Sanctuary Celebrates 20 Years

By Christine Shenot

“Don’t it always seem to go, that you don’t know what you’ve got ’til it’s gone. They paved paradise, and put up a parking lot.”

Hearing Joni Mitchell’s Big Yellow Taxi quoted in the middle of the Sanctuary’s 20th anniversary celebration brought it all home. Former Maryland governor Parris N. Glendening drew from the song to make a point. The protection and preservation of this rich estuarine ecosystem just 15 miles from downtown Washington, D.C., didn’t happen by chance. It was the passion and commitment of concerned citizens, volunteers, staff, scientists, government representatives, and countless other champions of the Sanctuary who had, over the years, seen what a jewel it was. They knew what they had, and they were determined to save it.

“That’s what got public officials’ attention. That’s what got it on the agenda,” said Glendening, who received a special award from the Friends of Jug Bay for his role in purchasing and protecting park land in the Jug Bay area.

County Executive Janet Owens announced that the county will enter into a protective covenant to prevent development and inappropriate land uses in the Sanctuary.

On a crisp sunny day in October, the Jug Bay Wetlands Sanctuary celebrated 20 years of ecological research and education with a crowd of supporters from all ages and walks of life. Chris Swarth, the

Contents
Message from FOJB president 3
20 years of research 4
15 years of MAPS 5
Upcoming Events and Programs 6/7
Volunteers 8
Invasive Garden Plants 10
Invasive SAVs 11

Former governor Parris Glendening addresses Sanctuary supporters while Anne Arundel County Executive Janet Owens and Maryland Delegate Virginia Clagett look on.

Sanctuary’s director, opened the ceremony by talking about some of the things that make Jug Bay such a special place as his audience shivered in the gusty wind. He hearkened back to Anne Arundel County’s decision to create a park here 30 years ago, and to the days when staff wore hip waders “almost as a uniform.” He mentioned the Patuxent River’s role in the War of 1812. He talked about it being a State Scenic River, noting that it might be nominated as a federal Wild and Scenic River.

“We have a guiding principle,” he said, “Plants and animals come first. Humans come second.” But Jug Bay is a sanctuary for people, Swarth said, one that will remain unchanged except for natural succession.

Other speakers echoed that sentiment. In addition to Glendening, Anne Arundel County Executive Janet Owens shared stories of her family’s ties to the area and announced that the county will enter into a protective covenant to prevent development and inappropriate land uses in the Sanctuary. Edward “Big Ed” Reilly, vice chair of the Anne Arundel County Council, also pledged the county’s support. Maryland Delegate Virginia Clagett reminded people that there once had been a plan to turn the area into an RV park, and added, “The volunteers are the ones who really made this place.”

Continued on page 2
Artist John “Bud” Taylor after the unveiling of his painting to commemorate Jug Bay’s 20th anniversary.

Laurie McGilvray, director of NOAA’s Estuarine Reserve Division—of which Jug Bay is part-talked about the importance of research in the Sanctuary, as did Ken Shanks, program manager of Maryland’s Chesapeake Bay National Estuarine Research Reserve. “You’re part of a much larger partnership,” Shanks said.

The Friends of Jug Bay commissioned artist John “Bud” Taylor, who has been photographing and painting scenes at Jug Bay for 30 years, to create a special painting commemorating the anniversary. His painting of a marsh scene was unveiled, and afterwards, people had a chance to buy limited edition posters that Taylor signed.

In the middle of these tributes came a fitting reminder of why the group was marking the day. Marilyn Fogel, Chris’s wife, suddenly shouted, “Folks, I’ve just got to interrupt. There’s a bald eagle flying overhead!” People jumped from their seats or craned their necks to catch a glimpse. Laughter followed, and a lot of good feeling.

But it was Bernie Fowler, the former state senator famous for his “sneaker index,” who really captured the importance of Jug Bay’s 20th anniversary by urging people to look ahead. In 20 years, the Sanctuary has grown from 178 acres to 1,400 acres. For almost as long, Fowler has been leading his annual Wade-In to measure water quality in the Patuxent. It’s a simple concept. Every year in early June, Fowler wades into the river and he keeps going until he can no longer see his white sneakers. Then he measures the depth of the water line on his overalls – the sneaker index. As a waterman in the 1950s, Fowler could see his feet when he was chest-deep in the river. He hasn’t come close to that depth in the time he’s been doing the Wade-In, but he continues to advocate for efforts to improve water quality.

In marking Jug Bay’s anniversary, Fowler spoke of the importance of marshes as filters, and he gave his honest prognosis of the river’s health. “I call it our sick patient,” he said. “It’s in no better shape today than it was when I started my wading 35 years ago.” But he didn’t stop there. “We want to stay determined,” Fowler said. And then he quoted Winston Churchill.

