

Conference Shines Spotlight On Turtles' Troubled Habitats

By Elaine Friebele

Turtles need our help. That was the message from researchers at a conference entitled "Conservation and Ecology of Turtles of the Mid-Atlantic Region," held October 30 - 31 at the Patuxent Research Refuge National Wildlife Visitor Center in Laurel, Md. The conference, organized and co-sponsored by Jug Bay Wetlands Sanctuary, highlighted the findings of 51 researchers who follow the ecology, biology and behavior of mid-Atlantic turtles. More than 160 participants, a cross-section of private citizens and representatives from academic, public and private non-profit organizations, gathered from 11 states to learn more about the biology and current state of turtles.

Research discoveries suggest that these stalwart creatures, which have survived natural catastrophes for more than 200 million years, now face a variety of human-induced challenges. The turtle's worst enemy is suburban sprawl, said keynote speaker Dr. Michael Klemens, a veteran turtle researcher and director of the Wildlife Conservation Society's Metropolitan Conservation Alliance ("Speak Up on Land Use," Page 5). "The decisions that we make in our back yards are of vital importance to turtle conservation," he said.

"The United States is an important center of biodiversity of turtles," said Klemens, noting that one-fifth of the world's turtle species live in this country. The fact that the densely populated mid-Atlantic region holds the bulk of the United States' 50 turtle species makes it "a globally significant turtle conservation area," said Klemens. Because turtles and salamanders live in habitats that are mosaics of wetlands and upland forest, these organisms are more sensitive to landscape changes than animals living in only one habitat type.



Dr. Michael Klemens told conferees that the turtle's most dangerous enemy is suburban sprawl.

Klemens's point was supported by much of the research presented at the conference. One study showed that during warm weather, woodland turtles use streams and wetlands to cool off and prevent dehydration. Conversely, most aquatic turtles make increasingly treacherous journeys to upland areas to lay eggs.

"The presentations, posters and organizational displays were well done and extremely informative," said Mike Quinlan, a Jug Bay volunteer turtle researcher who, with Director Chris Swarth, presented a poster on Box Turtle ecology. "It is reassuring to know that so many research, restoration and conservation projects to benefit turtles are underway."

Troubled turtles. Nearly half of the presentations focused on two visibly troubled species: the Bog Turtle and the Diamondback Terrapin. Researchers also presented results on the Wood, Spotted, Box and Blanding's Turtles. According to recent surveys by Department of Natural Resources biologist Scott Smith, Bog Turtle populations have declined 43 percent in Maryland in the past 14 to 18 years. At some sites, researchers are finding elderly populations of turtles, with young turtles strangely absent. These populations are likely to go extinct within the next 15 years if reproduction does not improve.

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Jug Bay Home page:
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 Calendar of Events:
<http://members.aol.com/jugbay>

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

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Marsh Notes is produced quarterly by Jug Bay Wetlands Sanctuary. Comments and suggestions are welcome.
 Editor: Judy Burke
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 Grafix Galore, 410-822-6305

This newsletter is printed on recycled paper.



John Klocko holds the \$50,000 check for the completed exhibit project, as Doug Kuzmiak, Chris Swarth, Virginia Claggett and Steny Hoyer look on.

Dear Friends,
 It is with a great deal of pleasure, and relief, that I am writing to say that the opening of our Interactive Wetlands Education Project went off without a hitch and was attended by one of the more remarkable assemblies of dignitaries ever to be at Jug Bay Wetlands Sanctuary.

A list of those present reads like a “dream team” of people associated with research, education and preservation. Among them were U.S. Representative Steny Hoyer, in whose district Jug Bay is situated; Maryland Delegate Virginia Claggett, who is indisputably the “First Lady of Jug Bay,” instrumental in its creation in addition to being the first winner of our Jug Bay Award; Former State Sen. Bernie Fowler, who has for many years championed the preservation of the Patuxent River watershed; and Mrs. Fowler. Representing President Mike Miller of the state Senate was senatorial aide Mollie Benz. Anne Arundel County Councilman John Klocko III—who has been the Friends’ voice in the council—along with Delegate Claggett accepted on behalf of Anne Arundel County a ceremonial \$50,000 check from the Friends. This signified completion of our assigned fund-raising responsibility. Also from the county was Brian Woodward of the Department of Recreation and Parks.



Representing the National Estuarine Research Reserve System of the National Oceanic and Atmospheric Administration were Branch Chief Randall Schneider and Project Specialist Matt Menashes. NOAA, through the former CBNERR manager Kathy Ellett, gave the Friends a substantial grant to help realize the fund-raising success, while Randy and Matt have been good friends as well as good administrators. Also present was new CBNERR manager Carol Towle, who I am sure will be an asset to the program and a friend of Jug Bay. Thanks to all the FOJB members who assisted in catering and promoting the event, in particular Sharon Brewer for her cakes celebrating Chris Swarth’s 10th anniversary as director.

