

THE NORTHEAST SECTION OF THE WILDLIFE SOCIETY NEWSLETTER

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MESSAGE FROM THE PRESIDENT

Greetings,

We've each endured unprecedented upheavals in our education, work, and home life this year, and face major uncertainties going forward. My heart goes out to those of you who have suffered losses and personal challenges these past weeks, and I hope you find the community and support you need during these challenging times. As a university professor, having to immediately transfer the mode of delivery of my hands-on course in Applied Wildlife Science to an online venue in the middle of the semester was a shock to the system, but nothing compared to the challenges students faced in completing all of their courses online, many lacking reliable access to computers and internet connectivity let alone a dedicated, quiet space within which to study. Not to mention

MESSAGE FROM THE PRESIDENT (CONTINUED)

the disappointment of our graduating seniors unable to come together for the pomp and circumstance they so duly deserved.

Another casualty of the pandemic this year was the NE Student Conclave, which is quite a thing to organize and prepare for. This year the workshops, speakers and associated events were lined up, the venue was booked, the students were ready, and then came the shelter-in-place order. I want to recognize the SUNY ESF Student Chapter organizers – Laura Wallace, Meghan Dwyer, Kanika Jakhmola, Meredith Grimshaw, Emily Plummer, Avi Schlect, and Michael Rosenthal. Thank you so much for your efforts! If you've never participated in a conclave as a student or professional, I urge you to offer your services to the Keystone College Student Chapter, which will be organizing the 2021 conclave. It is very rewarding to interact with our future wildlife leaders by delivering a workshop in telemetry, wildlife conflict management, or other area of your expertise.

Likewise, the 2020 Wildlife Field Course delivered by the NE Section was also cancelled, along with most every other field course, internship or seasonal job this summer. Not only are our wildlife students disappointed, they may have less opportunity to develop the critical field skills we expect of recent wildlife graduates before they enter the work force. As society begins to open back up, we should be looking for creative opportunities to engage students in the field. Toward that end, I commend Kevin Berner for sponsoring TWS workdays (see page 15) – a low cost way to get students engaged in field activities while earning the student chapter some much needed cash. Tara McElhinney (our wonderful newsletter editor) has also compiled short stories from wildlifers in the Northeast on what they've been up to during isolation, giving us all ideas and inspiration for getting in the field.

Wildlife professionals face growing difficulties in the months to years ahead given severe fiscal constraints, hiring freezes, and work place restrictions. Meeting conservation objectives just got that much harder. Please help the NE TWS Section help you by letting us know about impending or proposed actions that might critically undermine conservation gains, as well as opportunities for providing connectivity among and support to our members. I found a lot of much needed professional support through regular, informal zoom meetings of the College and University Wildlife Education Working Group of the National TWS chapter that sprung up this spring as we all had to shift to online education.

Those discussions were just what I needed, and I'm certain there are many other such forums available – so consider dropping us a line and we can help get the word out to other wildlife professionals through the newsletter.

MESSAGE FROM THE PRESIDENT (CONTINUED)

As spring is finally giving way to summer, enjoy some much-needed warmth and fresh air and take in the beauty that is erupting all around you. Let our featured photographer (Jerry Hassinger, pages 18-19) inspire you, and be sure to take your camera in the field with you... we might just feature your pictures next time! Until then, drop us a line and let's stay connected.

Jacqueline Frair, Ph.D.

President, Northeast Section

TWS Fellow

Professor and Director of SUNY-ESF Roosevelt Wild Life Station

Jacqueline L. Frair



Interested in hearing more from TWS...

Sign up [here](#) for our free, monthly edition of the **eWildlifer** — your one-stop shop for the latest wildlife news, Section and Chapter updates, TWS announcements, and more.



NORTHEAST UPDATES

What are Northeast Wildlifers Doing During COVID-19?

“We are still working in Maine. We are encouraged to stay home as much as possible or do fieldwork, while always maintaining personal distancing of 6 feet or more. We are not allowed to travel in a truck with another person. We can use our accrued sick leave if we run out of work to do at home, which has turned out to be a good benefit of State employment right now. Some people are having a lot of remote meetings. People are encouraged to get out to hike, hunt, and fish, but always maintaining personal distancing from people outside your own household.”

-A Maine wildlifer



“The Maine Chapter has postponed our 2020 meeting until the fall with no set date. We did pull together a newsletter.”

-Rodney from the Maine Chapter

Click below to check out the fantastic Spring 2020 Maine Chapter newsletter!



