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It All Starts Upstream: What Do We Know About the Freshwater Tributaries to Parkers Creek?

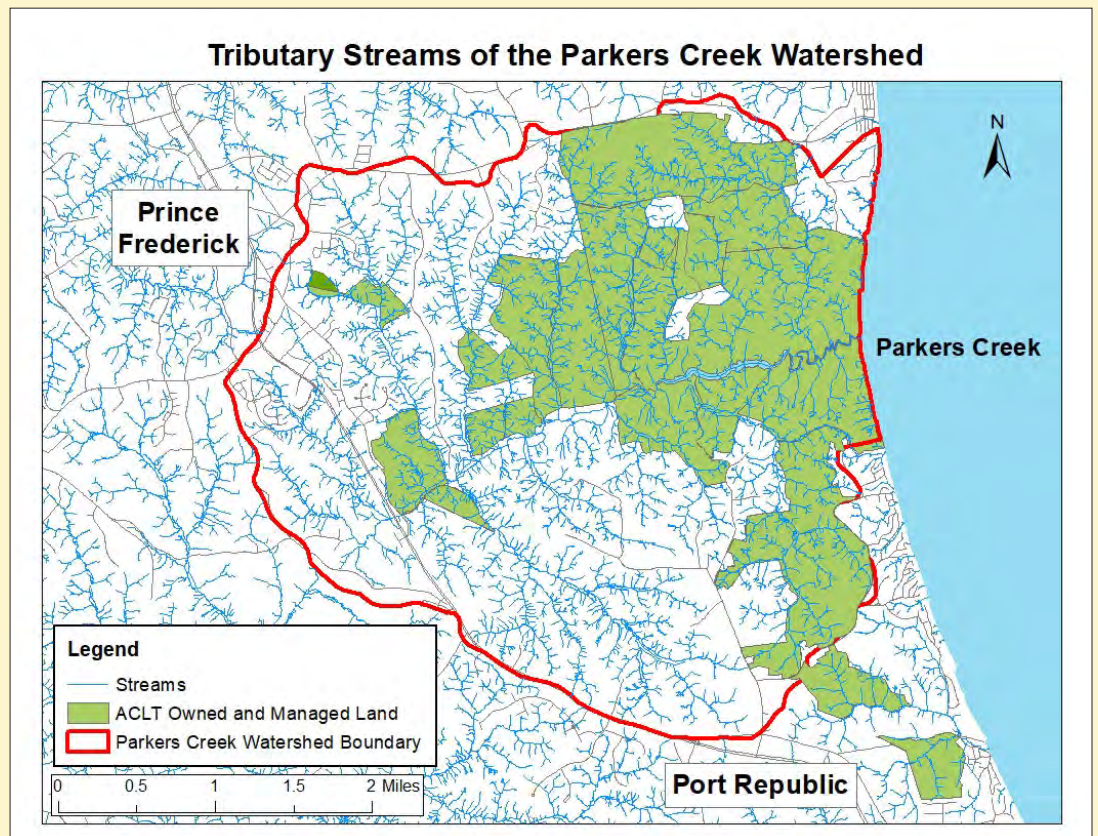
by Ron Klauda, Member ACLT Board of Directors

"However far the stream flows, it never forgets its source." (Nigerian Proverb)

When most of you think about Parkers Creek, what likely comes to mind is the 2-1/2+ mile tidal portion that flows directly into Chesapeake Bay. This is the iconic and scenic water course that winds through tidal marshes and can best be experienced, up close and personal, in a kayak or canoe. Less often seen and less well known are the much smaller tributaries, most with no names, that drain the 7,949-acre watershed and empty into the mainstem Parkers Creek.

How many miles of tributary streams flow through the Parkers Creek watershed? On the base map the Maryland Department of Natural Resources uses for their Maryland Biological Stream Survey (the MBSS), a 1:100,000 scale map, there are 18 miles of flowing waters in eight separate tributaries—let's call them headwater streams

If we look at the finer-scale topographic map of Calvert County available from the Maryland Geological Survey (a 1:62,500 scale map) or an even finer-scale map (1:24,000) from the National Hydrography Dataset (NHD), produced by the U.S. Geological Survey, you can find 12 separate headwater streams (mostly unnamed) flowing into the mainstem Parkers Creek. Six flow down slope from the north, two from the west, and four from the south. A good working number of the miles of headwater streams in the Parkers Creek watershed is at least 25.



(CONTINUED ON PAGE 7)



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From the President's Desk ...

The Unexpected

Along with everyone else, ACLT has had to make adjustments in response to the pandemic. But we have continued to welcome visitors to enjoy hiking, walking and relaxing on the properties of ACLT. And our staff and volunteers have been incredibly busy.

One big advantage for ACLT is that much of our work is outdoors and thus with care we can continue our outdoor maintenance. Volunteers have spent several weeks trying to remove as much of the invasive wavy basketgrass as we can, before it goes to seed and is spread. See the article on page 8 in the Spring 2020 Watershed Observer: bit.ly/ACLTSpringNewsletter2020 .

The enthusiasm of our volunteers manifested itself after the tropical storm Isaias. The storm dropped approximately 10 inches of rain on the Prince Frederick area in about 14 hours, along with severe winds near the Chesapeake Bay. As a result, we:

- Lost a bridge on the PF2Bay Trail—it had to be disassembled and re-assembled, but has now been returned to its proper location.
- Lost a bridge on Flint Trail, but it has been repaired (see before and after pictures below).
- Lost the bridge at Horse Swamp—A temporary bridge is in place and a fully-repaired bridge is on our work plan. The trail is still passable.
- Lost the raft on North-South Trail—We found, repaired, and returned it to operation. For details see: bit.ly/ACLTRaftRescue .
- Had 22 trees fall on our trails—The trees have been removed.

As always, we strongly recommend checking the trail conditions section on our home page before heading out for a hike.

The heavy rains from the tropical storm also caused a sewage spill that flowed into Parkers Creek from a pumping station in Prince Frederick. We contacted county and state officials. You can find more details about the sewage on our website: bit.ly/ACLTSewageSpill .

