

Watershed Observer



NEWSLETTER OF THE AMERICAN CHESTNUT LAND TRUST - VOLUME 35 No. 3 SUMMER 2021

CONTENTS

QUO VADIS, ACLT AND THE PARKER'S
CREEK PRESERVE? 1

PRESIDENT'S MESSAGE: 2

HOW TO MAKE YOUR BACKYARD A
HAVEN FOR WILDLIFE 3

CALENDAR OF EVENTS 4

DEVELOPING ON A RAZOR'S EDGE:
THE CASE FOR SUSTAINABLE
DEVELOPMENT THAT KEEPS THE NAT-
URAL ECOSYSTEMS THRIVING 5

JOIN ACLT'S FORCE OF NATURE 7

CONTRIBUTIONS AND NEW
MEMBERS 10

ACLT MEMBERSHIP – WHAT'S IN IT FOR
YOU 11

COMING UP ON THE CALENDAR

July 2021

4th through Labor Day (September
6th) - Passport to Preservation
(See calendar on page 4 for
details)

August 2021

29th - Guided Evening Hike – Fare-
well to Summer

SEE MORE OF THE 2021 CALENDAR ON
PAGE 4 OR ONLINE AT [HTTP://
ACLTWEB.ORG](http://acltweb.org).

BE SURE TO CHECK OUR WEBSITE, [HTTP://
ACLTWEB.ORG](http://acltweb.org), TO VERIFY THE CURRENT
STATUS OF OUR EVENTS.

QUESTIONS? COMMENTS?

PLEASE CALL US AT 410-414-3400

Quo Vadis, ACLT and the Parker's Creek Preserve?

Part II — Will rapid sea level rise turn the marsh to mud flats and shallow lagoon?

In the last newsletter, I speculated on the future of the ACLT as the successful land conservancy it has become. Now about the future of the **Parkers Creek Preserve (PCP)**, its dramatic habitat diversity, an island in a vast urban-suburban sea. Our small but growing oasis is protected into the indefinite future for nature and passive human recreation. The protection is by legal, not physical fencing, and how we manage this oasis. Ecology is the response of life to physical forcing—notably climate. Absent human influences, it would be easy to predict the climate, sea level and ecology even millennia from now.

As is, what will happen especially to the salt marsh and adjoining freshwater swamps in the coming decades and centuries is awash in uncertainty. How fast will humans reduce greenhouse gas emissions? How fast and how much will climates change, and how much and how fast will sea levels rise—largely by ice loss in Greenland and Antarctica? How will tidal Parkers Creek and the PCP respond to those distant and global processes? How will PCP biota respond to warmer climates and higher CO₂? How much will the oceanic and thus the Chesapeake's acidity increase, impairing carbonate shell growth by oysters and clams? How much will land-falling tropical cyclones intensify due to a warming Atlantic? Will land-fall frequency change? How might multidecadal variability change—confusing long term climate change predictions?



Drone photo of tidal Parker's Creek and marsh by Nathan Bowen (May 2020).

(CONTINUED ON PAGE 8)



**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>

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 3,200 acres. We own 1390 acres, manage 1,819 acres owned by the State of Maryland, and hold conservation easements on 374 privately-owned acres.
Editors: Ellen and David Farr

Board of Directors

David F. Farr, President
Dawn Balinski, Vice President
B.L. Johnston, Corporate Secretary
Cheryl L. Place, CPA, Treasurer
Richard Aldrich
Joy Bartholomew
Walter Boynton
Denise Breitburg
Steven P. Cloak, Jr.
Peter Daly
Bob Field
Darlene Harrod
Ron Klauda
Shirley Knight
Penny Moran
Nathan (Nate) Novotny
Birgit Sharp
Suzanne Shelden
Robyn Truslow
Frederick Tutman
Randi Vogt

Executive Director

Greg Bowen

Community Relations Manager

Miriam Gholl

Land Manager

Autumn Phillips-Lewis

Chesapeake Conservation Corps Interns

Alyssa Matanin
Nicole Stevens

Office Coordinator

Janel Young

Ann White, Contract Accountant

Volunteer Staff

Ginny Murphy,
Susan Helmrich
Membership Coordinators

From the President's Desk ...

Despite the pandemic, ACLT has had an outstanding year!

On the land preservation front: After many years of negotiations ACLT has finally purchased the GRDC property. This is a significant milestone in ACLT's work to protect the Governors Run watershed. This 78-acre plot was the last remaining large unprotected forested property in the West Governor Run Watershed. Importantly, this property provides a link between the Kenwood property and the East Gravatt property. The importance of this property was described on page 3 of the summer 2019 *Watershed Observer*¹ and the funding process was covered on page 2 of the Spring 2020 issue². If you haven't seen the article in the *Bay Weekly*, follow this link: <https://bayweekly.com/land-trust-protects-old-growth-forest/>

During the pandemic ACLT was able to continue to offer events such as the **Hit the Trails** challenge, the members only **Full Moon Hikes**, **The Parkers Creek Challenge**, and the ongoing **12 Hikes in '21'**. ACLT's 22 miles of trails have seen a significant increase in use over the last year. There has also been a welcome increase in memberships. Even though the pandemic caused the cancellation of some of our popular canoe trips in 2020, we have a full calendar of trips for this summer. See page 4 of this newsletter and the web site for more details. Visit the front page of the ACLT web site often. You will find upcoming events; trail conditions; new blog entries, including a new blog series on "The Secret Lives of Insects"; and a live feed from ACLT's Facebook page.

The two major articles in this newsletter, "Quo Vadis, ACLT and the Parker's Creek Preserve?" and "Developing on a Razor's Edge: the case for sustainable development that keeps the natural ecosystems thriving" testify to our ongoing interest in documenting and reporting on the natural history of the Parkers Creek area.