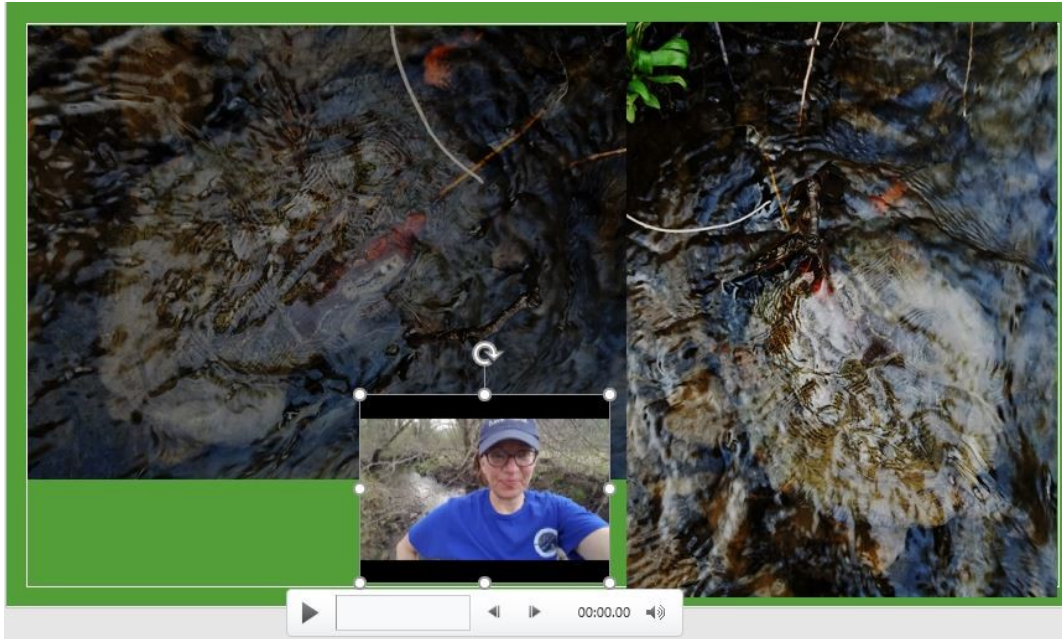
THE MAINE CHAPTER OF THE WILDLIFE SOCIETY

THE MAINE WILDLIFER



NORTHEAST UPDATES

What are Northeast Wildlifers Doing During COVID-19?



Tammy from Pennsylvania:

“I created a how-to video for my local watershed association to teach citizen scientists how to survey wood turtles in streams.”

Did you have to cancel in-person events or field trips? This is a fantastic idea for a Plan B!



“The increasing number of people that are out ‘enjoying nature’ as part of the pandemic is also increasing impacts on wildlife in areas where we have limited management. Our office recently added a [notice](#) to the public about this issue as it relates to nesting shorebirds.”

-Eric from New Jersey

NORTHEAST UPDATES

What are Northeast Wildlifers Doing During COVID-19?

“Core functions on our end at the Massachusetts Division of Fisheries and Wildlife have not changed significantly. We are all still working, whether in the field or from home. Working from home has certainly taken some getting used to, but most of us whose job duties allow for it, have made do with grabbing what we need for files etc. from ‘cubeland’ and making a new office space at home.

I’ve been fortunate in that I have been able to both work from home and conduct field work independently. We’ve been able to wrap up New England cottontail pellet sampling and we have started fast and furious on conducting deer pellet count transects, a project that is done on the individual level anyways. The Deer Project Leader is happy in ‘data land’ analyzing our 2019 harvest data for the annual deer review to the Fish and Wildlife Board (I think he’s relieved to be away from the ever-distracting office phone and noisy co-workers).

Our District personnel recently completed spring trout stocking efforts, and from what I’m told, freshwater fishing license sales are at a record high. Our Information and Education staff are still posting on social media, keeping our constituency engaged. Our Wildlife Section has been hard at work preparing for spring turkey season. We anticipate that hunter effort will be high and more non-hunters will likely be sharing the woods this year than typical (not sure what that will mean for harvest success rates, we’ll see!)

Overall, I think I can say that spirits at MassWildlife are high. These times are weird, but we still all have our jobs, are keeping busy, staying positive, and looking forward to things going back to normal. I hope the same holds true for our colleagues in other states!”

-Susan from Massachusetts

Thanks, Northeast wildlifers, for sharing your experiences and continuing your hard work. It’s great to hear that people are staying positive and important work to protect wildlife is still happening during these crazy times!



NORTHEAST UPDATES

2020 NETWS AWARDS



The John Pearce Memorial Award

The John Pearce Memorial Award is awarded by the Northeast Section of The Wildlife Society to Society members in the Northeast for outstanding professional accomplishments in wildlife conservation in the Northeast. This year we are proud to present the John Pearce Memorial Award to **Thomas Decker**. Tom is a biologist who, throughout his extensive career, has served Mass Wildlife, Vermont Fish and Wildlife Service, and the US Fish and Wildlife Service.

His expertise in furbearer management led to the publication of *Trapping and Furbearer Management in North American Wildlife Conservation* and the development of Trapping Matters Workshops. He has served as an advisory board member and instructor for the very successful Conservation Leaders for Tomorrow program, and has mentored many students and new professionals along the way. Thank you, Tom for your many contributions.

The P.F English Memorial Award

The P.F. English Memorial Award is presented annually by the Northeast Section of The Wildlife Society to an outstanding undergraduate senior student of wildlife biology or wildlife management within the region. Its purpose is to acknowledge and to encourage students, and to perpetuate the name of the late P.F. English, an outstanding educator, sportsman, and inspiration to youth. We are pleased to present the PF English Memorial Award this year to **Connor Hughes** of the University of Massachusetts. Connor has a strong academic record in both wildlife and geographic information systems. He has used skills in both to obtain field experience, including work with endangered turtles, sea turtles, and salmon. He also volunteers for Partners in Amphibian and Reptile Conservation and organizes many outdoor activities for his student chapter of The Wildlife Society. Well done Connor.



NORTHEAST UPDATES

2020 NETWS AWARDS (continued)

Best Student Presentation

The Northeast Section has been a longtime supporter of students attending this conference. Through 2019, we reviewed student presentations and recognized outstanding papers presented at the Northeast Conference by graduate and undergraduate students. At this time, we would like to recognize **Alison Kocek** of the SUNY College of Environmental Science and Forestry for delivering the Best Graduate Student Presentation for her paper titled, "Conservation of Tidal Marsh Sparrows in an Urban Setting." Alison, keep up the good work.

Outgoing Officer

The Northeast Section also wishes to recognize our outgoing Past-President, **Michael Fishman**, and express our appreciation for his dedication to the Section. Thank you, Mike.

