

Northeastern Cave Conservancy News

Volume 24, Number 2

June 2022



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The *Northeastern Cave Conservancy News* is published quarterly by the Northeastern Cave Conservancy, Inc. The Northeastern Cave Conservancy promotes the study and preservation of speleologically significant properties in the northeastern United States. Annual membership is \$20 (Regular), \$5 (Additional Family), \$50 (Benefactor), \$100 (Institutional), \$125 (Family Life Membership), and \$400 (Life Membership). All checks made payable and sent to:

Northeastern Cave Conservancy Inc. · P.O. Box 254 · Schoharie, N.Y. 12157

www.necaveconservancy.org

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Next Board Meeting

Saturday, September 24, 2022

The meeting will be at 10:00 a.m. at the Knox Octagon Barn, or 9:00 a.m. if entirely via videoconference. Contact secretary@necaveconservancy.org to obtain a zoom link.

Winter Board Meeting

Sunday, December 4, 2022

The meeting will be held at 10:00 a.m. at Speleobooks, or 9:00 a.m. if entirely via videoconference.

The Northeastern Cave Conservancy, Inc. (NCC) is a not-for-profit corporation committed to the conservation, study, management, and acquisition of caves and karst areas having significant geological, hydrological, biological, recreational, historical, or aesthetic features.

To these ends, the NCC combines the resources and expertise of affiliated cave explorers, educators, scientists, landowners, and conservation officials.

The NCC programs are focused mainly on the preservation of caves and karst. Outreach includes education in schools and local communities, establishment of park spaces on karstlands, and educational messages about the significance of groundwater pollution on this sensitive underground ecosystem.

NCC members assist in the exploration, survey, and protection of these natural resources, and manage them so you can explore them yourself.

NCC logo design by Christa Hay



MOBILE BAT ACOUSTIC SURVEY - SUMMARY REPORT 2021 — Kate Ritzko, NYS DEC Wildlife —

Introduction

New York is home to nine species of bats. Three of these species are migratory and spend their winters in more amenable climates with enough insect fodder, and six hibernate underground in caves or abandoned mines. The migratory (tree bat) species found in NYS are the eastern red bat (*Lasiurus borealis*, LABO), hoary bat (*Lasiurus cinereus*, LACI), and silver-haired bat (*Lasionycteris noctivagans*, LANO). These species are difficult to track, and their migratory patterns remain largely unknown. We do know that these species are particularly vulnerable to mortality from wind turbines, with most wind mortalities occurring in the late summer and fall, coinciding with the presumed migratory season of July - September. Four species of hibernating bats (cave bats), the northern long-eared bat (*Myotis septentrionalis*, MYSE), Indiana bat (*Myotis sodalis*, MYSO), little brown bat (*Myotis lucifugus*, MYLU), and tri-colored bat (*Perimyotis subflavus*, PESU), have experienced massive declines because of White-nose Disease, also known as White-nose Syndrome (WNS). WNS is an invasive, bat-specific, fungal pathogen that arrived circa 2006 in Albany and Schoharie counties in New York and continues to spread across the continent.

In 2009, biologists and technicians at the NYS Department of Environmental Conservation implemented a statewide, mobile acoustic monitoring program to evaluate the status of several species of bat, obtaining data that represents summer distribution and abundance of bats within NYS. The program was targeted towards migratory species, and this strategy is currently our only method of monitoring New York's tree bat populations. For most hibernating species, we rely on underground surveys, in which individual bats are counted to track populations; however, the mobile acoustic program supplements the data for following those trends. Our summer acoustic surveys have shown a decline in detections of northern long-eared bats, Indiana bats, little brown bats, and tri-colored bats, corresponding with severe decreases in our winter survey counts. Two species of cave bats, big brown bats (*Eptesicus fuscus*, EPFU) and eastern small-footed bats (*Myotis leibii*, MYLE), are highly variable in their winter roosting habits, making hibernacula surveys an impractical way to reliably monitor their populations. Both species appear to be more resistant to WNS than our other cave bats, and various summer monitoring programs increase our confidence about their population health. Big brown bats are easily detected during the summer acoustic surveys, enabling us to monitor them consistently. Unfortunately, small-footed bats are the most difficult species to detect using mobile acoustic surveys.

The data obtained by our volunteers' efforts is invaluable

to the management of NYS' bat species. The results, when analyzed alongside our other monitoring efforts, provide a comprehensive view for use in evaluating proactive approaches to understanding and managing these bat populations. As WNS spreads across the continent, and wind energy development continues to grow, these annual surveys remain vitally important.

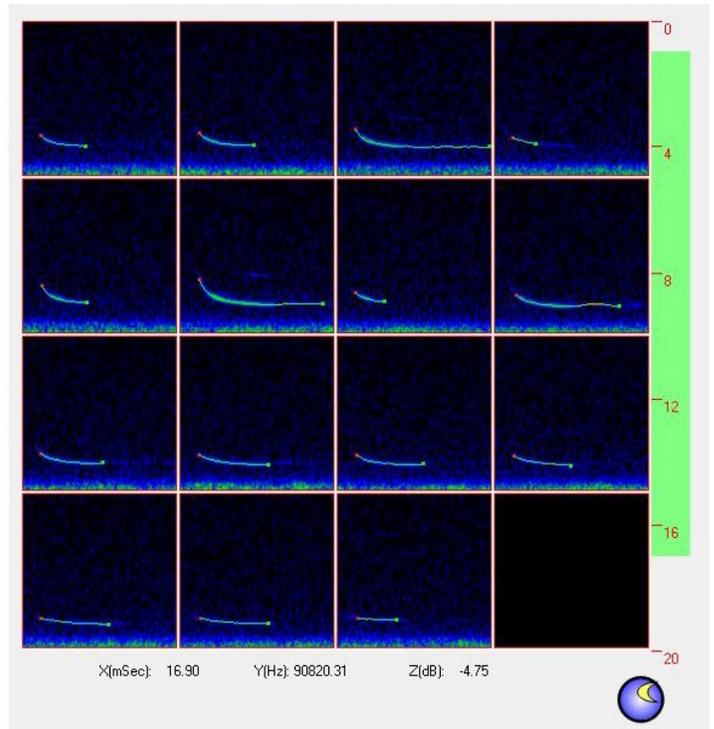
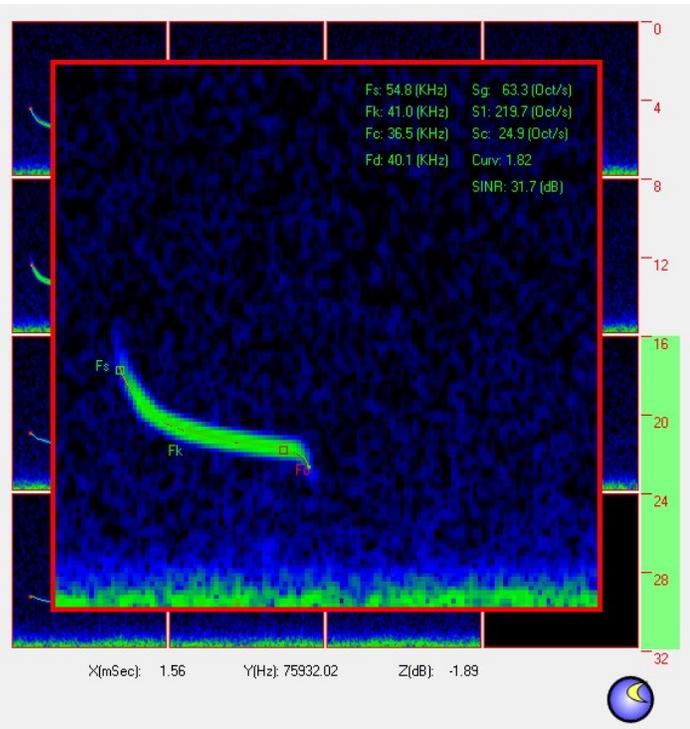
Methods

