

World Wide Web

by Michael Kieffer

For many, maybe most folks, the title of this article leads one to think of our computers and phones. To me, I think of the World Wide Web of fungus, and how fungus and roots bring the bedrock to the surface. I also reflect on how that connection creates, on land, the base of the entire ecosystem, as well as how the ecosystem, being intact from the bottom up, determines the health of the entire system. Bedrock-fungal-root connection leads to a healthy landscape. Destroying the connections leads to a cancer of the landscape, mainly seen by ever-aggressive invasive plants.

The World Wide Web of fungus, which joins rock to mineral soil, and humus to rootlets and roots is organic and reproduces/replaces itself. This system is energized in a sustainable manner from a combination of the minerals from the bedrock and the input from the plants they support. Outside factors such as tractors, bulldozers and pavement can cause long-term failures in the system.

The World Wide Web humans have created has been developed and produced with computers, and its energy source and production are based on fossil fuels. Its structure and construction depends on the past. It depends on the energy sequestered and the ways that it can be consumed and reformed into products such as the plastics that our computers need for their construction. Ways for this web to fail include connection errors, lack of backup, and unsustainable energy source.

Soil and its erosion were recognized as one of the first signs of land degradation by one of the founders of conservation, Aldo Leopold. In fact, it was his work in the Southwest and the serious erosion issues occurring there in the early 1900's that began to influence his thoughts and was an essential component to developing his "Land Ethic" based on the lands "integrity".

Soil formation begins with the breakdown of rock. All rock, no matter how hard, will succumb to the relentless forces of wind, water, topography, climate, and time. These forces break rock into smaller and smaller sizes eventually creating sand, silt, and clay sized particles. These particles make up the mineral components of all soil types and, depending on the percentage of each of these particles, a soil's texture is named. Equal contributions of sand, silt, and clay form a loam soil, optimal for life. A sandy loam is characteristic of the Bull Run Mountains.

Lichens are the first visible signs of life on the earth's barren surfaces. These organisms begin a cascade of events that add to the connection between the mineral world and the organic world by combining and recycling both inorganic and organic components. Lichens, half algae and half fungus, have many advantages to begin life on rock, such as abundance and longevity (an individual lichen may live hundreds if not thousands of years). They can also produce acids unique to the kingdoms of life that aid the breakdown of rock. These pioneers pave the way for mosses, ferns, herbs, shrubs, and trees that take advantage of each other, as well as each bringing a myriad of life into the fold, including animal decomposers, detritivores, scavengers, herbivores, and predators. It seems that life has evolved to trap energy on land before its eventual loss to the sea. The more time nutrients from the soil cycle through living things, the more time the natural processes that create new soil have to replace the eventual loss.

Bacteria and fungus do the bulk of the work to provide the minerals and elements that are the building blocks of all life. Solar radiation provides the energy that drives photosynthesis in autotrophic bacteria, lichens, and plants. Energy is stored in sugars that reciprocally feed the bacteria and fungus. *(continued on page 5)*



When a Butterfly Flaps Its Wings...

by Anna Ritter

As Anna prepares to move on to her next stage in life, we wanted to revisit one of our favorite articles of hers...

Last summer, I read a book that told the conservation stories of three different species: the polar bear, the Lange's Metalmark butterfly, and the whooping crane. *Wild Ones* it was titled, and I found it an enjoyable read; the author took a journalistic approach, weaving interviews and his personal reflections together to create the three stories. One of the overlying themes of the book, or the one that impressed itself upon me the most, however, was a quietly disturbing question: why should we conserve and protect these species? By asking this question, the author was not discouraging the protection but rather attempting to explore deeper into why we expend so much energy and so many resources in fighting for one species of butterfly. It seems right...but why?

I remember myself indignantly defending conservation when the question came up in class discussion, but as time went on the question stuck with me, and now almost a year later a response has finally measured itself out.

Perhaps one species of butterfly does not matter. That seems like a hard truth, but many species have gone extinct, and the world still turns. One butterfly disappearing from one distant location in California will not spin our world into chaos.

But there is that quote, which I am sure many of you have come across, by an unknown source, that "when a butterfly flaps its wings in New Mexico, a hurricane happens in China". Ignoring here the chaos theory and fractal math technical aspect of the quote, it reminds us that the entire world connects and intertwines. Each member, including our human species, has relationships with every other member.



The endangered Lange's Metalmark Butterfly

Still, losing one butterfly does not seem like an overly huge deal. Each species though contributes to the earth's biodiversity; each species adds another number on to the list. List is not the best way to describe biodiversity though: as one professor at George Mason University put it, biodiversity is like a net, with each species threaded together with others. This metaphor shows why one butterfly is important. If you start poking holes in the net, one hole alone does not matter, but more and more will finally cause the net to collapse. A good fisherman takes care of his net. As a dominant species on the earth, in the sense that we have great influence on the planet, we are the fisherman.