A thriving organization needs members and volunteers. See page 11 of this issue for detailed membership levels and benefits. Find out how you can become part of ACLT's Force of Nature on page 7.

David Farr
President

1. <https://www.acltweb.org/wp-content/uploads/2020/09/summer2019.pdf>

2. <https://www.acltweb.org/wp-content/uploads/2020/09/spring2020.pdf>

How to Make your Backyard a Haven for Wildlife

You don't have to travel far to find awesome animals—cool critters can reside right in your backyard! Natural spaces around your house create safe wildlife habitat while simultaneously benefiting your mental health and reducing the amount of time and money needed for yard upkeep.

Native shrubs and trees provide shelter and food for a plethora of species including insects, birds, and mammals; whereas introduced plant species that have not coevolved with native fauna often provide little to no benefit to wildlife. By replacing just a few ornamental plants or converting part of your yard to a native meadow, you will notice a huge change in the number of animals on your property! Limiting the addition of chemicals to your yard—such as herbicides, insecticides, and rodenticides—will also avoid inadvertent harm to beneficial or unintended species (such as a hawk eating poisoned mouse). Further, making some small changes to common practices (such as keeping cats indoors where they won't affect local bird and mammal populations) can really make a big difference.

Keep reading to learn more about how your yard can become a wildlife oasis for animals like birds, bees, and herps (reptiles and amphibians)!

Birds

Maryland is home to many beautiful bird species and you don't need to be an experienced birdwatcher to find them. Native foliage is an appealing refuge for migratory travelers or nesting residents and a few plantings will likely increase your number of backyard visitors. Native plants provide food for birds as well as habitat for the insects that many birds prey upon. You can also directly assist birds by providing baths (preferably with running water to reduce the risk of breeding mosquitos) or feeders with a healthy food source.



Bluebird house outside the ACLT office

Another great way to entice feathery friends to your yard is to create or provide suitable nesting sites. Different species require different types of breeding areas so it is helpful to replicate this environmental diversity on your property as best you can. Reducing lawn cover and instead planting in layers from native grasses to small shrubs and trees with varying heights will increase habitat density and diversity. Many bird species are considered “cavity nesters” so leaving large dead standing trees—especially those that already have holes—or adding birdhouses will provide sites for these animals to nest. Check

out our bluebird and wood duck boxes at ACLT if you need some inspiration!

Bees

Bee pollination is essential for the reproduction of about 90% of plant species (including many crops), yet many bees have already faced or are at risk of extinction. Your backyard could be just what your local bee population needs to keep thriving! If you keep a few native flowering plants in your yard, including wildflowers, this will encourage visits from these helpful pollinators and will provide them with some sustenance for their travels. The addition of a small rock in a bird bath or shallow pond will also provide bees safe access to water without risk of falling in.



Bee hotel recommended designs - image by David Werner.

Source: <https://www.naturgartenfreude.de/wildbienen/nisthilfen/schautafeln/>

While many of the bees we hear about are colonial and live inside hives, such as the well-known honeybee, most native species are actually solitary. Many of these bees live alone and females nest in burrows that they drill into wood, dried plant stems, or directly into the ground. These habitats can be easily replicated in a backyard setting! A patch of sandy soil could be a great nesting site for burrowing miner bees and some old wood could be useful for tunnel-drilling carpenter bees. If you have any dry plant stalks in the fall or winter, it is not a bad idea to leave some in place and cut off a bit of the top end (leaving the bottom of the stems attached to the plant), and you might have some new bees come springtime!

A fun project, especially if you have a garden, is to build a “bee hotel” which incorporates a few of the above ideas. These are often fairly simple to make by placing drilled logs, dried flower stems, or other hollow tubes into wooden boxes. The tubes should be replaced annually and new holes should be drilled in the wood each year to prevent the spread of diseases. There are lots of guides on the internet to help with bee hotel construction if you are interested.

Herpetofauna

Herpetofauna, or “herps” is a general term that encompasses the reptiles and amphibians. These animals—including snakes, turtles, lizards, frogs, toads, and salamanders—control pests such as mice and mosquitos, are important parts of the food web, and are excellent indicators of environmental quality. Downed woody debris like fallen trees and branches are important habitat and hibernation areas for animals like snakes, skinks, and salamanders. You can also make your own piles of scrap wood or decaying forest material to attract some scaly friends! Flat

boards (like plywood) or metal sheeting across the ground, especially near wet areas, will also create dark, moist spaces that make good homes for salamanders and snakes and are commonly referred to as “coverboards”.

For more aquatic animals, like frogs, the construction of a seasonal wetland or a permanent pond can be a great habitat and breeding area to help imperiled amphibian populations rebound.



Green frog enjoying a manmade pool at ACLT

To make a natural pool, dig a shallow depression, lay down an animal-safe liner, add a few plants or some woody and leaf debris, and that’s it! The spring-time rains will fill your pond and soon it will be full of splashing frogs singing jubilant nighttime song. If you’re feeling creative, you can install “treefrog tubes” by vertically placing PVC pipes in the ground or “toad abodes” using flowerpots placed sideways in your garden as protected places for these animals to rest. These projects can be great for kids as well as adults since they are easy to install and can be decorated using outdoor paint or glued-on objects.



Toad abode-from Pinterest no credit found

Read more about ACLT’s active amphibians and related conservation efforts in our “Frog Blog” series: <https://www.acltweb.org/index.php/frog-blog-1-active-amphibians-and-related-conservation-efforts-at-aclt/>

I hope you have a few new ideas to make a wildlife-safe backyard! There are tons of ways to help your local animals (many more than could fit into a single article) but it only takes a few small additions or changes to really make an impact.

Nicole Stevens,
Chesapeake Conservation Corps Member

Check us out on
Facebook.