Our two invited speakers were Fran Flanigan, executive director of the Alliance for the Chesapeake Bay, who spoke about the need to preserve wetlands, and Dr. William Hilgartner of Johns Hopkins University, who stressed the importance of taxonomy in science education. Dr. Hilgartner’s remarks seemed to strike a chord with many of the 70 people at the ceremony and provoked lively discussion. We would like him to return to Jug Bay for an expanded lecture.

I had a particular interest in Dr. Hilgartner’s talk because quite independently I have felt the need to

become more taxonomically literate and have discovered that the subject is more than a lot of seemingly semi-unpronounceable Latin and Greek strung together in an unfathomable order. The subject contains not only language and science but adventure, drama, jealousies, careers made and ruined, and a whole host of human emotions that could make the daytime soaps look positively wimpy. And you thought we were just talking about plants!?

Binomial nomenclature

The “father of botany” and author of binomial nomenclature (naming by genus and species) was Sweden’s Carolus Linnaeus (Carl von Linne, 1707-1778), who by all accounts was not only brilliant and superbly educated but a real character. An intrepid adventurer in his youth, he journeyed to the arctic regions of Sweden and Norway before returning to launch a wave of taxonomists and their descendants over the Earth. Meanwhile, Jane Colden (1724-1766), America’s first female botanist, was talking about St. John’s Wort (*Hypericum virginicum*) and was an early follower of the Linnaean system to classify wildflowers.

Later in America’s history, heated taxonomic disagreements and allegations of incompetence erupted, leading to all sorts of rancorous recriminations. Asa Grey, America’s “grand old man of botany,” was arguably able to rise above the fray—or maybe he just dominated it—but others all felt the lash of professional dispute. From the 18th century until about 60 years



Volunteer Mary Burton and a new friend try out the migration wheels.

ago there was an unbridled desire to classify, during which time ecology seemed to suffer, and for the last half of this century ecology has dominated at the expense of classification and taxonomic expertise. The next century is going to have to realize an integration of these two vital elements if we are really going to walk the nature walk and talk the nature talk.

On a personal level, something occurred recently that shows the need for understanding taxonomy. I had been reading *Rural Hours*, by Susan Fenimore Cooper (1813-1894), who is considered to be one of the earliest American nature writers. The book twice mentioned “dogmackie,” which is a term new to me. Pulling out my 1895 edition of *Gray’s Field, Forest and Garden Botany* (1868) to get the jargon of that era, I found not “dogmackie” but “dockmackie.” Luckily,

Ms. Cooper also made a reference to the Arrowwood group, which put me on the right track: Dogmackie (aka dockmackie) turns out to be *Viburnum acerifolium* (Maple-leaved Viburnum), which is in the same genus as Arrowwood (*Viburnum dentatum*).

The problem with common names is that they can change from region to region and from one century to the next. Standard binomial nomenclature, on the other hand, eliminates the uncertainty. I think there’s a lot more to this taxonomy thing than just dried plants and tongue twisters, and Jug Bay is the place to learn about it.

Doug Kuzmiak
President, Friends of Jug Bay



Holiday shopping at Jug Bay

Need gifts for the holidays? T-shirts from Friends of Jug Bay make wonderful presents. Turtles, birds and other marsh animals are featured on cotton shirts of many colors. Available at the Sanctuary.

Surprisingly, Bog Turtle populations at environmentally similar sites contain hatchlings and juveniles, as well as older adults.

Though development continues to chop up the habitats of the endangered Bog Turtle, its range has been fragmented ever since the Ice Age, when advancing glaciers split the population that once lived in Midwestern wet prairies. According to Dr. David Lee of the Tortoise Reserve in White Lake, N.C., decimation of larger mammals by Native Americans and then European colonists meant that the bogs that had been kept open by grazing mammals became grown over by woody vegetation, destroying the habitat the turtles needed. Surviving Bog Turtle populations are now limited to two widely separated areas: the Southern Appalachians and the lower Susquehanna River Basin.

Scientists hypothesize that as habitat fragmentation divides and isolates Bog Turtle populations, their populations become genetically less diverse and, as a result, less robust. Preserving their habitat is obviously key, but how much and where? What conditions are essential for Bog Turtles to have reproductive success? These questions need to be answered by further studies.

