FALL TRAVEL ISSUE

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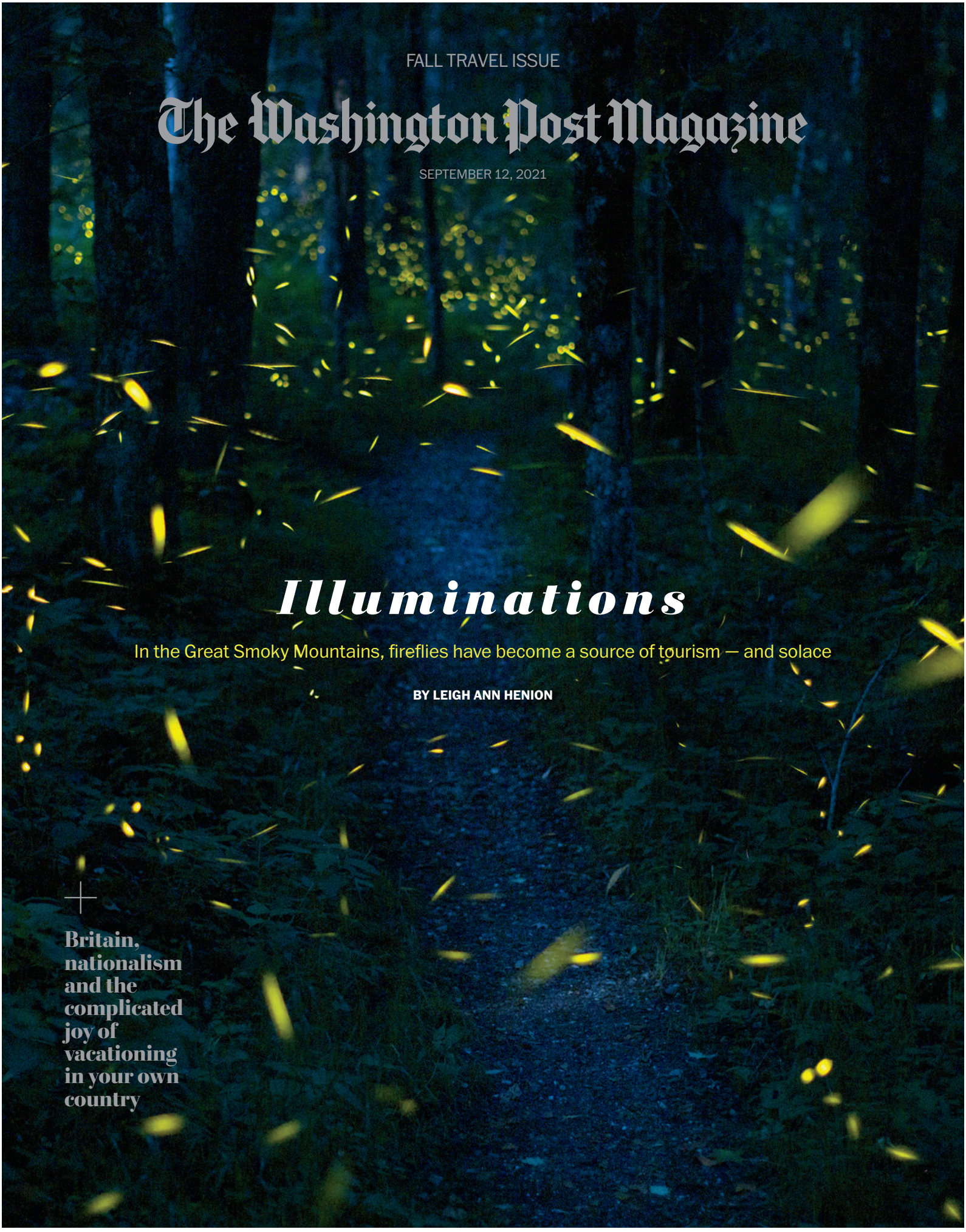


Illuminations

In the Great Smoky Mountains, fireflies have become a source of tourism — and solace

