Bluffviews
a quarterly newsletter by Clifftop

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IDNR Purchases Geologic Gem

On a hot summer evening in 2012, HeartLands Conservancy partnered with Clifftop to purchase a unique tract of land in Randolph County adjacent to Swayne Hollow Nature Preserve and just down the road from Piney Creek Ravine Nature Preserve. At the time, the Illinois Department of Natural Resources was unable to bid on the property, which would have linked the two nature preserves. That's when IDNR turned to two small conservation organizations who had joined forces in 2010 to purchase the White Rock properties in Monroe County. On short notice, major funding was secured through the Grand Victoria Foundation, while individuals and smaller foundations contributed the remainder of the funds needed. The auction took place in the basement of a hall in Campbell Hill, packed to the gills with interested parties. Bidders, acting on behalf of HeartLands and Clifftop, tried their best to acquire the whole 300+ acre property, but we came out with the ecologically and aesthetically best portion, which would become known as Mill Creek Natural Area.

The 115-acre parcel of land contains sandstone canyons and gorges and cliff systems that host unusual plant communities. A significant stretch of Mill Creek also winds through the property.

A huge amount of stewardship has been accomplished there, including tree planting in the old fields, exotics removal, mesic species timber thinning, stream stabilization, and a large prescribed burn.

Sandstone cliff at Mill Creek Natural Area. Photo courtesy Tom Rollins, Thomas Rollins Photography.

Sandstone canyon at Mill Creek Natural Area. Photo courtesy Tom Rollins, Thomas Rollins Photography.

In June 2018, IDNR indicated that they had the means to purchase the Mill Creek Natural Area, as was the original plan. Both HeartLands Conservancy and Clifftop were in favor and on December 13, 2018, the sale was finalized. IDNR received a property in great shape and will likely present it to the Illinois Nature Preserves Commission for dedication as a Land and Water Reserve or Nature Preserve to protect it in perpetuity.

Guestviews...

Copperheads at Paul Wightman Subterranean Nature Preserve

Story and photos by Benjamin C. Jellen and Brittany I. Neier

Happy New Year fellow Clifftop supporters! While the snow is falling outside and the temperatures plummet, some of our wild friends have migrated off to warmer climates, and some are nestled in warm little nooks and crannies scattered about Paul Wightman Subterranean Nature Preserve (PWSNP). One such species not capable of flying south for the winter is the Northern Copperhead (*Agkistrodon contortrix*). For the past few years, we have been monitoring a handful of individuals via radio telemetry at PWSNP and the surrounding areas and we have made some interesting observations; well, interesting to us at least.

For those of you who don't know, Copperheads (Figs. 1, 2) are the most commonly encountered venomous snake in the United States. However, because of their superb camouflage and secretive nature, surprisingly little definitive information is known regarding their habits, overall ecology, and even population size. Perhaps some of this is due to their broad geographic range which extends from southwestern Texas northward through eastern Kansas and then northeastward through Rhode Island. With such a wide swath of area covered, it's not surprising that Copperheads utilize a wide variety of habitats throughout and therefore might behave differently in different areas. The literature indicates that they primarily inhabit deciduous (particularly oak-hickory) forested

Figure 1: Northern Copperhead

Figure 2: Northern Copperheads mating

hillsides containing rock outcrops and adjacent open grassy areas (for foraging in the summer months). However, they are also known to frequent pine woods, abandoned fields, high-ground in swamps and marshes, hedge rows, ravines in creeks, forested dunes near beaches, and even blueberry thickets.

Trying to pinpoint where they hibernate proves equally as tricky. The typical overwintering sites have been reported as rock crevices with cracks and fissures on timbered hillsides with a southern, eastern, or western exposure; though they have also been documented to hibernate in caves, gravel banks, old stone walls and building foundations, animal burrows (particularly those of small mammals), hollow logs, and even sawdust piles. As you may be well aware, many of these potential refugia are available on and near PWSNP. Additionally, with PWSNP being a sinkhole prairie, there is an abundance of sinkholes creating exposures on all sides.

Our radio-equipped (Fig. 3) snakes all elected to hibernate in small rodent burrows found in sinkholes. One snake even hibernated in the exact same burrow in three consecutive years! We are still not entirely sure

Figure 3: Endoscopy of female radio-equipped Northern Copperhead to ascertain reproductive status.

what makes one particular burrow "better" than another in a snake's eyes; however, this observation helps to illustrate how important selecting a suitable burrow is and that there may be other important factors that we are not yet examining. Another radio-equipped individual was not so lucky. He went into hibernation in the winter of 2017, and when came up for a bit of sun on a relatively warm day in January 2018, he was captured and eaten by a predator. Being an ectotherm and having his physiological and motor activities heavily influenced by the ambient temperature, the individual was likely not able to move as quickly and efficiently as he might otherwise been able to under warmer conditions.