Many surveyors, who are responsible for setting up the software and hardware, are familiar with the methods but understanding the 'why' of those methods and the background work done can be important to keep standards up. The official timeline of the season typically runs from the Friday before Memorial Day to the Monday after Independence Day. The 2021 season ran from May 28th - July 5th although due to a cold start to the season and considerable rain, we extended the final deadline by about a week. The purpose behind the timeline is to maintain accuracy and consistency. Bats should finally be out of hibernation and foraging routinely by May, and females will begin with their pup birth season around then, sometimes extending through July. By the end of July, most pups are beginning to fly; by excluding them, we are consistent with population estimates. Insect activity also greatly increases around the end of July, which can cause excessive amounts of noise in the sound files and make manually identifying the species impossible. It is also important to aim for the more southern routes to get surveyed first, as the northern routes can still be too cold in the first half of the season for bats to forage reliably.

Specialized hardware and software designed to detect echolocations from bats records sound files, and those files are then analyzed. Bat species in NYS have different foraging habitats and behavior, and this influences their echolocation parameters. Thus, we can differentiate the echolocation calls of various species. We run the files through an automated program that filters out files with no bats detected and then run them through an auto-ID program that measures the pulses and assigns the echolocation call to a species (Images 1 and 2). We then manually vet each call, and if enough high-quality echolocation pulses are recorded, can identify the call by species. There is some overlap between species, and weak pulses or interference can disrupt accurately measuring pulses. Many hours of training and practice are devoted to manually vetting bat acoustics, and thousands of files are analyzed each season.

Results

This was the 13th year for the program. The past two survey seasons have seen a wide variety of issues, including incompatible hardware/software, uncooperative weather, and a rather inconvenient pandemic. While we were una-



Images 1 and 2, showing the recorded echolocation pulses in ‘full spectrum’ view. The pulses are collectively measured and then vetted.

ble to cover every route, surveyors were able to complete an impressive 87 successful survey nights across the state. This year’s results, along with comparisons for previous years, can be seen in the accompanying figures.

Most detections this year consisted of big brown bats/silver-haired bats and bats categorized as ‘Unknown’, meaning there weren’t enough high-quality, measurable pulses to accurately assign them to a species (Figure 1). Big brown bats and silver-haired bats produce echolocation calls that are too similar to differentiate from each other and so are consolidated. Tracking the trend is still meaningful (Figure 2), and we presume that most of the calls are made by big brown bats as they are vastly more common than silver-haired bats in most places.

Two of our migratory bat species, the eastern red bat and the hoary bat, are showing an overall positive trend in detections, even with fluctuations (Figure 3). Note that this does not include silver-haired bats, despite them being a migratory species, as their calls are indistinguishable from big brown bats. Big brown/silver-haired bat calls can be found in Figure 2, showing a stable trend over time.

While these surveys are not designed for our more interior forest-dwelling *Myotis* species, they still provide useful data. As seen in previous years, results of these acoustic surveys suggest that populations of little brown bats may be stabilizing. Although we haven’t seen a significant increase (Figure 4), these results support the similar trend we are seeing in winter counts. The state mortality rate determined by those winter counts is currently hovering around 77% for this species (decreased from previous years). Other states in the Northeast are still experiencing

worsening mortality rates for little brown bats, leading to questions about why New York may be faring somewhat better.

The remaining *Myotis* species are rarely detected. Indiana bats and northern long-eared bats favor foraging in forested areas with more vegetation clutter that tends to obscure their naturally quieter calls. The Indiana bat, which tends to concentrate in pockets within NYS, has been federally listed as Endangered since 1967 due to disturbances to their hibernation sites. Their numbers were improving before the onset of WNS, but NYS has now seen about a 76% decline. Northern long-eared bats, widely dispersed in population but now very rare, are at a 99% mortality rate and were listed at both the state and federal level as Threatened in 2015, with WNS being recognized as the major threat. Eastern small-footed bats have echolocation calls that are quite difficult to detect using mobile acoustics, and the characteristics of their pulses aren’t as well understood.

Tri-colored bats have never been detected in high numbers with mobile acoustics, but as they have experienced a major decrease in population (98%), we are seeing fewer driving routes detecting them (Figure 5), although if one looks at all routes, we are seeing evidence of persistence (Figure 6).

Conclusions

The mobile acoustic survey program is a valuable resource for determining bat species’ abundance and distribution within New York State. Continuance of these efforts provides the state with long-term data, which aids in directing other monitoring efforts and management prac-

tices.

The network of participants involved in this effort has helped continue one of the longest-running, mobile acoustic programs for bats in the nation. The contribution effort, involving hundreds of hours and thousands of

miles dedicated to learning and reviewing the process and performing the surveys, is a testament to the citizen scientists of NYS.

Kate Ritzko is a wildlife technician in the Wildlife Diversity Unit of the NYS Department of Environmental Conservation.