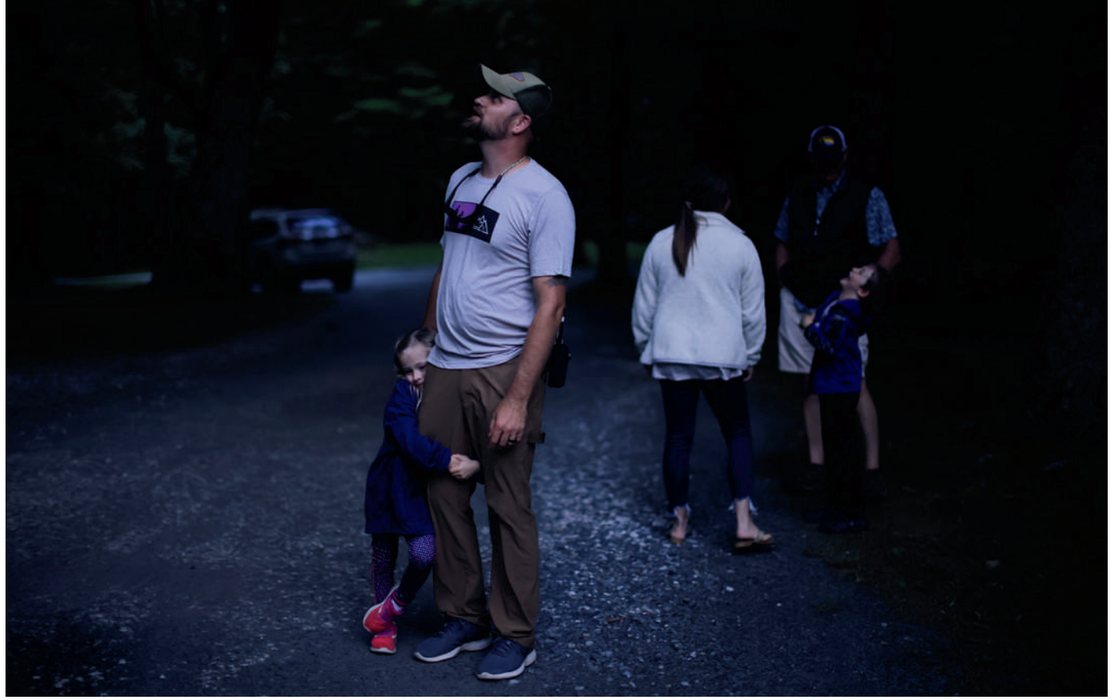
BY LEIGH ANN HENION

Britain, nationalism and the complicated joy of vacationing in your own country

In Search of the Light

Tourists in Appalachia are seeking out fireflies and finding comfort in these dark times

STORY BY **LEIGH ANN HENION** PHOTOGRAPHS BY **TRAVIS DOVE**



I've been in Great Smoky Mountains National Park for less than an hour when I'm mistaken for a woodland fairy. Even though I'm here to witness the ethereal phenomenon of synchronous fireflies — a species famed for its ability to flash in unison — the association is surprising since, after a pandemic period of virtual living, I'm feeling more like a haggard dweller of the modern world than an enchanted being of old-world mythology. In fact, when I hear a stranger calling out from across the forest glen I'm wandering, it takes me a second to realize that she's addressing me. She waves me over and asks again: "Are you a magical creature?"

The woman gestures toward the two young children with her and says, "We saw you walk down to the river, and then you disappeared. I told the girls you must be magical. This whole place is magical. Reminds me of Narnia or something."

It does feel like we've traveled through a portal to another realm. The woman is sitting on a porch stoop, but there's no porch. And there's a chimney nearby, but no house. To reach a trailhead in an area of the park known as Elkmont, we — along with hundreds of other visitors here to witness the synchronous fireflies' light show, which generally occurs in a two-week period around early June — had to walk through an avenue of mountain cabins, abandoned after the park was formed. Remnants of the former human settlement — some of which has been lost to the elements — are visible everywhere, scattered among river-rounded stones and beds of fern.

