Watershed Observer

Newsletter of the American Chestnut Land Trust - Volume 26 No. 2, Spring 2012

Contents

Coming Up on the Calendar

May 2012

19 **Guided Canoe Trip** (1:00 p.m. – 4 p.m.)

19 **Vine Vindicator Work Day** (9:00 a.m. – 12:00 p.m.)

June 2012

2 **Guided Canoe Trip** (12:00 p.m. – 3:00 p.m.)

9 **Parkers Creek to Flag Ponds Paddle** (7:30 a.m. – 12:00 p.m.)

16 **Guided Canoe Trip** (12:00 p.m. – 3:00 p.m.)

See more of the 2012 calendar on page 11 and or the Web.

Visit Us Online at
http://acltweb.org/nl

Land Manager's Corner

The American Chestnut: A Giant Remembered

There is little dispute among naturalists that the loss of the American chestnut, *Castanea dentata*, to the chestnut blight was a serious environmental disaster. Taking into account the role and rarity of this tree species in the development of this land trust, I thought it would be appropriate to focus my first two newsletter articles on this topic. This article will be one of a two-part series, the first article consisting of a brief description of the American chestnut, the chestnut blight fungus, and the host-pathogen introduction and implications. The next article will touch on some specifics concerning how the blight has been able to thrive and the efforts science is making towards re-establishing this magnificent organism in regards to hypovirulence and hybridization.

The American chestnut is a member of the Beech family, and is closely allied with both beech and oaks (Audubon Society, 2000). The natural range of *Castanea dentata* reaches from the north to Maine and Ontario, South to Georgia, with a western reach to the plains of Illinois and Indiana. The size and shape of the American chestnut is often described as glorious, with heights reaching upwards of 100 feet, and up to ten feet in diameter. The American chestnut has been reported to be one of the most important trees in its native range in terms of contributions to wildlife, commercial value, and ecological integrity (Virginia Tech, 2012).

The American chestnut was a major species component of eastern forests until the early 1900's, composing 25–40% of the canopy, and represented a key component of several ecological complexes**.** The wood of the chestnut has historically been used in most types of structural construction in addition to split rail fences, shingles, shakes, telegraph/telephone poles, railroad ties, and bridge timbers/pilings. Furthermore, the wood splits easily along the grain allowing for wide planks. This wood is also characterized as being light in weight and relatively soft textured, rendering the wood ideal for carving, furniture, cabinetry, and musical instruments (American Chestnut Foundation, 2001). Another beneficial attribute is the ability of the species to resist rot, largely accounting for its presence in structures to this day. Perhaps the greatest loss of the American chestnut is felt on the wildlife front. North American chestnuts produce a highly nutritious fruit that has large amounts of protein. A large assortment of wildlife such as bear, turkey, and deer (not to mention humans) relied on this tree as a nutrition source. Another important quality, in addition to being of high nutritional value, was the importance of consistency. The American chestnut was a tree that produced seed/fruit late in the season, and was therefore less likely to be impacted by frosts, deeming it consistent in hard mast (fruit of forest trees, like acorns and other nuts) production in comparison to oak and hickory.

(Continued on page 6)

American Chestnut Land Trust, Inc.

P. O. Box 2363
Prince Frederick, MD 20678
Phone: 410-414-3400
Fax: 410-414-3402
info@acltweb.org
http://acltweb.org/nl

Published quarterly by the American Chestnut Land Trust. The ACLT is dedicated to the preservation of Calvert County, Maryland's Natural and Historical Resources. Since it was established in 1986, ACLT has preserved over 3,000 acres. We own 911 acres, manage 1,780 acres owned by the State of Maryland, and hold conservation easements on 374 privately-owned acres.

Editors: Ellen and David Farr

From the President's Desk

Spring and summer are an especially busy time at ACLT. As the weather warms, members, family and friends head to the hiking trails, kayaking Parkers Creek, or whacking invasives. However, almost nothing symbolizes the beginning of a new season more than preparing the earth for a new round of planting, tending and harvesting of vegetables. Jeff Klapper and his team are well along in that process over at our Double Oak property, as part of ACLT's very own Community Supported Agriculture (CSA) project. As many of you may know, a CSA generally begins with an individual or organization providing locally produced, agriculturally based goods. These could include vegetables, fruits, meats, cheese, eggs, etc. They then agree to provide any or all of these products over a specified period of time to those who have purchased a share in their effort.

It was just three years ago when Jeff generously offered his time and talent to spearhead our CSA. He proposed to plant a variety of vegetables and share the bounty weekly over the entire growing season of about 26 weeks. In our first year, Jeff planted vegetables in an area of less than an acre. Eleven shares were sold for $600 apiece and 3 more were given in exchange for work in the garden. In 2011, the number of shares sold grew to 22 and the work shares expanded to 4, plus 2 paid interns. Further, the planting area was expanded to a totally fenced in full acre, with a new irrigation source from the ACLT's office well instead of being trucked in. Progress continues to be made as we enter the 2012 planting season. We have 30 paid shares still at $600 each, 6 work shares, 1 full-time volunteer funded through a grant from the Chesapeake Conservation Corps, and 1 part-time paid intern.