Thank you so much to our faithful corps of volunteers. ACLT is strong because of you.

Keep in touch. Visit our web site (<https://www.acltweb.org/>) or facebook for the latest news, upcoming events, and opportunities to join us in ACLT's land preservation and stewardship endeavors.

David Farr, President



On the bridge l to r: CCC Intern Nicole Stevens, Former CCC Intern Rachel Delbow, Volunteers Jeff Buyer, Paul Blayney, and Kevin Donahue. Kevin is on the bridge in the before photo.

Around ACLT

Large Landscape Conservation is Needed in Southern Maryland

by Greg Bowen, Executive Director ACLT

Southern Maryland has played a major role in the history of America. Native Americans valued its abundant fishes, wildlife, fertile soils, and temperate climate. Early colonists were drawn here for the same reasons plus its sheltered harbors for sea going vessels. Many of those same attributes are still present today and are worthy of preservation.

Containing some of our country's earliest settlements, Southern Maryland also has played a major role in our nation's history. The **Captain John Smith Chesapeake National Historic Trail** weaves through its waterways. The **Religious Freedom National Scenic Byway** traverses its country roads. The War of 1812 sliced through the center of the region as the British fought its way to Washington, D.C. Slavery was practiced in the production of tobacco during a darker period of our history. All of these events and activities are still evident on our region's landscape.

Once transportation systems moved from boats to land vehicles, much of our region became geographically isolated by the Potomac and the Chesapeake Bay. Calvert, St. Mary's and much of Charles County were bypassed by residential sprawl until the 1960s.

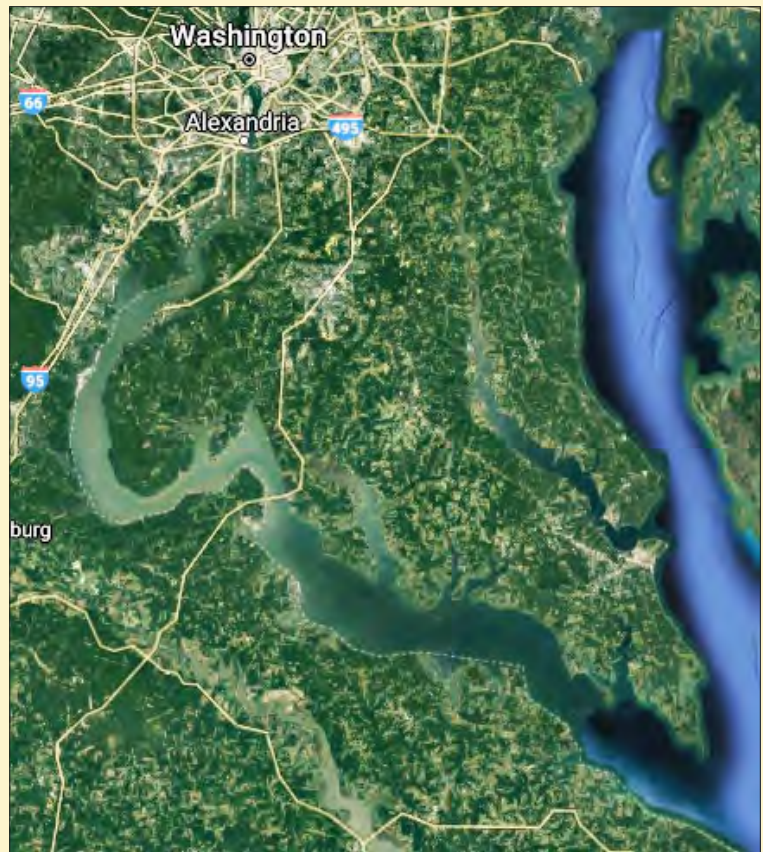
Despite rapid residential growth over the last few decades, Southern Maryland still contains some of the richest amphibian and freshwater fish species habitats in the state. It is one of the most forested areas in the state and it contains the most coastal streams in the state.

Large landscape conservation¹ is needed to protect biodiversity and healthy ecosystem processes that are key to our health and economic survival.

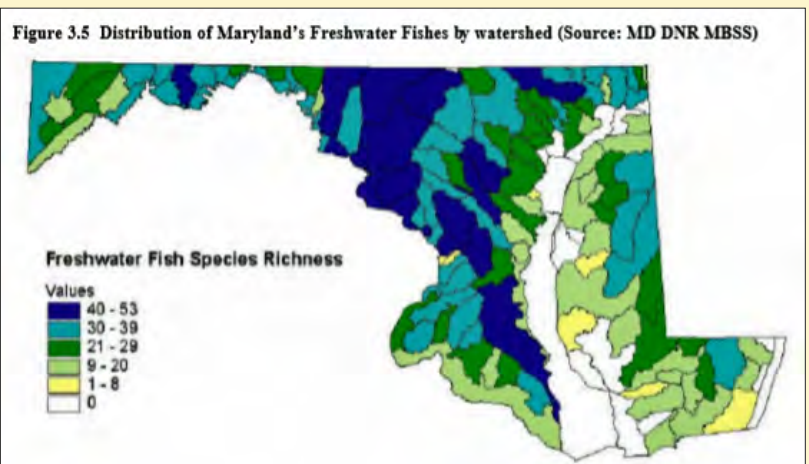
The resources sustaining our fish and wildlife species also provide essential benefits like clean water, clean air, and storm water attenuation to the people who make their home in Southern Maryland. The region is a mosaic of communities, working lands, open spaces, and protected habitats. It is a place where our history has been shaped by our relationship to the land.

But changing land use and environmental conditions are threatening the natural places that define us, the resources we depend upon, and the wild places we care about. To sustain these resources into the future, we need to work with others.

ACLT is a member of the Land Trust Alliance



Aerial view of Southern Maryland



Freshwater Fish Species Richness Map

and in 2016, the Alliance helped to form the Chesapeake Bay Land and Water Initiative (the Initiative)², along with the Chesapeake Bay Funders Network (CBFN). CBFN provides grant support, policy, communications, partnership building and training resources to organizations working to preserve land and protect water quality in the Chesapeake watershed.