This year, Tufts University released the first-ever comprehensive study of firefly tourism. Researchers found that, globally, 1 million people travel to witness firefly-related phenomena every year. Given that the synchronous fireflies of Elkmont are some of the most famous fireflies in the world — and that I live in their home region of southern Appalachia — coming across the study during lockdown made me think it was past time to see these brilliant creatures.

The firefly event in Great Smoky Mountains National Park, which straddles this section of Tennessee and my home state of North Carolina, draws seekers from across the continent. Years ago, the National Park Service instituted a lottery for people to secure passes, since the species' growing popularity raised concerns about conservation. But, even with these limitations, the annual gathering isn't a small one.

I explain to the woman that I'd dipped down to the river for a brief respite from the crowd. The woman, visiting from Michigan, empathizes. "People aren't wearing masks here like they are in Michigan. It's hard to know what to do, know what I mean?"

Indeed, I do. It's been hard to know what to do for a long time running. Even mundane errands have, throughout the pandemic, required abstract risk assessments. And it doesn't feel like we've figured out, as a society, how to reckon with the magnitude of what we've been through.

I'm seeking fireflies' bioluminescence, or living light, mainly because I've been spending too much time basking in the artificial illumination of screens. According to the International Dark-Sky Association, 99 percent of people in the United States don't have access to natural night anymore, the blinking sun-and-moon patterns with which we evolved. Internationally, artificial light pollution is growing at a rate of 2 percent a year with no signs of slowing. It's as if we, as a species, have grown afraid of the dark.

Since the initial covid shutdown, I've stayed up too late, acting as if the light of screens might stave off doom. In a sustained state of hypervigilance, I've fallen under the influence of phones, tablets and computers. For several seasons now, I've been beating myself against screens like a moth against a lightbulb, seeking entertainment that might numb me, news that might comfort me. In a time of global confusion, I've been trying to find answers that do not exist, and the process has only served to disrupt my animal instincts. Tonight, I'm hoping to break the spell that screens have cast.

These pages, from left: John Caveny, a natural resource management specialist for the Grandfather Mountain Stewardship Foundation, brings his family along to observe fireflies. A synchronous firefly in western North Carolina. Previous pages: Synchronous fireflies glow along a road on Grandfather Mountain.

Along the trail designated for firefly viewing, people have been setting up folding chairs, as if they're waiting for a parade. They're a diverse bunch. There are 9-month-olds and 90-year-olds among them. Some of them have been to the firefly viewing several times. Some, from the West Coast, are awaiting the first firefly sighting of their lives. They've come because they needed time alone after a year of remote learning with five kids in their house. They've come because this event was something they'd always wanted to attend and, because of the pandemic, they've stopped taking next year for granted.

Firefly habitat is so specific, so mercurial, that it's possible to see a great show from one section of the trail while another remains relatively dark. No one, not even rangers, can predict the best seats for the evening, so people mill around until they find a spot that feels right to them. Finally, dusk comes.

When the first synchronous fireflies appear, sporadically flashing, they don't seem, to my untrained eye, to be much different from common species that illuminate backyards across the country. But, as their numbers grow, expectant murmurs travel up and down the row of spectators. Instinctively, when hundreds of insects grow to be thousands — each appearing to light the one next to it, like a candle being passed — the crowd stands.

For a while, the insects' rhythms remain a bit discordant, like that of an orchestra warming up. Scientists have found that the more individuals there are participating, the more in tune the insects get. Before long, there are so many of the species that it's clear they're working in unison. The effect isn't a lights-on-lights-off situation, as I'd expected; it's more like watching a human-born stadium wave, when members of a crowd incrementally lift their hands, swept into the fervor of something larger than themselves.

The insects are responding to each other's light, working with their neighbors to find their role in the whole. From a distance, the activity appears as a shimmering current running through the forest from right to left: Whoosh. Then, darkness. Then again, a whoosh of light.

I cannot see the face of the woman beside me, but I come to attention when she calls out, "*Dun, dun, dun, dunnn*," mimicking Beethoven's famous Fifth Symphony motif. "It's like they're playing music," she says to someone beside her.