Diamondback Terrapin populations also face major threats from human activities. In Cape May, N.J., where nesting grounds are separated from the water by a well-used highway, over 500 female terrapins are killed by automobiles each season. College students working with Dr. Roger Wood and Project Head Start are offsetting some of this loss by salvaging eggs from the dead female terrapins, incubating them, raising the hatchlings and then finally releasing the young turtles to nearby marshes.

Many terrapins are dying in crab pots as well. Dr. Willem Roosenburg of Ohio University calculated that if the current rate of Diamondback deaths in Chesapeake Bay traps continues, some populations in the Bay could go extinct within the next three or four decades. Though scientists and state agencies in Maryland and New Jersey have promoted devices that exclude the Diamondback



The conference on Mid-Atlantic turtles drew more than 160 people from 11 states.

from crab pots, their efforts have been met with strong resistance.

While conservation work continues, we are still gathering information about the basic biology and ecology of Diamondback Terrapins, including successful nesting conditions. A study by Dr. Roosenburg showed that land use decisions could ultimately affect the sex ratio—and the eventual breeding success—of terrapin populations. The gender of terrapin embryos, like those of crocodiles and alligators, is determined by the temperature of the eggs at crucial times during incubation. The study suggested the need to conserve a variety of habitats with different sun exposure, vegetation, moisture and soil types.

Basic Research. Presentations on other turtle species illustrated that basic research on the life of turtles is providing important information for conservation efforts. Research at Jug Bay, which is helping to fill that gap in our knowledge, was well represented and well received, said volunteer Quinlan. In addition to organizing the conference, Chris Swarth presented research results on the natural history and breeding biology of Red-bellied Turtles on the tidal Patuxent River. Michael Marchand, a former 1998 Friends of Jug Bay summer intern and current graduate student at the University of New Hampshire, described his work using radio telemetry to track habitat use and movement patterns of Eastern Box Turtles in the woodlands and wet areas at Jug Bay. Mark Teece, now a faculty member at SUNY-College of Environmental Science

and Forestry in Syracuse, spoke about determining nutritional requirements of the Red-bellied Turtle during hatchling development, based on work he and Chris Swarth have done at the Sanctuary.

Studying all the facets of turtle habitats is important, because we need to understand how and why turtles use and abandon nest sites, said Dr. Eric Kiviat of Hudsonia Ltd. at Bard College in New York State, who provided summary remarks for the conference. Knowing what elements are essential to a nesting site might make it possible to predict nest site locations. Kiviat applauded turtle research being conducted in mid-Atlantic estuaries, which provide rich opportunities for studying a diversity of species in diverse habitats. His list of the important things we still need to know about turtles was long. For example, where do juvenile and hatchling turtles spend their time? What are adult turtles doing in the winter? And what about increasing predation from human-tolerant animals like raccoons? Kiviat made it clear just how much about these strong yet vulnerable creatures we do not yet know.

Thanks to Don Forester of Towson University, who spoke at the banquet on his life as a naturalist, and to the co-sponsors: Mid-Atlantic Turtle and Tortoise Society, Friends of Jug Bay, Fisheries Service of Maryland Department of Natural Resources, Patuxent Research Refuge, Tortoise Reserve and Hudsonia Ltd.. Thanks also to Tom Petska, Friends of Jug Bay treasurer, who handled all the finances, and to volunteer Mike Quinlan, who contributed to this article.

The Drought of 1998-1999

By Charlie Muise

With all the rain Maryland received during September, it may be easy to forget that the eastern United States recently suffered one of the worst droughts in recent history. As some people continue to clean up months after Hurricane Floyd, others are still recording the aftermath of the 15-month drought, which began in June 1998 and apparently ended at the end of August 1999, when the remains of Hurricane Dennis arrived.

Perhaps the first effect of the drought people noticed in the Chesapeake Bay watershed was the early presence of Sea Nettles at area beaches. Sea Nettles, or jellyfish, can deliver a wasp-like sting. Because they require a certain salinity (they don't occur at Jug Bay), they work their way up the Bay and its tributaries each year, moving inland and north as summer progresses, since seasonal lack of rain causes an increase in salinity. This year they were found in high numbers very early in the year, to the dismay of people not accustomed to worrying about them until July.

Some people remained unaware of the severity of the drought until mid-summer when Gov. Parris Glendening issued voluntary water restrictions—which he later made mandatory. This was done because of record-low levels in the reservoirs that supply drinking water to much of Maryland. Similar restrictions were put into place in most East Coast states. These restrictions caused changes in most peoples' lives, from minor inconveniences such as unfilled swimming pools, to loss of income for certain businesses, such as car washes. Worst hit were families whose wells ran dry and farmers whose crops failed.