Through its competitive grant program, the Initiative provides financial and capacity resources to accelerate preservation activities already

underway and prioritizes new conservation and stewardship projects for water and land. On a large landscape basis, it works regionally so that land trusts have better tools to do more.

Thus far, it has focused on grant funding in the Upper and Lower Susquehanna, the Juniata, the Shenandoah and Upper Potomac, the Rapidan/Rappahannock, and the Eastern Shore watersheds. Unfortunately, Southern Maryland is not included, in part, because there has been no partnership in place to pull land trusts, local governments and others together to work on regional conservation projects.

How might we preserve species diversity and how much habitat needs to be conserved?

The North Atlantic Landscape Conservation Cooperative (NALCC) and the Northeast Association of Fish and Wildlife Agencies (NEAFWA) have been working to help regional organizations to do just that. They have coordinated a team of partners from 13 states, the U.S. Fish and Wildlife Service, nongovernmental organizations, and universities, to develop a regional conservation design that provides a foundation for unified conservation action.

The product of their work is called *Nature's Network* and it has mapped areas that it considers are essential to protect a high diversity of flora and fauna into the future despite adverse land use changes and climate change. It identifies a network of habitats that represent the highest conservation priorities in the region to sustain natural resources and benefits for future generations.

Nature's Network:³

- Reflects scientific consensus from experts across the 13-state conservation community.
- Represents a shared vision for natural resources in the Northeast.
- Offers a practical set of tools that help people working at different scales to contribute to regional conservation goals while also meeting the goals of their individual organizations.

Core areas were identified by five characteristics: high ecological integrity, great potential to be resilient to changing conditions over time, rare natural communities as identified by state natural heritage programs, priority river floodplains, and current and predicted future high quality habitat for 27 surrogate species representing the habitat requirements of the majority of species in the northeast. They were designed to cover approximately 25% of the Northeast Region of the U.S.

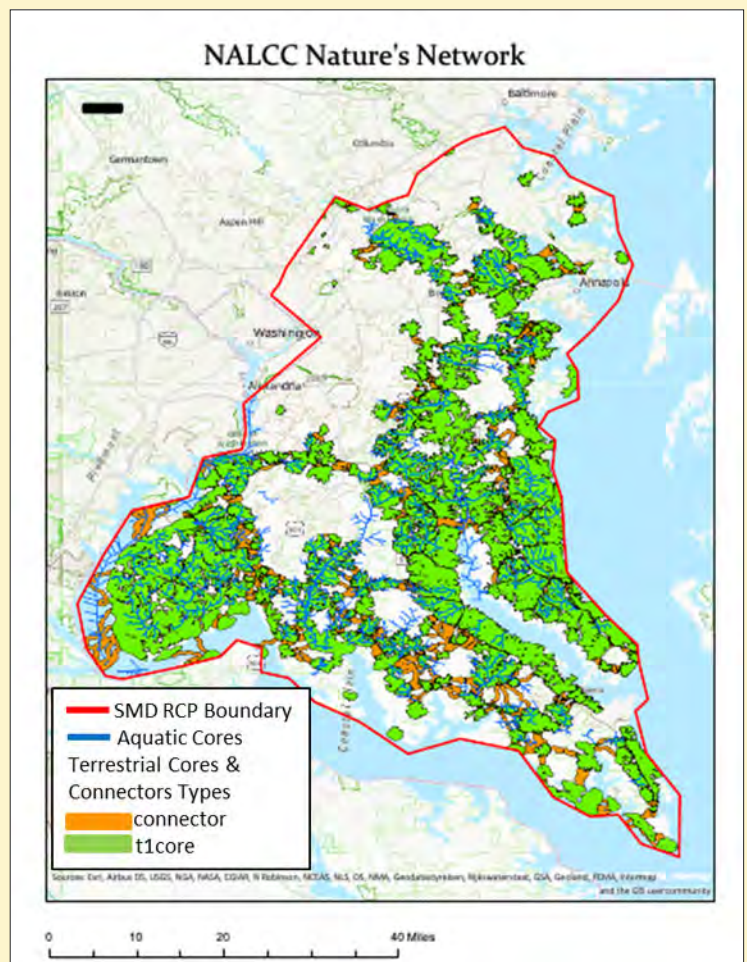
As you can see Southern Maryland is indeed an important area for species protection. The Southern Maryland Resource Conservation Partnership is very much needed, and it has its work cut out for it!

As poet, farmer, professor, and author Wendell Berry says, you must imagine it first. Benton MacKaye was an American forester, planner and conservationist. He said that he first imagined the Appalachian Trail when sitting in a tree atop Stratton

Mountain in Vermont. The notion of a thousand-mile foot trail in the mountains stirred the imaginations of hikers and outdoorsmen from Maine to Georgia. Inspired by him, groups began building trails and trying to connect them. To have, live, and belong in a place without destroying it, we must imagine it.

Southern Maryland needs that kind of imagination and vision today. Imagine a future where our grandchildren or great grandchildren can still fish for bass, perch, or blue gill in the streams just a mile or two from their houses; a place where hunters can still find turkey or quail on the meadows or mallards abundant on the coves; a place where oyster and crabbing have returned as a viable career for young people; a place where birders can come to find an incredible diversity of species; and a place where locally sourced food, beverage, and clear streams, trails, and wild lands are available for all who seek them out.

Working with the Maryland Environmental Trust and other partners, ACLT hopes to have a Southern Maryland Conservation Partnership in place in 2021.