Despite the awkwardness of approaching strangers in the dark — even more acute after a year when many people haven't seen their extended families outside of video calls — I pipe up: "I couldn't help overhearing what you just said about music. Have you heard about how the synchronous fireflies were found here?"

"Whoa, a messenger from the dark!" she says, laughing. "No, tell us!"

So, I share what I've read: about how naturalist Lynn Faust, who used to spend summers in the now-defunct Elkmont community, grew up admiring the fireflies we're watching. As an adult, she came across an article about synchronous fireflies in Asia, and she recognized similarities in what the scientists were reporting and what she'd seen as a child.

When she reached out, researchers were skeptical that an unknown-to-science species existed in the most-visited national park in the country, so she sent a musical composition mimicking the sequence of flashes in Elkmont. It's what convinced firefly scientists that they should make the trip to Great Smoky Mountains National Park, where they confirmed a never-before recorded synchronous species: *Photinus carolinus*. This is, ultimately, how we all ended up in Elkmont, bearing witness this evening.

I can sense more people gathering around me as I'm speaking. When I finish, strangers' voices ping to my left, to my right, from the trail behind me. Their words, unmuffled by masks, ring like bells.

"Amazing!" says a baritone.

"Fantastic!" shouts a soprano.

"What, exactly, do you think they're singing?" a man asks the crowd.

"Beyoncé! 'All the Single Ladies'!" a woman says. Laughter ripples up and down the trail.

Most people in attendance seem to be familiar with the concept of firefly flashes as a function of mating. The insects we're seeing are males, signaling to females who stay close to the ground. Scientists generally agree about the utility of fireflies' bioluminescence as mating-related, but they've long tussled over how, exactly, fireflies make light. It's generally thought that illumination occurs when a firefly opens an air tube — allowing oxygen to ignite inborn, organic compounds in its body. This means, in a roundabout way, that when you see a firefly light up, you're watching it take a breath.

Collectively, the crowd gasps and sighs as fireflies crackle through the forest. But, despite the dazzle, I find my eyes wandering toward the infinitely dark ground. Because, once I started researching fireflies, I came across this unshakable fact: By the time we see a firefly in flight, it has potentially been living among us for up to two years in various life stages, dimly glowing

on the ground. What we're witnessing now is the grand finale of a long-term metamorphosis. These famed fireflies have spent much of the past year crawling around in the dark to find what they elementally needed to survive, so that their species might ultimately thrive.

Throughout the pandemic, these creatures have been waiting for their turn to rise. And, finally, they've found it. When people begin leaving the park, headed for their hotel rooms and tents, the fireflies are still working like cells of a glowing, forest-size lung.

There are more than 2,000 known species of fireflies in the world, and 19 of those — with synchronous being the most famous — reside within the borders of Great Smoky Mountains National Park. Will Kuhn, director of science and research at Discover Life in America, a nonprofit centered on biodiversity, believes there are more. "I don't think we've found all firefly species in the park," he says. "And there's still a lot we don't know about the ones we have found." Given that species are still being discovered, there is a chance we won't know what we've got even after it's gone. Globally, firefly populations are under assault, and the largest threats to their well-being — according to the Tufts report — are habitat loss, pesticide use and light pollution.

When I meet Will, he's holding court with two dozen people who've signed up for a synchronous firefly viewing event hosted by his organization, which often partners with universities and other research institutions. Since Discover Life in America's founding, in 1998, the group's efforts have led to the documentation of more than 10,000 animal and plant species in the national park — with more than 1,000 of those being previously unknown to science.

We're getting ready to travel down the mountain, to a private creekside habitat outside of the park. Will knows the area to be home to a large population of synchronous fireflies, which have now been observed in Appalachia as far north as Pennsylvania. The group is already buzzing with questions. Many of them are here because, year after year, they've failed to win federal lottery passes. Given that they've found another route to witness the synchronous phenomenon, they're already feeling lucky.

