

TRAILBLAZER

SPRING 2018



*Supporting Oregon Ridge Park
and Nature Center for 36 years*

BREAKFAST!

**COME AND GET YOUR
HOTCAKES AND SAUSAGE
AT OREGON RIDGE . . .**

Date and place?

Saturday, March 3

Sunday, March 4

Oregon Ridge LODGE

And the time?

From 8 AM to Noon

How much?

\$8 for Adults,

\$4 for Children 2 to 8

\$2 for three extra sausages



WHAT'S INSIDE...

March to May Speaker Details

Upcoming Spring events

Oregon Ridge is a VIP

ORNCC Scholarship Reminder

THANK YOU, Generous Donors!

Nature Articles:

Singing Frogs and Maple Syrup Facts

Meet Ridge Runner Sophia Bennett

Trails Initiative Update

What's cookin'?

Pancakes and real Maple Syrup,
Sausage, OJ, Coffee, Milk

What else is happenin'?

Box Raffles, Live Music, Plant
Sale, Face Painting, Honey,
Syrup and Maple Candy Sales,
and FUN!



ORNC COUNCIL SPEAKER SERIES

THE CHESAPEAKE BAY: Progress, Challenges, and Actions

By Alice Christman

**Senior Manager of Community Engagement
Chesapeake Bay Foundation**

March 19 at 7:30 PM, FREE at ORNC

Marylanders love the Chesapeake Bay. They love it for the fishing and boating, its beaches and marshes, the birds and other wildlife, the beauty of its sunrises and sunsets, its rich history, and of course, Marylanders love the seafood, especially their steamed crabs. The Chesapeake Bay is a way of life, and we all become concerned when we hear that the Bay is in trouble. Alice Christman works for the Chesapeake Bay Foundation (CBF), and during her presentation she will try to address your concerns, answer your questions, and give an overview of policies and actions now in play to protect the Bay.

Alice Christman has been with CBF for 14 years, speaking to over 30 groups each year about the progress and unique challenges in preserving the Bay. She also talks about the actions each of us can take in our communities to reduce pollution in the Bay and in the 50 tributaries (rivers and streams) that feed into the Chesapeake Bay watershed. Ms. Christman has a bachelor's degree in Communications from Frostburg University. She's an avid traveler and loves to race sailboats.



ORCHIDS IN MARYLAND: Ecology, Status, and Conservation

By Dennis Whigham, PhD

**Senior Botanist for the Smithsonian Environmental
Research Center**

**Founding Director of the North American Orchid
Conservation Center**

April 16 at 7:30 PM, FREE at ORNC

Orchids make up 10% of the world's plant species. It may be surprising to learn 50% of native orchids in North America are officially threatened or endangered in parts of their home range. There are about 51 native orchids growing in a wide range of habitats across the state of Maryland. Dr. Whigham will focus on the diversity here, orchid ecology and its unique interactions with fungi, and the ongoing work to assure their survival through a continental scale effort. He will talk about seed banks, fungal banks, propagation and education. Orchid-fungal interactions will be described to demonstrate the level of knowledge that is needed to assure the survival of native orchids.

The ecology of plants is Dr. Whigham's primary interest. His research has taken him on journeys through forests,



fields and wetlands around the world, explorations that led to studies of woodland herbs – including orchids, vines, wetland species, invasive species and studies of forests in the tropics, temperate and boreal zones. In recent years, studies of interactions between orchids and fungi have led him in new and exciting directions. His current passion is to establish the North American Orchid Conservation Center (NAOCC), an initiative of the Smithsonian and the United States Botanic Garden. NAOCC's mission is to secure the genetic diversity of native orchids for future generations. Dr. Whigham obtained an undergraduate degree from Wabash College and a Ph.D. from the University of North Carolina. He joined the Smithsonian in 1977. Whigham and his collaborators have published more than 250 articles in journals and books.