Former state senator Bernie Fowler urges supporters to “Never, never give up” efforts to preserve wetlands and improve Patuxent River water quality.

“Never give up. Never, never, never give up,” he said. “That’s the attitude we need on the Patuxent River.” And that’s the attitude all of us need to encourage more sanctuaries like Jug Bay, not just in Maryland but throughout the country.

Christine Shenot discovered Jug Bay through her brother, Jeff (a current FOJB board member), with whom she has shared many outdoor adventures. She has worked on land-use and growth issues, first as a newspaper reporter covering sprawl and related issues in Orlando, Florida, and now in Maryland’s Office of Smart Growth.
As co-president of the Friends of Jug Bay, I spent time thinking about a fitting present for the Sanctuary on its 20th anniversary. The friends designed a new tee-shirt to commemorate the anniversary; it looks great. We also commissioned a new painting by renowned wildlife artist Bud Taylor and it is spectacular! You may be familiar with some of Bud’s other works that include his osprey and blue heron paintings. The new painting is a beautiful landscape of Jug Bay, and the comment I heard over and over again at the unveiling was that it just radiated light. (The print is for sale at the sanctuary for $20, but it’s a limited 20th anniversary edition so when it’s gone, it’s gone.)

But the best present that I could have wished for was the permanent preservation of all the land included in the Sanctuary. As many of you know, different parcels of the land have been acquired at different times, over many years, with money from several different sources. Only one parcel, the Parris Glendening Nature Preserve at Jug Bay, had protection. Permanent protection may not seem important until you hear of plans by the present Governor to sell off open space and parkland. Yes, there was public outcry and the plan was stopped, and yes, Jug Bay is county

parkland and there would be a huge amount of outrage if some of the land was sold for development, but there currently is no legal protection. That all changed when County Executive Janet Owens made a proclamation at the 20th anniversary celebration that protective covenants would be placed on all 1,400 acres of Sanctuary land. I would like to thank Executive Owens for her foresight. Her love of Jug Bay and understanding of the needs of South County is evident. Under her tenure, the Glendening Preserve and the Riggelman Farm were purchased and incorporated into the Sanctuary, and she has been a leader in agricultural preservation in the county.

As part of the 20th anniversary celebration, the Friends presented an award to former Governor Parris Glendening. The award was a magnificent striped bass-shaped platter, and I’m certain that he does not have another one like it. We wanted to recognize all the environmental accomplishments during his time as governor. It seems that his environmental work did not stop there and in his speech he talked about his continued work in this area.

He pointed out that many natural disasters are compounded by man-made disasters, illustrated by the Gulf Coast states where destruction of wetlands and the channeling of waterways halt valuable land replenishment through silting. He came to the anniversary celebration so that we could honor him but as it turns out, he reinvigorated all of us to protect wetlands.

Senator Bernie Fowler, Mr. Patuxent himself, reminded us that the river is a precious resource that will need our constant attention. His closing line was, “Never, never, give up” and who better than Bernie is a living example of that motto? Delegate Virginia Clagett, the first recipient of the annual Jug Bay award, reminded us how it all really started 30 years ago. Wonderful things sometimes take a long time in the making. But we all know that the good things are worth waiting for.

At the ceremony, Bud Taylor asked, “Doesn’t fall seem to be quite late this year?” I was afraid that the leaves would just turn brown and fall from the trees, but the colors are brilliant orange, yellow and red. I’m amazed at the resiliency of the trees, with the strange weather this year. I hope you get the chance to get outside and enjoy the wonders of an Indian summer.

Peggy Brosnan, Co-president
20 years of Research at Jug Bay

At any one time, as many as 20 different research studies can be taking place in the Sanctuary. Our strategic location on the edge of the tidal Patuxent River, our status as a National Estuarine Research Reserve, and our welcoming attitude towards scientists makes the Sanctuary a popular location for mounting short- and long-term investigations. For a relatively small site (1,400 acres), there are a large number of research projects constantly underway!

Key to our research is our volunteer force, which is trained in field techniques and carries out studies of the ecology of the forests and wetlands. The information they gather serves as a basis for visiting scientists to probe questions about plants, animals, or ecological in greater depth. Six doctoral dissertations and at least 10 master’s theses have been completed here over the past twenty years. The staff has also mentored another 10 university students for their senior theses and over a dozen high school students carrying out senior projects here.