One of the women encircling Will says that she's excited for a good show because she has only "plain old fireflies" on her farm in Ohio. Will suggests that, if she does a little research, she'll find that her region is likely home to several species, each with their own songs and longings. The most common firefly in the United States is the big dipper, but there are 150 species with specific habitats and behaviors across the nation. Each of the bioluminescent species' flash patterns are as unique as fingerprints. And, where you find one species in a meadow, there's a good chance you'll be able to find others in forests nearby. Diverse habitats breed diverse kinds of light.

Susan George, a nurse from San Antonio, lives in the city proper, and she's always been amazed that fireflies are tenacious enough to find homes there, in rare squares of land that have been spared from asphalt and concrete. "Sometimes, when I'm sitting out in my yard, fireflies land right on me," she says.

The farmwoman from Ohio nods. "When they do that," she says, "it feels like love."

Susan gives a weak smile. "I'm here because, at the hospital, I work with bugs of a different kind," she says. "And after this year, I really needed a break." Everyone falls silent. We are — as any group of humans might be at this point in history — a swarm of loss embodied. On Norton Creek, we're seeking abundance.

Unfortunately, when we finally make it to the waterway, the

From top: Tourists on Grandfather Mountain. Wildlife wanders the forest.

local population of synchronous fireflies fails to greet us. There are only a few partnered dots of light. Predicting emergence dates of fireflies at Norton Creek involves, as it does everywhere, a formula of temperature patterns and other factors. But, even with careful calculation, the details of firefly metamorphosis can be difficult to precisely predict. It's several degrees cooler here than it has been in the Elkmont region of Great Smoky Mountains National Park. The synchronous residents of Norton Creek apparently need a few more days to fully wake.

Long after it's clear that we've been stood up, the group continues to loiter at the edge of the woods. Just when it seems spirits are irretrievably waning, someone spots a strange orb of light rising from the understory. It peers at us from across the creek, blue and unblinking.

I've been familiar with the term "blue ghost" for years as related to my home region's firefly attraction. Until recently, though, I didn't understand that synchronous fireflies and blue ghosts were different species. They have slightly different mating seasons, but these often overlap as conditions transition evening to evening. Currently, on Norton Creek, it's the blue ghost firefly population that's peaking.

The ghost moves toward us. And it isn't flying, it's floating.

Soon there are carpets of light in and around the forest on all sides of us. These creatures, notable for their neon-bright color and enduring flashes — which hold for up to 60 seconds at a time — are visible demonstrations of how to breathe deeply. Their traceable flight patterns make them look as though they're intoxicated.

As group members wander off, I find myself walking alone. But with every step I take, more fireflies reveal themselves, until the entire mountain is trembling. Blue orb-fairies, hundreds of them, appear to be following me. They're continually swooping and swerving and serenading me — not as a visitor to this landscape, but as part of it.

I've seen the aurora borealis in the Arctic. I've witnessed migrations in the Serengeti, and I've snorkeled the Great Barrier Reef in Australia, yet I'm not sure that I've ever appreciated any natural phenomenon more than this marvel of Appalachia.

By the time I hear voices on the road ahead, I've lost all sense of time and space. In dim moonlight, I can make out half a dozen silhouettes in the distance. Will's voice is hushed. "People typically don't walk around at night without lights on," he says. "But it's amazing what happens when you let your eyes adjust to the dark. When you take the time to really look."

For weeks after I return from Tennessee, I find myself scanning meadows and creeks — not as scenic backdrops, but as habitat. Every plot of land I see is suddenly weighted with secret, golden glory. And each night, around 9:30, when I'd typically be logging on to Netflix, I get the urge to go outside to check on the local firefly population.

The High Country of North Carolina, where I live, is primed to become the next firefly tourism hot spot. In 2019, a population of

(Continued on Page 20)

(Continued from Page 17)

synchronous fireflies was discovered near Boone, N.C., on Grandfather Mountain, a beloved regional attraction. The entomologist who found the species — during a nocturnal stroll, taken on a whim — had been traveling a trail I've walked dozens of times in daylight.