The big news this year is that we are planning to construct a 30′ x 30′ oak timber frame barn. The barn will serve as ACLT's north side trailhead information building as well as provide storage for farm and other land management equipment. The resources for this project comes in part from a grant from the Maryland Heritage Areas Authority, donations from our Founding Farmers group and eventually, the skills and sweat of volunteers who will put up the siding, build porch decks and storage lofts.

Without much more expansion, our CSA will likely require additional equipment and infrastructure investment to operate at maximum efficiency. We will probably need a large tractor for maintaining our remaining 10 acres of fields and cultivating the 1 acre CSA farm, a permanent irrigation source and maybe some indoor restrooms for our hikers and other visitors.

As a small nonprofit organization, we would be negligent if we didn't acknowledge that we would welcome your help in terms of your time in the fields or by contributing directly to our CSA effort or the Spring Appeal that you recently received. However, I am primarily writing today to make sure our membership is fully aware of the substantial progress our CSA has made in the few short years it has been around. It is a very special project that embraces the ACLT's mission in fun and interesting ways. It is an effort that is making a difference and one of which we all can be proud. I strongly encourage you to find a way to support this work that makes sense for your family, even if it is no more than stopping by and saying "Hi" to our farmers and asking them what they will be harvesting that week.

Pat Griffin, President
(Pgriffin@griffinhome.com)

Around ACLT

Annual Meeting of the Membership

ACLT's 25th Annual Meeting of the Membership was held on March 10, 2012. Highlights included recognition of one retiring board member; election of two new board members; renaming of ACLT's Conservation Award as the Ralph Dwan Memorial Conservation Award; and a distinguished panel of keynote speakers that addressed water quality in Parkers Creek.

Retiring board member Jim Greene was recognized for his 14 years of service as a member of the ACLT Board of Directors. Jim served as Vice President from 1999–2003. He also served as Chair of the Land Management Committee in the late 1990s and as a member of the Administration & Fundraising Committee for many years. Jim was influential in developing the plan to build ACLT's Land Management Endowment Fund, originally established by the Murphy and Greene families.

ACLT's two new board members are well known to many. Greg Bowen recently retired from the Calvert County Department of Planning and Zoning where he worked for the last 32 years, serving as the Director for the past seven years. Greg is currently also serving on the board of the Cove Point Natural Heritage Trust and is a member of the Maryland Sustainable Agricultural Growth Commission. Dr. Ray Noble was in private medical practice until 2006 and subsequently became the Medical Director for Calvert Hospice. He founded Calvert Healthcare Solutions, a nonprofit organization that provides primary medical care to the uninsured in Calvert County, Maryland.

Jeff Klapper was awarded the 2011 Ralph Dwan Memorial Conservation Award for his outstanding achievements in launching the Double Oak Farm CSA in 2010, which has now completed two successful seasons with Jeff serving as its volunteer farm manager. The CSA has engaged the community in a sustainable future for agriculture in Calvert County, expanded ACLT's outreach, provided educational opportunities for students and interns, and provided over two dozen families with fresh, locally grown food. Last year, the CSA also regularly supplied produce to Project Echo and the Abused Persons Shelter.

Top: Jeff Klapper, Volunteer Farm Manager (*left)* receiving the Ralph Dwan Memorial Conservation Award from ACLT President Pat Griffin.
Bottom: Newly elected board member Greg Bowen (*right)* accepting a Land Management Endowment Fund commemorative plate on behalf of Cove Point Natural Heritage Trust.
Photos by Carl Fleischhauer.

Water Quality in Parkers Creek ~ from Headwaters to the Bay

The ACLT web site reminds us that Parkers Creek is the crown jewel of our land trust. "A visitor today can still paddle a canoe over a mile and a half through unspoiled salt marshes and wooded freshwater wetlands and see little sign of human activity." While the beauty of the watershed is readily apparent, people often ask us about the condition of Parkers Creek.

- What do we know about its water quality and its biological health?
- Have changing land uses and the county's sewage treatment plant had an impact?
- What will the newest efforts to improve water quality at the local, state and federal levels—the Watershed Improvement Plans (WIP)—mean for Parkers Creek?

At the annual meeting our panel of experts, representing local government, state government, and a

researcher with the University of Maryland Center for Environmental Studies provided us with valuable insights on these questions.

Dr. Dave Brownlee, Calvert County's Principal Environmental Planner, presented a summary of the county's WIP to meet state set target Total Maximum Daily Load (TMDL) reductions in nitrogen and phosphorus. He expressed a concern that the county's projected cost to meet the TMDL standards, on a per capita basis, are among the highest in the state.

Dan Boward, with the Maryland Department of Natural Resources, explained the state's biological stream survey monitoring program which monitors freshwater streams for indicator aquatic insects and fish species. According to Dan, there are no pristine streams in Maryland. All streams in Calvert County are considered "impaired." Despite Parkers Creek's extensive preserved forested watershed, Dan attributed Parkers Creek's ratings, which range from poor to fair to good depending on the sampling year and level of rainfall, to "legacy" issues tied to the area's erodible soils and steep slopes as well as the inability of freshwater fish species to recolonize the creek due to being blocked by the salt waters of the Bay.