MORE SPEAKERS AND SPECIAL EVENTS

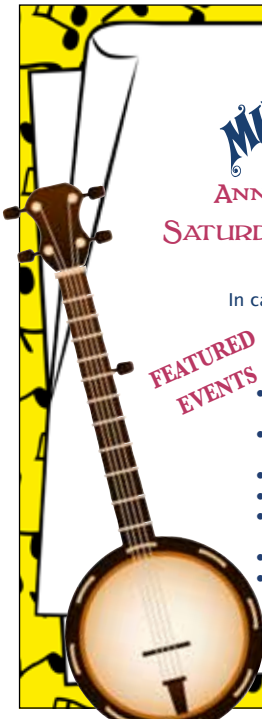
THE VIEW BELOW: Amazing Sights in our Everyday Streams

By Keith Williams
Executive Director of North Bay

May 21 at 7:30 PM, FREE at ORNC

We often perceive that there isn't much to see beneath the surface of our nation's freshwater rivers and streams, but once we look underwater, an amazing world appears. Fish of incredibly diverse colors, shapes, and behaviors live in freshwater ecosystems. The streams themselves create other worldly, breathtaking streamscapes, giving humans willing to submerge themselves the opportunity to witness incredible ecological feats, such as thousand-mile fish migrations, predator-prey interactions, or the vibrant-colors of mating displays. The underwater world of our rivers and streams is unexpected, largely unnoticed, and amazing! Underwater naturalist, Keith Williams, shares his adventures of exploring and discovering the underwater world of our mid Atlantic region rivers and streams in this engaging free presentation.

Keith Williams is the founding Director of Education and the current Executive Director of North Bay, one of the National leading outdoor and character education programs. Keith has developed river snorkeling based science curriculum, and established river snorkeling programs for non-profits and the U.S. Forest Service. Keith has led thousands of people on river snorkeling adventures. His first book on river snorkeling, *Snorkelhead*, was published in 2016.



MUSIC IN THE WOODS
OREGON RIDGE
NATURE CENTER'S
ANNUAL FESTIVAL OF TRADITIONAL MUSIC
SATURDAY, JUNE 2, 2018 BETWEEN 2 TO 8 PM
IT'S FREE! COME RAIN OR SHINE!
In case of rain, the venue moves inside the Nature Center
Bring lawn chairs or blankets for your comfort.

FEATURED EVENTS

- Listen to Local Musicians & Bands Play Folk, Bluegrass, and Rock
- Bring Your Instrument and Join a Jam Session
- Learn about the Dulcimer
- Visit the Vendor Booths
- Enjoy Crafts, Face Painting, and Animal Encounters
- Buy a Hotdog at our Stand
- End the Night Roasting S'mores at the Campfire



**COMING UP
THIS SUMMER
AND FALL!**

**SUMMER PROGRAMS
FOR ALL AGES!**

Camps, Hikes, Canoeing,
and Much More!

TRAIL GUIDE TRAINING

September 4 to 7,
from 10 AM to 1 PM
\$20 Donation first time attendees.

**HONEY HARVEST
FESTIVAL!**

October 6 and 7
11 AM to 4 PM,
It's Fun and it's FREE

THERE IS SO MUCH TO DO AT OREGON RIDGE!

ORNC YOUNG PROFESSIONAL GROUP INFORMATIONAL SESSION

March 19 at 6:30 PM

Oregon Ridge Nature Center Animal Room

Oregon Ridge Nature Center will be hosting a Young Professional (YP) group informational session on March 19, 2018, beginning at 6:30 PM in the Center Animal Room. Come learn about this new venture and meet fellow aspiring leaders before the March Speaker Series event. The goal of the ORNC YP group is to connect young professionals ages 21-40 (although all are welcome) to diverse opportunities for networking, professional development, social interaction, and service to ORNC. Let's engage, connect, and empower each other to actively shape the future of ORNC. For more information, please contact Jonathan Rowe, Council At-Large Director, at jjkylrowe@gmail.com. (Jonathan Rowe)

OREGON RIDGE'S "BIG TREE" TULIP POPLAR

As this newsletter was about to go to press, word came about a special tree in Oregon Ridge Park. A detailed article will appear in the next issue, but here are the minimal facts: The MD DNR has officially declared a tulip poplar near the lake to be the 2nd largest tulip poplar tree in Baltimore County, measuring: 18'9" circumference, 122' height, 105' crown spread. It will be listed in Maryland's Big Tree Program. More to come....

NATURE QUEST IS AN ADVENTURE

Discover the 9 parks and 16 trails in Baltimore County by joining *Nature Quest*. Find trail markers at these county parks, including Oregon Ridge Park. Special prizes and rewards await those completing nine+ trails! Start by obtaining a Nature Quest Passport at one of the participating parks, at Wegmans, or online. For details, call ORNC (410-887-1815) or visit www.OregonRidgeNatureCenter.org.