The mountain is closed to night visitors, but natural resource staff members are investigating how Grandfather might host future firefly viewings without harming habitat. Surveys of synchronous populations on the mountain have led participants to find — in locales frequented by more than half a million visitors a year — previously overlooked blue ghost populations as well.

Even my ordinary front door, on the far end of neighboring Watauga County, is a portal to a parallel universe once the sun has set, but it's taken global upheaval — and falling through the proverbial trap door of the pandemic — for me to recognize it. My guided night walks have acted as a sort of training. Even so, it still takes me a few nights of distant firefly watching to leave the familiarity of my front porch. This ease-in approach gives me an opportunity to correct the light pollution seeping from my house, mitigating trespasses against my bioluminescent neighbors that I hadn't been aware I was making. I close curtains, turn off porch lights. The difference made by these small changes is staggering.

Incrementally, as the darkness around my house deepens, I move farther out. I take to sitting beyond an old chicken coop, watching what I now understand to be femme fatale fireflies, winking from treetops, and big dippers plunging through meadows. Then, one night, I decide that I'm going to leave my immediate environs to explore the valley beyond.

I set out for a place where fields and forest meet. When I reach a neighbor's livestock gate — open since its last inhabitants, a family of goats, were killed by an unidentified predator — I pause, mustering the courage to enter the rhododendron hell in front of me, beyond briers where I often see rabbits munching and jumping. But, before I embark on my chosen path, I hear a rustling in the feral pasture above me.

My eyes are not fully attuned, but they're adjusting. I use vestiges of twilight to trace the ragged outline of high grass. I'm on the verge of dismissing the sounds as manifestations of anxiety when a wildcat flings itself into the sky. I can see it, claw to claw, arched like a crescent moon that rises and sets, nearly close enough for me to touch it.

The predator has pounced onto something I cannot see — so quickly that I hardly have time to register what's going on. Then, from thorny bramble, the wildcat exhales in a guttural hiss. The sound slithers around me, and I yelp from the pressure of it.

I turn to run, but somewhere beyond my conscious mind, I have a vague understanding that running would trigger the animal's prey instinct. It takes everything I have to slow my stride. I pivot to an unexpected route, keeping my pace steady.

I target the yellow pool of a distant security light, even though I know the light cannot save me. When I realize this, I mutter aloud: *The light cannot save you.* That's when it registers: I might have set out on my firefly pilgrimage because I wanted to revel in light, but what I needed was a reconciliation with darkness.

Fireflies are light bearers, but — blue ghosts notwithstanding — it is the darkness between most species' flashes that reveal their true character. Without intermittent darkness, there would be no firefly music, no signal, no communication. There would be no synchronized light shows, no J-stroke patterns from the common

"Blue ghost" fireflies (which appear as continuous lines) float below a synchronous species on Grandfather Mountain.

big dipper. There would only be glare. Stars are, after all, in the sky above us, even at midday, but we see them only when the sun takes its leave. Because while it's true that only light can drive out darkness, there are some forms of light that only darkness can reveal.

Maybe we will not see another pandemic. Maybe climate change — caused, in part, by our collective addiction to artificial light — will rear back and strike in ways we cannot foresee at this moment. We live in an age that's asking us to get comfortable with constant disruption. There will always be, as there always have been, threats beyond our line of sight. But, as we venture into the unknown, we also stand to encounter wonders yet unimaginable. I keep walking.

When I'm half a mile from the site of my wildcat encounter, I slow my stride. Out of the corner of my eye, a lone firefly is blinking in what appears to be a synchronous pattern. It repeats, with a dark pause that holds, beat after beat. I cannot imagine that I've found a synchronous firefly here, but I'm no longer willing to discount the potential of any patch of land in southern Appalachia.

Slowly, entire constellations of fireflies rise from the coal-black earth around me, twinkling with oxygen. I attempt to align with their rhythm: *Inhale, light. Exhale, dark.* We are breathing at this moment, in sync, on this complicated planet. And even the deepest parts of the mountain valley I'm standing in are pulsating with life, illuminated.

Leigh Ann Henion is the author of "Phenomenal: A Hesitant Adventurer's Search for Wonder in the Natural World."