References

¹ To learn more about large landscape conservation, go to:

<https://largelandscapenews.org/>

² To learn more about the Initiative, go to [http://bit.ly/](http://bit.ly/LandTrustAllianceInfo)

[LandTrustAllianceInfo](http://bit.ly/LandTrustAllianceInfo)

³ Learn more at <http://naturesnetwork.org/>

Update on Data Security Incident

By Miriam Gholl, Community Relations Manager

In late July, ACLT was alerted to a data security incident involving Blackbaud, Inc., one of ACLT's service providers. We were informed that one of Blackbaud's service providers had been the victim of a ransomware attack that culminated in May 2020. Immediately following the discovery of the attack, a detailed forensic investigation was undertaken, on behalf of Blackbaud, by law enforcement and third-party cyber security experts.

ACLT data accessed by the cybercriminal in the Blackbaud database did not contain any credit card information. Further, the cybercriminal did not gain access to bank account information because it is encrypted. ACLT does not store usernames, passwords, or social security numbers, so none of this type of data was accessed. We do retain donor information that enables us to communicate effectively with you. None of our data was lost or corrupted as a result of this incident.

A notification was sent via email to all accounts for which ACLT has an email address and via US postal service to all other accounts. Read more about the data breach here: <https://www.acltweb.org/index.php/data-security-incident-notice/>

Visit ACLT's New Online Merchandise Store

Show off your support for ACLT! Our NEW online store offers a wide variety of t-shirts, tank tops, kids' clothing, tote bags and hats at very reasonable prices—all with the ACLT logo and/or an inspirational message. Proceeds support ACLT's ongoing projects to protect the lands, waterways and wildlife habitats of the Parkers Creek Preserve. Visit: [bit.ly/ACLTStore](https://www.acltweb.org/index.php/merchandise-store/)



Life IN the Edge: Ecotones and Ecoclines of the Parkers Creek Preserve

By Peter Vogt, ACLT Charter Member

The ACLT's **Parkers Creek Preserve (PCP)** is—especially for its small area—exceptionally rich (diverse) in **ecosystems**. (This term was invented 1935 by British ecologist Arthur Tawley as part of his research on the transfer of materials between organisms and their environment). Today it's defined as "*A community of living organisms in conjunction with nonliving components of their environment, interacting as a system.*" Examples of natural PCP ecosystems include salt marsh, intertidal beach, and upland forest. These natural ecosystems have been here long before European settlement and, while altered by humans are still "vibrant".

We are used to thinking of ecosystems and—led by some members of the ACLT Science Committee—are studying several of them. However, we should also think about **ecotones** or **ecoclines**—the boundaries or gradual transitions (gradients) between neighboring ecosystems. Such dynamic belts offer both dangers and opportunities to organisms inhabiting or crossing into them. A dragon fly might venture for food into the open space above Parkers Creek but be itself snatched by a hungry bird.

The term *ecotone* (tone derives from Greek *tonos*, meaning "tension") was coined already in 1904. One of the PCP's many ecotones is the two banks of lower Parkers Creek, which separate the *spartina* salt marsh from the brackish tidal creek. Our most prominent ecotone is the boundary—formed by the Calvert Cliffs—between forest and the Bay.

Unnatural (artificial or manmade) ecotones, not discussed here, include field-forest, highway-forest, and commercial (paved)-field edges. These are commonly bordering or within the PCP, but there is also life along those edges. Future ACLT land preservation and land management should aim for more contiguous forest and fewer miles of artificial ecotones.

Of course we can subdivide some ecotones into lesser (but no less important), thin ecosystems. For example, a low, narrow natural levee-sporting high tide bush- separates brackish tidal Parkers Creek from the actual salt marsh. The Calvert Cliffs ecotone is not just a line but comprises the actual cliffs and below them the intertidal beach, two narrow ecosystems very different from the Bay and from the forest above.

Some ecosystem biota are found in other ecosystems, but some are pretty exclusive—for example, fish are not found in forest ecosystems unless a dead one is dropped by a clumsy eagle. Puritan tiger beetles are exclusive inhabitants of beach and cliffs. While bald eagles do soar and forage along the cliffs they also nest in a forest and are found inside Parkers Creek. Great blue herons don't ride the updrafts above the cliffs but frequent both the beach ecosystem and the creek. Bald eagles, ospreys, vultures, kingfishers and rough-wing sparrows are all common but not exclusive in the Calvert Cliffs ecotone. One would not however expect turkeys or warblers there.

Among flora, high tide bush is never found in our interior forests. The ample sunshine along the Calvert Cliffs favors—where cliff slope

permits—shade-intolerant trees such as black locust, and, unfortunately the invasive ailanthus (tree of heaven). Both species are rare inside closed PCP forests. Miocene fossil shell beds buffer the naturally acidic soils, resulting in European coltsfoot at the base of some cliffs. The same buffering effect seems to occur inside the PCP, wherever Parkers Creek tributary streams incise those same shell beds, increasing pH and likely affecting the floral composition—an effect that is still asking to be investigated.

I think the natural forests of the PCP can be divided into three main forest ecosystems: 1) mesic valley floor woods (sycamore as signature species, plus three reported bald cypress still not rediscovered on the Holly Hill tract), 2) buffered Miocene-subsoil forests (dominated by tulip poplar) below 100 ft elevation, and 3) Upland Deposits (acid substrates) forests dominated by oaks, pines, and mountain laurel. These three ecosystems share most species and have only subtle borders between them—unlike the very sharp forest-salt marsh ecotone around Parkers Creek. The Upland Deposits were laid down on top of our famous fossil-rich marine sediments by the ancient Potomac and its tributaries, and lack the pH buffering shell beds.



From intertidal beach to grassy berm to scrub forest berm Photo P. Vogt.

salinity tolerances and preferences. From aerial photos and casual observation from canoe, it looks like the corresponding transition between salt marsh vegetation and freshwater swamp flora (think cattails) is more a sharp ecotone than a gradational ecocline. Why that is I leave to the experts.

Our grandest PCP ecotone—the Chesapeake Bay Calvert Cliffs shoreline—was also the first to be noted. After sailing and rowing north along the cliffs in June, 1608, Capt. John Smith pronounced “the woods extream thick, full of Woolves, Beares, Deare, and other wild beasts.” Our woods must have appeared “extreame thicke” from offshore because of ample half-day sunlight—supporting dense vegetation, including underbrush and low living branches on canopy trees. This phenomenon is basically still seen today wherever fields or highways border forests. The wolves and bears are long gone, but the Bay’s shore still concentrates food resources for hungry mammals and birds.

