

Streams and Storm Water: Impacts and Solutions

By Janis Oppelt, volunteer contributor

When we think of a sanctuary, we automatically think of words like refuge, protection, and shelter—and these words do, indeed, apply to the 1,700 acres that are the Jug Bay wetlands. Unfortunately, the word sanctuary also implies that trouble lurks just outside the boundaries, particularly for Galloway Creek, Two Run Branch, and Pindell Branch—the three Chesapeake Bay tributaries that run through the Sanctuary.

As stated in the summer edition of Marsh Notes, one example of the lurking trouble, as evidenced by the Patuxent Riverkeeper's 2008 Report Card, is the poor water quality found in the Patuxent River and health index parameters (such as dissolved oxygen, water clarity, aquatic grasses, etc.) that are “well below target levels.” And since the Patuxent, like all rivers, is fed by smaller tributaries, this poor grade is a direct reflection of the streams that feed it, and the land-use practices along those streams. On page 2 is a table of the land-use practices within the Sanctuary's three tributaries.

A primary reason for the poor water quality is the abundance of impervious surfaces (such as roadways, parking lots, and buildings) and the lack of effective storm water management. Rain and melting snow turn into storm water, which runs off streets, lawns, farms, and construction and industrial sites. Under natural conditions, the ground absorbs the storm water, where it is filtered and ultimately replenishes aquifers or slowly flows through forests and meadows into streams and rivers.

However, in developed areas with extensive impervious sources, which are located upstream from the Sanctuary, that is not the case. Most of the storm water does not seep into the ground immediately. Instead, it runs off of impervious surfaces and into storm drains, sewer systems, and drainage ditches. The resulting rush of storm water discharge can cause infrastructure damage, downstream flooding, and stream bank erosion. In addition, the bacteria and other pollutants not filtered from storm water can contaminate watersheds and coastal waters.

View From the County

Every four years the county uses high-resolution satellite imagery to delineate all of its impervious



Photo by Lindsay Hollister

This storm drain near the headwaters of Galloway Creek catches whatever comes in off the road and transports it directly to the creek. Note the aluminum can and other debris clogged in the drain.

surfaces. The view in 2007 showed that the impervious surface in the Middle Patuxent (where the Sanctuary is located) is 6 percent—the lowest percentage within Anne Arundel County.

According to the Center for Watershed Protection, the physical habitat and biologic functions of streams degrade when the impervious surface reaches between 5–10 percent of the total watershed area. This suggests that subwatersheds such as Galloway Creek and Pindell Branch, with less than 10 percent of impervious surface, are considered sensitive but not impaired. However, evidence shows that sediment, nutrient, and biologic impairments persist despite the low impervious cover.

Ginger Ellis, a planning administrator for Anne Arundel County's Watershed Ecosystem and Restoration Services, says, “In the case of the Middle Patuxent, we know that we are exceeding water-quality thresholds for three indicators: biological, sediment, and nutrient impairments. However, the Maryland Department of the Environment (MDE) has not developed TMDLs for this part of the river yet.”

Although TMDL is, indeed, yet another government acronym, it's an important one that stands for total maximum daily load. The Environmental Protection Agency (EPA) defines TMDL as the “total pollutant loading that a water body can receive and still meet water quality standards. [The TMDL] assigns a pollutant allocation to a specific point source [sewage

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 Lothian, MD 20711
 410-741-9330
 e-mail: info@jugbay.org

Jug Bay web page:
www.jugbay.org

Jug Bay Wetlands Sanctuary is operated by the Anne Arundel County Department of Recreation and Parks. It was established in 1985 with the goals of wetlands research and environmental education. The Sanctuary is a limited-use park. Groups 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 Maryland system, which promotes scientific research, public education, resource management and stewardship in estuarine reserves across the nation.

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Comments and suggestions are welcome.

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treatment plants and factories, for example] and nonpoint sources [impervious surfaces].” For our state, it is the Maryland Department of the Environment’s responsibility to develop TMDL allocations, and each county government is responsible for implementing the restoration plans.

However, there are two big challenges for the counties to implement plans to reduce these pollution levels.

- Local jurisdictions don’t have sufficient funds to create enough restoration projects to meet the water-quality standards. Ellis says that this is exacerbated by the fact that “most of the pollution was created in an era that preceded current storm water management policy and regulations.”
- Local jurisdictions don’t have control over private, state and federal land, which typically comprises more than 80 percent of the total area within the county.

The good news is that Anne Arundel County has designated the Sanctuary as a “high-priority-for-preservation area” in its Greenway Master Plan and Comprehensive Watershed Studies, says Hala Flores, program manager of the Anne Arundel County Watershed Assessment and Planning Program. The reasons for this designation include several elements that are important for watershed health, including high and contiguous forest cover, high percentage of wetland cover, highly erodible soils, high

density of headwater streams, and the presence of historic spawning areas for anadromous fish such as American and hickory shad (those that migrate up rivers to spawn).

Challenges to Clean Water

Jeff Shenot, a Friends of Jug Bay (FOJB) board member whose professional background is coastal and marine fish and wildlife habitat, points to changes in land use and ineffective storm water runoff management as two of the threats to Sanctuary streams.

Land-use changes include a variety of human activities that affect runoff, such as vegetation clearing; grading the land surface to change the slope; and construction of buildings, parking lots, sidewalks, and roads. Impervious surfaces are created with impenetrable materials such as asphalt, concrete, brick, and stone—materials that seal surfaces, repel water, and prevent precipitation from infiltrating soils. Impervious surfaces also can concentrate and accelerate the flow of runoff, which enables the water to carry larger particles of dirt, debris and pollutants. This enhances the erosive capability of runoff, which further exacerbates its effect on watersheds.

