wear waterproof boots or shoes and clothes that can get wet and muddy. Bring a change of clothes and a towel. Date is subject to change. For adults and children over 12 years old.



Fish Survey

Saturday, May 19; 10 am-noon
(Two Run Creek)
Saturday, June 23; 11 am - 2 pm
(Patuxent River)

Using a large seine net, we monitor the fish populations living in shallow water and creeks. Volunteers willing to get wet are needed to help catch, identify and measure (and then release) fish. Wear shoes and clothes that can get wet and muddy. Bring a change of clothes and a towel. Children must be at least 12 years old.

Herp Search

Saturday, June 2; 10 am-3 pm
Saturday, June 9; 10 am-3 pm

Join our annual reptile and amphibian (a.k.a. herps) research study. We'll search the forest, stream banks and marsh edges for turtles, frogs, toads, salamanders, lizards and snakes. Participants will be assigned to teams to help identify and map where the herps are found. Free admission to the Sanctuary. Children should be at least 8 years old.

Adopt-a-Plot Training

Join our team to remove the non-native invasive plants from our forests and nip them in the bud before they spread and threaten the special habitats and rare plants found on the Sanctuary. Individuals, families and groups can adopt their very own plot to monitor, map and manage the invasives. Wear long sleeves, long pants, and sturdy work shoes. Bring water, and if you have them, work gloves and hand pruners. Children should be at 8 years old. Trainings are done on an individual basis. Please contact Karyn Molines or Lindsay Funk Hollister to arrange for training.

Box Turtle Population Censuses

Volunteers are needed from early May through October to help with weekly turtle censuses of 1 hectare study plots. The one hour censuses take place on Thursdays at 1 pm.

Box Turtle Movement Studies

We need volunteers to help track and map the movements of adult and juvenile box turtles. Fieldwork takes place several days each week and we can fit the field work to match a volunteer's schedule.

MAPS Songbird Population Study

2007 will mark 18th year of our songbird breeding productivity and survivorship study. Volunteers help open mist nets, remove birds from nets, band, and determine the age and sex of songbirds. Fieldwork dates are: May 24; June 3, 12, and 24; July 3, 15, 24, and 31; August 5.

Have fun while volunteering at Jug Bay!

Lichens Notable in Winter Landscape

By Jennifer Muro, Volunteer

With the combination of melting snow and bright winter light, lichens are more colorful than at any other time of the year. They begin to glow on overcast days, bringing a richness of shapes and colors-red, yellow, apple-green, orange, brown, black, and sometimes blue. As chameleons change their colors, lichens, as well, alter from an earthy brown to bright green on a wet day. Round patches of bright green *Parmelia* lichens are noticeable on most trees.

Unusual, fascinating, and somewhat mysterious, lichens are slow-growing organisms of simple structure. They grow in most habitats and abide or flourish in a broad array of environments around the world: desert, jungles, ice-lands, and near fresh- and saltwater.

Lichens are composed of two organisms: a colorless fungus and photosynthetic green algae living together. Ecologists refer to this symbiotic relationship as mutualism, where both organisms benefit. Lichens lack flowers, leaves, stems, and roots. Chlorophyll is absent from the fungus, which is therefore unable to make its own food. Using the sun's energy, the alga creates simple sugars from water and carbon dioxide. Both the alga and fungus receive nourishment from the alga's production of sugar. The alga, in turn, receives shelter and protection from the fungus.

Lichens succeed in a wide variety of moisture and temperature conditions. They lack the protective waxy outer cuticle that flowering plants have and therefore have little control over water loss. Lichens have evolved a host of adaptations that make it possible to endure a lengthy period of dehydration-even periods of drought lasting for several months. During extended dry periods, when their water content decreases to 15 - 30%, they can switch off metabolic processes. With rain or heavy dew, lichens absorb water and photosynthesize within minutes, provided there is sufficient light. Some lichens rely on absorbing water from the atmosphere, for example, from fog, rather than from rain. When dry, lichens are very brittle and crush easily, but many become bright green with hydration. They also have a limited need for nutrients and can withstand extreme temperatures.