New Officers of the Northeast Section TWS

The Northeast Section recently held its annual elections for Officers. During a normal year, these individuals would take office immediately after the Members Meeting held during the Northeast Association of Fish and Wildlife Administrators conference. As all you know, because we're isolating and working from home, we did not get to have our meeting. We'd like to announce the new officers along with the candidate statements they provided for the ballot.

But first, a big **Thank You** to all of the candidates. This year marks what is hopefully a great change for our Section. In most years, we struggle to get candidates to run for any office and many times each office has only one candidate. This year, we had the required two candidates for each position and in many instances we had more than two. To the wonderful candidates that didn't get elected this year, Tracy Rittenhouse, Lucas Price, Mark Jackling, Amanda Cheeseman, Danielle Begley-Miller, and Chalis Bird... Please run again next year, or volunteer for one of the committees of the Section. Your help is always welcome! Again, Thank You for your commitment to TWS. Now, the new officers... (on next page)



Jerry Hassinger

NORTHEAST UPDATES

New Officers of the Northeast Section TWS

President-elect

The By-laws were changed in 2019 to change the progression of the terms of President-elect – President – Past-president from three years to four years. This means that elections for President-elect will now move to an every other year cycle. This year's new President-elect is:

MEGAN LINSKE



Megan has a B.S. from Nazareth College (2012) in Environmental Science with minors in Biology, Chemistry, and English Literature. She completed her Master's (2014) and Ph.D. (2017) in Natural Resources with a concentration in Wildlife Biology at the University of Connecticut.

Currently, she is employed as a Postdoctoral Research Scientist as a member of both the Center for Vector Biology and Zoonotic Diseases and the Northeast Regional Center for Excellence in Vector-Borne Diseases at the Connecticut Agricultural Experiment Station in New Haven, Connecticut.

Her area of expertise is in zoonotic and vector-borne disease ecology. Specifically, her research focuses on tick-borne disease ecology and the role mammalian and avian hosts as well as habitat play in the density and dispersion of the blacklegged tick vector and their associated disease-causing pathogens. She is an author on 12 publications appearing in numerous peer-reviewed scientific journals.

She also is employed in Unity College's Distance Education Program as an Adjunct Undergraduate Course Instructor. She teaches Wildlife Plant Identification: Wildlands and Wildlife Habitat; Humans, Parasites, and Wildlife: Understanding the Impact of Insects on Wildlife; and Professional Skills.

Megan joined The Wildlife Society in 2016 and has since held multiple positions within the Northeast Section. She was elected to the Northeast Section's Executive Committee as Secretary in 2018 and immediately agreed to head the Communications Committee, became a member of the Awards Committee and the Workshop Committee for which she is now Chair. She is also engaged at the national level as an alumna of The National Wildlife Society Leadership Institute Class of 2018, a mentor for the Class of 2019, and on the Selection Committee for the Leader-

NORTHEAST UPDATES

-ship Institute Class of 2020. She is also a member of the Network and Engagement Committee for the 2019 Annual National Wildlife Society Conference in Reno and the upcoming conference being held in Louisville in fall 2020.

“I knew from the day that I joined the Northeast Section of The Wildlife Society as a student member that I wanted to be as involved as possible. The people I have met and the experiences I’ve had have only furthered that desire. I have had the privilege of working with and learning from many high-caliber professionals within this field and they have inspired me to become more engaged and take on greater leadership roles. Through my time in the Leadership Institute and in my various roles in the Northeast Section, it would now be an honor to take on the role of President-Elect to better serve my Section, my Society, and wildlife as a whole.”

Secretary

The position of Secretary is responsible for taking and maintaining the minutes of meetings of the Executive Committee and Members meetings, maintains the membership rolls, is in charge of general communications, and much, much more. The position has a two-term limit.

Our new Secretary is:

I am an Associate Professor of Environmental Communication at the State University of New York College of Environmental Science and Forestry in the Environmental Studies Department. My research is interdisciplinary in nature, focusing on science and environmental communication with interests in conservation of natural resources through communication and cooperative learning among stakeholders including but not limited to scientists, managers, policy-makers, industry and concerned publics. My work can be best described as being embedded in the human dimensions of environment and natural resources literature. My current research focus is split between energy systems and natural resources conflict management, though additional interests include climate change mitigation and adaptation strategies, natural resources management, energy policy, public participation in environmental decision-making and environmental movements. I’ve published in journals including, but not limited to *Conservation Biology*, *Wildlife Society Bulletin*, *Local Environment*, *Sustainability Science*, *Environmental Communication*, *Energies*, *Conservation and Society*, *Urban Ecosystems*

ANDREA M. FELDPAUSCH-PARKER



NORTHEAST UPDATES

and Front Frontiers of Communication, and have received research funding from NSF, USDA, New York Sea Grant, and the New York State Department of Environmental Conservation.

From an educational perspective, I am a bit of a bent arrow. My Bachelor's degrees are in Zoology and Fisheries & Wildlife from Michigan State University. As an undergraduate, I served as President of the MSU Fisheries and Wildlife Club and was a member of the Michigan Chapter of TWS. In graduate school, I transitioned to human dimensions with a focus on wildlife management education at Texas A&M University in their Wildlife and Fisheries Sciences Department. While there I was able to spend time as a Master's student working with Texas Cooperative Extension specialists on a multitude of wildlife management programs across the state. As a PhD student at Texas A&M University, I was lucky enough to be a Boone & Crockett Fellow. Though my dissertation focus was communication, looking at public participation in energy systems and climate change mitigation, I was still an active member in the Texas Chapter of TWS and attended Boone & Crockett annual meetings. Due to my unique educational trajectory, I am able to span the social and biological disciplines with almost all of my research being interdisciplinary in nature.