Changes in land use also affect water quality. As the percentage of vegetative (especially forest) land cover decreases and

Land Use in Patuxent Tributary Streams

	Galloway		Pindell		Two Run	
Land Use Types	acres	%	acres	%	acres	%
Forest	808.8	58	370.8	72	813.9	58
Row Crops	155.7	11	79.5	16	80.8	6
Pasture/Hay	35.3	3	5.9	1	69.1	5
Roads	73.5	5	7.3	1	20.2	1
Open Space	60.5	4	4.7	1	17.5	1
Water	2.3	<1	0.0	0	2.4	<1
Residential	227.3	16	44.8	9	181.2	13
Open Wetlands	24.7	2	0.0	0	209.2	15
Commercial	11.4	<1	0.0	0	3.0	<1
Total Acreage	1399.4		512.9		1397.3	
Stream Length (mi)	3.3		1.47		2.3	

Data from Anne Arundel County Department of Public Works (table by 2009 Research Intern Andreas Moshogianis)

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Dear Friends,

Why is Jug Bay Important? At first glance the question appears too simple and the answer seems obvious, but upon reflection the nuances embedded in it become extremely complex. I think if you ask this question to the Sanctuary staff, the volunteers or our members, you would get a broad spectrum of answers, since each of us has a different reason for coming to Jug Bay. But when one looks a little deeper into this question, I think you will find a common underlying purpose that few of us take time to articulate.

Some come to enjoy the peacefulness and beauty of the “Sanctuary”. And others come to “work” helping with research projects or with educating others, knowing that they are contributing to understanding the role wetlands play in the global environment. And others among us contribute with public advocacy and awareness for the greater public good. One might argue that these are utilitarian points of view and reflect individual personal preferences. Yet each of these activities collectively underpin a greater purpose of why we think Jug Bay is important.

Over time we have come to understand that Jug Bay really represents a unique local ecosystem, and like all other local ecosystems around the world, external forces threaten its unique viability. The threats though are distinctively human, resulting mostly from the global monoculture introduced by suburban living and the large ecological footprint it requires. It brings forest clearing, introduces non-native plants, creates impervious surfaces for roads, houses office buildings and schools, and produces air and water pollution. These actions, in turn, consume the local ecosystems that remain, and which harbor the native fauna and flora. Already the environs of Jug Bay have seen the demise of bobwhites, copperheads, and now the failure of oak and other hardwood trees to regenerate. Meanwhile, invasive trees like ailanthus and box elder crowd the remaining hardwoods, while animal species like deer dominate and destroy the underlying food chain.

In short, the principal threat to the Sanctuary is the loss of its biodiversity. Those ecosystems that are best positioned to survive are those that maintain a diverse number of species of plants and animals. I have come to believe that maintaining biodiversity is that common underlying purpose of why Jug Bay is important.

The value of biodiversity is not universally recognized. Two important characteristics that result from it are:

- Adaptability to climate change and
- Fundamental Economic Value

Natural selection depends on a wide range of biodiversity, since it increases the chances for genetic variation. When these choices become limited, evolution ends in abrupt extinctions and then the process restarts from a new beginning. Some pessimists believe we are headed for the “Sixth Extinction”; one caused by humans. Without a broad spectrum of plants and animals suited for local climates, the chances for our ecosystems to adapt to climate change is severely diminished.

Often we overlook the economic value an ecosystem returns to us. For example, the bacteria, plants and animals in wetlands at Jug Bay make a tremendous economic contribution by trapping sediment and purifying the estuarine water flowing through them. Typically, they remove ~50% of the nutrients, while sequestering carbon, denitrifying nitrates and producing oxygen at rates far higher than other types of ecosystems. If one had to build water treatment plants to remove the nutrients captured and recycled in Jug Bay, then one could begin to understand the economic value they provide to us.

Lastly and arguably the reason for why Jug Bay is important is the moral and ethical one, namely the need to protect biodiversity for future generations of humankind. I suggest that perhaps this is the underlying motivation for why each of us is committed to Jug Bay.

Several groups have overarching goals to protect the environment, but that number decreases rapidly when it comes to those who directly preserve local ecosystems. It is here that the really hard work needs to be done. As you can see, the scope of the effort at Jug Bay spans the entire gamut of activity for protecting its biodiversity. It takes the commitment of individuals working together to save these ecosystems. So please come to the Sanctuary, enjoy it, become a volunteer and/ or member of the Friends and help us ensure the future.

*“What is man without the beasts? If all the beasts were gone,
man would die of great loneliness”*

—Chief Seattle

Al Tucker, President

**Register for FOJB
Programs at
www.friendsofjugbay.org**

Animal Outreach: A celebration in crafts and stories

Sat., Jan. 23, 2010 (10:00 a.m. – noon)
Join Sanctuary volunteers and Greenstreet Gardens in a morning of family fun making pinecone birdfeeders, edible garlands, and other bird crafts.

Tanzania Wildlife Adventure

Sun., Feb. 28, 2010 (noon - 3:00 p.m.)
Enjoy a variety of hearty home-made soups and fresh bread with fellow nature lovers. Then sit back with a cup of coffee or tea and dessert and enjoy Harry Coulombe recount his travels through Tanzania with his wife and fellow biologist, Linda.

