Moth Night draws nearly fifty participants, hundreds of moths

Report and pictures by David George, Kenneth Geisert, Jeff Niznik, and David Bradley

A girl admires an Imperial Moth (Eacles imperialis) found during Moth Night while educator and event leader David George takes a picture to record the observation.

This summer, the Durham County Open Space Program had the privilege of working alongside a fantastic group of naturalists, led by David George, to host a public Moth Night event at Hollow Rock Nature Park, a popular 82-acre preserve jointly managed by Durham and Orange counties. Located at the northern end of the state-significant New Hope Creek Corridor, the Park opened to the public in 2016 and offers opportunities for low-impact recreation, protects water quality in the New Hope Creek watershed, and serves as a refuge for native species.

As an environmental educator, identifier on iNaturalist, and co-author of the Moths of North Carolina website, David George has led countless events sharing his knowledge about moths. This event marked the first of its kind ever hosted at a Durham County park. David first proposed the idea during a meeting with staff and researchers in early 2024 to shine a light on the importance of moths and the challenges they face in the Triangle region. David and several other naturalists, including Jeff Niznik, Kenneth Geisert, and Becky Watkins, generously offered to help host the event, while County staff coordinated logistics and outreach. Staff and event leaders agreed that Hollow Rock Nature Park – with its diversity of habitats, well-established trail system, and legacy of citizen-led conservation – would be a perfect Moth Night venue.

David George is an environmental educator and naturalist and co-author of the Moths of North Carolina website. Kenneth Geisert is an entomology student at NC State University studying longhorned beetles. Jeff Niznik is an avid naturalist and has assisted with research throughout the New Hope Corridor. David Bradley is an Open Space Specialist with the Durham County Open Space Program.

Thanks to the Durham County Public Information Office, the County's conservation partners, and a wonderful piece by WUNC, word about the event spread far and wide; Open Space staff were receiving inquiries as late as 7:00 pm on the evening of the event. Nearly fifty people from across the Triangle attended. Some of the participants were seasoned naturalists – entomologists, conservationists, and hobbyists who have spent decades studying these creatures and their role in local ecosystems. Others were nearby residents who walked to the park from adjacent neighborhoods, including several folks who have helped care for and protect Hollow Rock for nearly 20 years. For many in attendance, however, this was their first visit to Hollow Rock Nature Park, and their first exposure to the remarkable lives of moths.

Upon arrival, participants were greeted not just by event leaders and Open Space staff, but by live caterpillars that David and Becky had raised and brought to the event. Attendees flipped through field guides, pored over scientific reports, and did moth-themed crafts and games as people continued to arrive. A few borrowed flashlights and magnifying glasses to examine the insects and arachnids they found around the old Hollow Rock Store. As dusk fell, David provided an introduction to the creatures we call moths. Like butterflies, David explained, moths are members of the order Lepidoptera. Compared to butterflies, however, moths are far more diverse: North Carolina alone has over 3000 species of moths (and counting!), compared to 177 species of butterflies. Moths of all shapes and sizes collectively play a crucial role in our local ecosystems, most of all as a food source for an array of wild animals. They are adept at converting plant matter into a dense, nutritious, easily digestible package, so much so that many young migratory birds rely almost exclusively on caterpillars during their first months of life.

A Walnut Sphinx caterpillar (Amorpha juglandis, top) and an adult Large lace-border moth (Scopula limboundata). Moths are a highly diverse insect group.

Carrying flashlights and donning headlamps, the group then ventured into the woods. After a short walk along the Headwaters Loop Trail, participants came to the first in a series of insect survey stations. Blacklighting, or night lighting, is a common method used by entomologists to sample biodiversity in which ultraviolet or mercury vapor lights are draped near large white sheets, attracting countless arthropods. These contraptions make the insects easier to see, photograph, and study. For the next two hours, participants visited each of the 10 stations to see which species had decided to make an appearance. During this time, David, Jeff, Kenneth, and Becky, along with ecologist Julie Tuttle and naturalist Patrick Coin, moved back and forth between stations, answering questions, identifying species, and providing an endless supply of fun facts.

Top: visitors hike to the survey sheets on the Headwaters Loop Trail. Right: Several participants watch as moths (and many other insects!) gather on one of the survey sheets.

Clockwise from top left: guests find moths on one of the survey sheets; Patrick Coin shows off a Rhinoceros Beetle found on one of the sheets; visitors explore the Headwaters Loop Trail; guests practice identifying insects on one of the survey sheets; Kenneth Geisert carefully captures a European Hornet to show to guests. Moths aren't the only insects attracted to bright lights!

After the event wrapped up around 10:45, the event leaders spent another hour and a half on the trail, diligently photographing and cataloging species before hauling their equipment out of the woods. Over the next few weeks, they reviewed the findings to create a full species list from Moth Night, which can be found on iNaturalist here: Hollow Rock Moth Night Project.