So why preserve these species? In brief, biodiversity provides a technical answer. It can seem daunting though, when you are in the field dedicating your life to protecting that one butterfly in California. And hopeless too, as extinction rates continue to increase above natural rates despite all our work. That is how many of the conservationists and naturalists whom the author of the book interviewed ended up feeling as time passed. Angry, hopeless, crushed.

But the author closes with the story of a man, who one afternoon was interrupted in his office by a breathless intern, carrying the news that the pond up the hill, holding the only population of a certain species of fish, had nearly dried out. The man jumped up, drove in an old pickup to the pond, and began moving the fish to another safe pond with an old bucket. At one point the entire population of that species of fish in the world was in the back of his pickup, moving to a new pond. When asked if the gravity of the situation occurred to him, he answered, "I just did what I had to do".

Sometimes, you have to ignore the big picture. Sometimes, the big picture does not matter. All that matters is doing what you have to in the moment you are given. We have a responsibility as a species to save those who are in danger, often because we put them there; they have a right to life as well. And in doing so, we preserve the net of biodiversity that holds us all.

So, there is my response to the author. I might have to send it to my professor from last year, just to get some peace over the matter after an entire year. Now, Michael might ask me what on earth this article has to do with the mountains, even if this article is educational or enjoyable to read (which I hope). But as a Natural Area Preserve, the Bull Run Mountains are specifically dedicated to protecting biodiversity and preserving that net around us. In fact, the Natural Area Preserve system under the Virginia Natural Heritage Program is one of the only preserve systems specifically concerned with biodiversity. So, next time you take a hike, remember that, and hopefully you will appreciate the living museum around you a little more.



The endangered Whooping Crane

SHOOTING THE BREEZE
is a publication of
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Public Programs Spring 2019

HIKE WITH A NATURALIST*

1st Thursday of Every Month at 10 a.m.

Join a professional naturalist and discover the flora and fauna of the local region. This program is free; all are welcome. Meet at the Mountain House.

MONTHLY SPEAKER SERIES

These programs are free and open to the community!

Saturday, May 4th, 2pm-4pm *Trout Unlimited, Marcia Woolman*

Saturday, June 1st, 2pm-4pm *Land Trust of Virginia, Sally Price*

MIGRATORY BIRD WALK

May 4th, 2019—Saturday, 7a.m. –10a.m.

Join us as George Wallace leads us on a bird walk at North Fork Wetlands. Last year we saw a total of 53 species, including a variety of warblers and newly arrived migrants. George has been active in bird research and conservation for over 30 years, in the past working for American Bird Conservancy and now acting as Chief Conservation Officer at Rainforest Trust.

Pre-registration required.

Members: \$20/non: \$25

HOPEWELL OBSERVATORY

Saturday, TBA, 2019, 7:30pm-9:30pm

Meet at the Mountain House at 6:30 before visiting the Observatory for an evening of stargazing.

Space is limited, pre-registration required.

Members: \$15/non: \$20

HERPETOLOGY CAMP*

Session I: June 24th—25th, 9a.m.—4p.m.

Session II: June 27th—28th, 9 a.m.—4 p.m.

Herpetology is the study of reptiles and amphibians. BRMC invites your child to spend two days hiking and handling, searching, and observing salamanders, frogs, lizards, snakes, and turtles on the Preserve. Marty Martin, a premier mid-Atlantic herpetologist, will be joining both camps. Ages 7-12.

15 participants per session; pre-registration required.

Members: \$100/Non-members: \$150

BUDDING NATURALIST CAMP *

July 8th—12th, 9 a.m.—12 p.m.

At this week-long camp, young children will be exposed to the outdoors and wildlife, as they explore life on the Bull Run Mountains through a series of discovery hikes, frog and salamander searches, snake viewing, stream exploration, nature crafts. Ages 4-6.

Pre-registration required.

Members: \$125/Non-members: \$175.

SUMMER NATURALIST CAMP*

Session I: July 15th-19th, 9a.m.—4p.m.

Session II: July 22nd—26th, 9a.m.—4p.m.

BRMC invites your child to spend an adventurous week interacting with the natural world. Each day we will focus on different groups of plants and animals on the Bull Run Mountains. Campers will add to their understanding of natural systems through hikes, stream walks, snake handling (only if desired!), frog and salamander catching, bird watching, butterfly and insect collecting, crafts, and games. Ages 7-12.

Pre-registration required.

Members: \$250/Non-members: \$300.

CHESAPEAKE WATERSHED WORKSHOP *

July 29th—August 1st, 9 a.m.—4 p.m.

Thanks to support from the Chesapeake Bay Restoration Fund, six scholarships are available for this workshop.