A broad array of surface features and structures help us classify and identify lichens: foliose (leaf-like), crustose (thin and crusty growing close to surface), fruticose (shrub-like), squamulose (scaly), and umbilicate (having an indentation). Some known lichen varieties are: mushroom, coral, pin, reindeer moss, pixie cups, script, flask (similar in appearance to golfer's tees), pyrenolichens (those having round, fruiting bodies in a small, flask-shaped body structure), and urban lichens, found on tarmac, old cathedrals, gravestones, rusty cars, buildings, and brick.

Lichenologist William Purvis, states that "many different lichens grow on trees, for a single tree provides diverse habitats for lichens during its life. Lichen communities change through natural succession and due to changes in the environment of the tree. Some take up to 30 years to develop to maturity. Locations of species on the tree may vary." Aged woodlands have greater lichen variety; some lichens have restricted powers of spreading and are limited to old-growth forests. A tree's nutrient status, bark texture, ability to store water, aspect, slope, and acidity (pH), as well as light levels, air quality, humidity, and competition from mosses influence the abundance and variety of lichens that grow on it.

Parmelia (found on trees and fallen logs) and ground-dwelling *Cladonia* (accompanies certain moss varieties) species are found in the outdoor classroom at the south end of the meadow and off the Otter Point Trail. With over one thousand species worldwide, *Parmelia* lichens make up the largest group of foliose lichens found on soil, rocks, bark and wood. Reindeer moss lichen *Cladonia* form a large genus containing several hundred species found in the world's heathlands. Architects and miniature railroad enthusiasts use the thick-branched, frost-like, ground-spreading *Cladonia*, which resembles small shrubs, in their models.

Drawing by Jennifer Muro

Some birds use lichens in nest building.

Photo credit: Richard Muro

Reindeer and flask lichen nestled among moss.

Lichens play an important role in many ecological systems. They break down rock minerals, leading to soil formation. Birds, insects, and other animals use lichens as food, nesting material, and camouflage. Observations that high levels of nitrogen and sulfur in the atmosphere have a negative impact on lichens have lead scientists to use certain lichen species as indicators of air quality. A great variety of beneficial lichens indicates cleaner air. When seeing a healthy diversity of lichens, think of lichen expert David H. Richardson's quote: "Air fit for lichens, and water fit for trout."

Winter, when leaves in the deciduous woodlands have fallen from trees and light levels are best, is a good time to examine lichens. Why not come out and discover some of these fascinating symbiotic organisms?

Wild Rice Research is a Study in Mud

By Christina Ludema, Jug Bay Summer Fellow

As winter has begun, blustery and cold here in Michigan, I wonder what the marshes at Jug Bay look like. Without the tall Wild Rice that I spent my summer researching, I imagine the landscape looks quite different. When I started work as a summer intern, the Wild Rice *(Zizania aquatica)* had just made its appearance, its vibrant green brightening the marsh. By summer's end, this plant is ten to twelve feet tall.

Many of you have probably heard of Wild Rice as a food, a heartier alternative to white rice. The rice that grows on the Eastern seaboard in freshwater, tidal marshes, however, is not generally harvested for human consumption. Its smaller kernels make a more suitable food source for migrating birds, particularly the Sora. In recent years, the Wild Rice population has been declining, primarily due to Canada Geese that graze on sprouting rice plants. Restoration efforts by Greg Kearns at Patuxent River Park, Elaine Friebele, and others have been very successful.

Despite the important role that Wild Rice plays in the wetland ecosystem, little is known about the specific ecological conditions under which it grows. The project undertaken this past summer dealt with three main questions. The first concerned how its rate of Wild Rice growth was affected by the presence of other wetland plants, principally Spatterdock. Elaine and I measured the heights and densities of Wild Rice plants growing with and without other emergent species. We found that Wild Rice grew taller earlier in the season and slowed down later in the season when growing with other emergent plants. Possibly Wild Rice plants growing with other vegetation invest more energy in growing taller than the surrounding plants to compete for light.