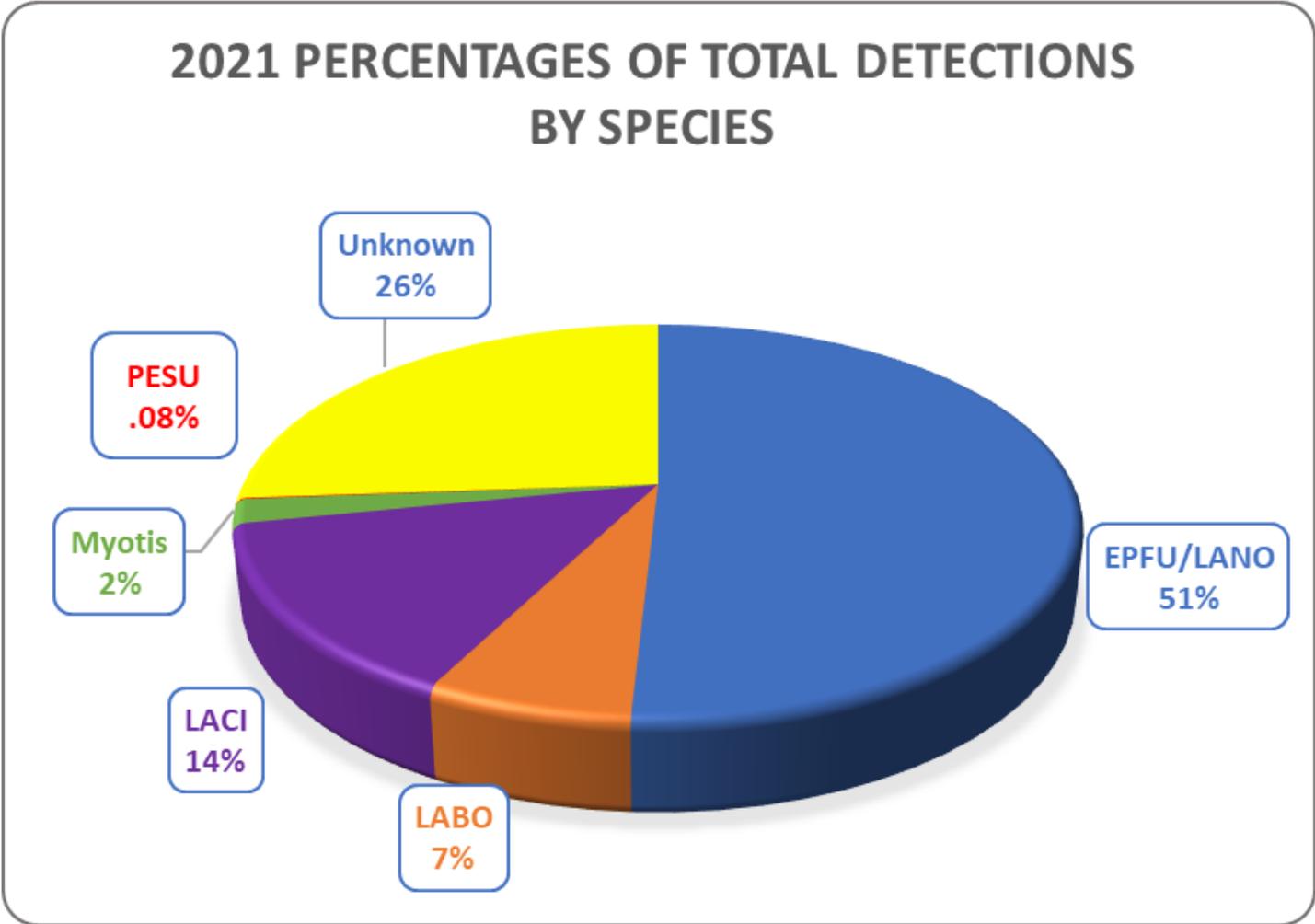


Figure 1. Big brown bats/silver-haired bats (EPFU/LANO) make up about half the detection at 51%, while tri-colored bats (PESU) hold the smallest percentage of total detections at .08%. Files containing bat call pulses that could not be identified due to poor quality constituted 26% of files.

EPFU/LANO = Big brown bat/Silver-haired bat LABO = Eastern red bat
LACI = Hoary bat PESU = Tri-colored bat
Myotis = Little brown, Northern long-eared, Indiana, and Small-footed bats

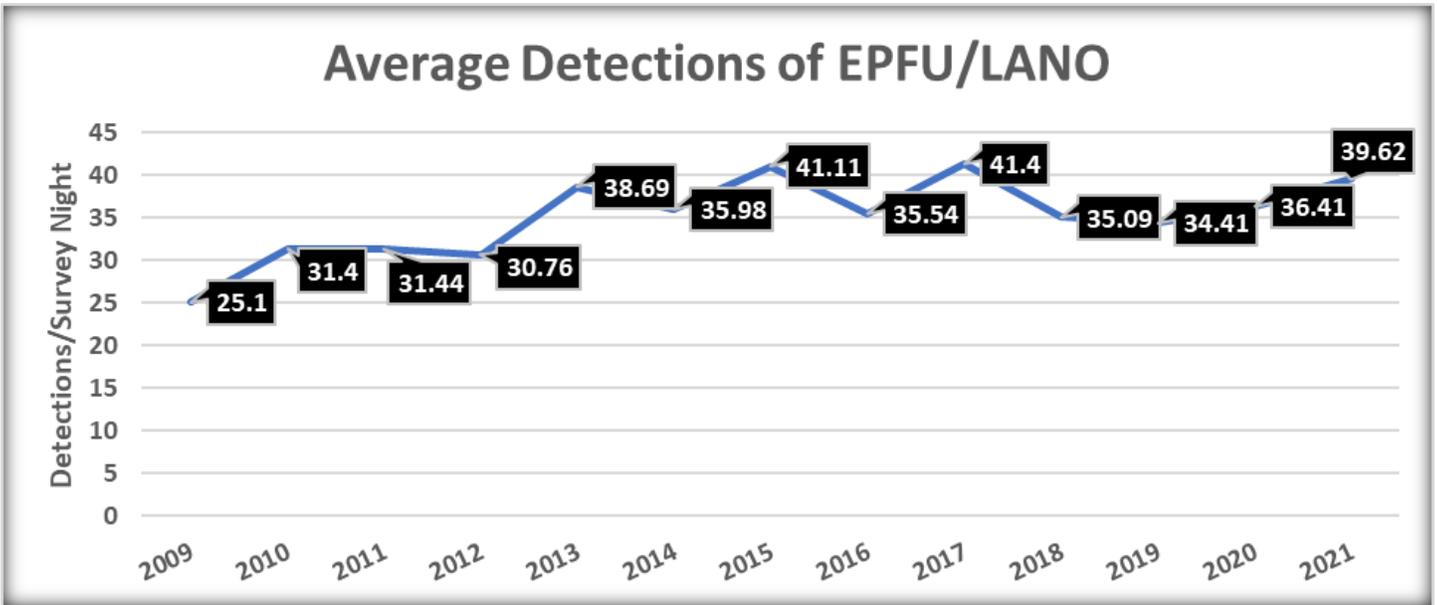


Figure 2. Average detections per route night of the big brown bat (EPFU)/silver-haired bat (LANO) complex, with stable trend.