As a new member of the Northeast Section of TWS and the New York Chapter, I want to dive back into TWS, and what better way to do it than in a service position! As Secretary of the Northeast Section of TWS, I will be able to contribute my expertise in communication and public participation in decision-making while at the same time learning more about the organization. And though I am new to this group, I have plenty of past experience in leadership positions, hav-

ing served as President of the Environmental Communication Division for the National Communication Association (included conference planning, running the awards nomination process and a multitude of other administrative tasks for the division) as well as conference co-planner for the International Environmental Communication Association's 2013 conference in Uppsala, Sweden.



Jerry Hassinger

NORTHEAST UPDATES

Members-at-Large

In 2019 the By-laws were changed to include two new non-voting members to the Executive Board. These positions are envisioned to be “Advisory” in nature, to provide member representation through giving input to the Executive Committee decision making process. These positions have a two-year term and each is voted on in alternating years. To get our initial two positions, one position was for the regular two-year term and the other for a one-year term that will re-open next year for a full two-year term. Our new Members-at-Large are:

Two-year Term

EMILY DOMOTO



I currently manage the Pennsylvania Bureau of Forestry’s Ecological Services Section, which houses 6 ecologists who assist in ensuring the protection and conservation of ecologically sensitive areas, native wild plants, and maintaining wildlife habitat for a suite of species. Prior to becoming the Ecological Services section chief, I was a wildlife ecologist with the Pennsylvania Bureau of Forestry for 10 years. I am very interested in becoming a Board Member at Large for the Northeast Section of The Wildlife Society. I have previously been on the NE Section board as vice president, president-elect, president and most recently past president, which I completed in 2018. As my role with the NE section came to a close I became more involved with my local Pennsylvania State Chapter of TWS as Secretary and have thoroughly enjoyed that role. However, I am excited to get back to playing a role in the NE Section as a board member at

large. I take great pride in being a Certified Wildlife biologist, and a TWS Leadership Institute Alum (2010) and love being involved with TWS. I am excited about the opportunity to get back to working with the Northeast Section.

As a Section Chief for the Ecological Services Section, I manage ecologists that focus on ensuring the Bureau of Forestry activities maintain ecosystem functions. I enjoy working on 2.2 million acres and the challenge of finding creative solutions to sometimes difficult resource manage-

NORTHEAST UPDATES

-ment issues. While working for the Bureau of Forestry, I attended DCNR's Leadership Development Program, was chosen to participate in the PA State Employees Emerging Leaders Program and have been awarded the DCNR Team Excellence Award and the Individual Excellence Award. Being able to create habitat for plants and wildlife, improve best management practices and work on difficult habitat related issues is engaging and exciting. I would love for the opportunity to bring my enthusiasm, leadership and management skills to the Northeast Section of The Wildlife Society.

One-year Term

EMILY BOYD



Emily Boyd currently serves as the Small Game Mammal Biologist for the Pennsylvania Game Commission where she is primarily focused on management and conservation issues related to snowshoe hares and Appalachian cottontails. In the past she has also worked with Delaware Fish and Wildlife as their Game Mammals Project Leader and with Pheasants Forever as a Farm Bill Biologist. Emily received her masters from the University of Arkansas at Monticello working with the spatial ecology of Rocky Mountain bighorn sheep and attended undergrad at Juniata College. Emily has been a member of TWS for over 10 years and has active-

ly participated on boards at state and regional levels. Emily served for 2 years as the Northeast Section Representative for Pennsylvania's State Wildlife Society Chapter and also co-chaired the Northeast Region's Conservation Affairs Committee for a year.



STUDENT CHAPTER UPDATES

AT SUNY COBLESKILL, DIVERSE FUNDRAISING HELPS TO SUPPORT STUDENT CHAPTER ACTIVITIES

During any given semester, members of the SUNY Cobleskill student chapter of The Wildlife Society find themselves planning for, and participating in, diverse fundraising efforts. Our student chapter is fortunate to also receive internal support from the Student Government Association, and external support from the Schoharie County Conservation Association. However, our students know that maintaining the financial stability of our club requires consistent, active effort to raise funds throughout the year. Here is a brief overview of some of our fundraising efforts that help support many of our annual activities including: travel to state, regional, and national meetings; networking socials and mixers; seminars by wildlife profes-

sionals; and outreach events.

During both Fall and Spring semesters, our students find themselves organizing and delivering numerous **Bake Sales**. These simple fundraisers are good ways to generate smaller amounts of money to support food and drink purchases for networking socials or seminars by wildlife professionals. Lately, student members have opted to plan themed bake sales related to major holidays or seasons. As a result, our student chapter hosts 3-4 bake sales each semester for a total profit of ca. \$350 per academic year. Bake sales also provide good opportunities for selling club merchandise and promoting club activities and involvement.



Student members facilitating a Bake Sale.

STUDENT CHAPTER UPDATES

Our student members also take advantage of **TWS Workdays** when these are made available. During TWS Workdays, participating students complete a variety of odd-jobs outlined by the workday sponsor. In the past, these tasks have included stacking firewood, protecting saplings from winter deer browse, Eastern bluebird nest box maintenance, and invasive species control among other chores. For their time, each student earns \$10 per hour which is paid to the club as a donation from the workday sponsor. Our club is very fortunate to have the consistent support of Professor Kevin Berner (retired) for sponsoring these workdays. We appreciate you, Kevin!



Student members participating in a TWS Workday.