<https://www.facebook.com/AmericanChestnutLandTrust/>

American Chestnut Land Trust Calendar of Events

All Dates Tentative and Subject to COVID Restrictions. For details, visit www.acltweb.org

July 2021

4th through Labor Day (September 6th) - Passport to Preservation - visit local breweries & wineries and get your passport stamped (receive discounts on beer and wine), enter to win prizes donated by venues.

August 2021

29th - Guided Evening Hike – Farewell to Summer

September 2021

11th - Sip & Save - Culmination of Passport to Preservation Event - beer-tasting festival featuring beers from local breweries

October 2021

16th - Parkers Creek Challenge - Triathlon including bike, run & paddle
23rd - Guided Hike – Fall Foliage

November 2021

6th - Annual Dinner & Auction
27th & 28th - Wreath-making Weekend (volunteers and their guests)

December 2021

4th - Annual Wreath and Greens Sale – Wreaths handmade from greens gathered on ACLT lands
5th - TENTATIVE 35th Anniversary Celebration

All ACLT members* are invited to join the Outreach and Membership Committee for our monthly “Full Moon Hikes”! For more information and to register visit:

<https://form.jotform.com/211104442770141>

*This is a members-only benefit. To join ACLT, visit our website (www.acltweb.org) and click “Join/Renew”. If you are uncertain as to your membership status, please send an email to miriam@acltweb.org.

Developing on a Razor's Edge:

The case for sustainable development that keeps the natural ecosystems thriving

In the November 2021 Land Use and Transportation Meeting, the consultants preparing the Prince Frederick Town Center Master Plan highlight one of the goals to be accomplished by 2040 is for the Town Center to be a “Model of environmental stewardship, livability and economic stability”. We hope that the Plan achieves that goal, because Prince Frederick sits atop two amazing watersheds and its soils are quite rugged and highly erodible. Maryland geologist Martin Schmidt, Jr. has said that Calvert is not sedimentary rock - it is simply sediment. This means that the majority of our land in the coastal plain is held together through vegetation and ground cover (Figure 1).¹

USDA soil maps indicate that much of these lands are not suited for high density or residential development due to our soils. The three other larger towns in Calvert (Solomons, North Beach and Chesapeake Beach) are primarily built on flat waterfront areas, whereas Prince Frederick is perched atop the central spine of the County at the headwaters of two major watersheds (Hunting Creek and Parkers Creek). The Prince Frederick expansion takes us down into steep swales that end in sensitive wetlands, bogs, and streams. Within parcels in Prince Frederick, one often finds elevations vary by over 100 feet and slopes greater than 25%. Without serious care taken during development, we are bound to have stormwater management failings, increased erosion, and high sedimentation in our waterways, especially as rain events become more frequent and severe with the intensification of climate change. A concern then, for Parkers Creek and its upstream tributaries, is the slated development of the Prince Frederick Town Center.

According to MD SSURGO² data, much of the soil within the suggested development areas have a *severe hazard* of erosion, including all of the soil around Mill Creek, which feeds into Hunting Creek, and much of the soil around Sulli-

van Branch and surrounding tributaries³ (Figure 2). Increased erosion in streambeds, especially from developed areas, is damaging to the health of a waterway. Water moves off of impervious surfaces at a faster rate, eroding

the sides of the streams, often resulting in the loss of streamside vegetation, soil caving, and increased sediment reaching the stream, as well as increased disturbance of the streambed. Loss of surrounding vegetation removes wildlife habitat

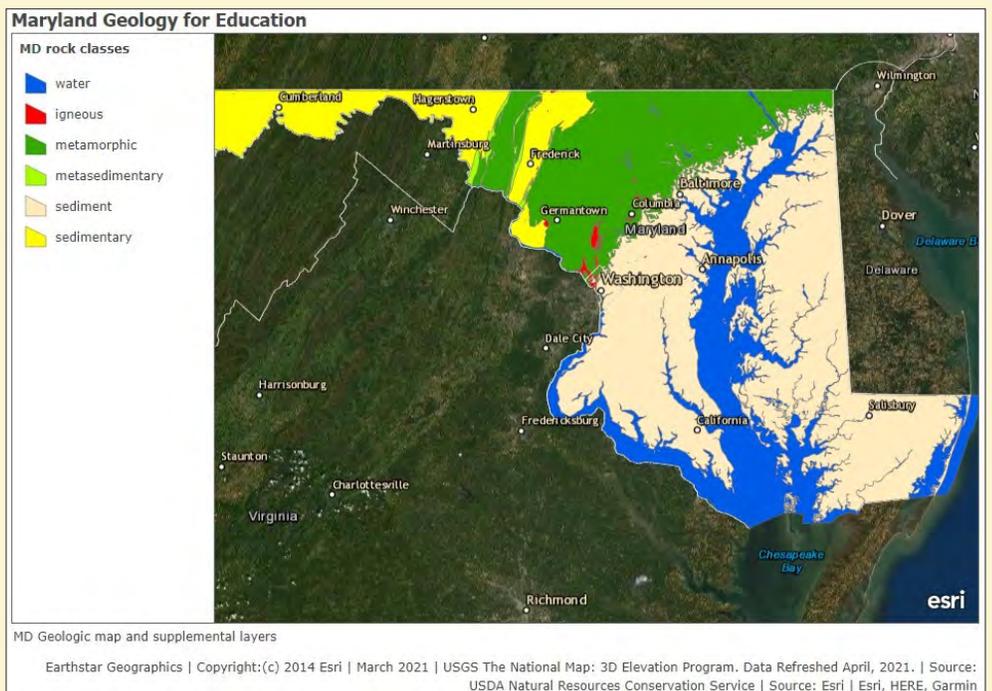


Figure 1: Map showing MD geology classes, based on data from the Maryland Geology for Education maps