Those completing five+ trails will earn FREE admission to Baltimore County's celebratory *Nature Quest FEST* (details TBA), so hang onto your Passport as it is your ticket for free admission.



ORNC COUNCIL OPENING DAY FOR TRAILS

April 7, 2018 at 12 Noon

Outside the ORNC Facility

In celebration of Rails-to-Trails Conservancy's (RTC) 6th annual *Opening Day for Trails* on April 7, Oregon Ridge Nature Center Council will be hosting an open house for ORNC trails to showcase our trails, our initiative to improve the trails, and RTC's nationwide celebration.

We begin with an informal jog/walk at 12 PM covering anywhere from 3-5 miles over varied terrain. Naturalist-guided hikes will begin at 1 and 2:30 PM. Please register for the guided hikes in advance; space is limited.

Volunteers from the Baltimore Road Runner Club (BRRC) and our own Council At-Large Director, Jonathan Rowe, a 2018 Boston Marathon qualifier/participant, will be available to answer any questions about running, jogging, walking, or the ORNC trails.

As the nation's kickoff to the trail season, *Opening Day* invites walkers, runners, cyclists, horseback riders and outdoors enthusiasts from across the country to celebrate spring by exploring trails in their community. In 2017, thousands of people pledged to participate in *Opening Day* by visiting a trail in their neighborhood or beyond—or by joining one of the special events offered around the country. This year, trail users can once again pledge to participate in the celebration and find events happening in honor of Opening Day at: <https://www.railstotrails.org/experience-trails/opening-day-for-trails/>.

"Opening Day for Trails is more than a celebration. It's an invitation for people nationwide to explore all that trails have to offer. We look forward to thousands of people using this as an excuse to get out and on a trail to be active, connect with friends and family, and spend time in nature," said Brandi Horton, RTC's vice president of communications. "2018's Opening Day celebration is gearing up to be the best yet—and we're looking forward to seeing everyone on the trail!"

For more information about the ORNCC Opening Day for Trails event, please contact Jonathan Rowe at jjkylrowe@gmail.com. (Jonathan Rowe)

OREGON RIDGE PARK IS SPECIAL IN MANY WAYS

OREGON RIDGE IS A VIP... A VERY IMPORTANT PARK

By Naturalist Justine Schaeffer

This isn't news to most of us who value the park as a recreational, educational, and interpretive natural area. But at January's Speaker Series, Dr. Peter Groffman from the Baltimore Ecosystem Study (BES) introduced us to another reason — Oregon Ridge Park is valuable to environmental science.

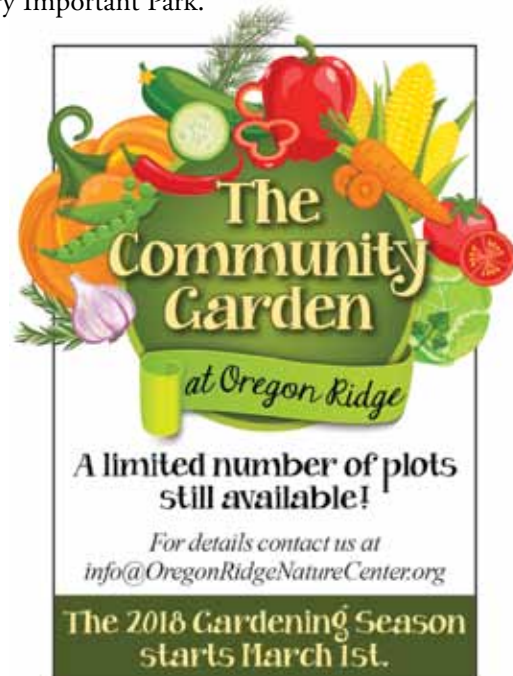
Dr. Groffman, and other collaborators in BES, have studied our vegetation, soils, and streams for over 20 years in an attempt to understand how ecosystems function, and to identify long-term changes and stressors to our local ecosystem. Beginning with pioneering work by Dr. M. Gordon "Reds" Wolman on Baisman's Run as early as the 1960s, Oregon Ridge is considered a reference area, and data from our forested and relatively undisturbed watershed offer important comparisons to other more developed areas along the Gwynn's Falls watershed in Baltimore County and Baltimore City. BES is one of 26 sites in the network of long-term ecosystem research sites across the United States.