During Spring 2019, our student chapter finally pulled off our first annual **Beast Feast** fundraising dinner. During this dinner, participants can sample a variety of game and non-game dishes prepared by students, parents, faculty, and staff. For example, gray squirrel soup with a side of venison mac-and-cheese, and a cricket flour brownie for dessert really hits the spot! Admission for our Beast Feast is minimal (\$10 per person or \$5 per person if you bring a dish to share) in order to encourage widespread participation. However, a variety of donated items supporting a post-dinner raffle facilitate a major fundraising effort. Our first Beast Feast netted a profit of ca. \$1,000 which was used to support student travel to state and regional meetings.



Example foods at the annual Beast Feast.

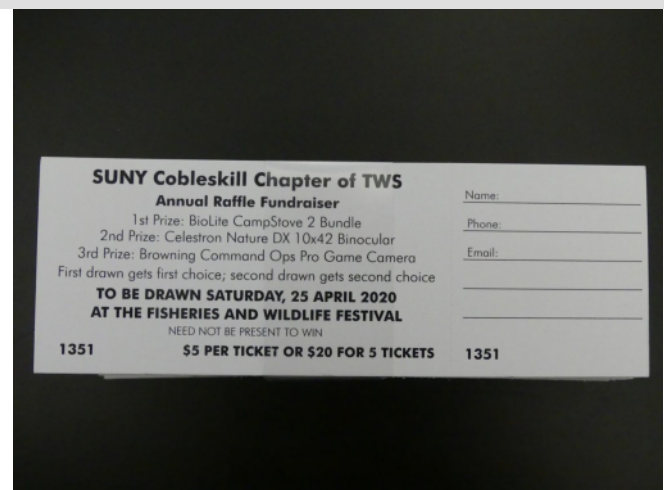
STUDENT CHAPTER UPDATES



Example raffle items at the annual Beast Feast.

Lastly, the **TWS Annual Raffle** is our largest single fundraising event. In many years, the New York Chapter of The Wildlife Society provides student chapters with a raffle item (e.g., Canon EOS digital camera package) and raffle tickets to sell at no cost to the student chapters. Moreover, student chapters keep all the proceeds that they generate from ticket sales. Thus, this fundraiser is a no-risk, win-win

for student chapters. During years when a raffle item and tickets are not provided, our student chapter purchases these because this is our most important fundraiser. For example, our club routinely generates ca. \$3,000 from this single raffle. This year, our club is raffling a BioLite Campstove bundle, Celestron binoculars, and Browning trail camera. Tickets are priced well at \$5 per ticket or \$20 for 5 tickets.



Example merchandise and ticket for the TWS Annual Raffle.

Unfortunately, due to the circumstances of COVID-19, the **2020 Northeast Section Student Field Course has been cancelled**. We are looking forward to hopefully hosting this wonderful program again in 2021!

TWS NATIONAL UPDATES

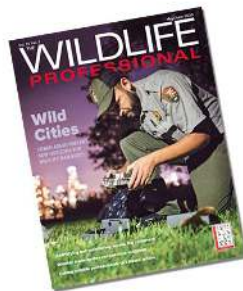
MEET AT THE TWS ANNUAL CONFERENCE!



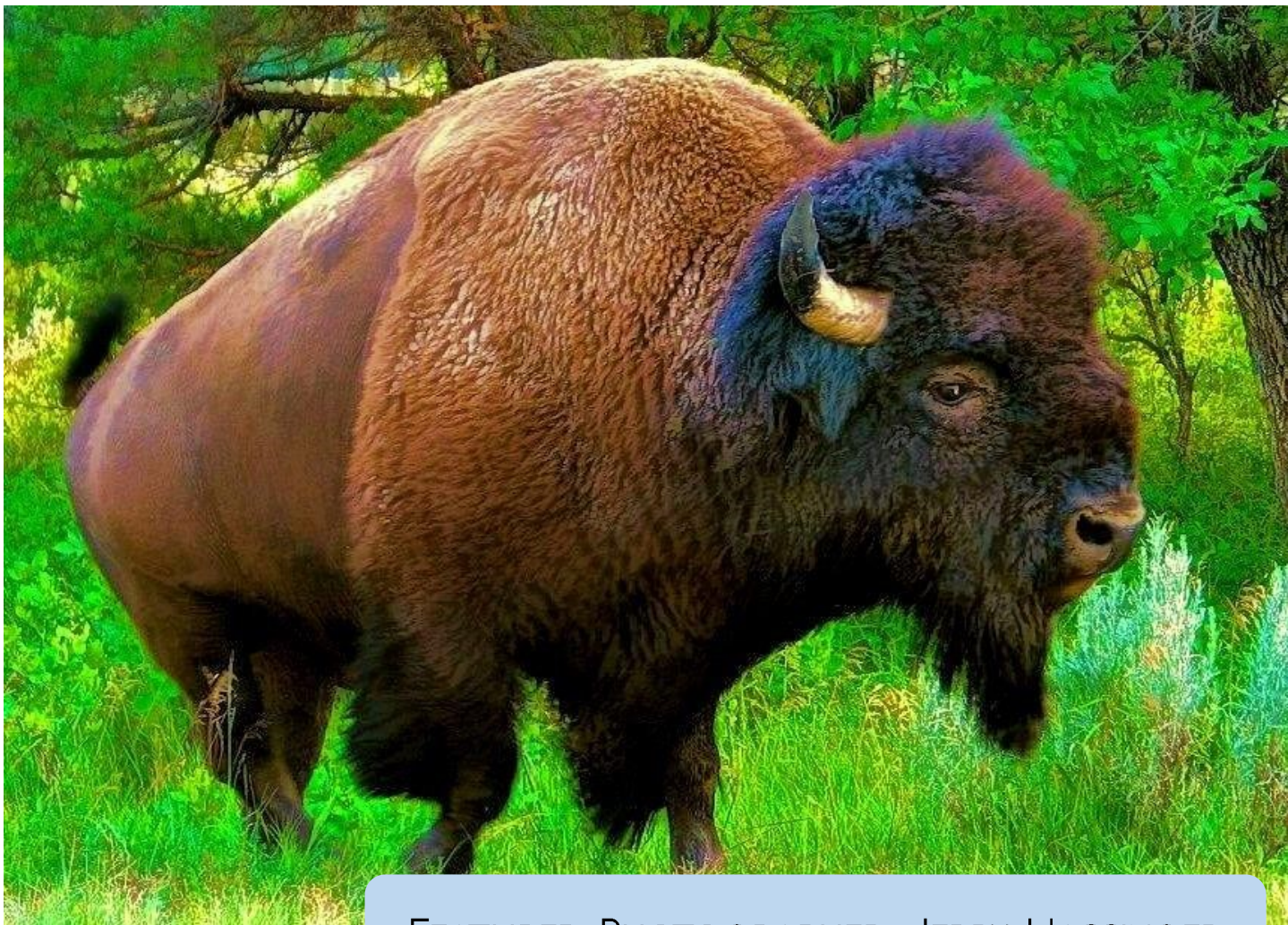
Louisville, KY September 27- October 1, 2020