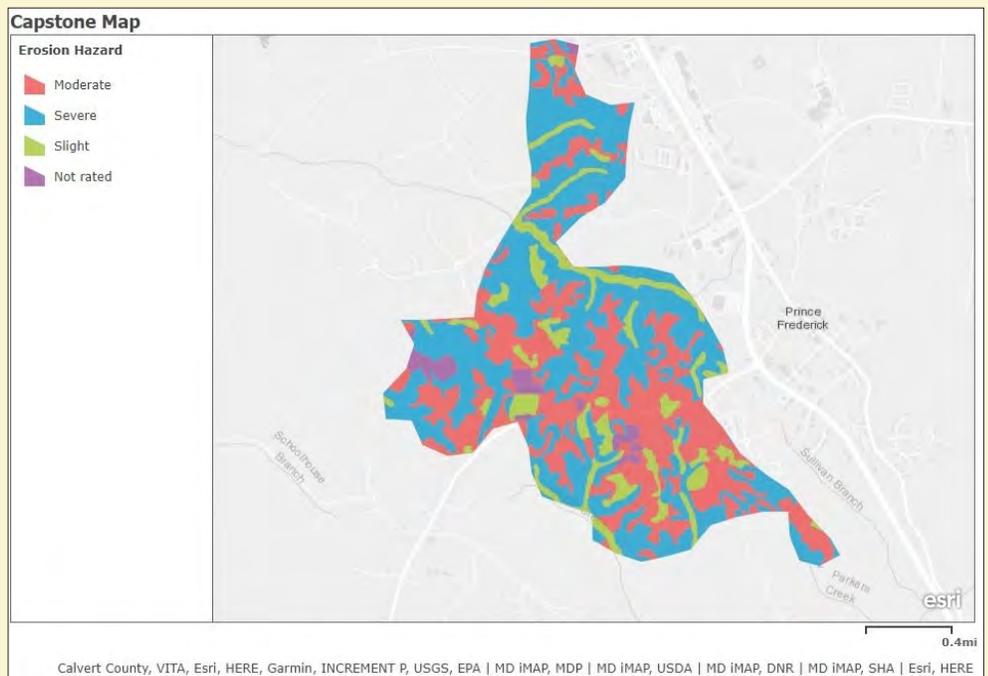


Figure 2: Map of erosion hazard based on soil type in the project Prince Frederick Town Center development area

and one of the main temperature control factors in streams, which is shading. Warmer temperatures in local streams have been linked to die offs of important species. The runoff from residential and developed areas also carries many contaminants into the waterways, and is not filtered through the natural system before reaching the water due to the increased loss in riparian buffer vegetation. Nutrients like nitrogen and phosphorus are common contaminants from residential and commercial zones, as well as oil, trash, and salts and other chemicals from roadways. The excess nutrients lead to harmful algal blooms, eutrophication, and eventual production of dead zones, while garbage and toxicants can lead to immediate death for certain stream and river dwelling specimens. That is quite unfortunate considering that Hunting Creek has been identified as having the greatest fish species diversity in the Patuxent River system, which has some of the richest freshwater species in the state. See page 3 of the Fall 2020 issue of the *Watershed Observer* (<https://www.actweb.org/wp-content/uploads/2020/09/fall2020.pdf>).

For people who care about nature in the way that many of us do, it can sometimes be frustrating to find that not everyone cares about the environment for the environment's sake. Not everyone chooses to, or can afford to, apply inherent value to an ecosystem, which is where the important discussion of ecosystem services comes into play. In the past, the loss of natural land and resources were seen as a separate externality, often viewed as minimally impactful and standing squarely in the way of development and economic growth. Researchers have now been able to point out that nature is *very* valuable within our economy. Ecosystem services are services provided by the ecosystem that are essential and valuable to human life. As one author puts it, "Imagine for a moment: would human society be able to sustain itself without the supporting, provisioning, regulating, and cultural services we draw from the natural world? Could we hope to engineer man-made systems that replicate natural processes like air and water purification, crop pollination, aquifer recharge, fisheries, climate and flood regulation, erosion control, seed dispersal, carbon storage, and soil fertilization and renewal?"⁴ When we support the loss of these critical ecosystems through development, our land loses a deeply important economic value that is

stabilizing for our community. If these services are lost, new structures and systems must be put in place to make up for their loss, and as we have learned in many instances, very few inventions are capable of doing so as efficiently as the natural processes do.

Our rivers and streams feed into important bodies of water imperative for supporting the economic sector in fisheries and aquaculture. What we do to our waterways is not done in a vacuum, and due to our proximity to the Bay, our decisions matter a lot in the health of local populations of economically valuable species. Species like striped bass, shad, and herring use our waters for spawning, while just downstream the Bay supports large populations of crabs, oysters and other shellfish. The changes we make to our landscapes will be felt in these other economic sectors whether planners realize it or not.

Scientists from the Maryland Department of Natural Resources recommend watersheds have between 1-5% impervious surface for optimum stream/watershed health. In Prince Frederick, we are currently, without any further development, at 6%, and due to our highly erodible soils, are at a higher risk of negative effects occurring even under lower-than-average percentages. The three watershed catchment areas included in the town center development plan currently have impervious surface percentages at 6.53%, 13.79%, and 15.60%⁵. What will further development do to the streams immediately in the town center and those downstream? The current town center and the proposed expansion already are within close proximity to many bodies of water, and while the aforementioned discussion of risk of runoff and sedimentation was in broad terms, there are clear negative impacts already present in Prince Frederick (Figure 3). As you can see in the images, behind current developments and downstream of stormwater management measures, there are extreme runoff issues and stormwater management failings, denoted by the eroded banks and canyons that have carved their way through the landscape due to poorly managed runoff, some of which is from sites with existing but not up to par stormwater management systems. The images shown are just a few from a site not unlike several others around the town center, out of sight from most, but very much a concern for the health of our creeks. To date, these treks to investigate stormwater management sites have revealed at least seven examples of failing systems in a small area between Fox Point Creek and Mill Creek, to the west of Route 4 and the current town center.