Area High School Students Serve Up Stewardship

By Lindsay Hollister

Emmett Carstens and Kaitlin Creamer—Enhancing meadow habitat

To earn their Silver Award (the highest award girl scouts age 11-14 can earn), volunteers Emmett Carstens & Kaitlin Creamer approached me to ask about a conservation project they could complete here. The meadow near our parking area has several features that made it a prime conservation project site. A few years back, an Eagle Scout created a sheltered area for over the benches. I always wanted to see a variety of native vines, like Trumpet-creeper, Grape, and the endangered milkweed vine *Matelea* climbing up and over this structure to create a living roof. Also, in the five years I have been here there has been a decline in the abundance of milkweed. I offered the girls the idea of establishing milkweed in the meadow using River Farm stock, and introducing *Matelea* and Trumpet-creeper vines to the base of the wooden supports to begin growing a living roof.

The girls developed a well thought-out and thorough plan for their project

early this past spring, and we were under way by April. Venturing along the edges of open habitats they learned how to identify the seed pods of their target species. The girls collected and successfully propagated Angle-pod (*Matelea carolinensis*), Trumpet-creeper (*Campsis radicans*) and Common Milkweed (*Asclepias speciosa*) seeds.

After growing the seedlings the girls came with plants and signs to install in the meadow, indicating to passersby the intent of their project. Emmett and Kaitlin diligently visited their plant plots for three months to check on the progress of their project while simultaneously creating a special “Vines of Jug Bay” educational binder to inform visitors about our native



Girl Scouts Emmett Carstens (left) and Caitlin Creamer at our entrance sign.

vines and each species benefits.

The project was completed by early summer and we have several new milkweed plants and vines fending for themselves in the meadow to add habitat variety as well as aesthetics. As added reassurance, Kaitlin retained “extra” milkweed seedlings that will be planted next year.

Zach Franklin - Eagle Scout project

Eagle Scout candidate Zach Franklin from Troop 741 installed an information kiosk at the Wrighton Road entrance to the Glendening Nature Preserve. This project was designed to compliment the kiosk installed by volunteer Mickey Taylor at the Plummer House. Zach’s family has been in the area for many generations so he was familiar with Jug Bay and has assisted his fellow scouts with other projects. And though this project required following extremely detailed plans, he tells me that he thought the project was going to be a lot harder than it actually was.

In classic eagle project form, Zach spent time organizing all his materials and labor. Then, in one weekend his crew came out and completed the entire installation.



Zach (on roof) and a fellow scout putting finishing details on the information kiosk.

In his follow-up interview, Zach said his “favorite part was putting on the doors” because they “really made the project look like a kiosk.” Zach “learned a lot about

leadership and teamwork”, and has “grown from this.” We were also pleased to hear that “Jug Bay is easy to work with and rewarding.”

Patrick Owens - Eagle Scout project

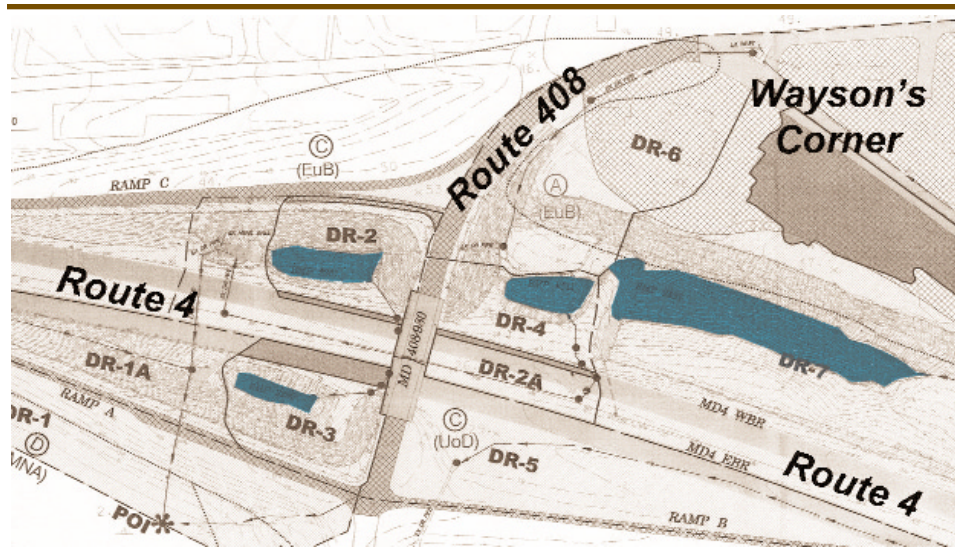
Our newly minted Boy Scout Badge Counselor, volunteer Harry Coulombe, was approached by scout Patrick Owens who wished to earn the William T. Hornaday badge. This was a first for Jug Bay. This award is presented “for distinguished service in natural resource conservation.”

Harry and Patrick designed a plan to remove the invasive Tree of Heaven (*Ailanthus altissima*) and Japanese Stilt Grass (*Microstegium vimineum*) from the forest between the Utility Road and the Otter Point Trail. After thorough planning, Patrick organized family and friends to join him for a weed-pulling fest in September.

The crew was treated to many wildlife sightings: Black Rat Snakes, Worm Snakes, Garter Snakes, a shrew, a Velvet Ant, a Six-lined Racerunner, a Five-lined Skink, a Box Turtle, earthworms, a Forest Millipede, and a Marbled Orb Weaver Spider. The most exciting wildlife discovery of the day however, goes to a tiny moth. In the ermine moth family, the *Ailanthus* Webworm Moth was found feeding on the leaves of the Tree of Heaven. Something that is helping to curb the spread of an invasive plant? This was good news. Read our “Take a Closer Look...” feature to learn more.

Over a two day period, Patrick mustered 15 volunteers to conduct 126 hours of labor resulting in 1/3 of an acre cleared and treated for invasives. The forest thanks you!

Patrick clearing stilt grass from the forest floor.