Calling all TWS Working Groups, alumni groups and other organizations! Our call for associated meetings and receptions at the TWS Annual Conference is now open. [Submit your request today!](#)

TWS is closely monitoring the situation regarding COVID-19 and its potential impacts on our conference. We are preparing for all possible scenarios, but **at this time we plan to proceed with the conference as scheduled.** Members will be notified of updates as they occur.



Don't forget to check out the [May/June Issue of *The Wildlife Professional*!](#) This issue contains fascinating articles on the effect of energy infrastructure on Central Arctic caribou, how bark beetle-affected forests become a refuge from hunters for elk, the importance of predator control for endangered Hawaiian seabirds, the influence of water depth on energy availability for ducks and more.



FEATURED PHOTOGRAPHER: JERRY HASSINGER

This issue's featured photographer is **Jerry Hassinger**, a man of many talents! Formerly a wildlife diversity biologist with the Pennsylvania Game Commission, he is now a photographer and self-taught mycologist.

Jerry was named Visionary for the Year by the Ned Smith Center for Nature and Art a couple of years ago. Through this, he produced a monthly nature diary and continues to do a monthly contribution to this day.

This newsletter is filled with Jerry's art.





“I need or am driven to explore and create.”

-Jerry Hassinger

Jerry says of his work:

“Many of these are composites. All the photos were taken by me. This is not documentary. It is photo art. I need or am driven to explore and create. I’m after emotion and inspiration. There are some dreams but mostly I want to feature a critter in the habitat it needs. People can take good shots of habitat. And they can take good shots of wildlife. But many of the wildlife shots don’t feature the habitat. Often that is blurred.”



For those of you curious about how Jerry creates his stunning artwork (and maybe eager to create yourself), here’s what he says about his process:

“I used to depend on SLRs with interchangeable lens. But nowadays and at my age I simply depend on a bridge camera capable of both macro and tele shots. I have always used Canon cameras. The one I use now is the SX 60HS. This is about 4 years old. It has been replaced and I’ll probably upgrade soon. These cameras cost under \$500. What the camera fails to produce, I have to correct etc. with Corel Paint Shop Pro, a program much cheaper than PhotoShop.”

Check out a fascinating article by Jerry below!

THE IMPORTANCE OF FUNGI FOR WILDLIFE AND HABITAT



BY JERRY HASSINGER (PREVIOUSLY PUBLISHED IN PA GAME NEWS)

Fungi, a unique and immensely diverse group, are in a kingdom of their own, and are quite distinct from plants and animals. They are important in and of themselves, but it's their relationships with other organisms that are absolutely critical to life on Earth, and have inestimable significance for wildlife and humans.

Whenever I talk about or point out a mushroom in the forest, the first question asked, "Is it edible?" For most of us, this is the extent of our interest and knowledge about wild fungi. Yet compared to the variety of birds, mammals, reptiles, amphibians, fish and vascular plants all put together, there are more than

***"Without fungi,
life on this planet
would be
unsustainable."***

twice as many kinds of fungi woven into Pennsylvania's landscapes; close to 8,000 species.

Few are edible, fewer yet taste good. In fact most fungi are inconspicuous because of their small size and hidden lifestyles in soil, dead organic matter, or other living organisms. Many only become noticeable when "fruiting" as a mushroom, mold or rust. So, in this article I've bent over backwards to avoid the off-putting terminology used by scientists specializing in the study of fungi- mycology. I hope I pulled it off!

For better or worse every living thing on planet Earth is either directly or indirectly affected by fungi. It's been said more than once,

“Without fungi, life on this planet would be unsustainable.” The basis for this importance relates to the biology of fungi and their pivotal roles in wild habitats. Unlike plants, fungi cannot produce their own energy. Instead, they secure it from relationships with dead or living organic matter. Following are a few examples of how these relationships, both harmful and helpful, impact wildlife and habitat, and ultimately our own welfare.

The worst first; and the worst are fungi introduced from other countries—invaders. Around the year 1900, the American

chestnut blight fungus, an invasive, found its way into Appalachian forests. By 1940, this fungus had virtually eliminated older chestnut trees; few survived above ground. The range-wide result was an estimated 4 billion trees were no longer producing wood or chestnuts. The density of these trees was particularly high in Pennsylvania; some counties had 40-50 percent of their timber acreage in American chestnut. This tree species was a reliable producer of chestnuts, a fall-fattening food on the menus of some of our most notable game species. Fast forward to today; chestnuts have been replaced



by oaks and acorns. But unlike the reliable chestnut crop available to wildlife every year, there are now numerous years when oaks fail to produce acorns. This affects wildlife in many ways. One example is that in years when there is an acorn crop failure, deer and bear spend less time in the forest and more time in crop fields and crossing highways. Bears, deer, crops

and vehicles pay the price. We can conclude this price would be less if American chestnuts still populated Pennsylvania's woods.