A major concern is that many of these streams currently feed Parkers Creek, and the negative im-



Figure 3: Left, Large gorge carved out by runoff from the stormwater catchment pool, about 30 ft away from the top point, behind the Chevy Dealership in Prince Frederick. Right- undercut and eroded banks downstream of the gorge

pacts of extreme runoff from development will only get worse as more land is developed. It is clear that even in our current level of development, systems intended to prevent these kinds of effects are at the very least not inspected enough, and at worst, are fully ignored once put into place, leading to the revelation of weaknesses in the system that are rarely resolved, at least not in a timely manner. It is difficult to imagine that those tasked with managing our stormwater systems within the county will be able to properly inspect *additional* development consistently. There has been no discussion of stormwater management best practices in future development, which is an issue of concern considering the existing failures.

Our area is a highly ecologically valuable one, and as can be gleaned from earlier discussions, is also highly vulnerable to negative effects of excessive development and poor planning. Parkers Creek has been called the most pristine on the western shore of the Chesapeake Bay, and it can be seen in these maps from the Nature Conservancy that both Parkers Creek and Calvert County in general have relatively high resiliency and natural connectivity, as was discussed in our winter newsletter⁶. The concern with current development plans is that we may lose these valuable areas that will only become more important as time moves on since development cuts back on both of these factors, especially when no environmental considerations are made.

By 2050, it is projected that more than two thirds of the world's population will live in cities⁷. Obviously, development is *going* to happen. The kind of development, however, depends on us. In our individual cities, towns, and neighborhoods, we have a responsibility to ensure that the development is done sustainably. There are benefits to intensifying a town center rather than expansion, which eradicates more valuable land and creates many environmental issues. Those benefits, however, only come if the development is done well. The goal for the development of the Prince Frederick Town Center should include keeping our natural ecosystems thriving and our waters fishable and swimmable, though as we know, the health of our largest bodies of water depends greatly on the health of those upstream. Sustainable city design can be achieved, and while often, the cities we tout as most sustainable - Copenhagen, Oslo, and Amsterdam, to name a few, often have over 6% impervious surfaces and highly developed landscapes, all of these cities were also designed, or retrofitted, to ensure that serious care was taken in building stormwater management systems, natural corridors, greenspaces, and ease of access to modes of transportation with low greenhouse gas emissions.

We are willing to accept that compromises will be made in the existing town center, that intensifying will mean increased impervious surfaces, and that development will lead to breakups in natural connectivity. However, as of right now, environmental considerations have not been addressed in what we have witnessed during the Master Plan process. The heart of what makes our little slice of Maryland so special - our clean waterways, our sprawling farmscapes, our diverse and

vibrant ecosystems - is at risk. We must do all we can to protect it, and that includes ensuring that development is done carefully and sustainably.

Alyssa Matanin,
Chesapeake Conservation Corps Member

- 1 <https://mdgeoed.maps.arcgis.com/home/webmap/viewer.html?webmap=d7cfa7a928f14d89ae9556612001033b#!>
- 2 SSURGO refers to digital soils data produced and distributed by the Natural Resources Conservation Service - National Cartography and Geospatial Center.
- 3 Note in the map that the *slight* that aligns with stream beds is such because they are where water exists.
- 4 http://www.landscape.org/explore/ecosystems/ecosystem_services/
- 5 <https://gis.chesapeakebay.net/healthywatersheds/assessment/>
- 6 <https://www.acltweb.org/wp-content/uploads/2020/12/Winter-2021-Newsletter-Print-Ready-FINAL-compressed.pdf>
- 7 <https://ourworldindata.org/urbanization#:~:text=By%202050%2C%20it's%20projected%20that,from%2054%20percent%20in%202016.>

Join ACLT's "Force of Nature"



Volunteer Today at
www.acltweb.org/index.php/volunteer

(CONTINUED FROM PAGE 1)

Instead of using fuzzy terms like “the middle of the next century” I will hazard predictions for four “preservation milestone years.” That is to sharpen our sense of past and future times, relating the ACLT to older Mid-Atlantic land preserves—all of which still exist today!

(A) The Boston Common (1634) was the first urban park;

(B) Thomas Jefferson’s sale (1815) of Virginia’s Natural Bridge as a ‘trust’;

(C) the oldest land conservancy (Trustees of Preservation, 1891); and

(D) the first Calvert nature preserve (Hellen Creek hemlocks, The Nature Conservancy, 1956).

The ACLT is 35 years old this year and will be as old as (A) in the year 2373, (B) in 2192, (C) in 2116, and (D) in 2051. While 2373 may feel unimaginably far in the future, that year is actually 35 years closer to us than 1634, when the first English settlers arrived in Maryland!

I’ll start by predicting that additional alien species will invade the PCP. These are biota not yet introduced, plus others, like fire ants, which will migrate up here, enabled by climate warming. If alligators get into Parkers Creek by 2192, would ACLT find them interesting or try to kill them off? Thousand Cankers Disease (fatal to black walnuts) is already in Cecil County, and the spotted lanternfly, chowing down on many tree species, is poised to invade from southeastern Pennsylvania. However, future gene editing might safely deal with many pathogens, as it has with the chestnut blight. Given time, native plant species might evolve resistance while some native predators might evolve a taste for invasives.

As the Bay widens by wetland loss in Dorchester County, the increasing fetch would increase Calvert Cliff wave erosion, but warming would also decrease the effect of freeze-thaw. Mostly, climate change and sea level rise won’t have major effects on Calvert Cliffs shoreline retreat rates—see more below.

More frequent high rainfall events will increase slope erosion—but scarcely to high historical erosion rates from farmland. Increasing CO₂ will stimulate plant growth (including invasives and poison ivy) but make foliage less nutritious for insects.