Please contact us at info@brmcconservancy.org to request an application. This workshop will focus on conserving the rivers and streams that flow into the Chesapeake Bay. We will explore headwater streams on the Bull Run Mountains, go downstream on Little Bull Run, and visit Turkey Run National Park. At each location students will perform stream monitoring, vegetation analyses, and stream habitat and riparian buffer evaluations. Ages 13-18.

Pre-registration required.

Members: \$200/Non-members: \$250

Leopold's Preserve *Monthly Naturalist Walks*

BRMC & the White House Farm Foundation are partnering to provide monthly naturalist walks on Leopold's Preserve. Free & open to the community.

Spring Schedule

Saturday, April 27th, 1-3 pm,.....Bird Migration

Saturday, May 18th, 10am-noon.....Ferns and Allies

Saturday June 22nd, 10 am-noon...Firefly Natural History

HOMESCHOOL PROGRAMS*

Cost: \$5 per participant including adults.

Bird Migration & Spring Wildflowers—April 11th, 10am-12pm Join us as we learn about bird migration as we observe the first spring arrivals. We will also focus on spring wildflowers.

Ferns & Allies—May 16th, 10am-12pm Join us for a fern and clubmoss exploration and learn about their lifecycles.

Freshwater Ecology—June 13th, 10am-12p.m. Join us for a stream exploration.

*Our host property for this event is the Bull Run Mountains Natural Area Preserve, which is owned & operated by the Virginia Outdoors Foundation, a public organization dedicated to the preservation of our state's open-space lands.

**GIVE LOCAL
PIEDMONT**

**May
2019**

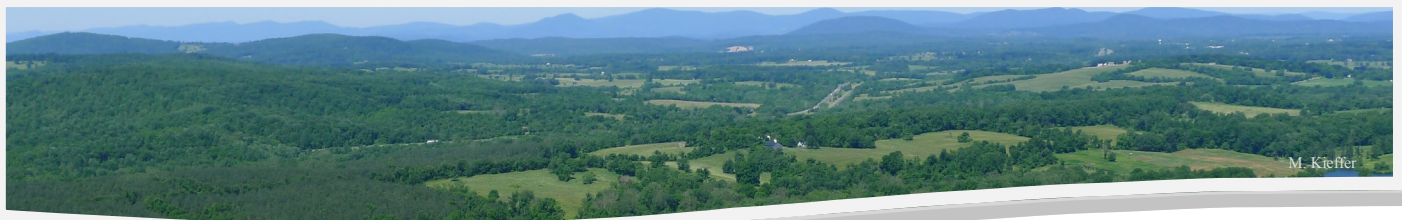
7

Tuesday

Last year, we raised enough funds to provide 6 fully funded scholarships for kids to participate in Youth Outdoors Naturalist Camps.

Your gift on May 7th, 2019, will enable children to participate in meaningful outdoor experiences this summer.

Give during the 24 hours of May 7th, www.givelocalpiedmont.org/brmcconservancy

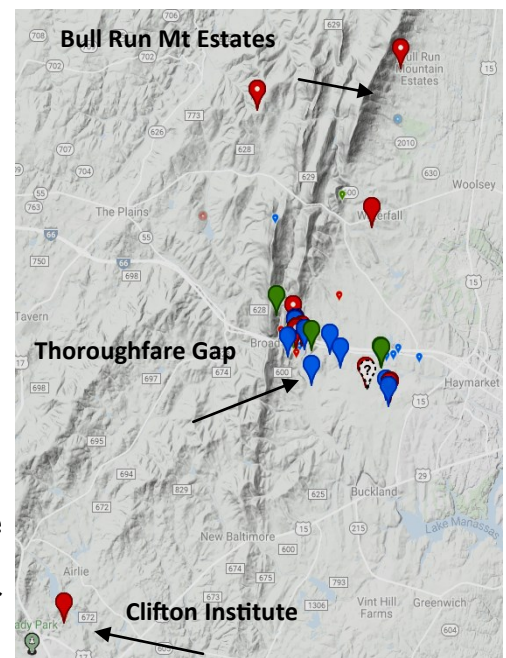


Share Your Own Nature Photos on BRMC's iNaturalist Project!

Just 4 steps and your photos join thousands of others in cataloging the biodiversity of our region. You can also share your observations on eBird, where data from community scientists around the world is used to document population shifts and changes. At right, see BRMC observations through 2018.

To Share Your Photo on the BRMC iNaturalist Project:

1. Do some hiking on the Piedmont.
2. Take a photo! Smart phone pics count 👍
3. Join our project on the iNaturalist app by downloading the app and searching "Bull Run Mountains Conservancy."
4. Share your photos by uploading to the app and tagging our project.



(continued from page 1) The mammals, birds, reptiles, and amphibians, which are composed of the minerals from this matrix, add to the process by keeping the recycling process going. Many bring nutrients “back uphill” and away from the water as they decompose on land. This is a loop that is run over and over again, as players in the circuit evolve and go extinct, in a process that has produced the most fascinating results.