Graphics here and on pages 5 and 9 display some of our findings. They will give you a little flavor of the projects headed up by Sanctuary naturalists and carried out by volunteers. Checking and inputting raw data, looking for trends and patterns and finally displaying data in summary form takes a lot of time and careful thought. This aspect of our research is one of our most time consuming tasks. But no study is worth carrying out if we don’t take the time to communicate our results to the public and the scientific community. If these graphics spark your curiosity and bring up questions, please stop by to talk with us. We enjoy discussing our studies, especially with the volunteers who assist us in the field and lab.

Female Box Turtles Range Far and Wide

This graph of home ranges is based on radio-tracking 31 female and 15 male box turtles over a five-year period. Each column represents a single turtle. Female home ranges are often much larger than male ranges. Females travel from forests to nesting habitats in fields and to tidal wetlands along the west edge of the Sanctuary. Males usually confine their seasonal activities to relatively small areas of forest. Some females traveled over two kilometers in a single season!

An Incredible Population of Marbled Salamanders

Since 1995 our reptile and amphibian monitoring program has focused on the amazing fall breeding migration of marbled salamanders. Marbled salamanders migrate from their subterranean forest homes to breed in temporary wetlands. Mid-September evening rains trigger a mass migration. As many as 377 salamanders have been captured in the pitfall traps in just one night!

In 2000 we began a new project to identify individual salamanders in order to calculate population size, determine how long salamanders might live, and track the frequency with which individuals return to the ponds to breed. We take a digital photograph of each salamander’s distinctive, unchanging pattern. Then using a classification procedure, we compare all the photographs and identify individuals.

Of the 400 salamanders captured at one sampling site (Wet Forest, traps 7-11) between 2001 and 2003, 46 individuals had been captured more than once. Using these records, we estimate that over this three year period, approximately 2,700 marbled salamanders entered the vernal pool to breed.

This male marbled salamander bearing a distinctive pattern was captured in the Wet Forest traps in 2001 (top) and in 2003 (below).
Monitoring Avian Productivity and Survivorship (MAPS) at Jug Bay: The First Fifteen Years

By Sandy Teliak, volunteer

Since 1990, the Sanctuary has participated in the California-based Institute for Bird Populations MAPS Program. The population and survivorship data from Jug Bay and 500 other participating stations across the nation contribute to the IBP’s efforts to identify causes of population declines, to formulate strategies to reverse those declines, and to evaluate the effectiveness of actions taken.

Jug Bay’s focus is on the migratory and year-round resident songbirds of the deciduous forest. Our core study area, approximately 12 hectares bounded by the Railroad Bed Trail, Otter Point Trail, and Two-Run Trail, contains 11 mist nets. In addition, three nets between Otter Point Trail and South Marsh have operated since 1993. The nets are opened for five morning hours per day, for one day during each of eight consecutive 10-day periods throughout the breeding season. Volunteers identify all captured birds to species, age (adult or juvenile—born this breeding season) and sex. Birds captured for the first time are then banded with a uniquely numbered aluminum band.

From 1990 to 2004, Jug Bay’s MAPS effort resulted in the initial capture and banding of nearly 2,000 birds (60 species) and over 1,000 recaptures of 507 previously banded birds. Migratory species (n = 1386) constituted 71% of the banded birds and included 31 species that typically breed at Jug Bay or are traveling to their breeding areas farther north. Year-round resident birds (n = 458), which accounted for 24% of banded birds, were represented by 14 species. The remaining 5% were migratory birds (15 species) that never breed at Jug Bay but travel through the area en route to their breeding grounds. Figures 1A and B show the proportion of migrant and resident species that were banded.

Wood Thrushes Thrive

A key finding from our study is that the Wood Thrush breeding population at the Sanctuary is relatively robust. Our Wood Thrush counts exceed those of the Red-eyed Vireo, one of the most common songbirds in the Eastern forest! By standardizing our data to net hours (one net hour is equivalent to one net open for one hour), we see that the number of Red-eyed Vireos per 100 net hours has stayed remarkably stable for the entire 15 years (see Table). However, the number of Wood Thrushes increased significantly in the 2000-2004 period. This is particularly heartening because the Wood Thrush population has decreased over much of their range since the late 1970s. Clearly, Jug Bay is providing a favorable and stable breeding habitat for this species.