Depending on future CO₂ (plus other greenhouse gas) emissions, our climate by 2192 and especially 2373 would range from somewhat similar to today to tropical. After that, climates should stabilize and very slowly cool. My optimistic prediction for those distant years is a new Old-Growth Forest similar but more bio-diverse than what hikers see today. Some American species will have migrated here from the coastal Carolinas or Georgia.

The most dramatic change in the PCP future may well be the transformation—by rapid sea level rise—of the salt marsh and adjacent freshwater swamp. They may turn into mud flats and then a shallow lagoon. A marsh doesn’t care how high sea levels will eventually get—provided the rise is not too rapid. What will happen in Parkers Creek is that the marsh may well

not keep up with faster sea level rise, and would essentially drown by flooding. It’s probably not if but when! Scientists will study the process. Whether or not “we” should then artificially maintain the marsh is another matter—for ACLT land managers maybe not yet born.

CBL scientist Dr. Lora Harris and her Lab Assistant Jessica Flester have deployed (2012) four rSETs (rod-surface-elevation tables) in the marsh. The repeated measurements will determine how well the Parkers Creek salt marsh keeps up with RSLR. [Sea Level rise and Land subsidence rates are reported in millimeters per year, where 1 mm/year=0.39 inches/decade. RSLR means Relative Sea Level Rise, which includes any vertical movement of land, in our area subsidence.]

The data since 2013–14 offer good news. There is no tide gauge in Parkers Creek, but Maryland tide gauge data reported in 2018 show RLSR rates since 2000 ranging from 4.2 to 7.3 mm/year. However, Parkers Creek marsh elevations at the four rSET sites increased even more rapidly (+5.9 to +13.9 mm/year), showing the **Parkers Creek marsh (and others in our region) are so far doing well in keeping ahead of the sea level rise**. Ironically, the main gas (CO₂) that is increasing global sea levels is also encouraging marsh plant growth.

Any change in living marsh vegetation over time and space can record the response to RSLR acceleration, which would increase both salinities and flooding frequency. For example, we predict the Parkers salt marsh species like *Spartina patens* (salt hay) will be gradually displaced by the more salt tolerant *S. alterniflora* (smooth cordgrass). Upstream in the freshwater swamp, narrow-leaf cattail tolerates a bit more brackishness than the common broadleaf cattail. A May 2020 drone image shows some dying trees in the small swamp forests—is this evidence for accelerated sea level rise and increased flooding, or/and increased brackishness? Or was this forest an “unnatural” consequence of greatly increased sediment input from eroding farmland?

According to Dr. Patrick Megonigal of SERC (Smithsonian Environmental Research Center), recent research in the Kirkpatrick salt marsh shows that sedges tolerate more flooding and thrive more under higher CO₂ concentrations than do grasses like *S. patens*. Sedges use a different type of photosynthesis than grasses. Being familiar with the Parkers marsh, Dr. Megonigal pointed out that our marsh vegetation is already dominated by types of plants like sedge, which should help stabilize our marsh against faster RSLR and extend marsh life by several decades.

How fast is sea level rising today? In recent decades relative sea levels have been rising around 3.5 mm/year in our part of the Chesapeake region, including the PCP. Of that, about 1 mm/year is due to land sinking, the remaining Earth response to the giant Laurentide ice sheet once north of here. Humans can’t change that. Of the remaining 2.5 mm/year, about half has been due to ocean warming and expansion, and the other half to glacier/ice sheet melting adding water to the ocean. Satellite sea level measurements beginning in 1993 plus data from ice sheets suggest that the effect of melting now dominates and

has accelerated, with present RSLR likely more like 4.5 mm/year. Limited data from other marshes suggest that the Parkers salt marsh may not keep up if this rate doubles.

An additional effect is possible Gulf Stream weakening, another RSLR effect in the Mid-Atlantic. The Gulf Stream circulation “holds” a broad 3-foot high dome of water centered over the Bermuda region. This is the same Coriolis ‘force’ which also causes the counterclockwise circulation of surface Chesapeake Bay waters and thus keeps Parkers Creek tidewater less salty than across the Bay. If the Gulf Stream weakens, the dome height decreases, and water levels rise here, west of the Gulf Stream. For a salt marsh, even a few inches rapid sea level rise matters. Increasingly frequent “nuisance flooding” (during normal high tides) in the Mid-Atlantic may in part reflect Gulf Stream weakening but is scarcely an issue for a nature preserve.



Parkers Creek salt marsh flooded by storm surge: will a lagoon form in the future? Photo ca Nov 1985 by P. Vogt, looking from near present ACLT canoe rack.

Different future greenhouse gas emission scenarios give widely different model predictions (from 2017) of the 2100 increase over 2000 sea levels, from the most optimistic (+ 1 ft) to the most pessimistic (+8.2 ft). The +1 ft prediction is scarcely realizable because it assumed anthropogenic emissions would peak by 2020, which they have not, and that they will decline to zero by 2100. These are the mean global values, and sea level will likely be somewhat higher here. Our 1 mm/year land subsidence adds 4” per century, and any Gulf Stream weakening would add more inches. I will guesstimate +3 ft for the Parkers Creek area between now and 2116. By 2373 a worst case might be up to +15 ft.

RSLR predictions are closely related to greenhouse gas and therefrom temperature rise predictions. If mankind holds the rise to +2° C, the 2116 RSL global mean may be only +1.5 ft, and the Parkers Creek marsh (+2 ft) may well survive. My +3 ft guesstimate for 2116 implies an average RSLR of around 9 mm/year, roughly twice the present rate. Will the Parkers Creek marsh keep up? Maybe not—rates later during this century have to rise above 9 mm/year for that to be the average. We might take comfort in the resilience of the biosphere to

dramatic climate—including sea level—oscillations especially in the last half million years. There have been few if any extinctions due to these changes. The megafauna (e.g., mammoths and sabre tooth cats) extinctions may be the only exception if rapid cooling 13,000 years ago was a cause, but other studies indicate the extinctions and climate change had the same cause).