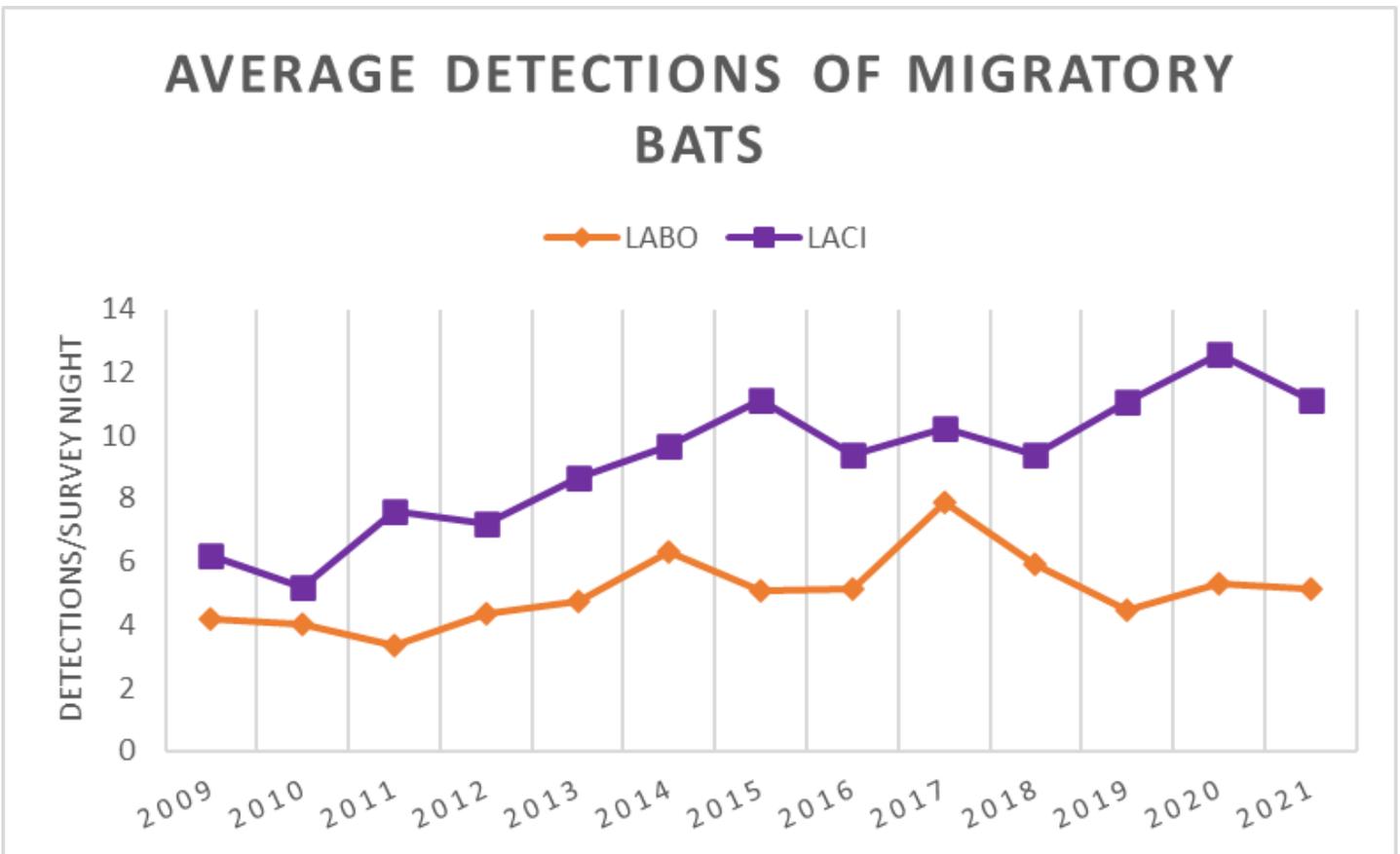


Figure 3. Average number of bat detections per route night (total number of route surveys completed in a season) for eastern red bats (LABO) and hoary bats (LACI).

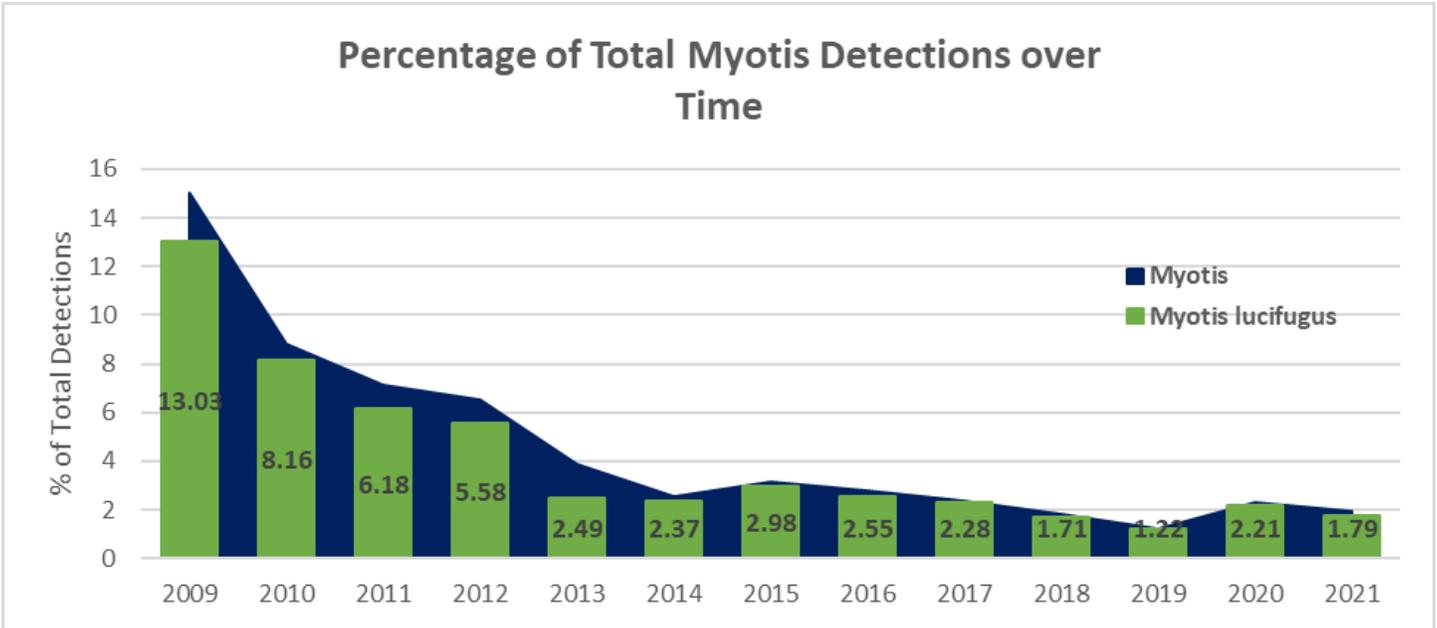


Figure 4. Percentage of total *Myotis* bat detections, paired with percentage of detections of little brown bats (*M. lucifugus*). *Myotis* bats include little brown bats (*M. lucifugus*), northern long-eared bats (*M. septentrionalis*), small-footed bats (*M. leibii*), and Indiana bats (*M. sodalis*).