Dr. Lora Harris, Assistant Professor, University of Maryland Center for Environmental Science's Chesapeake Biological Laboratory, explained the influence of land use on water quality, noting that the Parkers Creek watershed contains a "phenomenal" 70% forested area, 9% developed areas in and near Prince Frederick, and that agriculture accounts for 13% of land use. There are a total of 827 septic systems in the watershed. Lora's article summarizing her remarks at the annual meeting begins on page 8.

Karen H. Edgecombe
Executive Director

Keynote speakers (*left to right):* Dave Brownlee, Calvert County Department of Planning and Zoning; Lora Harris, University of Maryland Center for Environmental Science, Chesapeake Biological Laboratory; and Dan Boward, Maryland Department of Natural Resources. Photo by Carl Fleischhauer.

Spring Happenings around ACLT

from Kady Everson
Community Relations Coordinator

Earth Day Clean-up and Celebration

This year's annual Earth Day Clean-up and Celebration was a resounding success, with over 90 volunteers in attendance. Of those 90 volunteers, roughly half were members of Cub Scout Troop 789, here on a mission to help remove invasive plants from our Warrior's Rest property and to hike our South Side trails. For their hard work, they earned Conservation Good Turn patches and hiking belt loops.

Other crews of volunteers participated in roadside clean-up, worked on the native plant garden, repaired boardwalks and buildings on the north side, and spruced up the Hance-Chesley Cemetery grounds. After a full morning of clean-up activities, volunteers and staff kicked up their feet at Scientists' Cliffs South Beach for a celebratory picnic. Mother Nature must have appreciated our efforts, because she held off the forecasted downpour until the end of the event! Many thanks to all of our dedicated volunteers who make our mission to preserve and protect land around the Parkers Creek and Governors Run watershed possible.

Father and son make a fine vine vindicating team (Gavin and Garrett Hurley). Photo by Tom Pike.

Ground Breaking

On April 23rd, ACLT broke ground for the construction of a new barn and trailhead information center to be located at Double Oak Farm. ACLT's Master Plan for Facilities identified a need for a multi-purpose barn for storing agricultural and land management equipment with an outdoor covered space for multiple purposes including a trailhead, CSA share distribution, and small training events or other volunteer activities. The facility plan called for a 30' x 60' barn with the possibility of restroom facilities to be provided for hikers and volunteers.

ACLT has engaged Bruce Cowie, Susquehanna Timber Frames LLC, of Lancaster, Pennsylvania to construct a 30' x 30' oak timber frame barn with 10' deep porches on two sides. The barn committee decided to opt for timber frame construction to allow for potential future expansion. Support for this project has been provided by donations from ACLT's Founding Farmers in support of infrastructure for the Double Oak Farm CSA and a grant from the Maryland Heritage Areas Authority for construction of the new Prince Frederick to the Bay Overlook Trail. Once the timber frame structure and roof are completed in July, volunteers will complete the work by installing the barn siding, loft and porch decking.

Foundation work provided by Gary Hammett and crew of Hammett's Building Services, LLC. Photo by Kady Everson.

Don't forget to record your volunteer hours online by going to http://acltweb.org/Administration/volunteer/index.cfm.

Native Plant Garden

2012 has been a year filled with new and ambitious projects for ACLT, from constructing a greenhouse on the CSA farm and laying foundation for a new barn, to seeking accreditation from the Land Trust Alliance, and commencing work on the Prince Frederick to the Bay Overlook Trail, to name a few. An equally impressive undertaking has been the creation of a native plant garden near our South Side trailhead. The native plant garden is a follow on grant project from the MD House and Garden Pilgrimage Program from 2011 and is being managed under the watchful eye of ACLT's Chesapeake Conservation Corp volunteer, Taren Evans.

During this year's Earth Day Clean-up and Celebration, Taren organized a group of volunteers to plant the first phase of trees, which included White Flowering Dogwoods, Swamp White Oaks, and Eastern White Pine. In addition to planting dozens of trees, the garden crew installed protective fencing around the newly planted trees to keep away hungry critters. All in all, not bad for half a day's work!
To keep this momentum going, Taren will need continuous support from ACLT volunteers and gardening enthusiasts to keep the existing plants watered, while additional trees, shrubs, and grasses are planted. To get involved with the native plant garden, please contact the office at volunteer@acltweb.org or call 410-414-3400.

Our native plant garden crew working hard on Earth Day. Photo by Kady Everson.