Dr. Groffman explained that the Baltimore Ecosystem Study, which receives long-term funding from the National Science Foundation, seeks to understand more about how ecosystems function and react to human influences. Inconspicuous researchers are here every week, collecting water and soil samples, and monitoring rainfall and vegetation. Researchers are looking at nutrient cycling, energy dynamics, changes in plant and soil communities, water table and contaminants.

Some of the more interesting findings related by Dr. Groffman:

1. Our trees are changing. While oaks and tulip poplar dominated the Oregon Ridge forest 20 years ago, the same areas contain a preponderance of red maple and black gum. Why? Contributing factors are deer browsing of young oaks and fire suppression.
2. Pollutants released outside our watershed affect our park. Mercury levels, higher than expected at Oregon Ridge, are derived from the burning of coal, the source of most of our electricity.
3. Our climate is changing. It is raining more, and it's raining more in winter.
4. Levels of salt are increasing in our streams.
5. Nitrogen retention in our relatively clean watershed is very good, but nitrogen passes quickly through more developed watersheds, leading to nutrient loading problems in the Chesapeake Bay.
6. In urban environments, the big improvements in water quality, as well as community quality of life, result from schoolyard habitat enhancements, schools being the focal point of the community.

Dr. Groffman cited Oregon Ridge as an invaluable touchstone for helping to answer foundational questions about our ecosystem. Another reason to value and preserve our Very Important Park.



COUNCIL SCHOLARSHIP COMMITTEE NEWS

UPCOMING GRADUATES! APPLY NOW FOR ORNCC SCHOLARSHIP

Each year the ORNC Council awards scholarships to college-bound high school seniors from Baltimore County and City. Recipients should show a high level of commitment to the health of the environment and plan to continue their studies in environmental science and nature education.

Our goal is to support two or three scholarships up to \$5,000 each!

We hope you will help by giving generously to the Scholarship Fund. To make a tax-deductible donation, checks should be made payable to the ORNC Council, specifying on the note line "Scholarship Fund" and sent to:

Oregon Ridge Nature Center Council
13555 Beaver Dam Road
Cockeysville, MD 21030

To donate on-line, please visit our Web site:
<http://OregonRidgeNatureCenter.org/scholars.html>

The names of all donors will be published, so if you would like to make a gift in another's name, please specify the donor's name as it should appear on the list.

If you know a high school senior who may be eligible for the scholarship, please have the student call the Oregon Ridge Nature Center for an application form at 410-887-1815 or download an application from our Web site.

www.OregonRidgeNatureCenter.org



AN UPDATE FROM SCHOLARSHIP RECIPIENT ZACHARY LITTLE

Hello Dr. Roberts:

I am more than happy to say that the Oregon Ridge Nature Center Scholarship was very critical to my success in college; without that scholarship, I would not have been able to attend UMBC! *[Zachary received \$6000 in 2015]*

My freshman year served as an acclimation year for me. Being a first-generation college student, I had no real advice from my parents. I took mostly general education credits and my introductory chemistry and math courses. I managed to network to earn a job on campus and joined a fraternity (Pi Kappa Phi). I then secured a summer job where I worked for the residential life office.

My sophomore year has been much more productive and my most challenging, yet fulfilling academic year. I changed my major from chemical engineering to Environmental Science and Geography, and I'm also working towards a certificate in GIS (Geographic Information Systems). I enjoyed the introductory environmental science classes, so I decided to change my major after taking a class with professor Andrew Miller. Because of his enthusiasm, I have concentrated on landscape evolution, taking his classes in physical geography, geomorphology, and fluvial morphology. Dr. Miller has been critical in serving as my mentor. I am also completing the calculus series and will be completing the introductory calculus-based physics classes.

In addition to my major, I have become much more active on campus. In fall 2016, I served as a UMBC Eco-Ambassadors, where I advocated for social awareness and activism for sustainability on campus. I organized multiple information sessions, a sustainable Harvest Festival, and contributed to Green Office Certifications on campus for both students and faculty. I was able to raise \$1500 individually and an additional \$1500 with my student organization (Global Brigades: Environmental) to travel to Eastern Panama during my spring break and work with rural indigenous communities on sustainable agribusiness. The experience was life changing, and I am beyond thankful for the experience. I have also managed to earn a residential life job on campus, starting next year and until I graduate. I will be able to live on campus for free and have a very reduced meal plan, which is extremely

(CONTINUED ON PAGE 7)

FRIENDS OF OREGON RIDGE ARE GENEROUS

(CONTINUED FROM PAGE 6)

helpful since I have been funding my own college education by myself since before I began college.