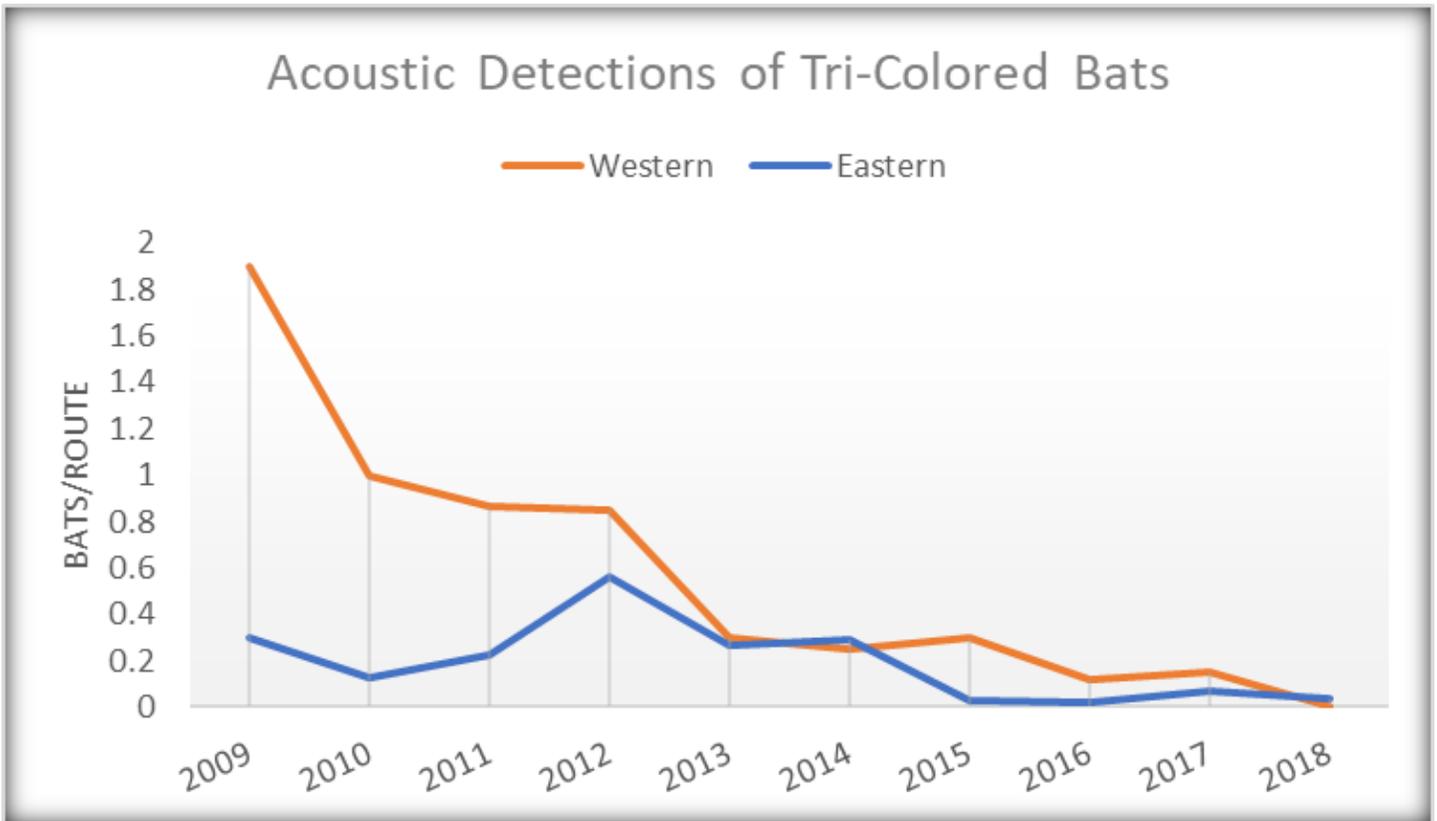


Figure 5. Average detections of tri-colored bats (*P. subflavus*) per route night, separated by 'western' and 'eastern' routes up until 2018.

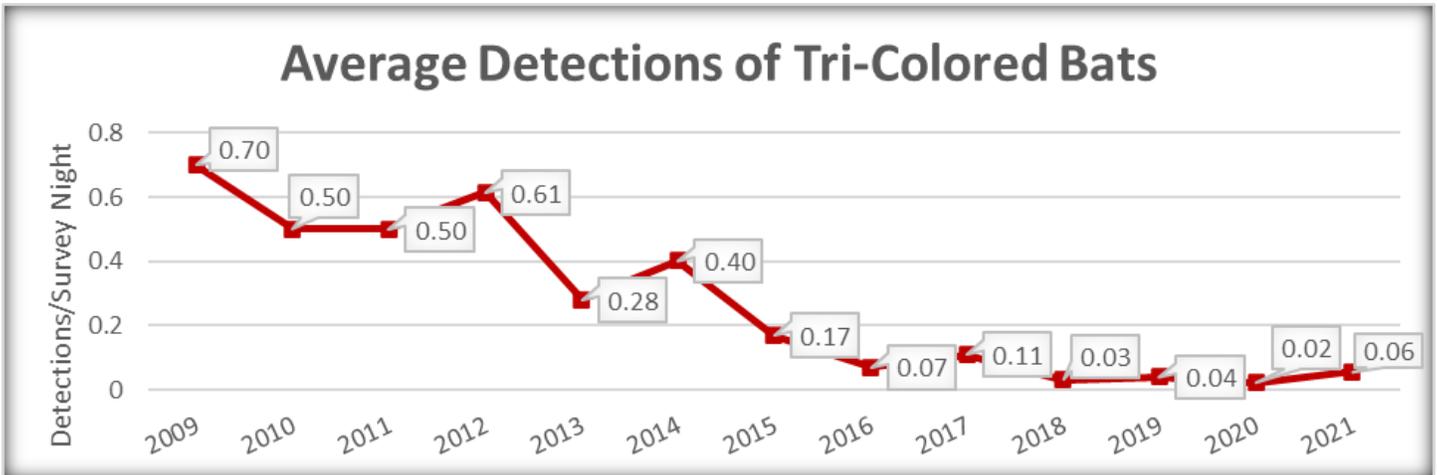


Figure 6. Average detections of tri-colored bats show very rare but persistent detections.

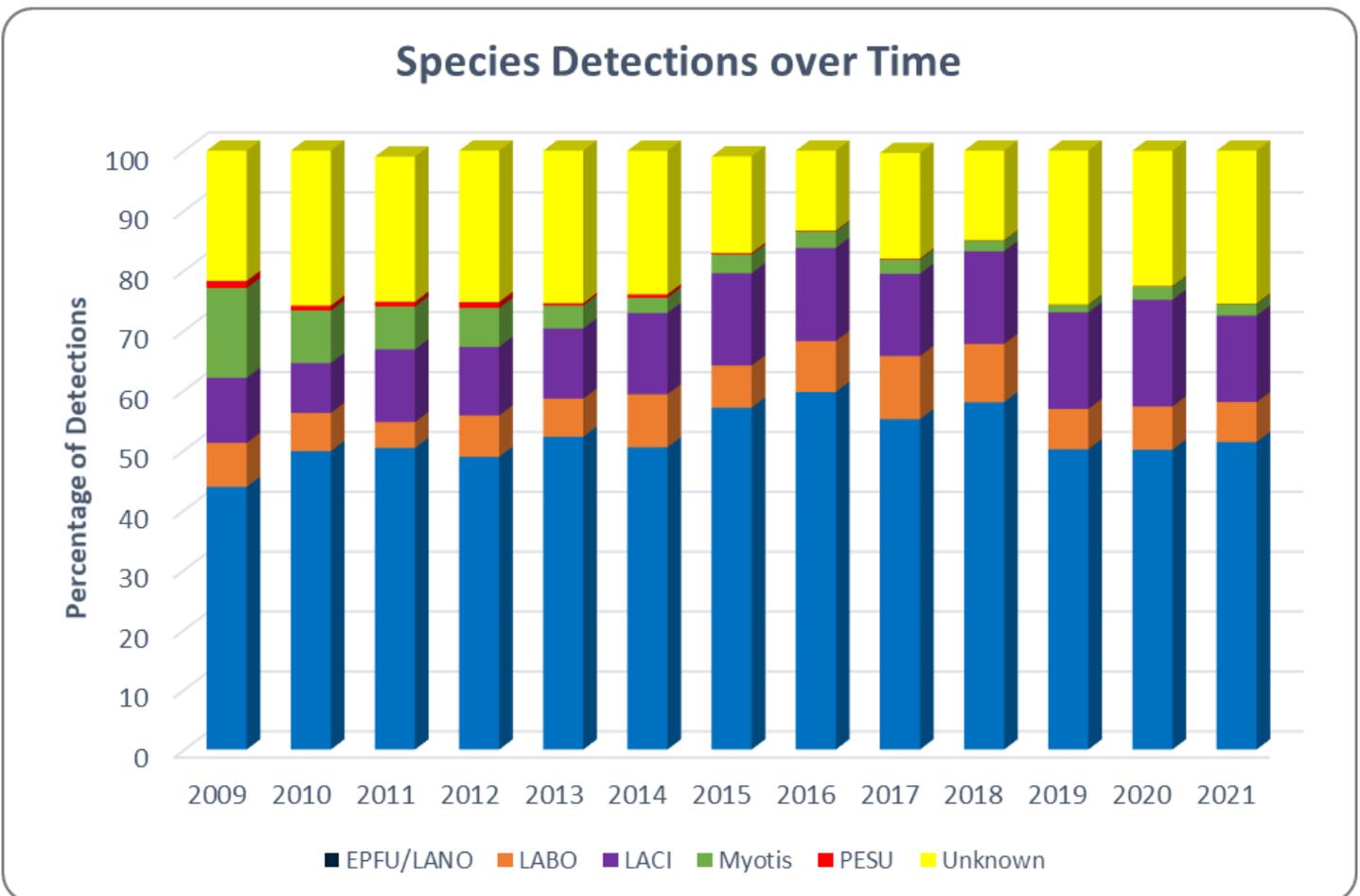
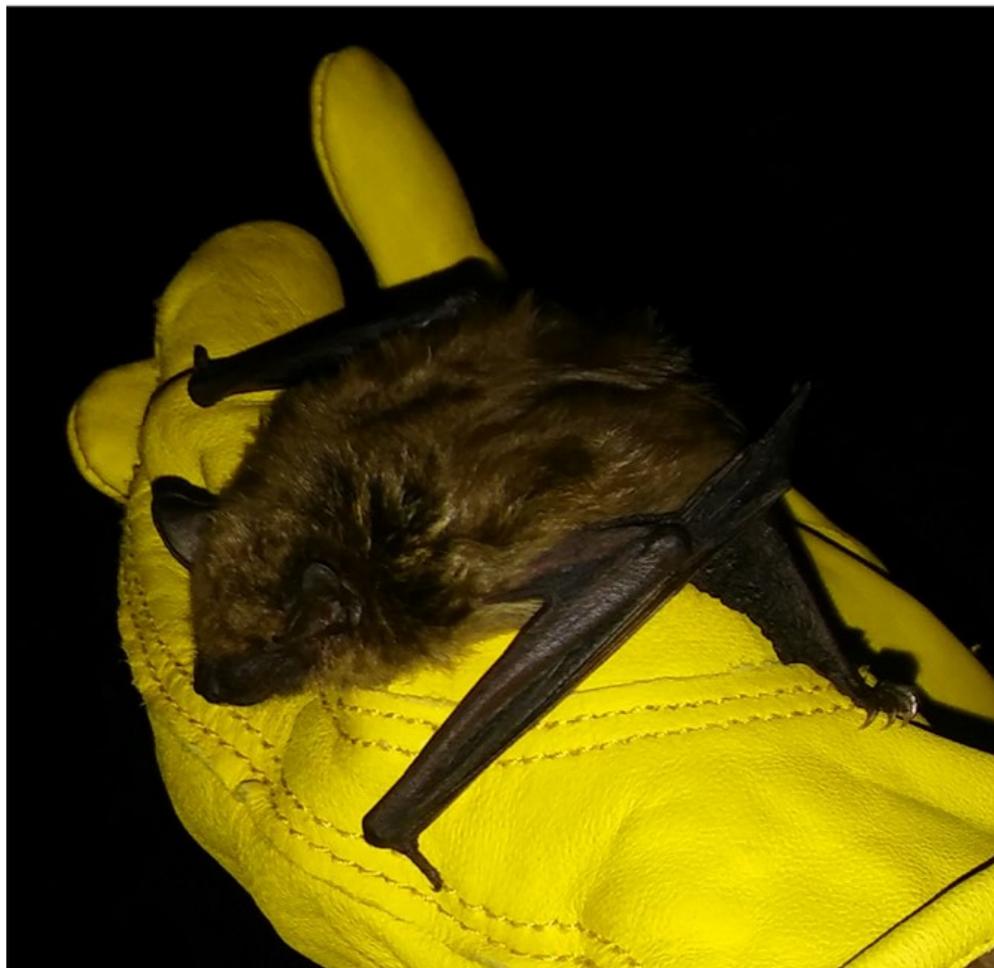