The four blue patches on the map show the stormwater ponds that the SHA is planning to upgrade. Wayson's Corner is located just north of Route 4 in the Galloway Creek watershed. (Map courtesy of State Highway Administration)

impervious surfaces increase, the average temperature of streams receiving the runoff increases, which can have a significant adverse impact on the watershed's biological resources. A loss of diversity, and in particular a loss of cool-water organisms, can be very difficult to mitigate in a stream such as Two Run Branch. As Shenot says, “There is a direct correlation between water quality, biological species, and impervious surfaces.”

One direct threat to Two Run Branch is the proposed construction of the Arundel Bay Christian Academy, an educational institution planned for 400 full-time students. Although construction has not yet started, the landowner already has performed extensive vegetative clearing. A homeowner adjacent to the property testified at an August public hearing held by MDE that his yard now receives flash flooding due to the clearing.

Including losses to the homeowner's property value, Two Run Branch now has additional sediment loading that covers gravel where fish spawn, suffocates salamander eggs, and dumps silt on streamside vegetation. The increased flow rate also contributes to the down-cutting of the channel, and it disconnects the creek from its floodplain wetland. The storm water runoff not only raises water temperature and erodes stream banks, it also carries pollutants like hydrocarbons, glycols, excess nutrients (phosphorus and nitrogen);

and potentially harmful bacteria or pathogens from sewage or other sources.

Another obvious problem with the proposal is that the existing culvert that conveys water in Two Run Branch under Pindell Road is already undersized. The proposal would increase the flow from runoff in Two Run Branch directly above the culvert, which the developer has no plan to address. The developer stated in the MDE public meeting that this problem would be up to the County to fix, since the developer is not required to do so.

Shenot says, “Although FOJB is not opposed to development, it is adamantly opposed to land-use changes that will degrade the quality of Two Run Branch's water quality. FOJB hopes the county and state will consider this when making the decision to approve the proposal.”

Managing Stormwater

Perfect examples of nearby impervious surfaces are Wayson's Corner at Routes 4 and 408—roadways that are maintained by the State Highway Administration (SHA). The SHA uses several types of storm water management facility types (also known as best management practices [BMPs]) to treat impervious surfaces caused by roadways. One type is a storm water management pond, and there are four ponds adjacent to the Sanctuary. (See illustration above.)

Although these are functioning

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Winter 2009/2010 Public Programs at Jug Bay

Join volunteer naturalists for nature programs.

- Reservations and entrance fees are required for all events, unless noted.
- Call 410-741-9330 or e-mail programs@jugbay.org
- Check www.jugbay.org for information, directions and updates to our schedule.
- Open to the public 9 am-5 pm Wednesday and Saturday.
- Glendening Preserve open Monday - Saturday at Wrighton Road entrance.
- Programs are open to families and individuals. An adult must accompany children under 13.
- Please note age limits for each program.

Entrance Fees: Adults \$5;

Children under 18 \$3;

Over 60 \$3;

FQJB family membership \$25.

Bird Walk

Saturday, Dec 5; 8:00-11:00 am

Saturday, Jan 2; 8:00-11:00 am

Saturday, Feb 6; 8:00-11:00 am

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

Soap Making Class

Saturday, Dec 5; 10:00-11:30 am

Learn about the history of soap and make several bars of soap to take home. These make great holiday gifts. Appropriate for adults and children over the age of 8. Meet at Plummer House (Glendening Nature Preserve). Materials fee: \$5.00 per person.

Tree Decorations for the Birds

Saturday, Dec 19; 1:00-3:00 pm

To celebrate the Winter Solstice we will learn how to make beautiful outdoor decorations for trees. And they are edible for the birds! For all ages. Meet at the Plummer House (Glendening Nature Preserve)

December Solstice Hike

Sunday, Dec. 20; 2:00-4:30 pm

Welcome winter on the shortest day of the year with a brisk hike through the Sanctuary. You'll have great views of the Patuxent River and enjoy the sunset. Be prepared to walk 4 to 6 miles on natural surface trails. For ages 12 and up. Limited to 15 participants. Reservations required.

Explore the Riggleman Preserve

Saturday, Jan 2; 10:00 am-1:00 pm

Join us on a hike to explore the beautiful Riggleman Preserve with its varied upland and wetland habitats. Meet punctually at the Wetlands Center in order to carpool to the Riggleman Preserve. Dress warmly, bring a snack or lunch, and be prepared to hike several miles. Children should be at least 10 years old.

Blackbirds and Woodpeckers

Saturday, Jan. 9; 9:00-11:00 am

Flocks of blackbirds and a variety of woodpeckers are often seen in the bare winter trees. Enjoy a slide show presented by volunteer David Gillum and then go on a hike to learn more about these winter residents. For ages 10 and older.

Waterbirds of the Chesapeake Bay

Thursday evenings,

January 14, 21 and 28 (7:00-9:00 pm)

Saturday mornings,

January 16, 23, 30 (8:00 am-noon)

Instructor: Chris Swarth

Learn about the lives of the waterbirds that make their home on the Chesapeake. This short course will cover identification, natural history, migration, behavior and conservation. Evening lectures take place at JBWS. Saturday field trips will be to the Bay and along the Patuxent River estuary. For beginners and experts alike. Cost: \$50. Advanced registration is required.

Skulls and Bones

Saturday, Jan 23; 10:00 am-noon

Have you ever examined animal bones or a skull and wondered about the creature that they came from? Skulls and bones hold telltale clues about an animal's lifestyle and habits. Learn more about identifying animals through their skeletal system. For ages 8 and older.