Spring Happenings continued on page 10

(CONTINUED FROM PAGE 1)

The chestnut blight, *Cryphonectria parasitica*, is thought of as one of the most destructive fungal species in American forests. This fungus is native to Asia, and has been responsible for the mortality of an estimated 3.5–4 billion trees throughout the range of the American chestnut (American Chestnut Foundation, 2001). In decimating the American chestnut, *C. parasitica* forever altered the forest landscape and stand dynamics of the Eastern United States. In Asia, this pathogen is regarded as little more than a nuisance, mostly infecting dying twigs and isolated patches of bark (Milgroom, 1995). The fungus was imported into the United States in the early 1900's, allegedly arriving in an infected shipment of Asian chestnut logs. In 1904, curators of the Bronx Zoo in New York began to notice a decline afflicting the American chestnuts on the avenues surrounding the zoo (American Chestnut Foundation, 2001). Symptoms were soon apparent on trees in adjacent areas, with symptoms including wilting leaves, crown die back, and the presence of sunken cankers on stems. In 2–3 years the blight had made its way throughout New England and South through Virginia, spreading at an approximate rate of 45 miles per year (American Chestnut Foundation, 2001). In a span of about 40 years (roughly 1910–1950), the American chestnut tree was essentially decimated, leaving the only living trees either functioning as sprouts from root stocks throughout the native range, or sizable survivors scattered at natural range edges. The chestnut blight swept through an estimated 3.5 billion trees, with financial losses (from three states: West Virginia, South Carolina, and Pennsylvania) estimated at $82.5 million for the year 1912 alone (Burnham, 1988). In an effort to salvage wood from the ensuing epidemic, many timber stands were harvested prematurely, more than likely reducing the chance of a genetic resistance within the native gene pool.

American chestnut saplings infected by the chestnut blight fungus. (Courtesy of the American Chestnut Foundation.)

Cryphonectria parasitica is an exceptional fungus in many ways and is alarmingly efficient in causing mortality in the American chestnut. North American chestnuts, as opposed to the Asian chestnut, are genetically predisposed to this fungus. With an absence of evolutionary history of pathogen attack and induced plant response defenses, the chestnut tree had no engineered plant defense against the pathogen, leaving it vulnerable. The life cycle of the fungus is not restricted by environmental conditions or host availability in North America, so reproduction and infection may occur at any time of year where host, pathogen, and environmental conditions coincide. The chestnut blight fungus reproduces by means of both sexual and asexual spores, which are easily transported by wind and rain splash and have no problem finding new stock to infect. To make matters worse, this pathogen has a number of alternate hosts readily available, mainly scarlet oak. In other words, the fungus isn't going anywhere. Specifics about the reproductive and infection mechanisms of this pathogen will be discussed in next season's article.

Although the fungus is devastatingly efficient at killing the above ground portion of the tree, the below ground portion remains intact. The root system will send up vegetative sprouts that are genetic copies of the parent tree, which will in turn attempt to compete for light and nutrients, only to be re-infected by the blight. The vegetative sprouts will often attain heights of 10–12 feet before succumbing to infection (MacDonald, 1991). There are of course exceptions to this commonality, as Calvert County, Maryland in particular, is well aware. The ACLT namesake tree was to some degree resistant to the advancement of the blight and was able to survive to a diameter size exceeding 20 inches. It is the ability of the American chestnut to sprout vegetatively that has allowed the species to escape extinction. However, since these sprouts are genetically identical to the parent trees, the amount of genetic diversity entering the gene pool is negligible, allowing little to no hope of new strains that may possess some evolved defenses against the pathogen.

The loss of the American chestnut has disrupted many ecological complexes, many of which are still poorly understood. The absence of the chestnut as the dominant species in woodlands has left a major niche vacancy throughout its range. The blight had a major effect on the composition, or types of trees, that were found in eastern forests. This

Chestnut Giants, Great Smokey Mountains, western North Carolina. Some of the trees in the background may be poplar. Photo was first published in the American Lumberman, January 1910. (Courtesy of the Forest History Society, Durham, North Carolina.)

was largely because the American chestnut did not allow less competitive tree species to grow to maturity. The chestnut would out-compete most other tree species for available resources such as light, water, and nutrients in the soil. When the chestnut disappeared, it gave some of the slower growing species a chance to compete for the needed resources. This is likely the reason that our Eastern forests have shifted from an overstory tree composition of Red oak and American chestnut to Tulip poplar, White oak and hickory. Changes in species composition and stand dynamics have also increased hardships for wildlife. As stated earlier, the American chestnut was an extremely important mast producing species. Although there are many producers of hard and soft mast utilized by wildlife, studies have shown a decline in mast production of an estimated 40% since the demise of the American chestnut (American Chestnut Foundation, 2001).

Other factors resulting from chestnut absence include impacts to understory regeneration. The American chestnut has been found to exhibit allelopathic properties toward specific vegetation species, particularly rosebay rhododendron and Eastern hemlock. In other words, the chestnut would secrete enzymes into the soil that would impact growth of rhododendron and hemlock; probably a mechanism to limit competition for chestnut seedlings. This would lend a solid explanation to the abundance of rhododendron currently found in our forests today. Further impacts have been examined in soils concerning decreased rates of nitrogen mineralization and increased rates of soil erosion of thin mountain soils in the Eastern United States (Vandermast and Van Lear, 2002). The bottom line is that we will never be certain about the full effects surrounding the loss of the American chestnut. I do hope that the next article will be helpful in providing an introduction to the science and methods that are currently being explored to revive this lost giant that was once so plentiful in our Eastern forests.