This particular individual had another strike against him though. He had contracted a fungal disease which has been decimating snake populations across the United States and Europe. *Ophidiomyces ophiodiicola* (Snake Fungal disease (SFD)) has been observed in free-ranging snakes, their shed skins, and carcasses throughout the Midwest and Eastern portions of North America, Great Britain, and the Czech Republic. While the overall impact of SFD on snake populations is still unknown, evidence suggests the infections associated with the disease increase the rate of morbidity and mortality among individuals. Tracking disease transmission and collecting data regarding possible treatment options is imperative for successful conservation and treatment objectives. This particular individual was treated for his infection at the University of Illinois College of Veterinary Medicine. He underwent amputation of his tail and hemipenes, as well as two treatments of terbinafine (an antifungal medication) nebulization. He was deemed free of the pathogen and healthy by the veterinarians and the Illinois Department of Natural Resources and was released back to the wild in July of 2017. He seemed to respond well and had even gained 15g before going in to hibernation before that fateful day last January. Though Copperheads are important for keeping our rodent population down, they are also fall prey to many organisms including canids, raptors, other snakes, and even moles!

Little is known about Copperhead movement patterns in human-altered fragmented habitats. Therefore, we compared the levels of fragmentation (roads, buildings, and agricultural land) to distances traveled by Copperheads on and near PWSNP (Fig. 4).

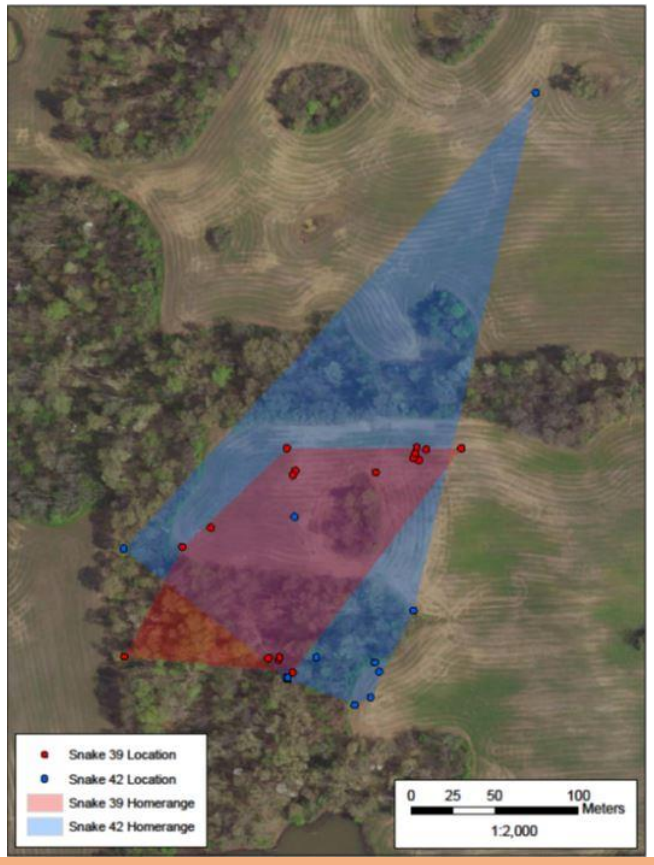

Figure 4: Homeranges of two Northern Copperheads at PWSNP.

The snakes that moved the farthest were located in the least disturbed sites. The snakes that moved the shortest distances were from more fragmented habitats, suggesting a connection between higher levels of fragmentation and reduced snake movement. There was also an increase in snake homerange overlap for snakes located in residential sites which typically have greater levels of habitat fragmentation. This elucidates the need for large areas of contiguous habitat, like that of PWSNP, and the need for continued management in these areas. We are very proud and pleased of the work Clifftop has done at PWSNP, and all of their managed properties, and thrilled for the opportunity to continue to conduct our research there.

About the authors: Benjamin C. Jellen, Ph.D. is an Associate Professor at St. Louis College of Pharmacy. Dr. Jellen has studied snake ecology since 1999 focusing on three main species: The Eastern Massasauga Rattlesnake, The Northern Watersnake, and the Northern Copperhead. He was initially informed of the Paul Wightman Subterranean Nature Preserve population by Clifftop Board member, Jim Hill, and began studying them in 2014.

Brittany, an educator at the Saint Louis Zoo, is currently pursuing her master's degree in Biology through Miami University in Oxford, Ohio. She first got involved with the Copperhead study at PWSNP in fall of 2017 with Dr. Benjamin C. Jellen after expressing interest in learning more about field research and studying snakes. She loves nature and learning about the connections between animals, plants, and people.