Farmers, naturalists and other outdoor enthusiasts were aware of this drought long before the restrictions, however. The drought began about June 1998. After a drenching spring, the period from June to December 1998 was 12 inches below the 30-year normal.

September was the worst: 2.7 inches below normal, or just 25 percent of the average. Overall during this period we received only 53 percent of what was expected.

Despite a general lack of snow, 1999 started better, with only one of the first three months below normal precipitation (warm temperatures brought rain instead of snow). This did not last long, however, as three of the next four months were dramatically below normal, with May the worst at 24 percent of normal rainfall. After record rainfall in September, October was normal. With luck, this natural disaster has ended.

Every day, staff and volunteers at the Sanctuary used two ground-water monitoring wells and our rain gauge to monitor the drought. Daily precipitation was recorded, as was the water level in two ground-water monitoring wells. The well in the field next to the weather station recorded low levels all summer, and the one in the forest ran dry in early June and remained so until after Hurricane Floyd. This same area had been under 3 feet of water last spring!

The effects of the drought on local habitats were also monitored. The news was not good for amphibians. Most species breed in seasonal wetlands, and those dried up early this year, leaving many thousands of larval salamanders, toads and frogs to die. Karyn Molines notes that Mark's Pond—a good breeding spot in the Sanctuary—dried up this year for the first time since she began studying this area in June 1995. An area at the Sanctuary's River Farm that had Gray Treefrogs and Spring Peepers and "all kinds of activity going on" last year had nothing this year, according to volunteer herp expert Mike Quinlan.

In September, before Hurricane Floyd, staff and volunteers found at least eight deer that had apparently died from Hemorrhagic Disease. This common disease does not always kill, so it is

possible that stress from the drought may have done them in. The lack of water caused deer to concentrate around the few watering holes that remained, possibly increasing transmission of the disease. (A ninth deer that died in November in the Sanctuary had been suffering from Hemorrhagic Disease, a DNR expert confirmed.)

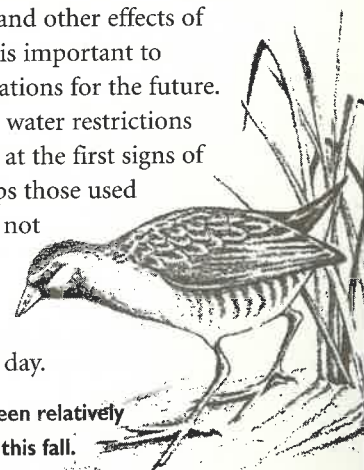
Greg Kearns, a naturalist at Patuxent River Park, discovered barnacles growing on the bottom of his boat for the first time since he started working at the park 20 years ago. Since barnacles are estuarine, this is evidence that the salinity of the Jug Bay area was higher this year than it has been in over two decades.

Drought conditions hundreds of miles away can also affect the wildlife populations that we see locally. Greg Kearns notes that as of October 20, his project studying Sora Rails had caught 290 Sora Rails migrating south through Jug Bay, as opposed to approximately 1,200 over the same period in 1998. The ratio of juveniles to adults this year has been four juveniles to each adult, whereas last year the ratio was 10 or 12 juveniles to each adult. This implies a very poor breeding year, which might have been caused by drought on the breeding grounds.

On a happy note, native shrubs that were planted at the River Farm to benefit wildlife survived the drought better than expected. At least 95 percent of the shrubs along the river made it through. On the slope away from the river, about 70 percent survived. Danny Bystrak, project leader, attributed the low mortality to heavy mulching.

Having experienced the economic, environmental and other effects of this drought, it is important to consider implications for the future. If less-stringent water restrictions are put in place at the first signs of drought, perhaps those used this year would not be necessary. And we can all try to limit water use every day.

Sora Rails have been relatively scarce at Jug Bay this fall.



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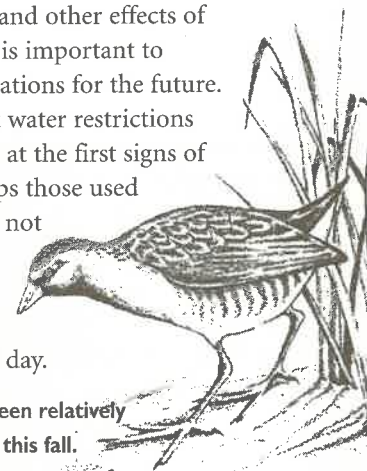
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High Schooler Recommends Camp On Natural Resources Careers

Evan Duke, 15, a volunteer with water-quality, amphibian and bird research, recommends to other high-school students the camp he attended this summer on careers in natural resources. The annual camp is sponsored by the Maryland Department of Natural Resources. He was one of 38 students who spent a week in Garrett County living in cabins in the woods learning about forestry, herpetology, fire fighting, fish and wildlife habitats. Evan said the best part, and the most work, was devising and presenting a natural resources plan.