Mean number of birds per 100 net hours, 1990-2004

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Wood Thrush</th>
<th>Red-eyed Vireo</th>
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<tr>
<td>1990-94</td>
<td>2.1</td>
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</tr>
<tr>
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</tr>
<tr>
<td>2000-04</td>
<td>4.0</td>
<td>2.0</td>
</tr>
</tbody>
</table>

A New Generation

One goal of MAPS is to determine how many young birds are produced annually. Merely counting the number of juvenile birds produced each year to project the future “health” of a species can be misleading, however. For example, the fact that more Carolina Wrens juveniles (73) have been banded over the past 15 years at Jug Bay than any other species might lead you to expect higher capture rates for Carolina Wrens in subsequent years. However, as year-round residents, Carolina Wrens often succumb to severe winter weather, resulting in relatively low survival rates. The winter of 1995-1996 was one of the harshest on record in this area. In 1996, we did not capture any Carolina Wrens, and for the following five years (1997-2001), we only captured an average of two per year compared to an average of almost seven per year throughout 1991-1995. The winter of 1995-1996 was probably highly detrimental to this species.

Surprisingly, the species with one of the lowest number of juveniles banded is the Red-eyed Vireo. Over the past 15 years, we’ve banded 256 adults but only five juveniles. At this apparently low population growth rate, we’d expect the species to go extinct at Jug Bay! But behavior may explain, in part, our low juvenile capture rate. According to researchers, days after Red-eyed Vireos hatch, both young and adults move well away from their nest site. As the two above examples demonstrate,

Figure 1 Percent of migrant (A) and resident (B) breeding species banded at Jug Bay, 1990-2004

Continued on page 9
Winter 2005/06 Education Programs

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

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

HOME SCHOOL SERIES:

Bird Life and Survival
Wednesday, December 7, 9:00 am-1:00 pm

Waterbirds of Jug Bay
Wednesday, December 14, 8:00 am-12:00 noon

Although many birds have flown south, many residents stay here for the winter. We will observe birds in the wild and record observations in a birding journal. Through games and activities, we will learn about bird adaptations, behavior, and migration. Activities to do at home will be provided following each class. Bring a lunch and dress for the weather, with hat and gloves. Bring binoculars and bird guides if you have them. You may also borrow binoculars from the Sanctuary. Designed for Home School children, ages 8 and older. Cost: $2 per child per session

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

New to scrapbooks? This event is for you! Create lasting memories at Jug Bay while enjoying the sites and sounds of the late autumn season. We’ll take a short hike outside to draw inspiration, afterwards returning to enjoy snacks and to create our scrapbooks. You bring the personal mementos to include and we’ll provide the rest. For adults and families. Children should be at least 4 years old.

Insects in Winter
Thursday, December 15; 10:00 am-12:00 noon
Find out what insects do during the cold months of winter. We’ll take a hike to look for insects, and then make a craft while sipping hot chocolate. For families with children 3 to 6 years old.

Winter Solstice Hike
Wednesday, December 21; 3:00-5:00 pm
The Winter Solstice marks the longest night of the year and the start of winter. Celebrate the season while hiking the winter woods. We’ll end the day watching sunset with a light snack.

Birding at Jug Bay
Saturday, January 7; 8:00-11:00 am
Saturday, March 4; 8:00-11:00 am
Saturday, April 1; 8:00-11:00 am

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

Birds in Winter
Friday, January 13; 10:00 am-noon
Many birds migrate to warmer climates in winter, but many stay to tough it out here. We’ll take a hike to see who spends the winter in our woods. We’ll end the program warming up with hot chocolate. For families with children 3 to 6 years old.

In a Nutshell
Saturday, January 14; 10:00 am-12:00 noon
Join us for a story about the amazing life of a tree. We will take a hike and then make a craft about what we see. For families with children 5 to 9 years old.

Hike the Preserve
Saturday, January 14; 3:30-5:30 pm
Sunday, February 12; 1:00-3:00 pm
Saturday, March 4; 1:00-3:00 pm

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

Nighttime Navigation
Saturday, January 21; 4:30-6:30 pm

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

Plants in Winter
Saturday, January 28; 1:00-3:30 pm

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

Throw Away Play
Saturday, February 11; 1:00-3:00 pm

Stop! Don’t throw that item away! We can reuse it! We’ll learn how to create games using clean reusable items. Material will be provided to make a game to take home. All ages welcome.

Weather Watchers
Saturday, February 25; 1:00-3:00 pm

We’ll learn the basics of weather forecasting as well as build all the instruments necessary for your very own weather station using common household materials. This program is designed for families with children 8-12 years old.

Wintering Trees
Thursday, March 2; 1:00 - 3:30 pm

Ever notice the pattern a tree’s silhouette traces against the winter sky? Though trees appear dormant in winter, they hold the coming year’s leaves and flowers. We’ll take a hike, using buds and bark to recognize the trees we knew last summer by their leaves. For adults and children over 8. Be prepared to walk 2 miles.