Literature Cited:

American Chestnut Foundation, Maryland Chapter. 2001. The American Chestnut Story. *http://www.mdtacf.org/story.shtml*

Burnham, C. 1988. The Restoration of the American Chestnut.
American Scientist. 76:478-487.

MacDonald, W. and Fullbright D. 1991. Biological Control of Chestnut Blight: Use and Limitations of Transmissable Hypovirulence. Plant Disease. 75:656-661

Milgroom, M.G. 1995. Population Biology of Chestnut Blight Fungus, Chryphonectria Parasitica.
Canadian Journal of Botany. 73:311-319.

National Audobon Society, 2000. Field Guide to North American Trees. Alfred A. Knompf, Inc. New York. P. 377-379.

Vandermast, D.B., Van Lear, D.H., Clinton, B.D., 2002. American Chestnut as an Alleopath in the Southern Appalacians. Forest and Ecological Management. 165 (2002): 173-181.

Virginia Department of Forestry. 2012. American Chestnut—History and Restoration Effects in Virginia. *http://www.dof.virginia.gov/research/chestnut-amer-hist-rest-in-va.htm* .

Virginia Polytechnic Institute, Department of Forest Biology, 2012. American Chestnut History. *http://www.dendro.cnre.vt.edu/forsite/Paul/paul1.htm* .

Steven Gaines
Land Manager

Check us out on Facebook. Become a fan of the American Chestnut Land Trust today!
(http://www.facebook.com/pages/American-Chestnut-Land-Trust/250928382473?ref=ts)

Science in the Watershed

The Influence of Land Use on Water Quality

The American Chestnut Land Trust has a tradition of defining its land preservation efforts as belonging to either the Parkers Creek or Governor's Run watersheds. To a scientist interested in the interactions between land use and estuarine water quality, the goal of targeting particular watersheds for land preservation is appealing. I greatly appreciated the opportunity to talk about our work in Parkers Creek at the annual membership meeting and I hope this article serves as a summary document of some of the ideas I presented as part of the water quality panel. The watershed of an estuarine system such as the tidal waters of Parkers Creek encompasses the area of land where precipitation, surface, and groundwater all run into the same receiving waters. In temperate, coastal waters like the Chesapeake Bay where water quality can be poor, problems such as low oxygen in the summer can often be traced back to inputs from the watershed of sediment or nutrients (nitrogen and phosphorus).

The microbial populations of the Chesapeake Bay include both phytoplankton that produce carbon through photosynthesis, as well as bacteria that break down dead plankton cells and recycle materials back to the water column. This microbial population also helps to support fish and shellfish. Just as your garden requires nutrients to grow, so do the phytoplankton cells in the Chesapeake Bay. Nitrogen and phosphorus are particularly important for phytoplankton production and a large portion of these nutrients in estuaries come from the watershed. Problems can occur when too much of these essential nutrients enter an estuary and lead to high carbon production by the phytoplankton. This process is called *eutrophication* and its symptoms can include low dissolved oxygen and loss of submerged aquatic vegetation (SAV). When large blooms of phytoplankton occur, the dying cells fall to the bottom of the water column where the bacteria break them down, a process that consumes oxygen. In estuaries where layers of freshwater and saltier water can cut off bottom waters from the surface, this process can lead to a lack of oxygen or "dead zones" that may affect the fish and other organisms that need oxygen to survive. Blooms of plankton can also cut off light to the bottom of the water column, affecting SAV and leading to losses of these important habitat-forming plants.

We typically use the ratio of carbon to nitrogen and phosphorus (106:16:1) that is necessary for the reactions of photosynthesis to evaluate which nutrient is *relatively* lower in availability. In the saltier portions of the Chesapeake Bay, nitrogen is usually the most "limiting" nutrient because the ratio of nitrogen to phosphorus is less than 16:1, leading to conditions where increased production occurs when more nitrogen is added to the system. Nitrogen is the most abundant gas in the earth's atmosphere, but in its gaseous form is not readily available to plants. Natural pathways to create biologically available nitrogen include lightning strikes and "fixation" of N_2 gas by specially adapted bacteria that live in soil as well as natural waters. In the early part of the 20th century, the Haber-Bosch process of industrializing nitrogen fixation from N_2 gas to ammonia was developed, first as a means of producing fertilizer for crops and then for explosives in World War I. Today, more than half a billion tons of nitrogen based fertilizer are produced as a result of this process. For agricultural lands in a watershed, any portion of the fertilizer or animal manure applied to crops that is not converted to plant biomass will eventually travel to receiving waters through surface water runoff or groundwater. Additional watershed sources include deposition of biologically available nitrogen originally put into the atmosphere through the combustion of fossil fuels. And, of course, nitrogen is a component of human waste that is processed through either wastewater treatment plants or septic systems. The average U.S. citizen produces 4.6 grams of nitrogen per day in sewage waste.