Also, I leave for my first research internship in less than two weeks! I have been selected to be part of the 2017 RESESS (Research Experiences in Solid Earth Sciences for Students) cohort, where I will focus my research on geology and environment science this summer. This program is held by UNAVCO in Boulder, Colorado, and is co-sponsored by the NSF and NASA. I will live in Colorado for 11 weeks (with a stipend and free housing) and conduct authentic research. I can intern for up to three years/summers before I begin graduate school! I will be working at facilities such as UNAVCO, USGS, Colorado School of Mines, or University of Colorado at Boulder. This program is relatively difficult to get into, but I am excited to say that I was accepted!

I have also very recently been accepted into UMBC's second cohort for the National Academy of Engineering *Grand Challenge Scholars Program*. In general, this scholars program combines science and engineering to tackle societal problems such as managing the nitrogen cycle.

Finally, I have been communicating with individuals working for the USGS (United States Geological Survey) to possibly secure an internship or volunteer work during the school semester. One of my ultimate goals is to work for the USGS as a research scientist. I want to study the environment, water quality, and erosion of the surrounding area.

I hope that my combined efforts will allow me to be successful in earning either a Master's or Doctorate in Geology. I will be unable to afford to pay for my advanced degree by myself, so I hope that my qualifications and experiences allow me to earn a Graduate Assistantship, fellowship, or some sort of scholarship that would fund my graduate education.

Thank you again for the scholarship that was awarded to me. I can most definitely say that the moment I received your call about winning the scholarship was one of the happiest days of my life.

Sincerely, Zachary Little

THANK YOU TO THOSE WHO DONATED!

The results are in for our recent Fundraising Campaign, which began in November 2017 and ended in early February 2018. Generous donors contributed \$5008.42 to help Oregon Ridge Nature Center Council complete two important projects: Library Renovation and Trail Revitalization. The Council and Staff wish to thank these wonderful supporters, some who prefer to remain anonymous:

Gifts up to \$100

Michael Borowitz and
Barbara Crain
D'Anne & Mike Avotine
Peter Boxx
S.J. Campbell, Jr.
Jay Cohen
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Louise Smith
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Thomas Snyder
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Sara Yosua
12 Anonymous Donors

Gifts over \$100

Deborah Bacharach
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Bill Hunter
Martha Johnson and
Raymond Suarez
David & Kathy Power
Daniel Rozics
Walter Schwidetzky
3 Anonymous Donors

In Memory/Honor of

ORNC Council

Oregon Ridge Staff

Bob Neuman
Millie Dreier

Cole Paul Snyder

Thea Willett

THANK YOU

SINGING THE PRAISES OF OUR AMPHIBIAN CHORUS

By Naturalist Justine Schaeffer

It's no secret — Oregon Ridge provides great habitat for frogs and toads. Our varied wetland areas offer the perfect breeding grounds for these amphibians, which typically live on land as adults but require water for their juvenile, or tadpole, stage. In fact, the word amphibian refers to this double life with the root *amphi*, meaning both kinds, and *bios*, meaning life.

We have several different types of wetlands at Oregon Ridge, each of which support the needs of different amphibian species. The vernal pool east of the lake and other temporary wetlands are perfect for the wood frogs (*lower photo*) and spring peepers (*upper photo*). Being relatively cold tolerant, these species emerge early in the year (February or March) and the tadpoles develop quickly in this fish-free habitat, emerging as froglets before the wetland dries up in mid-to-late summer. As adults, they inhabit the forested habitat surrounding the vernal pond. The Oregon Lake, a flooded ore pit over 40' deep, offers a permanent body of water perfect for tadpoles of green and bull frogs that hatch in summer and develop slowly over several years into adult frogs. Our other wetlands, including Oregon Branch with its tributaries and the pond in the wildlife management area, support several other amphibian species, including cricket frogs, pickerel frogs and American toads.