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

M A R S H  N O T E S
Stalking the Wild Timber-doodle
Friday, March 3; 6:00-7:00 pm
Late winter is the time for the annual courtship display of the American woodcock, a.k.a. timber-doodle. You can watch this dazzling aerial show right from your car! Male woodcocks should be performing their mating ritual at dusk over the meadow in front of the Wetland Center parking lot. Binoculars are not necessary, but it's always a good idea to bring them along, just in case some other interesting creature wanders past. Sometimes you can even see the bird on the ground after it has landed. Free. For adults and families with children at least 10 years old.

Vernal Pool Exploration
Sunday, March 5; 1:00-3:00 pm
Come take a hike through the sleepy forest and see what early risers can be found making use of our vernal pool habitats. For families with children ages 6-12.

Nature Scavenger Hunt
Saturday, March 18; 1:00-3:00 pm
As spring approaches the wetlands become active once again. Spend the day at Jug Bay as we hike to see what's under way. All ages.

Welcome Back Osprey
Saturday, March 18; 10:00 am-12:00 noon
Jug Bay is home to one of the largest Osprey populations in the world, yet they are only summer residents. Each year, around St. Patrick's Day, Ospreys can be seen building their nests and performing their “fish flight” courtship ritual. Learn about their migration cycle, life history, and unique adaptations to living by water. For adults and families with children at least 8 years old.

Vernal Equinox Hike
Sunday, March 19; 4:30-6:30 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.

Life in an Under Water Forest
Sunday, March 19; 1:00-3:00 pm
This program will feature a slide show explaining the history of Submerged Aquatic Vegetation in the Chesapeake Bay, their ecological niche and their importance to healthy shallow water habitats. Research methods for the upcoming field season will be discussed as well. For teens and adults.

Bringing Back Bluebirds
Sunday, April 2; 1:00-3:00 pm
Come learn about bluebirds and how they live. Each participant will assemble a nest box to take home and put up, hopefully 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 F08 members), in advance, to the Sanctuary. All ages welcome. Leader: Mike Quinlan

Animal Homes
Sunday, April 9; 2:00-4:00 pm
Early spring is a busy time of year for home building. Animal homes, that is. Come to Jug Bay to explore the many types of homes our animal friends are building. We'll take a short hike, afterwards returning to build an animal home to take with you. All materials provided. Designed for families with children ages 7 and younger.

Celebrate Earth Day
Saturday, April 22; 1:00-3:00 pm
What better place to celebrate Earth Day than right here at your neighborhood Sanctuary! We will take a hike, practice "green-living" tips to be environmentally friendly every day, and snack on organic treats. All ages welcome.

Amphibians
Sunday, April 23, 1:00-3:00 pm
Frogs, toads, and salamanders are awakening from their winter hibernation. Come explore the forest and ponds to learn all about amphibians. All ages welcome.

Puppetry by the Patuxent
Saturday, April 29; 1:00-3:00 pm
The stage is set, the script is written, and the only thing missing is you! The red carpet will be rolled out for Jug Bay's first ever, participant led puppet show. Participants will build their puppet characters and afterwards put on their very own puppet show. All ages welcome.

Vibrant Volunteers!
Saturday, February 25, 10 am-12:00 noon
For new and experienced volunteers alike this workshop is designed to help increase knowledge of the Sanctuary's goals, discuss our current research projects, and learn about the broad array of ways to get involved in our Jug Bay community. Free admission to the Sanctuary. For teens and adults.

Vernal Pool Census
Sunday, March 18; 1:00 - 3:00
Sunday, April 2; 2:00 - 4:00
Donning hip waders, volunteers will walk the vernal pool at the Glendening Preserve to document the eggs and larvae of spring-breeding amphibians. For adults and children over 12.

Water Chemistry and Nutrient Dynamics Training Workshop
Saturday, April 1; 1:00-4:00 pm
Since 1988, volunteers have monitored nutrient pollution, dissolved oxygen levels, pH and water clarity in Jug Bay's waters. We will refresh those skills and train new volunteers. Additional training is provided during the sampling dates. The workshop is recommended for all volunteers, new and experienced. Free admission to the Sanctuary. For adults or teens.