Great Backyard Bird Count Training

Saturday, Feb 13; 10:00 am-noon;

1:00-3:00 pm

The Great Backyard Bird Count is an annual four-day event that engages bird watchers of all ages in counting birds to create a real-time snapshot of where the birds are across the continent. Master the identification of the top 10 common feeder birds, learn how to attract birds to your yard, and enter your results on the GBBC web page. Sign up for the morning or afternoon training session.

Winter Tree Identification

Saturday, Feb 20; 1:00-3:00 pm

All trees do not look alike in winter! We'll learn the basics of plant identification using keys and field guides, then take a hike to use our knowledge. This program is designed for those with little or no experience and will focus on twigs, buds, and bark. For adults and teens.

Hawks and Vultures

Saturday, Feb 27; 10:00 am-noon

Soaring through the sky, hawks and vultures have amazing wingspans, not to mention adaptations for locating food from on high. Enjoy a slide show presented by volunteer David Gillum and then go on a hike to spy these denizens of the sky. For ages 10 and older. Meet at the Plummer House (Glendening Nature Preserve).

Spring Equinox Hike

Saturday, Mar 20; 5:00-7:30 pm

Join one of our volunteer naturalists for an exploration of the Sanctuary on the first day of Spring. Look and listen for signs of the new life which is exploding all around us. We'll end up on the Marsh Boardwalk, and watch the sunset over the Patuxent. For ages 10 and up.



Photo by Lindsay Hollister

Upcoming Volunteer Events

Most of our projects require no experience, come to learn!

- To sign up or for more information, call 410-741-9330
- Scouts and other groups must call to arrange a separate event (unless otherwise noted).
- Please note age limits for each event.

Winter Waterbird Survey

Thursdays; 7:30 – 9:30 am

December 3 and 17

January 7 and 21

February 4 and 18

March 4 and 18

April 1 and 15

Enjoy the beauty of a winter morning on the Patuxent while counting waterbirds: Canada geese, northern harriers, eagles, herons, and many species of ducks. Dress for the weather and wear comfortable walking shoes. Not appropriate for children younger than 12.



Trail Monitors Annual Meeting

Saturday, Dec 13; 1:00-3:00 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 and families.

Animal Outreach: A Celebration in Crafts and Stories

Saturday, Jan 23; 10:00 am – noon

Volunteers are needed at the FOJB and JBWS display board, to sell food as an FOJB fundraiser, help create turtle and bird crafts, and more. Event is offsite at Greenstreet Gardens: 391 West Bay Front Road, Lothian, MD 20711.

Great Backyard Bird Count Training

Saturday, Feb 13; 10:00 am-noon;

1:00-3:00 pm

The Great Backyard Bird Count is an annual four-day event that engages bird watchers of all ages in counting birds to create a real-time snapshot of where the birds are across the continent. Volunteers are needed to assist visitors with field identification.



Photo by Lindsay Holister

Student volunteers from the University of Maryland, Baltimore County after a fun-filled trash clean-up in the wetlands. Their motto: The muddier, the better!

Spring Stewardship Day

Saturday, Mar 27; 10:00 am-noon;

1:00-3:00 pm

Stewardship means taking care of the land we all share. Join us to pick up trash that has floated into the marsh, pull invasive weeds, and maintain our native plant gardens. 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. Sign up for am, pm, or both.

VOLUNTEER STATISTICS:

Fall Volunteers

Joe Acton	Woody Martin
John Allyn	Brian Matenich
Rebecca Allyn	Bill Miles
Colin Barnett	Louise Miles
Sandy Barnett	Rob Mitchell
Marty Barron	Dave Mozurkewich
Susan Blackstone	Anne Muecke
Richard Blass	Manfred Muecke
Cynthia Bravo	Dotty Mumford
Judy Burke	Jennifer Muro
Rae Burns	The Owens Family:
Jennifer Burroughs	Patrick, John, Ernie,
Mary Burton	Charlee, Regan
Stephen Caibine	Jan Owings
Jeff Campbell	Dave Perry
Karen Caruso	Tom Petska
Bryan Coble	Abby Powell
Molly Coffman	Carol Quinlan
Hannah Collins	Michael Quinlan
Linda Coty	Olaf Rask
Harry Coulombe	Natasha Rathler
David Davis	Gordon Reynolds
Cathryn Dippo	Samantha Rough
Malcolm Doying	Ame Shepherd
Eric Duce	Jackie Shrader
Kate Fazio	Lisa Siciliano
Jack Filigenzi	Robert Stall
Jean Filigenzi	Jay Stefany
Kristin Fischer	Kelly Svehlak
Ric Foster	Mickey Taylor
Robert Frezza	Sandy Teliak
Rosemary Frezza	Jessica Terneus
Lynette Fullerton	Denny Townsend
Clair Garman	Nancy Weber
Joyce Gillespie	Bruce Weidele
Diane Goebes	Bob Williams III
Ernie Goins	Kerry Wixted
Shirley Grace	Becki Wolf
Lynn Kenny	
Peter Kenny	
Dave Larrabee	
David Laughlin	
Claire "Grammie"	
Lind	
Daniel Lind	
Eric Lind	
Matthew Lind	
Rachel Lind	
Andrea Loudermilk	
Cliff Loudermilk	
Erica Loudermilk	

During the fall, volunteers logged 980.75 hours

Thanks to all!

Save the Date!

Annual Volunteer Appreciation Social

Sunday, February 21, 2010

2:00 – 5:00 pm

**Quiet Waters Park
(Blue Heron Room),
Annapolis**

Volunteers Going Above and Beyond

Website Assistance:

A special thanks to **Clair Garman** of the Friends of Sligo Creek. Modeling the Wildlife Sightings log that Clair created on the FOSC website, he worked with naturalist **Susan Matthews** to create a similar feature on our new website. Take a moment after your visits to share your wildlife sightings with the whole Jug Bay community.