While generally secretive during most of the year, male frogs and toads in spring bring these wetlands alive with the sound of music made to attract a mate. The wood frogs and spring peepers are the first to announce themselves in February and March, followed by the American toads and other species,

with the baritone “jug o’ rum” of the bull frog being a memorable sound on warm mid-summer evenings. Each frog and toad species has a distinctive song during their mating season. It is that song that we have used for several years to survey our frog and toad populations as part of *FrogWatch USA*, a nation-wide citizen science effort to monitor frog and toad populations, many of which are facing serious population declines. Once again, our natural and protected habitat at Oregon Ridge Park presents an important area for baseline scientific research.

I monitored wetlands close to my home for many years, reporting my observations to *FrogWatch*. It was a delightful experience for my family and me, as we learned the calls of the various frogs and set out each week, close to sunset, to quietly watch and listen as dusk settled on a wetland near home.

On these excursions, my young children learned that our frogs don't say “ribbit”; they say “peep peep” like the spring peeper, or “quack quack” like the wood frog. (Just so you know... “Ribbit” is the call of a Pacific tree frog that lives on the west coast and comes to us, unsurprisingly, via the influence of Hollywood movies and TV.)

At one wetland we monitored, each visit for weeks was filled with a resounding, almost deafening, chorus of spring peepers. But the next week there was nothing — complete silence. We sat and listened and wondered what could have happened — a toxic spill? Were we too noisy on our approach? As we gathered our data and prepared to leave, we heard a telltale “Who cooks for you?” in the distance and had the answer. The peepers knew that a barred owl was on the prowl and kept silent to avoid becoming an evening snack.

So, this spring, as evening temperatures begin to lose their chill, throw open the windows at night and listen for the delightful “peep peep” of the spring peepers or the high trill of the American toads. For me, these are the most enchanting sounds of spring.

If interested in more information:

To learn the calls of Maryland frogs and toads: <https://www.pwrc.usgs.gov/Frogquiz/>

More about FrogWatch, USA: <https://www.aza.org/become-a-frogwatch-volunteer>

To learn about the FrogWatch effort at ORNC, join us for a monthly Amphibian Walk on March 21, April 18, or May 16 at 2:00, led by Maryland Master Naturalist Sara Yosua. Call the Nature Center to register (410-887-1815).



COUNCIL AND VOLUNTEERS DO GOOD WORK

TRAILS INITIATIVE UPDATE

In February, the Oregon Ridge Nature Center Council approved the Trails Initiative Committee's proposal to appropriate \$1500 to Trail Conservancy to conduct a professional assessment of the ORNC trails. Trail Conservancy, Inc. is a 501c3 non-profit organization whose mission is to provide assistance in developing, building, and maintaining natural surface trails using sustainable design principles that minimize negative effects on the environment. In addition, the organization promotes and advocates shared-use trails that improve the quality of life for all trail visitors, while also preserving natural resources.

Trail Conservancy, Inc. has extensive knowledge in this field and has improved, repaired, or created new trails nearby at Little Bennett in Montgomery County, Cosca Regional Park in Prince George's County, Jug Bay in Prince George's County, Cylburn Arboretum in Baltimore City, Patuxent Park in Anne Arundel County, Town of Emmitsburg in Frederick County, and Hawk Mountain in Pennsylvania.

Executive Director Austin Steo started Trail Conservancy, Inc. 10 years ago to create good, sustainably designed natural surface trails. He has significant experience obtaining grants for similar projects.

The ORNC Council conducted a strategic planning process in October 2017 and determined that improving the outside trails was a top priority. A Trails Initiative Committee was created and members researched various options to proceed. The Trails Initiative Committee received and reviewed 3 different consulting proposals before unanimously selecting Trail Conservancy, Inc.

Assessment will begin immediately. Once there is a better idea of what trails (or parts of trails) need to be improved, the Council will determine next steps. All of us value the ORNC trails and every effort will be made to minimize disruption of use. For more information, to provide feedback, or to get involved with this initiative, please contact Jonathan Rowe, ORNC At-Large Director, at jjkylrowe@gmail.com.