See page 8 more volunteer opportunities.
Volunteer Opportunities

Become a Leopold Educator!
Thursday, February 9; 9:00 am-4:00 pm
Kathryn Reis (a Jug Bay volunteer) will lead an Educator Workshop for those interested in learning how to teach the land conservation ethic as envisioned by Aldo Leopold over 50 years ago. During the full-day workshop, participants will learn about the life of Aldo Leopold, a forward thinking forester who created the field of wildlife management in the 1930s. Additionally, the participants will learn how to use the essays of Leopold’s Sand County Almanac to teach children of all ages how to investigate natural systems. It is through this process of personal investigation, coupled with journal writing as a source of reflection, that children can begin to understand their connection to the land while developing critical thinking skills that allow them to develop their own vision of land stewardship. To register, contact Kathryn by January 23, 2006 at either (703) 933-1225 or reiskath@yahoo.com. The registration fee of $40 covers the cost for all materials distributed as part of the Leopold Education Project teaching kit plus lunch and snacks.
For more information about the Leopold Education Project, visit http://www.lep.org/about_lep.htm

Non-native Plants: The Green Invasion!
Saturday, March 4; 1:00-3:00 pm
This indoor slide lecture will focus on the problems non-native invasive plants cause in natural ecosystems and how to identify the native and non-native species of concern. Come learn about the new “Adopt-a-Plot” initiative to help control the invasives at the Sanctuary. Individuals, families and groups can adopt their very own plot to monitor, map and manage the invasives. This workshop is for leaders (adults and teens) of scouts, schools and community groups who would like to participate in Adopt-a-Plot workdays. Free admission to the Sanctuary.

Marsh Clean Up
Saturday, March 25; 10:00 am-3:00 pm
Saturday, April 8; 10:00 am-3:00 pm
Volunteers will pick up trash that has floated into 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. Free admission to the Sanctuary. Children should be at least 6 years old. Scout troops and community groups are encouraged to participate.

See page 7 for more volunteer programs.

Jug Bay Loses a Friend
Roy Gast, a retired government employee, died on October 29. His death has saddened those of us who knew him.
Roy and his wife, Grace, began volunteering when the Sanctuary was first founded, in 1985. At that time, the director lived in a trailer, and the Visitor’s Center was just being built. Roy and Grace served as Co-presidents of the Friends of Jug Bay and helped out with many activities. Roy especially enjoyed working with school groups. He and Grace continued to volunteer until his health prevented him from doing so.
Jug Bay has lost a good friend.

—Connie Mason, a long-time Friend of Jug Bay

Thanks for Your Donations
Mushrooms of North America by Orson K. Miller, donated by Dave Laughlin
Rogard Ross renewed our domain name for our website

MA R SH N O T E S
correctly evaluating and interpreting the data requires sophisticated statistical modeling and an in-depth understanding of a species' behavior.

Survivors!

Another key purpose of MAPS is to determine species survivorship. Migratory birds returning to their nesting area to breed are often recaptured. Recapture rates of birds initially banded at Jug Bay vary widely; for the resident birds listed in Figure 1B, it ranges from a low of 7% (Carolina Wren) to a high of 25% (Tufted Titmouse). For the migratory birds listed in Figure 1A, it ranges from a low of 4% (Common Yellowthroat) to a high of 31% (Wood Thrush). The interpretation of these numbers needs to be tempered by the fact that we don't always capture a bird just because it is in the study area. Also, the longevity of different species varies widely.

Our Wood Thrush counts exceed those of the Red-eyed Vireo, one of the most common songbirds in the Eastern forest!

Fifteen Red-eyed Vireos that were five to eight years old returned to our study site to breed. This is astonishing given that they winter in northern South America, over 2,000 miles away! The 8-year-old female Red-eyed Vireo, weighing about 17 grams (the weight of three nickels and one penny), has flown over 4,000 miles roundtrip each year for at least 8 years to breed at Jug Bay!

<table>
<thead>
<tr>
<th>Age in years of oldest individual recaptured at Jug Bay</th>
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<tbody>
<tr>
<td>Tufted Titmouse</td>
</tr>
<tr>
<td>Carolina Wren</td>
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<tr>
<td>Northern Cardinal</td>
</tr>
<tr>
<td>Wood Thrush</td>
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<tr>
<td>Red-eyed Vireo</td>
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</table>

The oldest bird we've banded to date will be a male Ovenbird. It was initially banded as an adult in 1993; it was subsequently recaptured in 1996 and again in 2003, making it at least 10 years old! This may be a species record since the Cornell University's "Birds of North America" data shows the oldest known Ovenbird as seven years old!

Volunteers and staff have gathered a large amount of data in this critically important MAPS effort. Much work still needs to be done to evaluate and document the results using the appropriate statistical modeling and comparing them to regional and nationwide results. Sounds like a project to keep this volunteer happy during the winter season. I wonder what the next fifteen years of MAPS at Jug Bay will bring!