Figure 7. Percent of species detected each year, with *Myotis* including *M. lucifugus*, *M. septentrionalis*, *M. sodalis*, and *M. leibii*.

Summary Data for all species across the span of this project can be seen in Chart 1 and Figure 7

TOTAL INDIVIDUALS	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
	4414	4985	4868	5289	5556	6200	5350	4993	6111	5627	6796	6779	6713
EPFU/LANO	1936	2484	2452	2590	2902	3130	3083	2950	3395	3263	3407	3398	3447
LABO	325	319	259	363	354	549	381	440	645	548	459	492	448
LACI	479	414	591	615	651	842	833	788	839	871	1096	1183	969
MYLE	0	3	1	3	0	1	0	1	2	1	0	0	1
MYLU	575	407	301	295	194	147	161	132	139	96	83	150	120
MYSE	60	12	31	31	13	4	5	2	1	2	1	2	3
MYSO	24	16	15	9	7	6	3	9	4	3	0	4	8
PESU	54	41	39	51	21	35	13	6	9	3	4	2	5
UNKNOWN	961	1289	1179	1332	1414	1486	871	665	1079	840	1746	1548	1712

Chart 1. Total counts of detections per species for 2009 - 2021. Big brown bat (*E. fuscus* - EPFU)/Silver-haired bat (*L. noctivagans* - LANO); Eastern red bat (*L. borealis* - LABO); Hoary bat (*L. cinereus* - LACI); Small-footed bat (*M. leibii* - MYLE); Little brown bat (*M. lucifugus* - MYLU); Northern long-eared bat (*M. septentrionalis* - MYSE); Indiana bat (*M. sodalist* - MYSO); Tri-colored bat (*P. subflavus* - PESU).



Big brown bat. Photo by Kate Ritzko.

SPRING 2022 NRO: OF NAMETAGS AND BOOTS — Shaya Tousi —

I joined the Central Connecticut Grotto (CCG) just in time to attend NR2.0 in Fall 2021. I was struck by how it seemed attendees could recognize almost everyone around them, while I desperately tried to craft mnemonic devices to remember names. NR2.0 was a fun, soft landing into weekend caving events, but I can't deny the excitement that I felt while packing for my first full-fledged spectacle at this spring's NRO.

I volunteered for registration partly because of that experience at NR2.0, with the hope that just seeing, if not conversing with, almost every person who came to the registration desk would help jog my memory later on. I joined Veronica Laviero and Leslie Hatfield behind the tables, and our team of three settled into a smooth operation. Between firmly reminding everyone that no, they could not use the porta potty, hole-punching nametags until we had to break open the reserve stock (hopefully no late registrants noticed that their nametags didn't have 2022 printed on them), and keeping careful count of the vegetarian meals for Emily, the afternoon and evening passed quickly. Since the registration tables were where people seemed to come with questions or just to say hi, I spent all of Friday evening chatting with those who cycled through the room. I was advised about what cave trips to sign up for, learnt about the Northeastern Cave Conservancy (NCC) as an organization, and heard amazing tidbits of personal caving lore. I had just as much fun helping out with other tasks throughout the weekend, but registration was the perfect way for me, as a new caver, to ease my way into the broader caving community outside of my grotto.

For the rest of the weekend, I was delighted to be on my first cave trips since September, especially to caves that were new to me. On Saturday, I joined Jacob Morris-Siegel's party of six to Onesquethaw Cave, which entered around 10:30 AM. The trip began smoothly, and we passed by a mostly full carton of milk (picked up on our way out), a sizeable bass that fretfully swished around an ankle-deep pool, and an eel on our way towards the fault zone. My troubles didn't begin until later—but some context is required.