The second and third parts of this project, were interrelated. We hypothesized that plants growing closer to the open water of the Patuxent River would grow better, more densely and taller, as they may have improved access to nutrients in sediments brought by the river. We again measured plant density and heights, this time in pure Wild Rice stands close to and far from the open water. As well, we saw an area early in the growing season where there was a distinct height disparity and color difference between two groups of rice plants. We thought that this difference could be due to differences in nutrient concentrations in the sediments.

The nutrient content of the mud in which the rice grows was by far the hardest thing to measure. We used two methods to measure nutrients in pore waters of the marsh soil. The first involved taking cores of the mud in the rice stands, sectioning the core, and removing the water by centrifugation. Walking out into the marsh in knee-high mud was usually challenging, but balancing on boards so as not to disturb the sediment while lugging a large metal corer was especially difficult. The second method used a device aptly named the "sipper." This device is a long Teflon tube with holes in a concentrated area connected by some tubing to a syringe. You insert the Teflon tube and draw up the pore water that is at the same depth as the holes. This method proved much easier, despite some roots clogging the holes. Though Elaine and I did collect some hard-earned data using these two methods, more research is needed to elucidate the ways that nutrient concentrations affect rice growth.

Jug Bay Fellow Christina Ludema samples nutrients in marsh soils

This research will help to build a greater understanding of how and where Wild Rice grows. Having spent so much time in the marsh, I really appreciate this kind of research in a different way. Being out in the marsh is peaceful, beautiful, slimy, and fun—an experience that I hope everyone can have. So, as the snow swirls outside, I think of summer when the Pickerelweed blooms, the dragonflies flit from plant to plant, and the Wild Rice makes its annual journey from seedling to ten-foot tall adult.

Continued from page 11

about 10 years ago to conduct field-based education programming on the Bay. I worked on traditional Bay boats for the Living Classrooms Foundation (LCF) in Baltimore and later beginning a new program for LCF in partnership with the Earth Conservation Corps in Washington, DC, on the Anacostia River. Five years ago, I began working for the Chesapeake Bay Foundation (CBF) as assistant manager of their Baltimore Harbor Program and captain of the *Snowgoose*, their educational workboat. These experiences enable me to bring a fair bit of experience in developing, managing and implementing field-based educational programming as the CBNERR Education Coordinator.

While at CBF I spent many of my nights in graduate school at the Johns Hopkins University in the Environmental Science and Policy program, where I completed the coursework for a master's degree just last month. My thesis project looked at the role of Baltimore City Building Codes in encouraging or precluding the use of green building practices. It is a real page turner if you are interested.

Again, we all look forward to working with the staff and volunteers at the Sanctuary.

Meet CBNERR's New Staff

The Chesapeake Bay National Estuarine Research Reserve in Maryland (CBNERR) has experienced many changes in the past year, and we would like to take this opportunity to let you all know about the biggest change: the new CBNERR staff.

Manager - Beth Ebersole

I'm very excited about returning as Manager of the CBNERR in Maryland. A few of you may remember me from way back in 1990 when I helped bring Jug Bay into the Reserve. Programs underway at Jug Bay are making a difference by improving environmental literacy, fostering a sense of stewardship, and helping Marylanders to understand estuarine systems and the connections between human activities and impacts to the estuary. The CBNERR staff and I look forward to supporting the ongoing programs at Jug Bay, as well as working together to develop complementary programs to further achieve these goals.

For the last nine months, I worked at NOAA's Estuarine Reserves Division, the federal arm of the NERR system. Prior to that, I served for nine years as an estuarine ecologist and statistician studying the Chesapeake Bay with the Maryland Department of Natural Resources. In that capacity, I analyzed long-term trends in water quality, managed benthic monitoring and ecosystem processes monitoring contracts, and worked with other scientists to try to understand changes in the Chesapeake and the effects of management actions on these changes.

I received my master's degree in marine-estuarine environmental science from the University of Maryland in 1992 and my master's in biostatistics from the Johns Hopkins University in 2002. In my spare time, I tutor children, specializing in students with reading disabilities. I am also an avid Ravens fan, so don't be surprised if you see me wearing purple on Game Days!