(Jonathan Rowe)

RIDGE RUNNER SOFIA BENNETT ENJOYS THE FESTIVALS

Sofia Bennett has been visiting Oregon Ridge since she was a little girl, so when she needed to acquire service hours for school, Oregon Ridge felt like the natural place to lend a hand. Sofia first began volunteering as a Counselor in Training, helping out with summer camps in 2016. When summer camp ended, she quickly decided to join the Ridge Runners to help care for the animals. While Sofia's primary job as a Ridge Runner is taking care of the Nature Center's animals, her favorite volunteer job is working at Oregon Ridge Nature Center's annual festivals — helping with crafts, showing animals, and face painting. When caring for the animals, the starling is her favorite, by far. She loves to whistle to him and let him eat mealworms right from her hand.

Sofia feels that Oregon Ridge is a great place volunteer, and she would recommend being a Ridge Runner because it's a great experience working with animals and helping at the seasonal events throughout the year. She enjoys sharing the animals with visitors who come to the center. One time while showing one of the frogs to a younger visitor, the toad surprised her by "peeing" on her and the visitor! They put the toad down, and when they picked it up again, it did the same thing. Sofia said it was startling the first time, but they all laughed when it happened the second time!

Sofia is a sophomore at Hereford High School and has a 3.6 GPA. Her favorite subject is math. After high school, she plans to attend college to earn her degree in Biology, work in a lab, and then possibly attend medical school. In her free time, she mostly loves to ice skate and ski, but also enjoys baking and going to the movies with friends. Sofia's hidden talent is being fluent in Greek! Sofia also likes to read books, such as *The Book Thief*, *Moby Dick*, or anything focusing on the ocean. Aside from caring for the Nature Center's animals, Sofia has two rabbits that she cares for at home — Velvet and Castor.



WHY DOES MAPLE SYRUP VARY IN COLOR AND TASTE?

Well, it's complicated...

By Mary Jane Shanks

Maple trees impress year round, but in early spring they are almost magical. As freezing nights turn into pleasantly warm days, maple trees awaken from winter dormancy, releasing their very life blood — sweet, clear sap — ready to be tapped to make rich syrup to compliment pancakes, French toast, even grits in the deep South. In late February, masses of visitors hike to the sugar bush at Oregon Ridge and other nature centers to learn how to tap and collect sap, and watch the evaporating process that produces maple syrup.

The first tapping produces the light, subtle tasting Grade A Fine syrup, which under the updated 2015 grading system is named *Golden Color and Delicate Taste*. This grade is so highly desired that scientists have devised creative ways to produce it longer in the tapping season. Left to nature, however, sap collected after the first tapping produces syrup that is darker and more intense in flavor as the season progresses. This syrup is still Grade A, but is now given descriptive names to reflect flavor and color — *Amber Color and Rich Taste*, *Dark Color and Robust Taste*, and *Very Dark and Strong Taste*.

What is actually happening to cause this change in color and taste? My husband posed this question to me one morning, as he smothered his French toast in warm maple syrup. Since I was working on the spring issue of the *Trailblazer* that day, I thought the answer to his question would make a timely article with our Annual Pancake Breakfast just weeks away. After consulting Baltimore County naturalists Justine Schaeffer and Kirk Dreier, I learned that the simple answer is *microbes*. However, further research by Justine and me revealed that there is nothing simple about the processes at work that cause variations in maple syrup flavor and color. In fact, part

of the answer to this question is still a mystery to the experts in maple syrup biology. Here is what we've learned:

Freshly tapped sap from the Sugar Maple tree (the preferred maple to tap here at ORNC) is about 98% water and the rest is sucrose, or sugar. Sap is extracted from the tree using spiles, tubes, buckets and bags. Lurking in this paraphernalia are microbes, including bacteria and yeast, which break-up the sucrose molecules into fructose and glucose — commonly called *invert sugar*. This breaking-up process is called *inversion*, which is fueled by the enzyme *invertase*. It seems hungry microbes prefer invert sugar because it's easier to digest. As the season progresses and temperatures warm up, more and more bacteria and yeast incubate in the buckets and tubes, breaking up sucrose into more and more invert sugar. The higher concentrations of fructose and glucose create the differences in color and taste during the heating and evaporating process that turns sap into maple syrup.

However, it's even more complicated than that. Amino acids also affect flavor. As maple trees emerge from winter dormancy, it's believed that metabolic changes inside the tree create increasing amounts of amino acids, especially as temperatures warm up over the season. Biologists believe that the unique combination of amino acids, maple furanone, strawberry furanone, and maltose within the tree create the distinctive maple flavor. What's *furanone*? It's an organic compound, and going beyond that is too technical — for me and this article.