Ruddy Duck Distribution on the Patuxent

The Sanctuary's winter waterbird study has revealed that Ruddy Ducks, one of the most abundant birds on the river in winter, are not distributed evenly on the lower Patuxent estuary. This graph, depicting the percent of total Ruddy Ducks occurring in February along segments of the lower 25 miles of the Patuxent, was derived from six years of census data gathered by volunteers. The bar graph indicates the mean annual number of ruddies that occur in each five-mile segment of the river. The uneven distribution of ruddies along the estuary is probably due to water depth and variable abundance and distribution of small clams and burrowing amphipods they feed on.

Wetlands and Nitrogen

Nitrogen analyses are performed on water samples collected by volunteers at high and low tide in the marsh, as well as other sites. Nitrate levels at high tide exceed those at low tide because the Patuxent River supplies the wetland with nitrate. In the spring and summer, the uptake of nitrate by phytoplankton and wetland plants, as well as denitrification (conversion of nitrate to atmospheric nitrogen) decreases nitrate concentrations in the marsh.
A Gardener’s Legacy: Benign Natives or Invasive Exotics?

By Lisa Siciliano, volunteer

"There it is," one of our group calls from in the undergrowth off to the right. "At last!" We close in on our quarry. It isn’t some endangered animal, but it has proved as elusive. It’s a white PVC pole "crouching" in a mass of green understory. We are conducting the Habitat Survey at the Glendening Preserve, and this pole marks the center of a 10m square plot in which we log topography, habitat type and flora. We have visited nearly 200 by the time the survey of the Preserve is complete. Some plots have striking natural features: ravines, vernal pools, massive trees and such. But this plot is startling because of manmade effects.

The practiced eye begins to resolve many shades of green into individual plant species. Karyn points out Japanese Stiltgrass (Microstegium vimineum). It covers nearly the entire surface of our plot—except where there is bright sunlight. Japanese Honeysuckle is swallowing up the sunlit patches. "There was clearly a house here at one time," remarks volunteer Tom Englar, pointing to one of many Japanese Privet shrubs. We look more closely and see the pattern of an old hedge. Tom’s inference is born out further by remains of a foundation we discover hidden in the sea of Stiltgrass. Multiflora Rose, an old hedgerow plant, abounds as well. We shake our heads. Each of us knows these as invasive exotic plants.

It may be easy for us to "tsk, tsk" over the seeming folly of those who plant invasive exotics such as these. But surely the people who once called this place home never intended the mess we see today. Perhaps they needed a sturdy evergreen hedge. They may have phrased it just so to the nurseryman who then recommended the Ligustrum, or Privet. Once established, only a backhoe or persistent poisoning can eliminate it. It doesn’t stay put either, spreading easily via underground shoots. The Multiflora Rose was imported ages ago as natural fencing for livestock pastures. The fruit, rose hips, taste good to birds that spread the seeds everywhere. It does provide food and cover for wildlife, but it is an aggressive colonizer that excludes benign native counterparts. Likewise, Japanese Honeysuckle started life here as a beautiful, fragrant ornamental vine. Unfortunately, it is a rampant grower, strangling whatever it entwines. Birds eat the berries and spread it well beyond garden limits. Some non-native exotics like the Japanese Stiltgrass are accidental introductions. They are thought to have come in as a packing material in crates from Asia. These species are as problematic as Kudzu, Purple Loosestrife, Bamboo, English Ivy, Vinca, and many more. Furthermore, what is happening in this one survey plot is happening across our county, state and nation.

At first glance, this seems an impossible problem to fix. However, there are solutions, and everyone can contribute something to the effort. Part of the remedy lies at home. We can become educated plant consumers. Before you make a purchase, check your plants against a list of “what not to plant,” available through the Maryland Department of Natural Resources (www.dnr.state.md.us/wildlife/iplists.html) or the Maryland Native Plant Society (www.mdflora.org, click on Resources, Gardeners). Consider choosing native flora for your landscape. Not only are native plants unlikely to become problems, but they also are well adapted to our local conditions. You can find inspiration by visiting public gardens and parks featuring native plants. These include: Quiet Waters Park in Annapolis, Arlington Echo Outdoor Education Center in Millersville, the U.S. National Arboretum in Washington, Irvine Nature Center in Stevenson on the north side of Baltimore, and Mt. Washington Arboretum in Baltimore, to name just a handful. Each has a website with directions and information.

Maryland Native Plant Society also provides information about native plants that suit most circumstances, helps you find nurseries specializing in Maryland natives, and publicizes native plant sales coming up. Another list of regional nurseries with native plants can be found at www.fws.gov/chesapeakebay/BayScapes/bsresources/bs-nurseries.htm. Some nurseries hold an open house each year so that you can see their gardens. Even more conventional nurseries are stocking increasing numbers of native plants and their cultivars. (Just be sure to ask whether their plants are nursery propagated rather than wild collected.) This is largely a direct response to customers’ requests for native plants.