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Upcoming events...

Seminar: Hunting for Conservation, Saturday, February 9, 2019, 1:00 – 3:00 p.m., Monroe County Annex, 901 Illinois Avenue, Waterloo, IL If you are interested in learning more about how modern hunting has saved our wildlife from overconsumption and commercialization as well as general game warden duties and the laws they enforce, please join us for this seminar conducted by Conservation Police Officer, Don Schachner. Register to attend by calling 618-935-2542 or emailing cliffmbr@htc.net by February 7.

Workshop: Chainsaw Safety/Technique, Saturday, March 23, 2019, 10:00 a.m. – 3:00 p.m. (with a break for lunch), White Rock Nature Preserve, 6438 Bluff Road, Valmeyer, IL. Presented by Chris Evans, Extension Forester with U of I Extension Forestry, this is a hands-on, in-the-field training that will focus on safety and the technique used for thinning small trees or removing invasive species. Attendees will get to practice with their own saws to cut down small diameter maple trees that need thinning. Attendance is limited to 15 (members get first chance) so register early by calling 618-935-2542 or emailing cliffmbr@htc.net by March 20.

All Clifftop seminars are free and open to the public unless otherwise noted.

Save the date...

PWSNP Grand Opening

The much anticipated grand opening of Clifftop's Paul Wightman Subterranean Nature Preserve is scheduled for **May 18, 2019** from 10:00 a.m. until 2:00 p.m. Refreshments will be served.

The journey toward this end began on December 30, 2013. With funding from the Illinois Clean Energy Community Foundation (ICECF), Grand Victoria Foundation (GVF) and individual donors, the sale was completed on that day. That's when the real work began. Our dream was to include a 5 mile trail system, one mile of which would be accessible to all, a pavilion in which we could center programs & seminars, facilities for when Mother Nature called and fields & fields of native grasses and forbs.

The fulfillment of this dream, however, required money. In 2015, Clifftop entered into the Conservation Reserve Program with USDA's Natural Resource Conservation Service. This cost-share program helped pay for seed, seed bed preparation and seeding of 264 acres which had previously been cropland. The results of that May 2015 seeding have been spectacular.

Compass plant, blazing star and coneflowers 📷 by Mike Fricke

Clifftop was awarded a U.S. Federal Highway Administration Recreational Trails Program (RTP) grant in 2016. This grant was administered through the Illinois Department of Natural Resources and required a match for a percentage of the dollars. Local charitable foundations and organizations generously donated toward that match.

The RTP grant and matches funded the infrastructure at PWSNP—improved roadway & parking lot, a nearly one mile totally accessible trail, accessible restroom facility, pavilion, picnic tables, interpretive signage (designed by a Girl Scout Gold Award candidate), concrete slab, sidewalk & handicapped parking spaces and much more.

The Illinois Recreational Access Program, which offers hunting on private property, and U.S. Fish and Wildlife Service were instrumental in funding massive invasive removal around sinkholes and in wooded areas. Lest we not forget the ICECF Community Stewardship Challenge Grants—one awarded in 2016 and another in 2018, which is still ongoing—that have provided funds for additional stewardship.

And, we can't say enough about our volunteers. Each time we put out a call for help—to plant hundreds of bushes & trees, assemble picnic tables, mow trails, remove invasive species, burn prairies, clean up tree lines & sinkholes, collect & process seed, blaze trails, install boundary markers, adopt ponds, etc.—the response was amazing.

Scientific studies are ongoing at PWSNP. Among the subjects that have been or are being studied are bats, caves, snakes, dragonflies, amphibians and bees.

We hope that you share our enthusiasm as we finally open our gates to the public. PWSNP offers hiking opportunities as well as a place to reflect on the wonders of nature. We have a number of programs scheduled for the preserve this year including the May 18 grand opening. Please plan to attend one or all of them.

What's new at PWSNP?

Concrete sidewalks & parking spaces and 8 picnic tables (two accessible).

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Conservation Achievement Scholarships available...

Applications are being accepted by the Illinois Conservation Foundation (ICF) for the 2019 Conservation Achievement Scholarship program. The ICF annually awards scholarships to outstanding high school seniors in Illinois who demonstrate effective, voluntary, long-term dedication to the preservation, protection or enhancement of the state's natural resources. Up to three scholarships of $2,000 each are available for the current school year. Detailed instructions and the 2019 application form can be accessed through the ICF website at: www.ilcf.org/portal/sponsorship-opportunities Applications must be received by March 15.