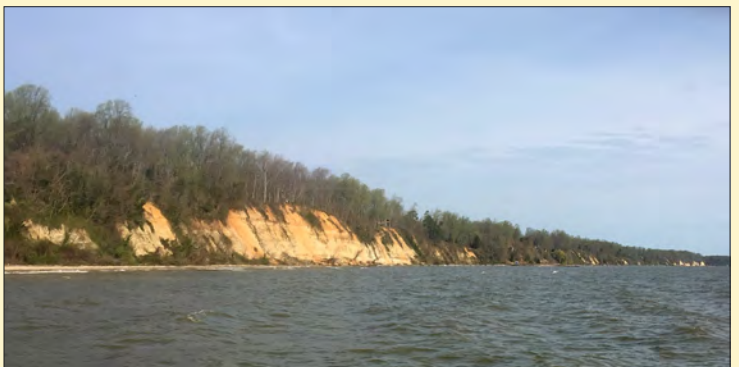
Smith rarely ventured beyond areas inhabited and partly cleared by natives. Had he penetrated our shoreline ecotone and ventured into what is now the PCP forest, he would have declared it, beyond where “the Savages inhabit: but all overgrown with trees and weeds being a plaine wilderness as God first made it.”



Eagles in Horse Swamp-Photo By Ian Messent via Trail Cam.

Another small but two-part ecosystem is the sandy berm above the intertidal beach at the mouth of Parkers Creek. Returning to its natural condition, this thorny scrub forest, populating a well-drained sandy venue, includes small persimmon, red cedar, and hackberry. I would not be surprised to see our native cactus. Between the intertidal beach and the scrub forest is another narrow berm ecosystem comprising grass. Loblolly pines are missing only due to lack of mother pines.

An example of a PCP *ecocline* is the upstream salinity gradient of Parkers Creek. Salinities fluctuate greatly over short time scales as Bay water sloshed into the creek by tides mixes with Parkers Creek fresh water, but the average upstream decrease is gradual, from around 10 ppt at the mouth to zero in less than a half mile. Most organisms inhabiting the Parkers Creek waters and adjoining marsh vary greatly in their



Calvert Cliffs-Chesapeake Bay ecotone just north of Governor’s Run-Photo by Peter Vogt.

From the view of a majestic bald eagle flying high above the watershed, the mainstem Parkers Creek could be viewed as an east-west oriented spine, with the head end represented by the creek's confluence with Chesapeake Bay and the two headwater streams flowing down slope from the north-northwest as the twin tails of the spine. The tributary that lies closest to and parallels Rt. 2/4 is Sullivan Branch. Sullivan Branch confluences with an upstream portion of Parkers Creek that flows roughly parallel and to the west of Sullivan Branch, then turns sharply E/NE, flows under Rt. 2/4 and MD 765, and becomes the mainstem Parkers Creek.

From the eagle's vantage point, the other 10 headwater streams could be viewed as relatively short ribs connected to the spine. The six ribs that extend to the north range in length from 0.8 to 2.7 miles, from their confluences with the mainstem Parkers Creek to their origins, with an average length of 1.7 miles. The four ribs that extend to the south range in length from 1.0 to 2.3 miles, with an average length of 1.7 miles.

These headwater stream lengths are my admittedly crude measurements, but they're probably in the ballpark. Even without more accurate length measurements, the 12 headwater streams that drain the Parkers Creek watershed are not long. So, whatever adverse environmental impacts occur in the most upslope portions of the watershed, the sources of these tributaries, the consequences do not have far to travel before reaching the mainstem Parkers Creek.

What else can be said about the 25+ miles of headwater streams draining the Parkers Creek watershed? Well, the good news is that 9 of the 12 headwater streams drain undeveloped land, mostly forests and farms. The not so good news is that the other three headwater streams, those in the western portion of the watershed, drain portions of the Prince Frederick Town Center. And, if we assume that all 12 headwater streams have about the same flow rates (admittedly, a somewhat shaky assumption), then about 25% of the surface water reaching the mainstem Parkers Creek could be adversely impacted by the Town Center.

One of the reasons we know less about the headwater streams that drain into Parkers Creek than the mainstem itself is that most of them are small and shallow, in addition to being relatively short in length. These streams are easily wadable. You can step across many of them without getting your favorite hiking boots wet. The smallest of these headwater streams have such small catchment areas they may dry to mere trickles between small pools during droughts or carry flowing water only after it rains or the snow melts.

"If there is but little water in the stream, it is the fault, not of the channel, but of the source." (St. Jerome).

Maybe another reason the headwater streams are less familiar to us is because most of them do not have official names. Sullivan Branch and upper Parkers Creek are officially named. And locally, the first headwater stream flowing down from the

north that you will encounter in a canoe launched at the mouth of the mainstem Parkers Creek and paddled upstream is known as Horse Swamp. The rest are nameless.

Because of their modest size, and I would add charming characteristics, headwater streams go by many epithets that you may have read or heard mentioned. They can be called becks, billabongs, bourns, branches, brooks, burns, creeks or cricks, races, rills, rindles, rivulets, runs or runnels, spates, streams, and watercourses—take your pick. Despite their overall 'smallness', they serve many important ecological roles. And, as mentioned above, they usually sit at the top of watersheds. That's important because water runs downhill. So, what happens in headwater streams can cascade down slope to larger streams, to lakes, to rivers, to estuaries, and eventually to oceans.

The Critters

So, who/what lives in the 25+ miles of headwater streams that drain the Parkers Creek watershed? As I hope you will say after reading the next several pages, "Wow, a lot more critters than I had imagined." See photos on page 9.