Your landscape, thoughtfully planned and wisely planted, will serve your needs and give pleasure now and in the years to come. What will you leave behind?

Help Protect my Habitat...

Join our new Adopt-a-Plant program to help control the non-native invasive (NNI) plants that are creeping onto our land.

Come to our lecture "Non-native Plants: The Green Invasion" on Saturday, March 4th to learn more.

Call (410) 741-9330 or e-mail volunteers@jugbay.org for more information.

Greetings like the one pictured and jack-in-the-pulpit (to the right) are just two of the countless species that are affected by the spread of NNI.

Multiflora rose, an invasive non-native
Non-native SAV: Wetland Friend or Foe?

By Lauren McChesney, Graduate Research Assistant
University of MD Center for Environmental Science, Appalachian Laboratory

Submerged aquatic vegetation (SAV) currently covers only a small portion of the 250,000 hectares where it historically grew within the Chesapeake Bay. These plants improve water quality, stabilize sediments, reduce water velocity, take up nutrients, and remove pollutants. In addition, these plants provide food for migratory and resident waterfowl, and habitat for economically important species such as crabs and fish. Declines in their coverage largely reflect human population increases within the Chesapeake Bay watershed and a proportional increase in urban and suburban development. These changes have caused increased amounts of nutrients, sediments, and toxins—all damaging to SAVs—to reach the Bay.

Native species of aquatic plants are also vulnerable to competition from nonnative invasives such as Hydrilla verticillata, an invasive submerged aquatic plant from tropical Asia. Hydrilla was introduced via the aquarium trade to Florida in 1958 and to the Potomac River basin in the early 1980s through a separate introduction. This SAV now occurs in over 17 states and in every continent except Antarctica.

The rate of invasive species introductions—both intentional and unintentional—has increased dramatically in the last 40 years due to human population growth, global travel and trade, and environmental alterations. Growing in monotypic stands, these species displace natives; threaten biodiversity; alter wildlife habitat; and disrupt food webs, nutrient cycles, and biogeochemical and hydrological processes. The good news is that Hydrilla provides some of the same benefits—such as habitat and sediment stabilization—as native species. The bad news: it interferes with human structures and activities such as canals and water use. Due to its canopy-forming capabilities and few available environmental controls, Hydrilla is especially problematic in drainage canals, irrigation canals, and utility cooling reservoirs. In addition, it interferes with navigation and recreational use, which can lead to financial losses.

Hydrilla invasions displace already declining native aquatic plant populations—producing long-term effects on ecosystem processes. However, in poor water quality conditions, Hydrilla takes up nutrients and causes settling of sediment particles. Its ability to inhabit areas of poor water quality and to improve habitat conditions may potentially facilitate re-colonization by native species.

Hydrilla is now the dominant SAV species in the Jug Bay marsh. The earliest record of its presence in the marsh dates to 1993. In one year, it had spread eight miles downriver, and by 1996, it had colonized over 20 miles of the Patuxent! Its distribution and density fluctuates annually in the marsh and even sometimes within the same growing season (April to October). Years of warmer temperatures and relatively low rainfall seem to create ideal conditions for the non-native plants which tend to prefer warm waters and high nutrients. While this non-native can out-compete natives for space and resources, it does provide many of the same functions as other native plants. Since it became dominant in the Potomac River in the 1980s, the population has seemed to stabilize, and populations of native species have increased. Scientists at Chesapeake Bay National Estuarine Research Reserve in Maryland (CBNERR, MD) are hoping to see a similar shift to a more diverse, native-dominated community in the Patuxent River, and researchers are monitoring this change.

Lauren McChesney is a CBNERR student intern who is studying the effects of sediment characteristics and flow on Hydrilla colonization for her Master’s thesis.
Timeline: the Last Five Years

2001
- Sanctuary size doubles with the addition of the Glendening Nature Preserve
- Resident Geese population multiplies, overwhelming the marsh
- A Diamondback Terrapin nests at the River Farm

2002
- Jug Bay appears in a nationwide interactive Internet program on National Estuaries Day
- New earthworm species discovered at the Sanctuary
- Plant Habitat Survey begins

2003
- Jug Bay Research Conference held
- Entire 1,400 acres marked with a GPS grid
- Hurricane Isabel sends a four-foot storm surge up the Patuxent, flooding trails and destroying the marsh boardwalk

2004
- 300-acre Riggleman Farm added to Sanctuary
- Box Turtle Conservation Workshop held
- Marsh boardwalk rebuilt

2005
- A Guide to the Amphibians and Reptiles of Jug Bay published
- Sanctuary celebrates 20 years!