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Volume 14

Number 4

# UTILITY ARBORIST NEWSLINE

FOCUS ON DISEASE IS ALL AROUND US

## CUTTING DOWN ON RISK

EXAMINING EXPOSURE  
FROM THE ROOTS UP

LEARN MORE  
ABOUT MANAGING THE  
SPOTTED LANTERNFLY



IMPACTS OF  
CLIMATE CHANGE  
ARE WE PREPARED FOR  
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Turn to **page 12** to learn more about the impact of the Spotted Lanternfly on vegetation and how to manage it.

Find out on **page 18** how utilities are responding to threats in New England's forests.



Cut down on risk for a safer work environment with these tips on **page 22**.



**This is a list of common industry terms and acronyms frequently used in this magazine.**

Best Management Practices (BMPs)  
Integrated Vegetation Management (IVM)  
Light Detection and Ranging (LiDAR)

Occupational Safety and Health Administration (OSHA)  
Personal Protective Equipment (PPE)

Rights-of-Way (ROW)  
Utility Vegetation Management (UVM)  
Vegetation Management (VM)



## President's Message



Tim Walsh



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In keeping with the theme of this edition, “Disease Is All Around Us,” I would like to look at disease in the broadest sense as it applies to the utility vegetation management profession. Let’s start with a definition that will go beyond the mere biological view of disease but expand it so we can look at as many aspects of our work as possible. I will define disease as anything that disrupts, or draws energy or resources from, our collective goal. The overall goal is to provide safe and reliable energy in an environmentally sustainable way.

We can start by looking at the standard “diseases” that impact UVM, those that directly impact the vegetation, and then indirectly or directly impact the energy grid. Things like oak wilt (*Ceratocystis fagacearum*), Dutch elm disease (*Ophiostoma novo-ulmi*), and similar diseases come to mind in the Eastern United States. However, if we are using the expanded definition above, we need to add emerald ash borer (*Agrilus planipennis*), Asian long-horned beetle (*Anoplophora glabripennis*), bark beetles (*Dendroctonus* and *Ips* spp.), gypsy moths (*Lymantria dispar*), and Spotted Lanternfly (*Lycorma delicatula*).

We then need to look at some of the climatic impacts—drought, heat, wind events, ice, and snow loads. Of course, this latter category impacts the former and vice versa. Climate issues weaken trees, both physically and structurally, as well as from a health perspective, which then makes it easier for insects and disease. All of these can improve the chances of one of the greatest threats that we face: fire. Dead, dry, standing, or fallen vegetation, regardless of the cause, increase the fuel loading.

Let’s shift our focus to some of the direct human impacts that can influence our goal. On the obvious negative side of the equation, we have things like arson or negligent activities that create fires. We can also have intentional attacks on the grid in a variety of ways. Moreover, during the process of maintaining the grid, there are a variety of examples of how humans can unintentionally disrupt the flow of energy. Sometimes, tragically, this may also result

in the loss of human life or cause serious injury to the very craftworkers who are trying to maintain the system. Additionally, uninformed, angry, or belligerent customers can interfere with keeping the lights on and the gas flowing.

Shifting to some less obvious things that can draw resources away from the goal, we drift into the budgetary aspects of what we do. It costs a lot of money (lots and lots, actually) to build and maintain our rights-of-way. There are always competing interests for the limited financial resources, capital projects versus operations and maintenance. Public

perceptions about rate hikes, outages, and delays in storm response put additional negative focus on what we do and take resources from where they are needed.

All that being said, on any given day, we all do a pretty good job of maintaining our utility vegetation corridors. Most people don’t even have to think about it when they flip the switch—they know the lights will go on! Let’s take a moment to honor the work that we do to keep things moving, even in the face of all the things that are making it hard to do so. ☘

I will define disease as anything that disrupts, or draws energy or resources from, our collective goal...to provide safe and reliable energy in an environmentally sustainable way.

Tim Walsh



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## Executive Director Message



Dennis Fallon



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The last movie I saw in a drive-in theater was *The Perfect Storm*—a story about a fishing boat that gets caught in an intense storm in the Atlantic Ocean. The storm became so intense due to the way the weather system intensity was able to grow. The *how* and *why* these anglers were out in such a storm is more of a topic for a safety edition of the UAN. But the confluence of the weather conditions is more analogous to the theme the Editorial Committee has established for this edition of the UAN—Disease Is All Around Us.

It doesn't really matter if we are talking about safety, fires, diseases, viral social media posts, or any other incidents; they all require a confluence of the correct conditions to have an impact. What is curious is the number of things around us all the time that lack the correct contributing factor to have an impact.

Recently I learned about a fungus in Washington State that has been linked to health concerns because the spores are allergens that can cause irritation to lung tissue. Trees in populated areas are beginning to be impacted by this fungus, *Cryptotestroma corticale*, which raises concerns for the community. The part that makes this fungal story interesting is the fact that this fungus has been observed in Washington since the 1960s and has not been a concern until recently. The species of tree being impacted has also been coexisting with this fungus without incident—until recently. What changed? The *environment* changed. Moisture availability and temperatures in the area around these trees and this fungus are not the same as they were before health concerns arose.