When we think about what lives in streams, most of us first think fish. To date, only five of the 12 headwater streams in the watershed have been sampled for fish. These survey efforts combined 'netted' 14 species (or kinds) of fish. In alphabetical order, they are: American Eel, Blacknose Dace, Brown Bullhead, Creek Chubsucker, Eastern Mosquitofish, Eastern Mudminnow, Fathead Minnow, Golden Shiner, Green Sunfish, Least Brook Lamprey, Northern Snakehead, Pumpkinseed, Redfin Pickerel, and Warmouth. Are there additional fish species living in those headwater streams that have not yet been surveyed? Perhaps.

By far, the Eastern Mudminnow was 'number one', the most commonly collected species and presumably the most abundant fish living in the tributaries to the mainstem Parkers Creek. Almost half (48.1%) of all fish collected were Eastern Mudminnows. The rest of the top five species were the Least Brook Lamprey (#2), Pumpkinseed (#3), Blacknose Dace (#4), and Eastern Mosquitofish (#5) (see Photos 2-5 on page 9). Collectively, these five species comprised 84% of all fish that were collected.

Let's meet and learn a few things about numero uno.

1. The **Eastern Mudminnow** (*Umbra pygmaea*) is a small freshwater fish, native to Maryland, that grows to 2 to 4 inches long (see Photo 1). A prominent identifying mark is a black bar on the base of the caudal fin. They live up to their name by having a tendency to burrow into mud and debris to hide from predators. They can also burrow into the mud during droughts, enter a state of dormancy called aestivation (similar to hibernation), and survive low oxygen conditions for several days and sometimes weeks. That's a handy survival skill. They also thrive in habitats with acidic waters down to a pH of 3.5. So, all in all, Eastern Mudminnows are a tough and tolerant fish.

Although not the most commonly-collected fish species, the **American Eel** (*Anguilla rostrata*) has a unique life cycle. Those individuals found in tributaries to the mainstem Parkers Creek are the offspring of adults that emigrated from freshwater streams and rivers, where they grew and matured, and then swam to the Sargasso Sea (in the western Atlantic Ocean east of the Bahamas and north of the West Indies) where they spawned once and died (see Photo 6). This type of migratory list history makes the American Eel a catadromous species. Newly-hatched young eels somehow make their way from the Atlantic Ocean back to freshwater habitats in eastern North America where they grow for a period of 5 to 25 or more years, become sexually mature, and then migrate back to the Sargasso Sea to spawn and die.

Because most of the tributaries to Parkers Creek are small, especially the most upstream reaches, habitat for fish can be limited. In these water courses, stream salamanders are often the top vertebrate predators. Two stream salamander species have been collected in the watershed: the Northern Two-Lined Salamander (*Eurycea bislineata*) and one of the two *Pseudotriton* species, either the Northern Red Salamander (*Pseudotriton ruber*) or the Eastern Mud Salamander (*Pseudotriton montanus*).

The dorsal band on the **Northern Two-lined Salamander** (see photo 7) is bright greenish-yellow to orange-yellow or brownish with small black flecks. Adults are typically 2-1/2 to 3-1/2 inches long. This species swims freely and lives near springs seeps and streams in forested areas. Northern Two-lined Salamanders resort to water during the egg-laying season. Clutches of 12 to 36 eggs are deposited by a female in late winter and spring on the underside of rocks and logs, usually in running water. The larvae are completely aquatic and metamorphose to adults in 2 to 3 years.

In addition to at least 14 fish species and two salamander species, surveys conducted by MD/DNR and ACLT staff and volunteers also revealed a rich community of aquatic benthic (bottom-dwelling) macroinvertebrates (visible to the naked eye) living in Parkers Creek tributary streams. To date, 68 genera of benthic macroinvertebrates from “A” for *Allocaupnia* (a small winter stonefly) to “Z” for *Zavrelimyia* (a non-biting midge) call Parkers Creek tributaries home. Many of these 68 genera (think last name) are represented in Maryland waters by more than a single species (think first name). For example, the winter stonefly, *Allocaupnia*, has at least 40 described species worldwide.

MD/DNR identifies stream benthic macroinvertebrates to genus, not species. Hence, the data from their MBSS sampling in the Parkers Creek watershed list genera collected. Knowing about the presence of 68 genera, it’s almost certain there are way more than 100 species of benthic macroinvertebrates happily completing their life cycles within the watershed.

The four most common benthic macroinvertebrate genera found in Parkers Creek tributaries are *Gammarus*, *Crangonyx*, *Amphinemura*, and *Parametriocnemus*.

Gammarus is a freshwater shrimp-like crustacean commonly called a scud or side-swimmer. Most are marine, but there are 50 freshwater scuds in the U.S. One of the most common scud in Maryland waters is *Gammarus fasciatus* (see photo 8).

But wait, there’s more

One of the tributaries to the mainstem Parkers Creek, Horse Swamp, is home to a new species of medicinal leech, *Macrobdella mimicus* (see photo 9). Why is it a medicinal leech? Because it will attach to humans and suck blood.

In August of 2018, Dr. Anna Phillips, with the Smithsonian National Museum of Natural History, discovered this new leech species in Thome Gut Marsh in the Nanjemoy Creek watershed, Charles County, Maryland. This was the first description of a new North American medicinal leech species since 1975.

About a month before Dr. Phillips’ discovery, Rob Aguilar, with the Smithsonian Environmental Research Center, and ACLT staff were sampling for fish in Horse Swamp. They also collected several leeches. Rob first identified the leeches as *Macrobdella decora*. He preserved several specimens and sent them to Dr. Phillips after learning about the new leech discovery in Charles County. She confirmed that the leech collected in Horse Swamp is the new species, *Macrobdella mimicus*. More sampling within the Parkers Creek watershed could find this leech in other tributaries.

Some Goals for the Future

To further expand our appreciation for and understanding of these tributary streams, these goals should be pursued.

1. Use GIS tools to obtain better estimates of total stream miles and individual tributary lengths.
2. Measure the drainage area (catchment size) and average annual flow (or discharge) of each tributary.
3. Use GIS tools to estimate land use/land cover (including imperviousness) in each tributary catchment.
4. Name the 12 tributaries.