To understand how much of these sources of nitrogen reach coastal waters, estuarine ecologists consider the land use in the watershed. Land use has an especially strong effect on nitrogen deposited from the atmosphere, with more of this source ending up in the water from land covered in impervious surfaces such as roads or rooftops, than those covered in forest that slow the rate at which nitrogen travels to streams and groundwater. Figure 1 shows a map of

land use in the Parkers Creek watershed and the prevalence of forested land (>70%), a direct result of the land preservation efforts of the ACLT. Almost half of the land in the watershed is protected. It is also possible to see how agriculture and the urban town center of Prince Frederick fall primarily in the headwaters of the watershed. This is an important pattern to notice, as impervious surfaces associated with urban land use can change the rate that precipitation runs off into streams, potentially changing the function of the streams in the watershed drainage network. Faster, flash-ier stream flows may result due to paved headwaters. Doctoral candidate Jake Hosen is studying the intermittent streams and headwaters of Parkers Creek and has already documented distinctions between urban and forested sites. In addition to the land use patterns, Parkers Creek hosts the Prince Frederick wastewater treatment plant, which implements spray irrigation of the treated effluent. Despite these challenges, another dominant feature of the watershed is the extensive wetlands that flank the tidal and non-tidal creeks. From brackish to freshwater tidal marshes, beaver ponds and forested swamps, the diversity of wetlands encompassed by this watershed is remarkable. These valuable ecosystems provide numerous services in processing nutrient and sediment inputs and slowing water flows through the system, allowing more time for specialized bacteria to turn biologically available nitrogen back into N_2 gas, a process known as denitrification.

Because the Chesapeake Bay has impaired water quality as a result of inputs of nutrients and sediment, Calvert County is currently designing Watershed Implementation Plans (WIPs) to describe our 26 watersheds and propose restoration and reduction plans for the pollutants of concern. Table 1 and Figure 2 show the breakdown of the estimated nitrogen loads for Parkers Creek. These are compared to the Hall and Mill Creek watersheds, which are also located in Calvert County. We estimate that between ~32,600 and 38,000 pounds of nitrogen are exported from Parkers Creek each year, with over 50% of these amounts from fertilizer. While this is an impressive number, it is less than half of the areal loading rates for the Hall and Mill Creek systems. There are certainly ways that we can reduce the amount of nitrogen entering the Bay, but this watershed stands out as relatively pristine in comparison to others in the region. The estimates we provide here are modeled numbers. A big part of the research that my group is doing in Parkers Creek involves actual measurements of the loads of nutrients and sediment from the watershed by monitoring stream discharge as well as taking measurements of nutrient and sediment concentrations. The stream monitoring that is done by ACLT volunteers is also critical for these efforts and provides us with a more holistic view of how nutrients vary at different locations in Parkers Creek. I hope that a separate article here in the near future

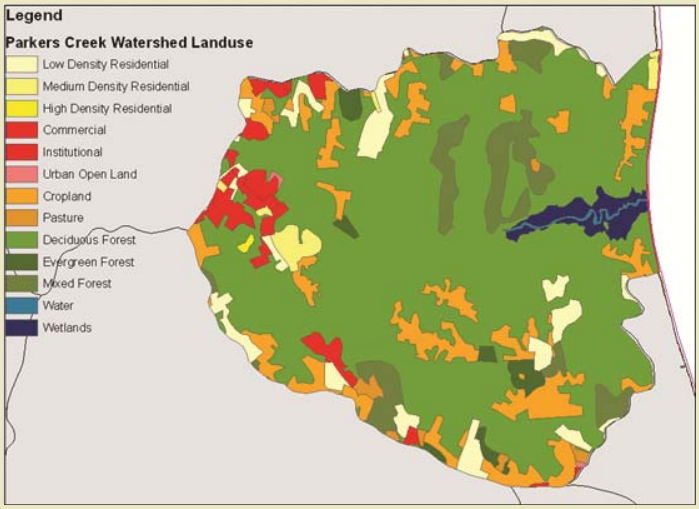

Figure 1. Land Use in Parkers Creek's watershed. Data from Calvert County Planning and Zoning based on 2007 aerial imagery

	Parkers NLM	Parkers CCounty	Hall Creek	Mill Creek
Lbs N/Year	37,843	32,616	129,160	71,918
Lbs N/Acre	4.8	4.1	9.4	11.6

Table 1. Estimates of nitrogen loading from Parkers Creek estimated by Harris (NLM) and Calvert County in comparison with Hall and Mill Creek.

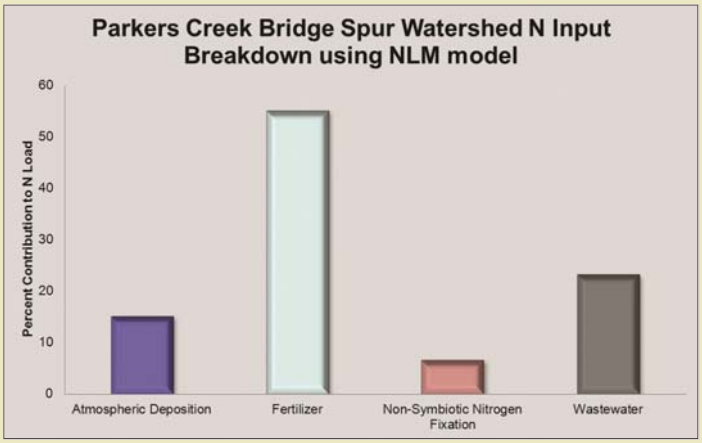

Figure 2. Breakdown of nitrogen sources into four major categories.

will highlight those citizen-collected monitoring data.