On this trip, I was wearing a pair of hiking boots that I'd picked up in very good condition at a thrift store and had worn before without issue. That morning, I'd noticed a small tear forming in the rubber around the toes of one shoe and had wrapped duct tape around both as a precaution. The duct tape quickly proved inadequate against the water and mud in Onesquethaw, and I peeled them off to zip into a pocket rather than wait until they fell off without me noticing. Every few minutes, I'd glance down again and notice with some trepidation that not only were there now tears forming on both shoes, but they seemed to be getting just a little bigger each time. By the time we'd

reached the Spider Room, the right sole had started to peel away from the shoe in earnest; another party member helped me tie it together with extra cord from my pack. Half of the party chose to stop about halfway between the Spider Room and final sump, with the other half continuing on. By the time we turned back and rejoined the rest of the party, the cord was proving insufficient for holding my right boot together; the back of the sole had started to peel as well, and the two tears were rapidly getting closer. For the rest of the return trip, I would occasionally peel off a stretch of rubber to stuff into my pack or pocket, laughing at how completely they were disintegrating for no clear reason. One party member, crawling behind me, exclaimed that the flapping soles "were talking to her!" though we couldn't quite make out whatever wisdom they were dispensing. By the time we were about 75% of the way to the cave entrance, I'd decided to cut my losses and just rip off what remained of the boot soles, rather than deal with them getting caught on rocks. Around 1:45 PM, with both of my boot soles safely in hand and many laughs about the situation, we exited Onesquethaw and posed for a precariously perched self-timed group picture. Fortunately, I was able to pick up a pair of well-fitting boots that night at the NCC auction and set off for Clarksville Cave the next day, praying that lightning wouldn't strike twice. I'd been very excited to see Clarksville, as it felt that several people I'd met the night before could find their way through it blind. I'd been advised to keep an eye out for specific formations with hyper-granular directions, with one recommender even warning that I'd have to take a few extra steps, on account of my height, to be at the right angle to see a section of flowstone that he was fond of.

My trip was led by Veronica. Other than her, only one participant had been to Clarksville before. Two others had been in their very first caves the day before, and the excitement of the entire group was palpable as we took a moment (around 12:15 PM) to savor the cold air blowing from the Gregory Entrance in face of the rising heat and humidity of the day. Veronica prefers to "lead from the rear," allowing the members of the team to switch off on leading the group through the cave. At no point did we consult the map, choosing instead to work our way through passages until we hit dead ends or a new room. My previous cave trips had all relied heavily on maps or the leader's familiarity to guide us through intersections, and it was both incredibly rewarding and plain fun to come to a branching point, discuss the options amongst ourselves, and then forge ahead.

After making our way to the Lake Room and pausing for pictures and trail mix, we exited Clarksville at 2:20 pm. While this trip was (thankfully) less eventful than my visit to Onesquethaw, the later sections of Perry Avenue, and

the Lake Room in particular, made strong impressions on me, as our headlamps threw shadows and reflections from the water across the walls and formations. Both trips benefitted hugely from capable leaders and good-natured par-

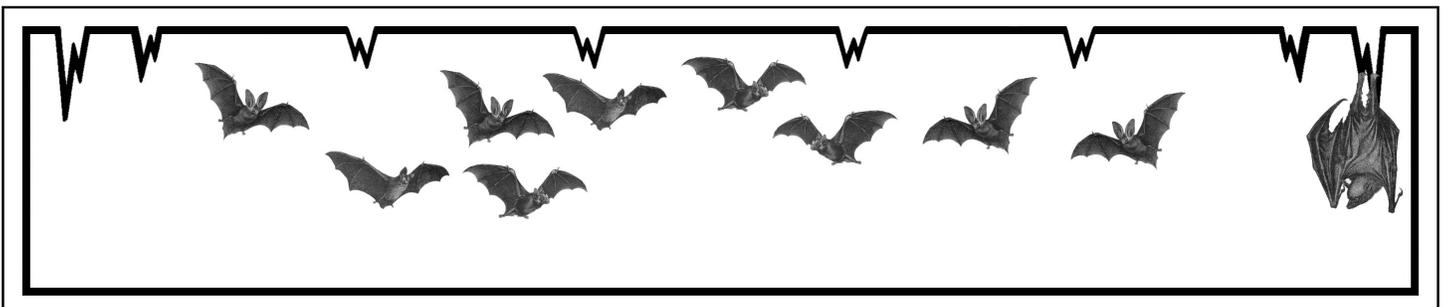
ty members, any of whom I would be glad to get back underground with. All in all, I had an absolutely delightful time at NRO, and will look forward to attending and volunteering again.

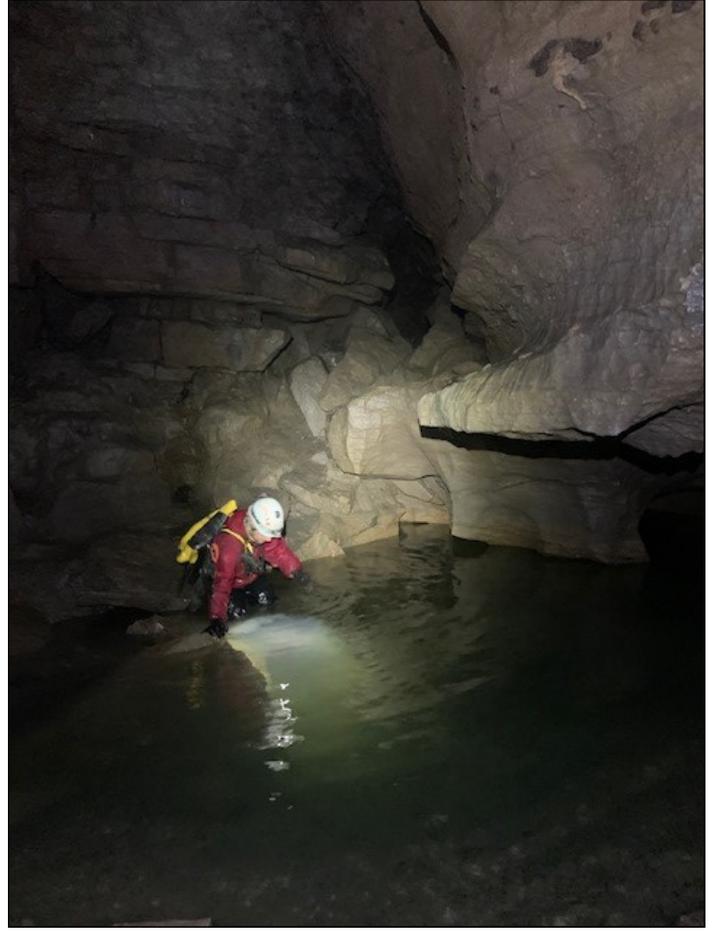
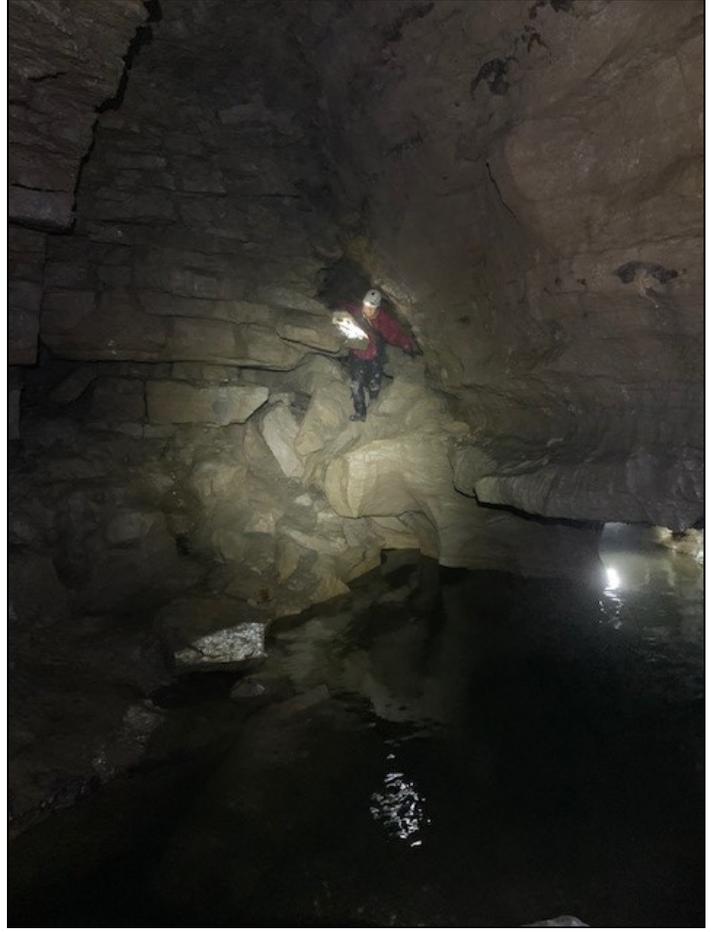


(Left) - Shaya Tousi emerging from Clarksville Cave. Photo by Bill Folsom.