Hag moth
(Phobetron pithecium)

Francesca Carpenterworm
(Givria Francesca)

Dryadauka visaliella

Snowy Urola
(Urola nivalis)

Eucosmomorphia nearctica

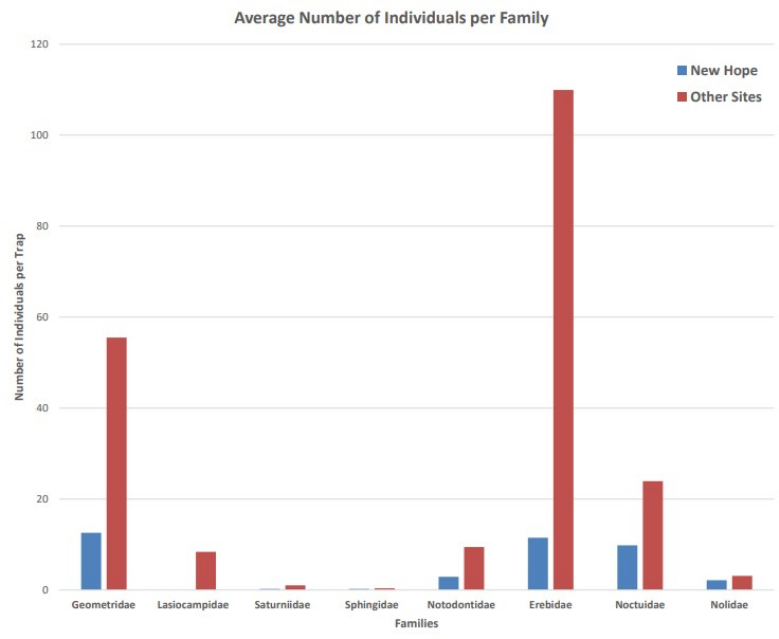
Juniper Geometer
(Patalene olyzonaria)

Orange-shouldered Sherbet
(Diaphania costata)

Esther Moth
(Hypagyrtis esther)

Feeble Grass Moth
(Amolita fessa)

In all, the group tallied over 100 moth species through the course of the event. Many of these, including the Streaked Dagger (*Acronicta lithospila*) and Francesca Carpenterworm (*Givria francesca*), are considered rare or uncommon, and at least five species had never been recorded in Durham County before: the Snowy Urola (*Urola nivalis*), Hag Moth (*Phobetron pithecium*), Feeble Grass Moth (*Amolita fessa*), *Eucosmomorpha nearctica*, and *Dryadaula visaliella* (only the 12th record of this species in North Carolina). Perhaps the most photogenic was the Imperial Moth (*Eacles imperialis*) who lingered for much of the evening. While not particularly rare, this species, known for its remarkable size and brilliant coloration, is always an exciting find.



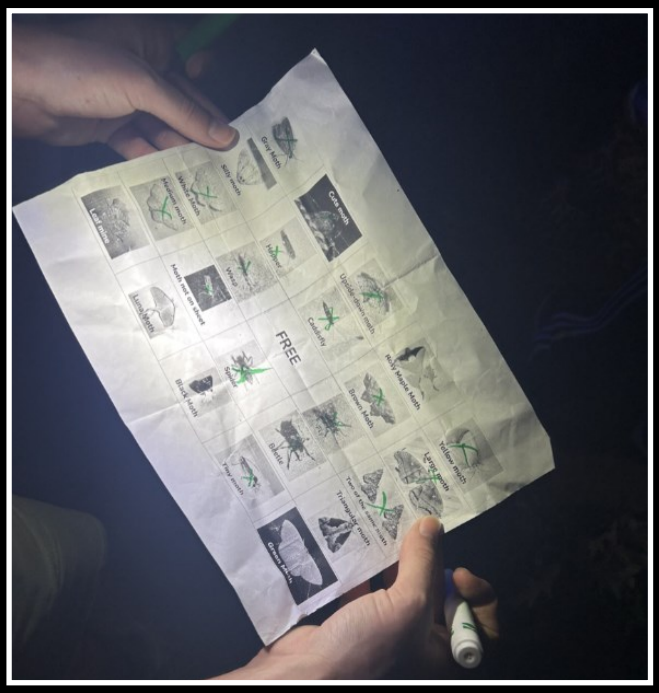
Getting a complete picture of moth diversity is essential for effective conservation and improving our knowledge of complex ecological processes. Insect numbers are on the decline throughout North Carolina, as they are across much of the globe. This decline appears to be especially steep along New Hope Creek; the data from the 2021-2022 New Hope Creek biodiversity survey are sobering.

A graph from the inventory report showing the low number of moths along New Hope Creek compared to similar sites.

Though more research is needed to confirm the precise causes of this decline, it is likely that a driving factor is the substantial increase in artificial light at night (ALAN) from new developments along the Corridor, as well as climate change. This light is highly disruptive for moths which are predominantly nocturnal and rely on natural light, such as moonlight and starlight, to orient themselves. When moths vanish, so, too, can the many creatures who rely on them. Continued research of the sort conducted during Moth Night is therefore essential to the ongoing efforts to conserve not only moths, but the entire food web they support.

Light pollution near New Hope Creek, summer 2024. This picture was taken at 2:00 a.m. The New Hope Corridor has seen some of the worst declines in moth populations in the region.

For much of Moth Night, however, the atmosphere was jubilant rather than grim. It was, after all, a celebration. Friends and families eagerly completed their Moth Bingo cards, children scrupulously examined insects with their magnifying glasses, and biologists discussed taxonomy and life histories and graciously shared their knowledge with anyone curious to learn more.



Counterclockwise from top left: a man finds a moth next to one of the UV lights; a game of Moth Bingo; a woman uses a flashlight to search for moths on one of the survey sheets; Patrick Coin and David George review photos of moths observed throughout the evening,

This festive mood seemed to suggest that, to many, moths are worthy of attention not merely because of their vital and irreplaceable ecological role, but simply because they are fascinating, strange, and beautiful. Moth Night was an opportunity for people to learn about and participate in the rigorous science that goes into understanding and protecting moths; it was also an opportunity to experience them, to venture out into the forest and, at least for a couple of hours on a Saturday night, peer into their remarkable world.

Counterclockwise from top left: David George shows a guest a caterpillar; Kenneth Geisert, center, answers questions from guests; Jeff Niznik records an observation; a close-up view of an Imperial Moth (Eacles imperialis).