As recently as 12,000 years ago, when people were already regionally present, the present PCP was forested with taiga conifers, and there was no Chesapeake Bay. Pollen studies suggest that it took only about a century for our present warm temperate hardwood forest ecosystem to migrate up here from the Gulf Coast once climates warmed around 11,300 years ago. Annual layers in Greenland ice cores tell us that this warming came with shocking speed but did not cause extinctions. The global warming only took about 40 years, in three different 5–year spurts, probably driven by instabilities in ice sheets no longer present today. A five–year temperature anomaly today would not be recognized as climate change! The subsequent climate stabilization—until now—enabled the spread of agriculture and growth of civilizations.

The species responsible for our climate change and imminent coastal inundations may seem to be the biggest loser, but it’s also about many other biota that may now become extinct or further decline in population and range. Much of this is due to habitat loss—like deforestation and fragmentation—not caused by climate change. Rising temperatures, sea levels and CO₂ concentrations are only a part of how humans have stressed the biosphere. The future of “nature” in the Parkers Creek Preserve depends very much on what happens beyond the preserve—not only future climate change as discussed above, but also—to name just two examples—habitat destruction in the Latin American wintering grounds of migrant birds which nest in the PCP during summer, and the herbiciding of distant milkweed needed by migrating Monarch butterflies.

Back to the Parkers Creek Preserve. The ACLT-managed Parkers Creek Preserve can’t have any significant global impacts (except perhaps by land preservation and management **examples**). However, the **PCP and especially the marsh is a priceless natural laboratory** for studying how a relatively pristine Mid-Atlantic ecosystem naturally responds to climate change. This was a major reason for Maryland DNR support for PCP land preservation. The ACLT Science Committee and others have already made a great start in studying diverse components of this natural laboratory.

For helpful corrections and comments, I thank (in alphabetical order): Greg Bowen (Executive Director, ACLT), Denise Breitburg (SERC, ret.; now chair of ACLT science committee), Lora Harris (Chesapeake Biological Laboratory, CBL), Pat Megonigal (Smithsonian Environmental Research Laboratory, SERC), Bill Ruddiman (Univ. of Virginia, ret.), and Deb Willard (US Geological Survey)

Peter Vogt, Charter Member ACLT

Read the full report at <https://www.actweb.org/index.php/quovadis-parkers-creek-preserve/>.

Thank you for your support

New Members

ACLT would like to welcome the following new members since the Spring 2021 Newsletter:

Alexis Allen
Cynthia Allen
Darryl Almassy
Peter Bagdovitz
Gwendolyn Bagley
Kelle Baker
Anna Barba
Katherine Bell
Calvert Internal Medicine Group
Karen Wallace-Chambers & Edford Chambers
Suzan Chastain
Po Yan Chiu-Rourman
Susan Cleary
Nicole Cline
Sharon Condor
Kimberly Connor
Catherine Cook
Kelle Crigger
Rose Crunkleton
Hilary Dailey
Nancy Edwards
Mark & Amanda Ernest
Aiden Faust
Susan Fennell
Kathleen Frankle
Karon Garrett
Laurie Goodwin
Robert Grenier
Jef & Julie Haesloop
Robby Hanovich
Douglas Harbold
Hilton Harrod
Dane & Michelle Hendrix
Nicole Kelley
Shirley Knight
Patricia Kosciński
Alex Levin
Britany Locher
Peter & Lillian McGraw
Margery McIver
Amy Melcher
Sonya Michael
Pat Milstead
Gregory Minnick
Kelly Phipps
Lawrence Quetsch
Bill, Andria & Jackson Rebeck
Margarita Roldos
Shannon Sausville
Roland Schlehuder
Robert & Jacqueline Scott
Katie Sinclair

Patti & Mark Stiles
Lara Thornton
Jamie Trickle
Will & Megan Twining
David Williams
Lori & Michael Willis
Ramona Wise
Rebecca Wolf
Julia Yansura
Debra Zanewich

Memorial Donations

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

In memory of **Paul & Doris & Don Berry:**
Marsha Berry

In memory of **Tina Boesz & in honor of Dan Boesz's Birthday:**
John & Barbara Butterfield

In memory of **Leslie Starr:**
Kitty Bailey
Mary Baldo
Julia Barker
Joy Bartholomew & Mark Edmondson
Andrew Beiderman
Mary Bisso
Joan Bob
Don & Judith Dahmann
James Dickey
Grace Flemming
Philip & Elizabeth Kolker
Robin Kummer
Erik Johnson & Francesca Maddaluno
Carolyn Marks
Jane Marvine
Pat & Ginny Murphy
Pamela Nelson
Georgina Pryor
Marilyn Rife
Lucy Rouse
Shannon Sausville
Nicholas Sharp
Jeffrey Shenot
Laurie Sokoloff
Margaret Troje-Meade
Joseph Turner
Randi & Peter Vogt
Marcia Watson
Claire Wayner
Sara Weiner

In memory of **John Hofmann:**
Laura Allison

Bayside History Museum
Jayne & Jim Beline-Hecht
Tom & Carol Blatt
Greg & Tamea Bowen
Grace Mary Brady
Collison, Oliff & Associates, Inc.
Edward Dorsey
Lonnie & Jon Frank
Faye & Samuel Hammett
Marcia & Gary Hammett
Mike & Kathleen Hammond
Laura Holbrook
Judith Jernigan
Steve & Sue Kullen
Nancy H. Klapper
Charles & Betty Jo MacDonald
Joseph & Trudy Mihalcik
W. Michael Phipps
Nancy Radcliffe & Mark Guiffrida
Penny & Steven Sigel
Zachary Sigal
Robyn Truslow
Jackson Upton
Lynn Wheeler & Jerry Klauber
Ann & Glenn Wolfgang
Shelly Zinkerman