Closing Thoughts

The next time you’re hiking alongside or step across a tributary stream in the Parkers Creek watershed, think about the rich diversity of aquatic critters that live there. Most of the time, you won’t see them. But, if you’re lucky, you might encounter an adult midge or stonefly flitting along over or near the water. If you turn over a log lying next to the stream, you might see a Northern Two-Lined Salamander. And if you wade around in Horse Swamp long enough wearing shorts, a medicinal leech might just latch onto your leg.

One more thought for you to ponder:

“A river or stream is a cycle of energy from sun to plants to insects to fish. It is a continuum broken only by humans.”
(Aldo Leopold)

[Data included in this document were provided by the Maryland Department of Natural Resources Monitoring and Non-tidal Assessment Division.]



Photo 1. Eastern Mudminnow (*Umbra pygmaea*)



Photos 2-5. Clockwise from top left: Least Brook Lamprey, Blacknose Dace, Eastern Mosquitofish, and Pumpkinseed.



Photo 6. American Eel (*Anguilla rostrata*).



Photo 7. Northern Two-lined Salamander (*Eurycea bislineata*).



Photo 8. Scud or "side-swimmer": (*Gammarus fasciatus*).

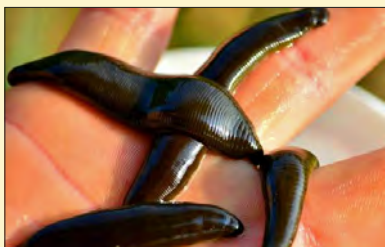


Photo 9. A medicinal leech *Macrobdella mimicus*.

When Are the Cicadas Coming Back?

by Rachel Delbo, Chesapeake Conservation Corps Intern

Hearing cicadas sing in the heat of summer is a common occurrence. You might even get to see one buzzing past or sitting on a tree limb. Then one summer comes along, and seemingly out of nowhere, thousands and thousands of cicadas descend from the sky like a plague. There are so many that you cannot escape them. To make the event even more dramatic, these cicadas aren't a subtle green color, but jet black with strikingly red eyes.



Cicadas close up. Source Pennlive.com.

Where do they come from? How did they get here? What do they want!?

These cicadas that come around only every once in a great while are known as periodical cicadas. In contrast to annual, or "Dog Day", cicadas, periodical cicadas mature on either 13- or 17-year cycles. That's right, periodical cicada larvae wait underground for almost two decades before emerging as adults. Thirteen and 17-year cicadas look similar, but they are actually a different species. Both belong to the Order Hemiptera, along with aphids, shield bugs, and about 75,000 species of other "true bugs".

You may be wondering why these peculiar insects stay underground for so many years and how they know to emerge all at the same time. Periodical cicadas do not differ significantly from their annual counterparts in terms of life history. Both are able to hatch and burrow into the ground as larvae before the end of the summer. What distinguishes the two is how much of their lives are spent maturing underground. Interestingly, periodical cicada larvae do not hibernate during their time underground but remain active, burrowing in the soil and feeding on plant roots. It is the plant roots that signal to the cicadas when it is time to emerge and mate. According to John Cooley, an entomologist at the University of Connecticut, periodical cicadas will count seasonal cycles in plant fluid content. Thirteen and 17-year cicadas count up to their respective target number of years, wait until the ground temperature reaches a comfortable 68 degrees F (18 degrees C), and ding! the long-awaited day has come. Now to the important question: when will that day be for us; when will the cicadas come back?

Periodical cicadas whose 13- or 17-year cycles sync on the same timeline are grouped into broods. Different broods can be spaced out across many years and regional areas. Currently, there are 15 active known broods across the continental US. Of course, there are sometimes stragglers, but for the most part, a brood will emerge again either 13 or 17 years after the last molting event. Thus, the next brood emergence year can be predicted with relative confidence. This summer, brood 9 has emerged in West Virginia, southwestern Virginia, and western North Carolina. Its last emergence event was back in 2003. That next year, brood 10 emerged in Maryland. This means

that in 2021, we will see the cicadas return in full force across central Maryland and the D.C. Metro area. Below is a map of chronologically-close broods and their approximate ranges. Brood 10 is shown in green triangles.

For those in Calvert, Charles, and St. Mary's counties, the next large cicada event will be a little further off in the future. The last periodical cicadas in southern Maryland were seen in 2013, so the cycle will repeat for brood 2 emergence in 2030.

When the time arrives, whether for the 2021 or 2030 event, you can expect to see cicadas gather in trees, on buildings and along sidewalks by the thousands as they rush to mate during a short window of adulthood. They will only live for a month or two while above ground, but with so many individuals within a relatively small area, no more time is needed. Another benefit of such a prolific emergence event is that any potential predators are totally overwhelmed, effectively nullifying the impact of predation. This ecologically-intelligent move makes for a spectacular event, amazing for some and terrifying for others, depending on how you feel about large numbers of insects taking to the streets and skies.

This information has been shared from articles published by the National Wildlife Federation, National Geographic, and Cicadomania.com. Check out these websites for more information on periodical and annual cicadas. The map above is accessible in an interactive format on Cicadomania.com with an option to add reported sightings. If you are in a brood 10 emergence area, get ready, the cicadas are coming!



Source: Brent Miles, Slate.com

“Faces in Nature” Photo Contest Winners Announced

Thank you to everyone who sent in photos for our “Faces in Nature” Photo Contest which ran in June and July on Facebook. The Outreach & Membership Committee requested that participants submit photos showing a “face” formed by the designs in the bark of a tree or etched into a rock.

1st Place Winner Kate Barrett submitted this “smiley face tree” photo. The Outreach & Membership Committee chose it because who doesn't need a little smile right now? Kate will receive a bunch of ACLT “goodies” as her prize.