In addition to evaluating inputs from the watershed, we are particularly interested in the ways in which the tidal wetlands of Parkers Creek remove nutrients and sediments and how these removal processes interact with rising sea level. Marsh ecologists now understand that many of the species in salt marshes respond to increased water depth associated with sea level rise by increasing the height and amount of the aboveground portions of the wetland plants. This has a feedback on the amount of sediment that is captured by the marsh. Increased nitrogen also causes plants to put more growth into above ground stems and leaves. My laboratory is very interested in exploring what thresholds exist for the amount of nitrogen, sediments, and sea level inundation that a given wetland can withstand. Ultimately, we hope to provide basic data to inform managers of the role that tidal wetlands play in removing nutrient and sediment inputs from the watershed before these contaminants reach the Chesapeake Bay. We greatly appreciate the opportunity to use the ACLT managed lands of Parkers Creek to explore these questions, which we hope will help managers and restoration efforts for Chesapeake Bay and other impaired temperate estuaries experiencing similar challenges.

Lora Harris
Chesapeake Biological Laboratory

MAPP Project Update

In the fall 2011 newsletter, we reported that the Mid-Atlantic Power Pathway (MAPP) project has been delayed but not abandoned. On September 6, 2011, the Maryland Public Service Commission "suspended for a period of time not less than one (1) year" their proceedings to determine the overall need for construction of the MAPP project.

At a presentation before the Calvert County Planning Commission in February 2012, PEPCO reported that their target completion date is now sometime in the 2019-2021 timeframe, as opposed to the original target date of 2015, based on an assessment of the need for the project conducted by the regional grid operator in August 2011. Another update by the regional grid operator is expected in August 2012.

In response to the scoping meetings held in Prince Frederick last spring by the US Department of Energy (DOE) for an Environmental Impact Statement (EIS), PEPCO reported that they have been asked by DOE to analyze additional alternatives to the proposed Port Republic location of the converter station. As a result, five additional sites have been identified and will be studied for economic feasibility, land availability, and impacts on community and natural resources. ACLT is pleased that DOE listened to the comments presented at the scoping meetings and agreed that alternative locations should be considered in the EIS.

Although the EIS process does not require PEPCO to *choose* another alternative, it does require adequate consideration of alternatives. The DOE currently lists the status of this EIS as "on hold."

If you would like to receive timely news about this project, please email **kedgecombe@acltweb.org** and ask to have your email address added to the MAPP project email contact list.

Spring Happenings continued from page 5

Hiking Trail Maintenance Day 2012

The ACLT staff extends a sincere thank you to all of our dedicated volunteers who came out for our annual Hiking Trail Maintenance Day on Saturday, March 31st. Crews of volunteers worked throughout the morning on various projects including clearing downed trees and vines, repairing damaged boardwalks, and installing a memorial bench and new trail signs. Volunteers also worked to restore a portion of our Kenwood Beach property that was vandalized over the winter. Back at the ACLT office, we were grateful to have a number of volunteers who helped us prepare for our post-maintenance day cook out and even stayed after for clean-up. Thank you to all of our volunteers for accomplishing so much in such a short amount of time! It is safe to say that our trails are ready for the 2012 hiking season thanks to your efforts.

Mark Stachnik, Ed Haack, and Mike Walls (left to right) making repairs to Parkers Creek foot bridges.

Thank you for your support ...

New Members

ACLT would like to welcome the following new members since the Winter 2012 newsletter:
Ms. Ellen Berry
Ms. Karen D. Cipressi
Cub Scout Pack 789
Mr. & Mrs. Edward Deska
Mr. Steven Gaines
Mr. & Mrs. Larry Gates
Ms. Rachel Graham
Mr. James Hindman
Ms. J. Amanda Machen
Mr. & Mrs. Marc Magninec
Mr. Randy R. Matteson
Ms. Lissi Mojica
Mr. Andrew Rappaport
Ms. Tracy Umstead
Ms. Paula Walker
Mr. John Whelan
Mr. John Wiland

Sustaining Membership

Congratulation to the following members who have reached the level of Sustaining Membership:
Mrs. Magda Freeman
Mr. & Mrs. Kenneth Romney

Gift Memberships

Thank you to the following members who donated gift memberships since our last newsletter:
Mr. & Mrs. Bruce Armstrong
Mr. & Mrs. Paul Berry
Dr. & Mrs. Glenn Edgecombe
Mr. & Mrs. Bob Poling

In Memory of Contributions

Thank you to the following persons who made a memorial contribution since our last newsletter:

In memory of **Mr. Robert Bibb** who was a Charter Member:
Mr. & Mrs. Daniel M. Head