In memory of **Ewing Miller:**
Joy Bartholomew & Mark Edmondson
Paul & Diana Dennett

In memory of the **Honorable Thomas V. Mike Miller Jr.**
Daniel R. Hoose, Bob Hall LLC

In memory of **Arnie Petty:**
Chris & Lori Alvord
Carol & Steve Bashore
Randi & Peter Vogt
James & Harriet Weaver

In memory of **David Schindler:**
Joy Bartholomew & Mark Edmondson

In memory of **George Sliker:**
Stephen Clagett
Virginia Clagett
Cheryl Monroe
James & Anne Sasscer

In Honor of Donations

Thank you to the following who made an "in honor of" contribution since our last newsletter:

In honor of **Mary Ellen Boynton:**
Jessica Boynton

In honor of **Tim & Connie Dow's** marriage:

Robert David
Jen, Liam & Robert David
Dennis Dow
Pamela Guedel
Kathryn Gurbuz
Steve & Sue Kullen
Pam Shilling
Amanda Webber
Harriet Yaffe & Jerry Adams

Gift Memberships

Thank you to the following who donated a gift membership since our last newsletter:
Joy Bartholomew & Mark Edmondson
Jane Head
Cheryl Place
Thomas Ward

General Contributions and Designated Gifts

Earth Day

Bert & Dayna Lane

Fall Appeal

Judy Bradt
Denise Breitburg & Mark Smith
Donald & Judith Dahmann
Paul & Diana Dennett
Miriam & Robert Gholl
Louise Hayes & Tom Tait
Jessica Howard
Penny Moran
Paul Vetterle

General

William At Lee
Jenna Campbell
Cedar Point Federal Credit Union
Jonathan & Sanya Chapman
Jessica & Ty Clark
Tamara Cofer
Davey Tree Expert Company
Annetta DePompa
Shannon Donaldson
David Drzewicki
Exelon Foundation
Fisher Foundation
Glynn & Dagmar Frank
Dorothy Howe
Sandra Jarrett
Golden Love
Elizabeth McGowan
Cindy Roberts
Michael & Nancy Rubino
Sydney Sowell

Stephen Straka
Elaine Strong
Theresa York

Holly Hill Donations

Thank you to the following, who made a donation to the Holly Hill campaign since our last newsletter:

Anonymous
Fran Armstrong
Ron & Kathy Klauda
Robyn, Eric & Wesley Truslow

Land & Stewardship Appeal

Michael & Joan Cunningham
Jane Head
Shirley Knight

Nancy Mck Smith
Joseph & Joanne Steller

Watershed Water Testing

Dawn & Steve Balinski
Greene House Salon
Judith Kay
Mark Schleicher

Workplace Giving

Matthew Abbott
Daniel Hayes
Kristen Heyer
Robert McHenry
Christine McMahon
Jason & Jenna Prowinski
Gerald Sneeringer & Christina Lansford

ACLT MEMBERSHIP – WHAT'S IN IT FOR YOU?

ACLT would be nothing without its dedicated members and volunteers. That's why the Outreach & Membership Committee has recently added several new member benefits! In addition to the satisfaction of knowing you're doing your part to preserve the natural and cultural resources of the Parkers Creek & Governors Run watersheds, as an ACLT member, you'll receive the following benefits:

LAND SAVER (\$35)

- Welcome Package & Decal
- Quarterly Newsletter
- Free Canoe Trip (new member benefit-subject to availability)
- 10% Discount on Merchandise
- Members-Only Events
- Natural Play Space Reservations

LAND PROTECTOR (\$60)

- ALL OF THE ABOVE PLUS
- Early Event Registration

LAND CONSERVATOR (\$150)

- ALL OF THE ABOVE PLUS
- ACLT Merchandise Thank-You Gift (e.g., hat, neck gaiter, mug, etc.)

HABITAT PROTECTOR (\$500)

- ALL OF THE ABOVE PLUS
- Invitations to Special Events
- Specially-Designed ACLT Gift (e.g., hiking journal)

TRUSTEE OF THE LAND (\$1000)

- ALL OF THE ABOVE PLUS
- Invitations to Inaugural Events
- Meet & Greet Events w/Board of Directors, Guest Speakers, etc.
- Specially-Designed ACLT Gift (e.g., framed photo of Parkers Creek)



For full details, visit: www.acltweb.org/index.php/aclt-membership



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

NONPROFIT
 STANDARD MAIL
 PERMIT NO.
 548
 PRINCE FREDERICK
 MD

Why does it say "Or Current Resident" in my address?

In order to use your donations as efficiently as possible, we use USPS Bulk Mail and this statement is now required in the address. Thank you for understanding!

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

Corporate Membership

- | | | |
|--|---|--|
| <input type="checkbox"/> Land Saver—\$35.00 | <input type="checkbox"/> Habitat Protector—\$500.00 | <input type="checkbox"/> Land Saver Corporate—\$150.00 |
| <input type="checkbox"/> Land Protector—\$60.00 | <input type="checkbox"/> Trustee of Land—\$1000.00 | <input type="checkbox"/> Land Protector Corporate—\$250.00 |
| <input type="checkbox"/> Land Conservator—\$150.00 | <input type="checkbox"/> Sustaining—\$5000.00 | <input type="checkbox"/> 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 directed to the American Chestnut Land Trust, Inc, P.O. Box 2363, Prince Frederick, MD 20678 or call (410) 414-3400. For the cost of copies and postage, documents and information submitted under the Business Regulation Article of the Annotated Code of Maryland are available from the Secretary of State.