Throughout its Appalachian range, the Allegheny woodrat is

classified as either a threatened or an endangered species. Did the demise of the American chestnut tree set the stage for the long term decline of the woodrat? Historically, woodrats stored American chestnuts in the vicinity of den sites in caves and rocks. The chestnuts were easily transportable, stored well and there was a crop every year. Now there are no chestnuts and in many years no acorns. As a result woodrats spend more time on the surface looking for food and exposed to predators, and females in poor condition produce fewer young. These and innumerable other consequences are root-



-ed in the still unfolding forest changes wrought by a single invasive fungus.

A more recent invasive, likely introduced from Europe, is the white-nosed syndrome (WNS) fungus that in under seven years has killed almost seven million cave bats. Infected hibernating bats awoken too often, deplete their fat reserves and fail to survive the winter. Five of Pennsylvania's six cave bat species are now of special conservation concern. In under five years the little brown bat went from being the most common bat in Pennsylvania to one of the least common. This has been called the worst wildlife health crisis in history. Because bats are the major predators of night flying insects,

replacing their free services with pesticides entails a cost. And trying to understand and control the WNS fungus also will be costly. One lesson already learned is that figuratively speaking, this fungus has both feet and wings. It hitch-hikes on dirty boots and flies from bat to bat. In seven years it has traveled from New York where it was discovered in 2006 to Illinois, Missouri, and Alabama. It now occurs in 20 states and five Canadian provinces.

The combination of climate change and an increasingly interconnected world has facilitated the spread of fungal diseases. The precipitous declines of cave bat species are only the latest examples. Beyond Pennsylvania and even more spectacular are the extinctions of at least 100 frog species in parts of Australia and the Americas caused by the post-1970s spread of the lethal chytrid fungus. It's been calculated that, worldwide, fungi have caused more than 80 percent of all disease-related animal extinctions in recorded history.



Fungi-wise, where are the good guys? Look no further than the nearest oak tree. In this instance some wild oaks are surviving because of a fungus. A fungus known to kill gypsy moths (call it GM) in Japan was introduced to areas near Boston, MA in 1910. It was thought that this early experiment in biological control of a pest had failed. But in 1989 GMF was identified in dead gypsy moths. Since, researchers have concluded that the long term effect of this “natural” control will be to decrease high level gypsy moth populations and reduce the frequency of significant outbreaks. As a result numerous oaks have been and will be spared in remote areas that fail to qualify for expensive spraying. And the cost of spraying is reduced.

The larger fleshy fungi, e.g. mushrooms, are food for wildlife. Mushrooms are a highly nutritious food supplement when the nutritional value of other native forages is on the wane. Fungi may dominate the foods eaten by game species in late summer and fall. They’re on the menus for deer, elk, bear, all squirrel species, grouse and turkeys. Most small forest rodents nibble on mushrooms. In some areas, an underground fungus called *Endogone* is the primary food for the woodland jumping mouse.



Truffles, the fruiting bodies of a subterranean fungus are a major component of the endangered northern flying squirrel’s diet. The Allegheny woodrat ingests fungi in all seasons, and fungi, for examples puffballs and species of mushroom in the genus *Russula*, are commonly found in woodrat food caches. Mushrooms are nurseries, homes and food sources for invertebrates, for example the pleasing fungus beetle. Robins, blue jays and wrens have been

seen shredding mushrooms presumably to consume insect larvae. Mushrooms are commonly eaten by box turtles. I found newly-hatched red backed salamanders under a damp, rotting sulphur fungus, and both prey, earthworms, and predator, long tailed salamanders, under a rotting hemlock fungus.

The impacts of fungi on wild plants and animals are pervasive. They’re parasites, path-

ogens– killers, biological controls and food items. But by far their major roles in maintaining and changing forested habitats are: 1.) forming mutually beneficial partnerships with trees and other plants; 2.) parasitizing weak and diseased trees; and 3.) decomposing plant and animal waste and recycling nutrients back into the soil.

The mushrooms we see growing out of the ground or wood are just part of a fungus. Most of the fungus, 90 percent or more, is underground in wood and consists of a web-like network of microscopically thin threads. This network is called a mycelium. Under suitable conditions the living and expanding mycelium will produce above ground (mushroom) or subsurface (truffle) fruiting bodies that are relatively short-lived. These fruiting bodies produce spores, a few of which may develop into new fungi.



Underground, the living microthreads of numerous fungal species connect to the rootlets of trees and other plants. This functions somewhat like a vast expansion of the plant's root system. Through this connection the fungus receives sugars and nutrients from the photosynthesizing plant and in turn provides the plant with water, mineral nutrients, and protection against pathogens, some pollutants and droughts. Most wild plants are connected to a fungal partner. Forest wildlife food and cover webs would be substantially different without this mutually beneficial and hid-