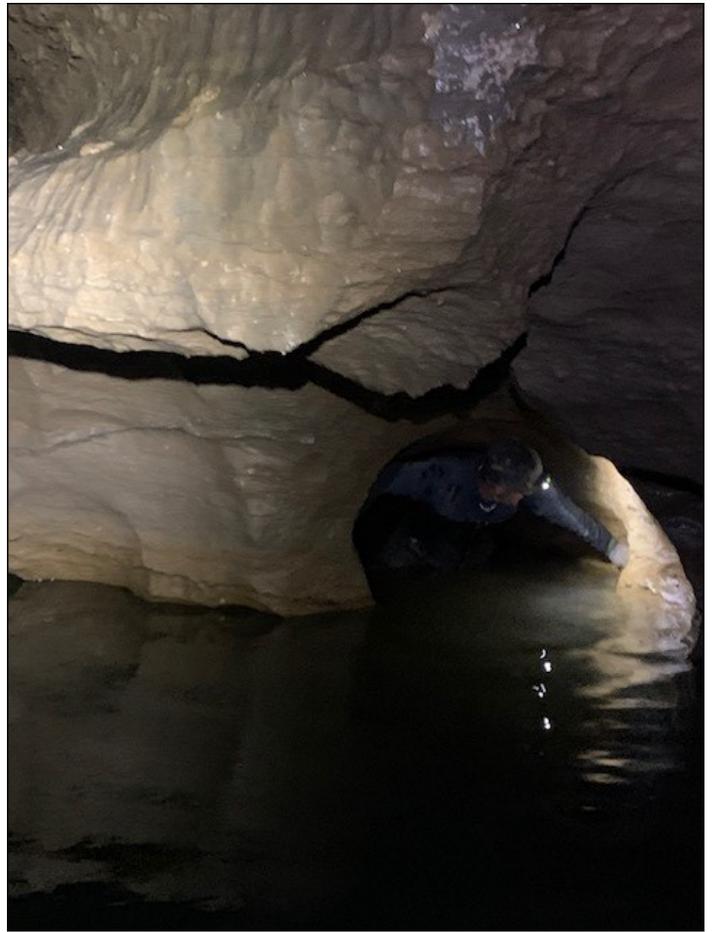
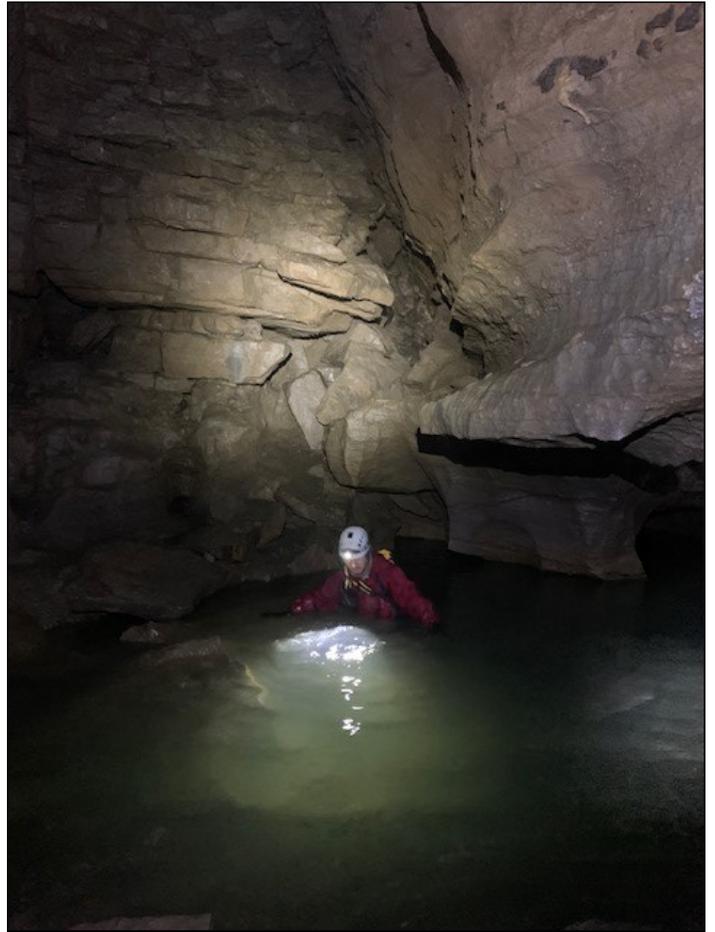
(Top Right) - Deep in Clarksville Cave. Photo by Jorge Robles.

(Bottom Right) - Après caving (Onesquethaw Cave). Photo by James Maughan.





Some NRO images from in and around the Lake Room (Clarksville Cave). All photos on pages 12 and 13 by Veronica Laviero.



NCC MEMBERS' DAY

SAVE THE DATE

SATURDAY, JULY 9TH

11:00 a.m. to 5:00 p.m.

at the NCC's

Clarksville Preserve

Join us to spend the afternoon with fellow NCC members, share your caving stories, and grab a bite to eat. The NCC will provide the food, you need to bring the stories, and perhaps a change of clothes!

Yes, people will probably be going underground!

ALL members are invited! We hope to see you there.

Questions?

Is your membership up to date?

Time to renew?

Email the membership chair

membership@necaveconservancy.org

Is it time to renew?

Top 20 reasons for supporting the NCC with a \$20 membership:

1. Clarksville
2. Ladder Dig
3. Knox
4. Crossbones
5. Bentley’s Cavern
6. Slingerland’s Hellhole
7. Selleck’s
8. Spider
9. Jack Packer’s
10. Natural Bridge Cave
11. George’s Surprise
12. Onesquethaw
13. Merlins
14. Dragon Bones
15. Dry Valley Cave
16. Benson’s
17. Levy’s Cave
18. Cave 575
19. Salamander
20. Ella

Membership Levels

- Regular: \$20.00 USD/yearly
- Regular + 1 Family: \$25.00 USD/yearly
- Regular + 2 Family: \$30.00 USD/yearly
- Regular + 3 Family: \$35.00 USD/yearly
- Benefactor: \$50.00 USD/yearly
- Institutional: \$100.00 USD/yearly

Solve the problem of remembering to renew and consider becoming a **Life Member: \$400.00 one time payment**

Several options for payment:

Autopay Membership Yearly - Pay your membership dues automatically every year.
Renew Online:

www.necaveconservancy.org/join/

Print & Mail - Download and complete the membership form, write a check, payable to **Northeastern Cave Conservancy**, and drop in the mail to:

Northeastern Cave Conservancy
P.O. Box 254
Schoharie, NY 12157

Questions? Unsure of your renewal date? Reach out to the **Membership Committee** with any questions: membership@necaveconservancy.org



Scan the QR Code to Renew Today!