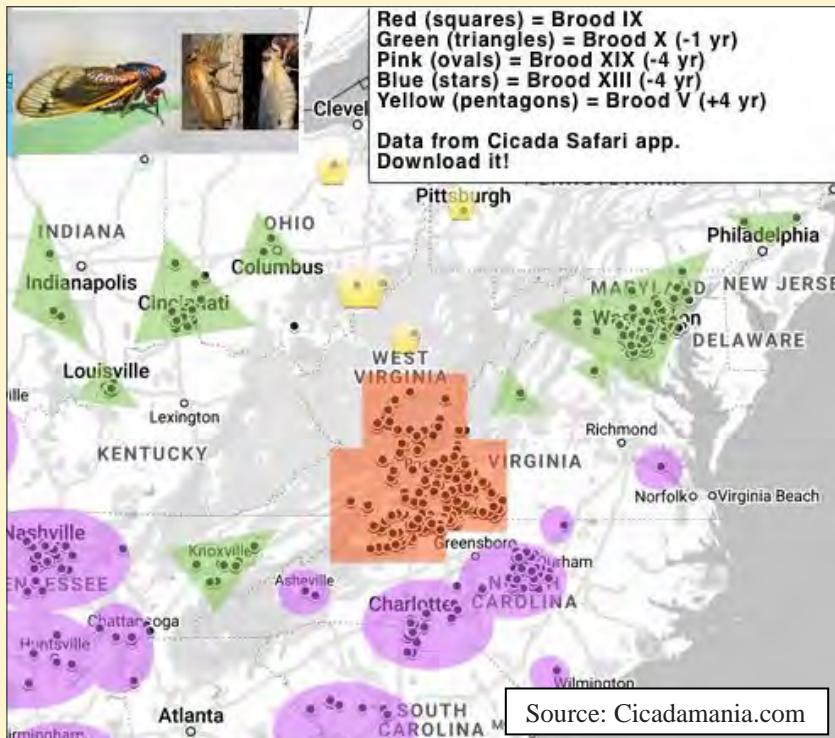
Second place goes to Mir Clark for her “Puff the Magic Dragon” photo, which included the clever caption, “Puff the Magic Dragon lived by the sea...and frolicked in the summer mist on a trail at ACLT!”



Smiley Face Tree by Kate Barrett



Puff the Magic Dragon by Mir Clark



Source: Cicadomania.com

Thank you for your support

New Members

ACLT would like to welcome the following new members since the Summer 2020

Newsletter:

Ann Alsina
Amber Bailey
Jen Barber
Alison Barry
Tammy Beardmore
John Bennett
Pauline & Andy Benson
Evaristo Bonilla
Jamey Borell
Kirsten Bourne
Melissa Bowen
Christine Bowker
Stephanie Burkhardt
Kelly Collins
Jeff Danielson
Melissa Day
Julia Donovan
Felipe de Vega
Annetta DePompa
Sue Dralle
Julie Elbrecht
Paul Fagan
Mr. Joseph Forgeng, III
Kenneth Good
Charles Gratch
Laurie Gray
Laurie Hall
Clea Hancock
Rebecca Haring
Herb & Jen Harris
Michael Hartman
John & Scottie Holton
Linda Hurd
Dominick Iascone
Jane Jamieson
Gail Janes
Brian Kennedy
Steven & Jackie King
Ron Klasmeyer
Gwen Klein
Liz Knoblauch
Francis Lukezic
Elizabeth Lynch
Shellie Marinaccio
Deb McGuire
Peg McLain
Sandra Normann-Kravitz
Laura Riddle
Melissa Rodriguez
Joanne Santiago
Sarah & Chris Schliekert & Family
Al & Vicki Scroggs
Cynthia Seymour
Randall Soileau
Terry Spohnholtz
Anne Stark

Sara Stephenson
Jeannie Swartz
Norm Talbot
Beth Terrence
William Terry
Katherine Thompson
Tessa Washington
Pamela Willet
Chris Wohlfarth
Kathryn Wolber
Liam Zanoni

Memorial Donations

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

In memory of **Tina Boesz:**

Ray & Sondra Pace
Patricia D. Peak

In memory of **Brian Bachant:**

Daniel Boesz

In memory of **Victor Breitburg:**

Daniel Boesz

In memory of **Philip Fleming:**

Joanna Fleming Bowen & Family

In memory of **Thomas "Summers"**

Gwynn III:

Jeanne Aelion
Carlton M. Green

In memory of **Jeff Klapper:**

Jack & Faye Hammett
Leon Meyers
Alan & Patricia Ullberg

In memory of **Carol Tomasello:**

Daniel Boesz

In memory of **Don Mighell &**

June Whitson:

Brett Raynor

In memory of **Patrick Sean Murphy:**

Janice & Charles Rodgers
Daniel Boesz

In memory of **Florence Yaffe:**

Cheryl Place

In Honor of Donations

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

In honor of **Diana & Paul Dennett:**

Richard Mersereau

In honor of **Vivian Poling; Valentina**

Poling; Thaddeus Valanidas:

Margaret Dunkle

Gift Memberships

Thank you to the following members who donated gift memberships since our last newsletter:

Janice & Charles Rodgers

General Contributions and Designated Gifts

Fall Appeal

Jan & Jim Degeneffe

Gary & Sandra Loew

General

Elizabeth Berg

Denise Breitburg & Mark Smith

Richard Casey

Jessica & Ty Clark

Kathy Daniel

Paul & Diana Dennett

David Drzewicki

Dale Hutchins

Sandra Jarrett

Joseph & Sara Koenig

Joyce Loveless

Peter Meyer

Matthew Norris

Mark Rinaldi

John & Betsy Saunders

Elaine Strong

Paul Vetterle

Becky White

James & Anne Williams

Debra Zanewich

Holly Hill Barn

Carl Fleischhauer & Paula Johnson

Holly Hill Donations

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

Fran Armstrong

David & Judy Bonior

Jane Head

Frank Nutter

Spring Appeal

Paul & Diana Dennett

Penny Firth & David Knapp

John & Mimi Little

Sharon Miyagawa

Edwin & Monica Noell

Mark Rinaldi

Helen Rubino-Turco & Paul Turco

W.A. & Pamela White

Workplace Giving

Ryan Baker

Elliott Hamilton



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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.