Ric Foster for being available to assist staff with learning the new site's features.

Cynthia Bravo for editing and uploading information and photos to the new site.

Animal Care volunteers:

Linda Coty, Shirley Grace, and Eric & Daniel Lind for keeping Tripod, Cinco and Patches well-fed and well-cared for all summer.

Administrative volunteers:

Cynthia Bravo, Mary Burton, Karen Caruso, Kate Fazio Gordon Reynolds, Jan Owings, and Dotty Mumford for keeping the Wetlands Center open with a friendly face when staff are unavailable.

Education volunteers:

Harry Coulombe, Lynette Fullerton, Robert & Rosemary Frezza, David Gillum, Diane Goebes, Jennifer Muro, Gordon Reynolds, and Mike Quinlan for the countless hours spent planning and leading hikes for our visitors.

Research Advise:

Jeff Campbell, Gene Meyer and Harry Coulombe for their part in moving new projects forward.

Sandy Barnett for organizing so many great Friends of Jug Bay events.

David Laughlin for the ongoing work of improving and expanding our herbarium collection.

Take a Closer Look ...

By **Stephanie Baldwin**,
volunteer contributor

This “creature feature” style column is devoted to things small and/or easily overlooked.

The *Ailanthus* Webworm Moth (*Atteva punctella*) is the cool featured critter here at Jug Bay. Its orange, white, and black stripes make it unique compared to other more camouflaged ermine moths. When resting, these small moths often roll their wings towards the body giving it the appearance of a beetle. The bold markings make it a commonly observed animal during the summer by keen eyes, however, it was not common knowledge the ecological role that this moth plays in our forests.

Native to Central and South America, “this insect has now spread through most of the United States on the heels of the spread of Tree of Heaven (*Ailanthus altissima*). This aggressive non-native invasive tree displaces native trees and is especially difficult to eradicate because of its root structure.

The Tree of Heaven is where the

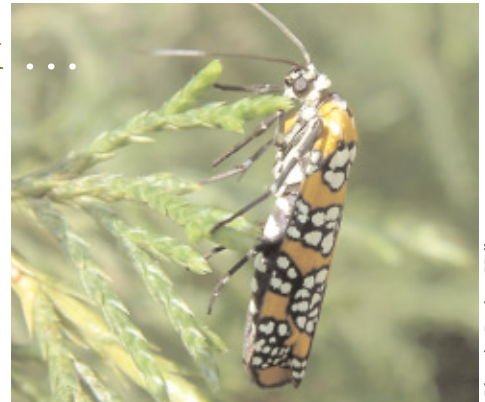


Photo by Lindsay Hollister

An Ailanthus Webworm Moth at rest near the Wetlands Center.

caterpillars construct an interwoven network of loose webbing on the leaves. The diet consists of anything from the flowers to the seeds, and bark. It was here that freshly hatched adults were discovered during Patrick Owens invasive plant removal event, that led volunteer Harry Coulombe to begin the investigation, that led to this great revelation.

Though not Maryland natives, these moths are host-specific as caterpillars and serve as wildlife food and pollinators as adults. They cannot survive the cold weather so adults migrate here each year. They tend to fly from March to November carrying on their life cycle of one generation a year, mating at dawn and laying eggs at dusk.

Garden Club

Recently, our garden volunteers got a boost of youthful assistance from area high school students. Volunteers Ami Shephard, Rachele Burns and Brandi Bottalico spent a few days helping to beautify the Butterfly Garden before the August picnic.

In October, ten Broadneck High School National Honors Society students helped us to finish maintenance on the BayScape garden, and continue improvements to the Butterfly garden. Their positive attitudes and good work ethic enabled us to accomplish much more than expected.

A sincere thank you to all the students who have spent time volunteering with us this year. Though you only spent a short time with us, the impact of your hard work and energy will last for many years.



Photo by Lindsay Hollister

Above: Our Broadneck High School volunteers rest after a rainy afternoon's work.

Right: Ami Shephard, Rachele Burns and Brandi Bottalico hauling weeds from the butterfly garden.



Photo by Cynthia Bravo

Native Plant Proponent: Kerry Wixted

By Susan Matthews

His past field season the Sanctuary flora has been thoroughly examined by new volunteer Kerry Wixted. Though Kerry has already become a valuable research volunteer, her research is for the Department of Natural Resources where she is a resource biologist. Kerry is updating the state records of rare plants in southern Maryland. She first became interested in studying plants while pursuing her BS degree in Wildlife and Fisheries Management from Frostburg State University. She followed this up with a masters degree in Biology from West Virginia University. Kerry is a native Marylander, and an avid nature photographer.

Like all of us who enjoy exploring the Sanctuary, Kerry has her favorite spot – the Cliff Trail at the Glendening Preserve. It was here that Kerry first saw *Matelea carolinensis* (Angle-pod). This species was considered extirpated in Maryland until it was discovered in the Sanctuary in 1987. Kerry has also observed *Desmodium viridiflorum* (Velvety Tick-trefoil) and the rare *Rhynchosia tomentosa* (Hairy Snoutbean). Her work also added several species of herbs to the list of Sanctuary plants: *Bidens frondosa* (Devil's Beggar-tick), *Dichanthelium clandestinum* (Deer-tongue Grass), *Oxalis stricta* (Common Yellow Wood-sorrel), *Lespedeza procumbens* (Downy Trailing Lespedeza), and *Menispermum canadense* (Moonseed).