In memory of **Mr. Ralph H. Dwan, Jr.** who was a Charter Member and one of the founders of the ACLT. Ralph served as ACLT's first President, and over the years served on the board as Secretary, Treasurer, and again as President, along with serving on numerous committees throughout the years:
Ms. Maureen Burns
Drs. Judith and Donald Dahmann
Dr. & Mrs. Edward U. Graham
Dr. Edward Hacskaylo
Ms. Sara Jane Hardin
Mr. Edmond Missiaen

In memory of **Amb. Patricia Lynch Ewell,** who was a Charter member and previous Board member of the ACLT:
Ms. L. Schaeffer and
Mr. Gian Carlo Guarda

In memory of **Mr. David Jaeger**, son of Charter Members Mr. & Mrs. Robert Jaeger:
Dr. Christine & Col. Daniel Boesz
Mr. & Mrs. Carl Jaeger

In memory of **Mr. William Johnston** who was a Sustaining Member and longtime supporter of the ACLT:
Mr. & Mrs. Glynn H. Frank
Ms. Kathleen McGillicuddy
Dr. & Mrs. Edward U. Graham

In memory of **Mr. Kenneth Masters,** brother of Gilbert Masters:
Mr. & Mrs. Michael Cunningham
Dr. & Mrs. Edward U. Graham

Spring Appeal

The Staff and Board of Directors wish to thank the following for their contributions to the 2012 Spring Appeal:
Mr. & Mrs. John Bailey
Mr. & Mrs. Paul L. Berry
Mr. Vernon W. Brumbaugh
Mr. & Mrs. Frank R. Caldwell, Jr.
Mr. & Mrs. Paul Dennett
Mr. & Mrs. Samuel M. Ellsworth
Flag Harbor Marine Service
Mrs. Magda Freeman
Dr. & Mrs. Oliver S. Flint, Jr.
Mr. & Mrs. Lawrence A. Gates
Mr. & Mrs. Edward P. Greene
Ms. Jane S. Harrell
Ms. Anne Warner & Mr. Michael Makuch
Mr. & Mrs. Jeffery Quesenberry
Dr. & Mrs. Austin Platt
Mr. & Mrs. Peter N. Stathis
Col. Caroline VanMason, USA (Ret)

General Contributions and Designated Gifts

Thank you to the following for your generous gifts and support:
Rev. Peter James Daly
Ms. Marcy Damon &
Dr. John Kane
Mr. Carl Fleischhauer &
Ms. Paula Johnson
Mr. & Mrs. Steven T. Kullen
Capt. and Mrs. Patrick Murphy, USN (Ret)
Mr. Jeremy Orr
Mr. Glen O. Pyles
Mr. & Mrs. Craig Shelden & Family

Through the IBM 2011 Employee Charitable Contribution Campaign:
Mrs. Kathleen Kingscott

Matching Gifts:

ACLT Calendar of Events
May–August 2012

May
- 19 **Guided Canoe Trip** (1:00 p.m. - 4:00 p.m.) *(Sunday Rain Date)*
- 19 **Vine Vindicator Work Day** (9:00 a.m. - 12:00 p.m.)

June
- 2 **Guided Canoe Trip** (12:00 p.m. - 3:00 p.m.) *(Sunday Rain Date)*
- 9 **Parkers Creek to Flag Ponds Paddle** (7:30 a.m. - 12:00 p.m.)
- 16 **Guided Canoe Trip** (12:00 p.m. - 3:00 p.m.) *(Sunday Rain Date – Father's Day)*
- 30 **Guided Canoe Trip** (10:30 a.m. - 1:30 p.m.) *(Sunday Rain Date)*

July
- 21 **Guided Canoe Trip** (4:00 p.m. – 7:00 p.m.) *(Sunday Rain Date)*

August
- 4 **Guided Canoe Trip** (3:30 p.m. – 6:30 p.m.) *(Sunday Rain Date)*
- 18 **Guided Canoe Trip** (3:00 p.m. – 6:00 p.m.) *(Sunday Rain Date)*
- 25 **Walk Along the Bay Membership Event** (tentative date)

American Chestnut Land Trust, Inc.
Post Office Box 2363
Prince Frederick, MD 20678

NONPROFIT
STANDARD MAIL
PERMIT NO.
548
PRINCE FREDERICK
MD

Come Join Us!

Detach and Mail to: The American Chestnut Land Trust, Inc., P.O. Box 2363, Prince Frederick, MD 20678

Name _____ **e-mail** _____

Address _____

_____

Phone _____ **I (we) learned about ACLT from** _____

Regular Membership

___ Land Saver—$35.00

___ Land Protector—$60.00

___ Land Conservator—

___ Habitat Protector—$500.00

___ Trustee of Land—$1000.00

___ Sustaining—$2500.00

Corporate Membership

___ Land Saver Corporate—$150.00

___Land Protector Corporate—$250.00

___ Land Conservator Corporate—$500.00

The American Chestnut Land Trust is a 501 (c) (3) charitable organization. A copy of the current ACLT financial statement is available on request. Requests should be