Mike Belknap

As humans, we are gifted, by luck, and/or circumstance; to reflect; to live; and/or to look forward. One of the first principles to conservation and our long-term existence should be keeping the first World Wide Web intact. Most of us live on soil and fill brought in from who knows where, and have no connection to the underlying bedrock that thousands of years of evolution created where the plants matched the rock/soil characteristics. Once we use our intellect to go beyond just understanding the importance of the first world wide web, but prioritize the conservation of the network, then, as Leopold wrote almost 100 years ago, we will move towards living “with the land, instead of on the land”.

To register for a program, fill out the form below and mail with your payment to:
Bull Run Mountains Conservancy, P.O. Box 210, Broad Run, VA 20137
Program registration is also now available online at www.brmconservancy.org/calendar.html.
For more information, call us at (703) 753-2631 or visit our web site at www.brmconservancy.org.

Name _____
Address _____
City/ZIP _____
Home phone _____
Work phone _____
E-mail _____
Are you a BRMC member? _____
No. of people registering _____
Fee _____
Amount enclosed _____
Name of children if registering for youth camp _____

Homeschool Programs

\$5 per participant

Bird Migration & Spring
Wildflowers, April 11th

Ferns & Allies, May 16

Freshwater Ecology, June 13

Migratory Bird Walk

May 4

Members: \$20, non: \$25

Hopewell Observatory

May ?

Members: \$15, non: \$20

Herpetology Camp

June 24-25, 27-28

Members: \$100, non: \$150

Budding Naturalist Camp

July 8-12

Members: \$125, non: \$175

Summer Naturalist Camp

July 15-19, 22-26

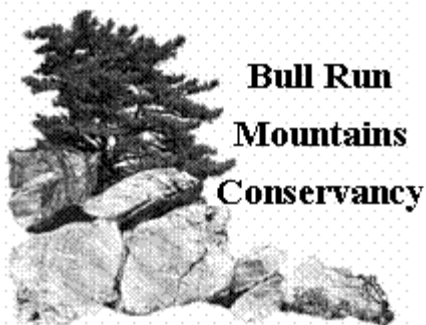
Members: \$250, non: \$300

Chesapeake Watershed Workshop

July 29-August 1

Members: \$200, non: \$250





Bull Run Mountains Conservancy

Education • Research • Stewardship

P.O. Box 210 • Broad Run • Virginia 20137
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Yes, I would like to become a member of Bull Run Mountains Conservancy.

Name _____

Organization _____

Address _____

Phone _____ E-mail _____

Referred by _____

- | | | |
|---|--|---|
| <input type="checkbox"/> \$15 Student | <input type="checkbox"/> \$20 Senior | <input type="checkbox"/> \$25 Individual |
| <input type="checkbox"/> \$35 Family | <input type="checkbox"/> \$75 Group | <input type="checkbox"/> \$100 Sustainer |
| <input type="checkbox"/> \$300+ Leadership | <input type="checkbox"/> \$1,000+ Benefactor | <input type="checkbox"/> \$1,000+ Corporate |
| <input type="checkbox"/> \$5,000+ Conservation Patron | <input type="checkbox"/> Other _____ | |

Please make your tax-deductible contribution to:
Bull Run Mountains Conservancy, Inc., P.O. Box 210, Broad Run, VA 20137

Bull Run Mountains Conservancy is a membership driven organization.

Become a member today and support our programs and support the public preserve. Your membership provides BRMC necessary funds to operate and shows our foundation and corporate supporters that the public values and appreciates the resource.

Membership Benefits:

- Support environmental and historical programs for all ages
- Support research and management of the natural area
- Discounts on all public programs and camps
- Quarterly newsletter including our program calendar

Bull Run Mountains Conservancy	2019 Calendar of Events
Bird Migration & Spring Wildflowers (Homeschool)	April 11th
Migratory Bird Walk	May 4th
Ferns and Allies (Homeschool)	May 16th
Hopewell Observatory	TBA
Freshwater Ecology (Homeschool)	June 13th
Herpetology Camp	Session I— June 24-25 Session II— June 27-28
Budding Naturalist Camp	July 8th-12th
Summer Naturalist Camp	Session I— July 15th-19th Session II— July 22nd-26th
Chesapeake Watershed Workshop	July 29th- August 1st
Unless otherwise noted, all programs and events will meet at the BRMC Mountain House at 17405 Beverly Mill Drive in Broad Run, VA, across from the Bull Run Mountains State Natural Area Preserve trailhead.	Directions: Take I-66 to Haymarket exit. Go south on Rt. 15. Go west on Rt. 55 for 2.7 miles. Turn right on Turner Rd., then left on Beverley Mill Dr. to the Mountain House 3/4 mi. on left.