Landscaping with native plants is a great way to provide beneficial habitats for wildlife. I asked Kerry to list the top five native plants that benefit wildlife:

Butterfly-weed *Asclepias tuberosa* – beautiful yellow-orange flowers bloom throughout the summer, and its fragrant nectar will attract many different species of butterflies.

Wild Columbine *Aquilegia canadensis* – is great for attracting Ruby-throated Hummingbirds.

Silky Dogwood *Cornus amomum* – attracts Scarlet Tanagers, and even Red Foxes.

Eastern Redbud *Cercis canadensis* – flowers attract butterflies in the spring, and songbirds feed on the seeds.



“Unless we modify the places we live, work, and play to meet not only our own needs but the needs of other species as well, nearly all species of wildlife native to the United States will disappear forever.”

—Douglas Tallamy, BRINGING NATURE HOME: How Native Plants Sustain Wildlife in Our Gardens



A *Matelea* flower, or Angle-pod. After the small purple flower is fertilized, it matures into a large pod (that is angled) which contains hundreds of seeds.

Kerry Wixted in the field assisting with black bear research. Newborn cub in hand.

Chestnut and Black-jack Oak (*Quercus prinus*, *Q. marylandica*) – attracts a variety of wildlife including game birds, Prothonotary Warblers, and many species of mammals.

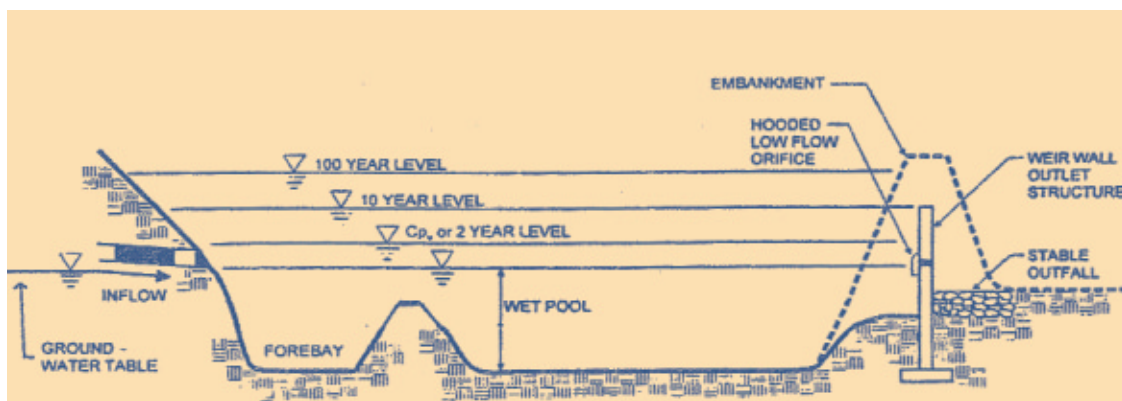
For more information on the benefits of planting native trees visit the Maryland Department of Natural Resources Tree Benefit Calculator at:

www.trees.maryland.gov/calculator.asp

Maryland State Rare and Threatened Plants in the Sanctuary

- | | |
|--|---|
| 1. <i>Desmodium viridiflorum</i>
(Velvety Tick-trefoil) – State Rare | 7. <i>Chelone obliqua</i>
(Red Turtlehead) Figwort Family – State Threatened |
| 2. <i>Desmodium laevigatum</i>
(Smooth Tick-trefoil) – State Rare | 8. <i>Castanea pumila</i>
(Chinquapin) Beech Family – Declining populations worthy of monitoring |
| 3. <i>Galactia volubilis</i>
(Downy Milk Pea) Pea Family – State Rare | 9. <i>Najas gracillima</i>
(Thread-like Naiad) Naiad Family – likely extirpated in MD |
| 4. <i>Lespedeza stuevi</i>
(Downy Bushclover) – State Rare | |
| 5. <i>Rhynchosia tomentosa</i>
(Hairy Snoutbean) – State Threatened | |
| 6. <i>Matelea carolinensis</i>
(Angle-pod) Milkweed Family – State Endangered | |

Status levels are from the 2007 Department of Natural Resources Wildlife and Heritage publication.



This cross-section view represents how the nearby stormwater ponds are designed to function. Notice the different flood levels for major storm events. The ponds will be upgraded to withstand 100-year floods.

What's a Storm Water Pond?

As you can see in the illustration above, a storm water pond consists of a permanent pool of water into which runoff is directed, detained and treated until it is displaced by runoff from the next storm. These ponds control both storm water quantity and quality. Their natural physical, biological, and chemical processes then work to remove pollutants. Sedimentation processes remove particulates, organic matter, and metals, and biological uptake dissolves metals and nutrients. According to the EPA, a higher level of nutrient removal and better storm water quantity control can be achieved in storm water ponds than can be achieved with other best management practices, such as dry ponds, infiltration trenches, or sand filters. (Graphic courtesy of the Maryland Department of the Environment)

“adequately,” according to Chris Swarth, Sanctuary director, they are no longer large enough to handle a huge storm event, such as a flood or hurricane. Such an event would fill the ponds and cause water to overflow into the creeks. As Swarth says, “The ponds need to be improved to handle such events.”

Dana Havlik, SHA’s storm water management director, explains that these facilities were developed during interchange construction in the early 1990s. In the future, they will be converted into wetland systems that are more suitable for the site conditions. Specifically, the SHA has initiated a storm water management retrofit project upstream from the Sanctuary to upgrade these old facilities to meet current (2000) MDE water-quality standards. Havlik says that the project will allow more roadway runoff to be diverted into these facilities, which will provide additional treatment of currently untreated pavement.