The heating, or evaporating, process that produces maple syrup kills all the microbes and also plays a vital role in determining color and taste. Much of this has to do with the *Maillard*

reaction, the term for “browning” that involves reactions between amino acids and invert sugar in food (including chocolate and toast). Chemical reactions occur as sap is cooked down in the evaporator, mostly of the *nonenzymatic* browning type, which critically affect syrup color and flavor — the more nonenzymatic browning, the darker and more flavorful the syrup. Again, sucrose and its two counterparts, fructose and glucose, are key to the end result. Sap from the first tapplings is mostly water and sucrose, which is less reactive than invert sugar and requires less nonenzymatic browning. The result is the Grade A *Golden Color/Delicate Taste* so favored by some syrup connoisseurs. Later on, a host of ravenous microbes have done their work and the sap is mostly water and invert sugar, which increases the Maillard reaction and results in Grade A *Amber Color/Rich Taste*, *Dark Color/Robust Taste*, and *Very Dark/Strong Taste* syrups. (This last is made very late in the season when the sap has low sugar density, high water content, and more microbes. It must be boiled longer to evaporate the water, adding to the darker color and rich taste. It's used primarily for cooking.) Under the current two-grade system, Grade B is now called *Processing Grade Syrup*. It's not permitted for retail sale because of its “off taste” and is used as an ingredient in food products.

One side note: Maple syrup is really healthy, despite being a sugar. It has 24 different antioxidants that combat inflammation and skin conditions, and help prevent arthritis and heart disease. More on that in a future *Trailblazer* article.

As you pour sweet syrup on your hotcakes at our annual breakfast, remember the science and the hard work Mother Nature and humans put into making it; then take some home.

BALTIMORE COUNTY COMMISSION ON ENVIRONMENTAL QUALITY (CEQ) ISSUES REPORT ON TREE PAINTING



TRAILBLAZER STAFF

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CEQ REPORT CORROBORATES ORNC COUNCIL CONCERNS

Many of our members are now aware of the 53 painted trees, which begin at the Children's Natural Playground and extend up and beyond the handicapped trail access. This project is the result of a very well intentioned fundraising campaign by the Nikki Perlow Foundation to celebrate young people who have conquered addiction — the Forest of Hope. However, the project is also a classic example of how good intentions for and by humans are often not good for other living organisms in our environment.

After a comprehensive research/review process, the CEQ recently issued a report on the Painted Tree Project at Oregon Ridge. The CEQ is a 15-member board appointed by the county executive and the county council to advise them on environmentally sensitive matters. We encourage people to read the entire CEQ report, linked below. The report explains the detrimental effects of the paint on the health of the trees and the species that depend on the trees. The report also stresses the negative effects on people who seek the natural beauty of the forest and especially on the environmental education and nature interpretation programs at the park. The report acknowledges that County approval for this project was authorized, but raises concerns about the approval being given “without any record of public notice or input, and without documentation of advice from stakeholders and forestry or environmental education experts.” Neither was the ORNC Council consulted or allowed input into the decision making phase. A poor precedent was set, which casts a negative light on the County. Had the County experts and the Council been consulted, the Foundation would have been guided to an alternative project that would have met their goals, preserved the safety of these living organisms, and resulted in a positive outcome for all.

On your next hike with family and friends through the Oregon Ridge woods, please take time to reflect on the spirit behind the Forest of Hope. But, think also about mankind's tendency to “use” nature in ways that often harm natural, living things. The paint will take 20 years to wear off and cannot be removed safely. It's predicted that the effect on the trees/wildlife will probably be temporary/minimal, unless weakened tree resistance invites invading insects and more permanent damage. These painted trees will be here for a generation of hikers to see. It is up to us to discuss with our children the positive and the obvious negative lessons of this misguided project.

The CEQ report includes the *whys and wherefores* in all regards of this project, including recommendations:

<http://resources.baltimorecountymd.gov/Documents/CEQ/treepainting.pdf>.

To contact your County Councilmen to express your concerns:

<https://www.baltimorecountymd.gov/countycouncil/index.html>

For more information about maple syrup:

https://northernwoodlands.org/outside_story/article/science-syrup

<https://trnonline.org/2015/03/21/the-science-of-maple-syrup/>

<https://shelburnefarms.org/blog/the-mystery-of-syrup-color>



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