Evan's younger brother, Adam, just presented Sanctuary staff with a report on an analysis of salamander research techniques. The report is in our library.



The Sanctuary's new exhibits need interpreters. Our training sessions this winter can turn you into a docent—and you'll have fun, too (see calendar of events for details).

Doug Barber

Donations

Our thanks for these gifts:

- Dennis Desmond for photographs of reptiles and amphibians.
- Dr. David Lee for a \$100 gift for the turtle conference.
- Mike Quinlan for paper that can be written on in the rain.
- J.P. Rooney for seven Golden Guides: on observing the sky, on weather and on venomous animals.
- Regina Salta and family for a tripod.
- Kathy Szlavec and Johns Hopkins University for a Brock microscope.

*For
volunteer
opportunities,
check out
the insert.*

Fall Volunteers

The following people donated time and labor this fall.

- | | | | | |
|--|-----------------|-------------------|--------------------|---------------------|
| Girl Scout Troop 209,
led by Sandy Bishop | Mary Burton | Lynette Fullerton | Mandy Lightcap | Jill Rooth |
| Susan Acree | Danny Bystrak | Jim Harle | Priscilla Lightcap | Rogard Ross |
| Cassandra Adams | Betty Chaney | Peter Harris | Dave Linthicum | Jill Russ |
| Kyle Apigian | Ginger Chaney | Carlton Hershner | Barbara Logan | Keith Siddall |
| Doug Barber | Jenny Cohen | Jean Hershner | Chris Logan | Diana Smith |
| Susan Barber | Sandy Curry | Bill Hilgartner | Rick Malmgren | Diana Spendelow |
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| Gordon Burton | Elaine Franklin | Lloyd Lewis | Ken Riggleman | |
| | Robert Frezza | Josh Lichtenstein | Arlene Ripley | |

Thank You!

W I N T E R 1999



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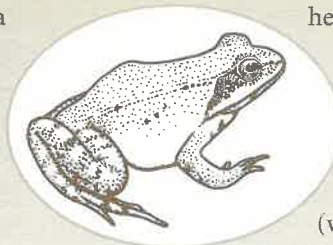
Amphibian Tales to Warm a Winter Night

By Mike Quinlan

Human activity at Jug Bay Wetlands Sanctuary varies greatly, both spatially and temporally. There are areas that people rarely, if ever, visit. This is good, because it provides the resident plants and animals sanctuary within a sanctuary. There is, however, another little-used portion of the preserve's environment: the hours between sunset and sunrise. During these hours of darkness, a whole new world awaits discovery.

One interesting activity I and other volunteers engage in at night is a frog and toad calling survey. Periodic calling surveys reveal which species are present and active. We have done these surveys for two years. The data collected closely correspond with the species list developed through casual encounters, visual searches, e.g., the annual Great Herp Search, and amphibian trapping results.

Wood Frogs start calling the earliest and Spring Peepers next—by late February or early March. Peepers and Green Frogs are the most abundant and widespread frogs in the Sanctuary. We have heard Green Frogs calling on our last survey of the summer, in August. The best places to hear a wide variety of frogs calling are the Beaver Pond on lower Two-run Creek and the north end of the Marsh Boardwalk.



Wood Frog

This year, I also sampled Wooton's Landing, where I heard Spring Peepers, Southern Leopard, Pickerel, Cricket, Green and Bull Frogs, Gray Treefrogs, both *H. versicolor* and *H.*

chrysoscelis, and American and Fowler's Toads. I also heard Wood Frogs there early in the spring, but not on a calling survey. Not bad for a gravel mine that's been turned into a freshwater wetland.

My most interesting nighttime forays occurred on rainy nights, especially in the spring, when I visited the Sanctuary on my own (with the knowledge and permission of the staff). I

had the opportunity to see Wood Frogs and American Toads mating and Spotted and Marbled Salamanders migrating for breeding.

So, think spring and think warm, rainy nights. That should help get you through the winter (and it's possible that even on a warm winter day you might hear peepers calling). Put on your calendar for 2000 Karyn Moline's workshop on vernal pool amphibian research ("Volunteer Activities"), and let her or Charlie Muise know if you want to participate in nighttime visits next year.

My thanks to Karyn, Judy Burke, the Duke family and Nancy McAllister for helping out with the calling surveys this past year.