Fungus mycelium

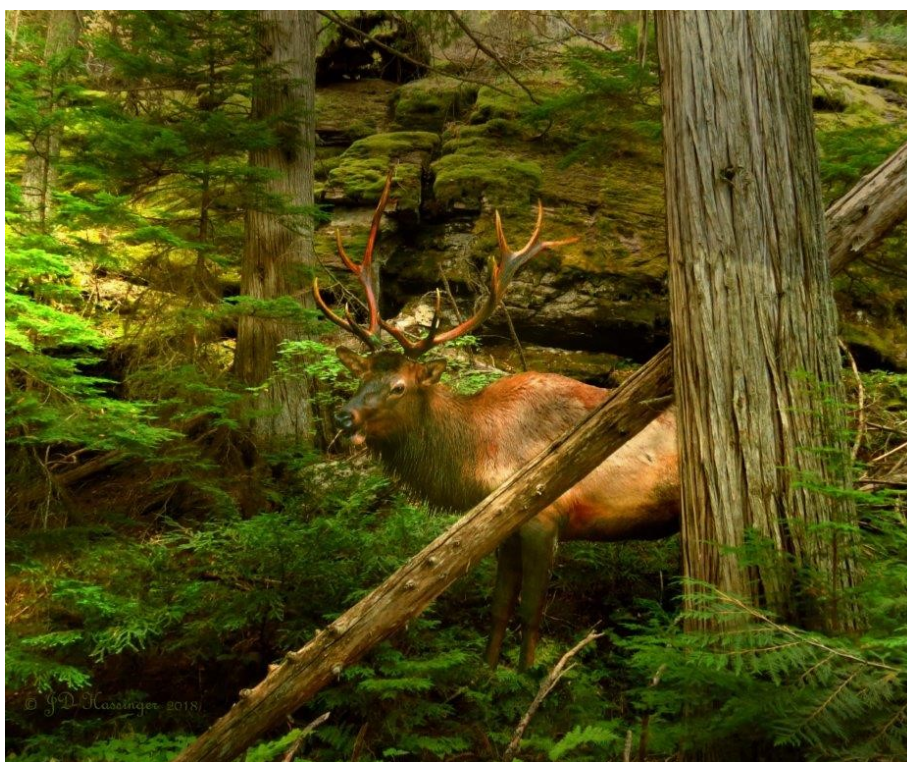
den partnership. For one thing, periodic droughts, which seem to be increasing in frequency and severity, would result in the deaths of more trees. It's possible too, for instance, that our dryer ridgetops would be barren of trees without this living water delivery system. Making matters worse, without these soil fungi, new, replacement tree seedlings may not survive because they're unable to obtain the nutrients and minerals they need for rapid growth.

Another set of fungi are nourished by decomposing dead plant tissues; in this process, these dead-eaters play a key role in recycling nutrients and promoting the growth of seedlings. Without these wood-rotting fungi, fallen trees and limbs would take

much longer to decay. Not only would nutrients be locked up but there would be a fuel build-up on the forest floor and wildfires would be more severe. The western United States is a contemporary example of this. The U.S. Forest Service acknowledged: "In the arid West, where moisture is too scarce to support fungal decay, fire is the primary mechanism for removing dead trees and limbs from the forest floor."

Insects, storms, fire, and natural pruning of limbs are a few of the causes of tree wounds. Decomposer fungi (heart rot and sap rot fungi), carpenter ants and other small organisms infect these wounds. Eventually an animal, often a woodpecker in the process of seeking out insects for food, excavates the softened, decayed wood and the result is a tree cavity. A variety of wildlife seeks refuge, nest or roost in, store food, or otherwise uses these cavities. For instance, in Pennsylvania the right cavity in the right location might be used by any one of 35 kinds of birds, 20 mammal species, or wild honey bees. In my backyard there's a locust tree that has been infected by a fungus called the cracked cap polypore or conk. Three years ago a northern flicker excavated a cavity about three feet above one of the conks on this tree.

Two youngsters were successfully fledged from this tree cavity. The tree-fungal combination provided the building materials and the flicker took it from there. Since, other birds have nested in this same hole.



I've barely touched on the many values, both good and bad, of fungi for wildlife, forests, and ultimately people. Despite these values and with the exceptions of pathological concerns and mushroom cultivation, conservation policy and management have virtually ignored fungi. We can name the invasive, usually troublesome fungi we've gained over the years. But who's knowledgeable about and keeping track of the beneficial fungi we might lose? Are there things we can do to help fungi help plants and wildlife; and what about people? We've already benefited from the discovery of the *Penicillium* fungus which revolutionized modern medical treatments. In fact, most antibiotics and statins are fungal in origin. So, too, in Cyclosporin, a compound produced by a fungus; it helps prevent rejection of transplanted organs by suppressing

the immune system. What other medical and ecological benefits await discovery? Answers to these and other questions are arguments for attention to and management of fungi.

Would you like to be featured or know someone who would like to be featured?

Please email Tara at taramcelhinney1@gmail.com.

ECO-POSITIVE THINGS TO DO IN ISOLATION!

REDISCOVER NATURE

Try “[patch birding](#)” in your own backyard or local green space.

Join the Student Development Working Group of TWS in a social distance [BioBlitz!](#)



TURN TRASH TO TREASURE

Learn [how to make a compost pile](#) in your backyard! By composting your kitchen waste, you reduce the amount of [waste](#) sent to landfill, provide habitat for critters, and create a natural fertilizer.



BECOME A MEATLESS MASTER CHEF

Restaurants switching to take-out only forced many of us to start getting creative in the kitchen. Why not test out your new skills on a delicious meatless meal? Enjoying a meatless meal can help reduce our carbon footprint and preserve resources like fossil fuels and water. Better yet- try to incorporate some [local produce!](#)

EXERCISE YOUR GREEN THUMB

This summer is the perfect time to grow things that can benefit you and the world around you. Check out these articles on planting for wildlife:

[How to grow a wildlife-friendly vegetable garden](#)

[How to create a herb garden for wildlife](#)

[How to attract moths and bats to your garden](#)

[Plant flowers for bees and pollinators](#)

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