Coastal Training Program Coordinator - Sasha Bishton

The Coastal Training Program (CTP) provides science-based information to individuals who in a professional, volunteer, or elected capacity make decisions that affect our coastal resources. The goal is to make sure that these individuals have the best information possible so that they understand how their decisions affect such things as water quality, living resources, wildlife habitat, land-use, and recreation. Through the program, we will deliver regional trainings, foster partnerships, and help build capacity with groups who are already providing training in the Bay region. We are committed to seeing this program reach it greatest potential and excited by where that could lead. If you have any input on this program, please contact Chris Swarth, who is a member of the Advisory Committee, with your suggestions.

I graduated from St. Mary's College of Maryland with an ecology focus. Prior to working with CBNERR I worked for the Chesapeake Bay Program on native oyster restoration and at the Smithsonian Environmental Research Center investigating the role that ballast water plays in the spread of non-native species worldwide. I hope to see you around Jug Bay soon.

Stewardship Coordinator - Candace Morrell

Prior to joining the CBNERR team, I held a position with BAE Systems (North America) as their natural resources and National Environmental Protection Act (NEPA) specialist. At BAE, I worked for a group of engineers who design and build nuclear submarine bases for the Navy. My role as a NEPA specialist was to evaluate potential environmental impacts associated with anything the Navy builds or installs on their submarine bases, and to ensure that they stay in compliance with the requirements of NEPA.

Before I began working with BAE, I was a staff scientist and instructor at the Academy of Natural Sciences Estuarine Research Center (NSERC) in St. Leonard, Maryland, where I conducted research on oyster diseases, bio-monitoring of Bay tributaries, and oyster and SAV restoration programs for the general public as well as mitigation efforts. I also taught environmental education classes for NSERC.

Education Coordinator - Bart Merrick

I was born in El Paso, Texas, grew up in Buffalo, New York, and moved to Baltimore

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Chesapeake Bay
National Estuarine Research Reserve
MARYLAND

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).

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Jug Bay Wetlands Sanctuary

DEPARTMENT OF RECREATION AND PARKS

Jug Bay Wetlands Sanctuary
1361 Wrighton Road
Lothian, MD 20711
410-741-9330

There is a spring activity for everyone

Come to the

Friends of Jug Bay Annual Meeting McCann Wetlands Center

Sunday, March 18 3 to 5 pm

- Speaker: **John Griffin, Secretary of Maryland Department of Natural Resources**
- Presentation of the 2007 Jug Bay Award.
- Election of officers
- Refreshments

Winter Volunteers (November 2006 - January 2007)

Sandy Barnett
Susan Blackstone
Cynthia Bravo
Peggy Brooks
Judy Burke
Gordon Burton
Mary Burton
Jeff Campbell
Betty Chaney
Ginger Chaney
Marjorie Crain
Eric Dabney
Carol Daniels
Paul Danko
David Davis
Mark Delfs
Eric Duce
Kathy Ellett
Kim Elliott
Caitlin Fleming
Brigitte Fortin-Zaidan
Robert Frezza
Diane Goebes
Jim Harle
Ami Hazell
Ben Hollister
Elizabeth Kurgansky
Deb Leifer
David Linthicum
Judy Mauriello
Caitlin Megonigal
Bill Miles
Louise Miles
Dotty Mumford
Jennifer Muro
Jim O'Reilly
Carol Quinlan
Michael Quinlan
Gordon Reynolds
Kenneth Riggleman
Jeff Shenot
Lisa Siciliano
Bob Smith
Yuka Tasumi
Sandy Teliak
Al Tucker
Peter Uimonen
Nancy Weber
Bruce Weidele
Bob Williams III
Brian Woodward
Dick Worth

New Board Members Needed

Do you love visiting the Sanctuary? Does your family enjoy our programs? Are you interested in continuing the Sanctuary's mission of conservation, research, and education? Consider becoming a board member of the Friends of Jug Bay. The board meets six times per year, and committees meet periodically. If you are interested, please call the nominations chair, Jim Harle (410 741-5855). Board members are elected at the Annual Meeting.