As she explains, “Several sites will be converted to shallow wetlands to detain roadway runoff and protect the downstream reaches. The new facilities will be planted with aquatic plants to provide better water-quality treatment. The project design is 65 percent completed. Construction schedule will depend on fund availability.”

“Several sites will be converted to shallow wetlands to detain roadway runoff and protect the downstream reaches...”

In addition to its storm water management program, SHA continues to initiate stream-restoration projects and wetland mitigation projects as part of its overall watershed-based restoration plans. In cooperation with other state agencies, such as the Maryland Department of Natural Resources, it also formed a partnership called the Million Tree Initiative to plant trees along Maryland roadsides.

The Bottom Line

It will come as no surprise to learn that, when it comes to storm water management, funding is a huge struggle for state and local governments that administer the Maryland program. Ellis explains that in the case of Anne Arundel County, the funds to mitigate the impacts of storm water come from the general tax revenue and compete for funding

with other services such as education, roads, police and fire services, and other governmental services. In other words, there is no dedicated fund to address storm water-related impacts.

As she explains, “We identify areas in need of restoration, such as eroded stream segments, evaluate those areas against what we have in the capital-improvement program, and incorporate critical needs into future budgets,” she says. “We also take advantage of opportunities for grant funding through state grants and federal stimulus money.” She also said that there has been discussion at the local and state level about creating a dedicated revenue source to fund storm water management restoration, but that has not yet occurred.

Meanwhile, back inside the Sanctuary, Chris Swarth reports the following:

“Beginning in 2010, we will mount a new investigation of the land-use practices in the small watersheds that surround the Sanctuary. We will also be collecting more data on stream biological and physical conditions in order to better understand how landscape-level impacts such as storm water have an effect on the aquatic life in the creeks and, ultimately, the Patuxent river estuary.”

Nature Play: Healthy Kids and a Healthy Environment

By Bart Merrick

This time of year you can sit on the observation deck overlooking the wetlands and be quietly inspired by the browning of the plants, the flocks of birds settling in, and possibly the laughter of children playing in the nature play area just behind the deck. The space was created this summer by a group of folks from the Patuxent river sojourn that were asked to think about what they used to do outside when they were kids. The volunteers were given materials like logs, old barn boards, and bamboo poles and asked to create a space for kids to just play, and let their imaginations rule, like they (and many of us) did when they were kids. It was great to hear the sojourners discuss with each other how they spent their outside time, balancing on logs, baking in the dirt oven, building forts, etc. After just a short amount of time the conversation came around to kids today and how they spend (or don't spend) time outside. It was this issue that was the inspiration behind the creation of a nature play area.

in a whole groundswell of folks working to get children and families outside. Just this past October, Governor O'Malley released Maryland's Children in Nature Action Plan which outlines the efforts the State is currently undertaking to advance environmental literacy and a connection with nature among Maryland's kids. This summer the Governor also established a Maryland Children's Outdoor Bill of Rights which says that every Maryland Child will have the opportunity to:

- Discover & connect with their natural world
- Play & learn outdoors
- Splash & swim in the water
- Camp under the stars
- Follow a trail
- Catch a fish
- Watch wildlife
- Explore wild places close to home
- Celebrate their culture & heritage
- Share nature with a great mentor or teacher



Top: Finnegan Merrick playing the bamboo xylophone. Right: Visiting students exploring the nature play area.



Jug Bay Wetlands Sanctuary, its staff, volunteers and beautiful lands offer children and

families a fantastic opportunity to simply get outside and engage with the natural world, helping them exercise their "outdoor rights."

The new nature play area is part of the effort to provide a little space for children to explore nature, in an unstructured, imaginative way. Currently it consists of balancing boards on logs, a bamboo xylophone and some bamboo poles. We hope to add elements to this area this winter and next spring, things like tree cookies (building blocks), a Jug Bay seed collection, and more. Next time you visit

You may have heard of a recent book by Richard Louv called *Last Child in the Woods, Saving Our Children From Nature Deficit Disorder*. The book makes the case that there has been a dramatic decline in the time that children spend outside, playing in nature. He adds that this decline has contributed to both health and behavioral issues as well as a deepening disconnect between humans and the natural world. This book has sparked a nationwide discussion about children and nature which has resulted

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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Check out the CBNERR-MD web page at
www.dnr.state.md.us/bay/cbnerr

Jug Bay stop by and have a look; if you have children, give them time to play, if you have suggestions please share them.

For more information on this topic, or to find out what other outdoor opportunities are happening around you below are a couple of websites to check out:

- Maryland Department of Natural Resources: www.dnr.state.md.us/cin/
- Children and Nature Network: www.childrenandnature.org/
- No Child Left Inside Coalition: www.eenclb.org/

WINTER 2010



Jug Bay Wetlands Sanctuary
1361 Wrighton Road
Lothian, MD 20711
410-74 9330

Adult Education Class

Waterbirds of the Chesapeake Bay

Thursday evenings, January 14, 21 and 28 (7:00-9:00 pm)

Saturday mornings, January 16, 23, 30 (8:00 am-noon)

Instructor: Chris Swarth

Learn about the lives of the waterbirds that make their home on the Chesapeake. This short course will cover identification, natural history, migration, behavior and conservation. Evening lectures take place at JBWS. Saturday field trips will be to the Bay and along the Patuxent River estuary. For beginners and experts alike. Cost: \$50.

Advanced registration is required.



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Donations:

- **Dave Laughlin** for insect collection boxes, 100 Poisonous Plants of Maryland, and Native Plants for Wildlife Habitat.
- **Karen Caruso** for Who on Earth is Aldo Leopold? By Glen Scherer and Marty Fletcher.

Thank you!