As I write this article, my local health department has mosquito control out distributing the bacterium *Bacillus thuringiensis israelensis* (Bti) from a helicopter into the wetlands near my home office. A month ago, I was snowshoeing across that wetland and there were no mosquitoes. Mosquito larvae need open water to develop. Adding the Bti bacterium to that open water impacts larval

development, resulting in fewer adult mosquitoes. Fewer adult mosquitoes should result in less human exposure to mosquito-borne pathogens and, hence, the connection to the health department's interest in stinging insects in my neighborhood.

We can apply this line of thinking to our work as well. If we manage outcomes of our corridor maintenance activities to enhance site conditions for specific habitats, we can impact the fauna using the corridors. Managers working near populations of Karner blue butterfly (*Lycaeides melissa samuelis*) often incorporate work plans that avoid impacts to wild blue lupine (*Lupinus perennis*), which is the only food source for this endangered species during the larval stages of its life cycle. These lupine preservation actions minimize the risk of incidental take of the butterfly and subsequently work to manage compliance. While this is not a disease example, understanding the systems at work around us not only helps keep us safe, but by better understanding how other industry managers approach impact mitigation, we may gain insights into how we might apply similar principles to our work.

Disease Is All Around Us may at first seem like a strange and possibly out-of-place theme for a UVM-industry magazine to tackle. Yet as access to monstrous amounts of information, data, and studies becomes more available, the opportunity to leverage that information to drive innovation into our industry grows. It certainly is beginning to feel like a perfect storm for learning, growing, and advancing our industry is brewing, and our Editorial Committee has cunningly developed UAN themes that push us to think bigger. If you like to think big and want to influence the environmental conditions in the industry, consider following the lead of the Editorial Committee members by joining a UAA committee where you can help create the conditions that advance our trade. 🌱

It doesn't really matter if we are talking about safety, fires, diseases, viral social media posts, or any other incidents; they all require a confluence of the correct conditions to have an impact.

*Dennis Fallon*





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## RESEARCH COMMITTEE UPDATE



# Engagement, Collaboration, and Artificial Intelligence

**T**he UAA Research Committee focuses each year on emerging areas “bringing items on the periphery to core focus.” This past year we worked on building out a connectivity framework to better engage researchers and connect emergent research with industry-related deliverables. We are engaging in several collaborations that involve artificial intelligence, renewed safety initiatives involving the human mindset, and training to be included in our outward-facing portals. It is the hope as we end first quarter 2023 that we have a working platform by the end of Q4 to more efficiently connect

industry needs and questions with researchers and funding.

Our technology transfer subgroup completed 22 research articles for easy assimilation of pertinent findings and articles to be presented in the *Utility Arborist Newsline*. Our second sub-committee focused on the funding of new research and worked on a process to align funding with research priorities. We are actively working with the Utilities Arborist Research Fund (UARF) to grow appeal to student researchers and actively encourage projects that engage practitioners in the technology and artificial intelligence space related

to utility arboriculture. Our planned goals are to continue to present ROW research effectively, encourage collaborations and build upon existing interfaces with our utility partners, and continue to grow relationships that will capitalize on the nexus of urban forestry.

As we continue into another year along our UAA research road map, we are encouraged by our members who reach out to us from the academic sector, our practitioners, and our utilities and cities: proof that as science meets practice, research can engage all. 🌱





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## SAFETY TOOLS

# Treating Complacency Like a Disease

By Adrienne Jones, Safety Manager, ACRT

**T**he concept of a disease can be described as a condition that impairs normal functioning or harmful development. Do you notice any parallels with complacency?

To spot the signs of complacency, the National Safety Council notes that first you must be able to identify the following signs in yourself.

- Dissatisfaction with your work and/or lack of motivation
- Missing steps in work processes
- Frequent near-misses or incidents

Take a look at Heinrich's Pyramid. In his book *Industrial Accident Prevention: A Scientific Approach*, Heinrich explains for every 300 near misses or first aid incidents, there are 30 minor incidents or injuries. And of those 30, one is a serious incident or fatality. According to the U.S. Bureau of Labor Statistics, in 2021 there were 2,607,900 nonfatal injuries and illnesses reported, and of those incidents, 5,190 were fatal incidents—up 8.9% from 2020.

There's a powerful poem, "I Chose to Look the Other Way" by Don Merrell, that speaks volumes about complacency. The opening line reads, "I choose to look the other way. I could have saved a life that day. But I chose to look the other way." The poem explores not wanting to inconvenience someone or take the time to pause, what it means for the person who didn't speak up, and the consequences of their actions—or lack thereof. It's important to think about our choices, maintain a questioning attitude, and consider what's going to happen as a result of them.

## COMBATTING COMPLACENCY

An article by Jeremy McCombs, an ACRT arborist training instructor, reminds readers that complacency comes well-equipped with consequences, including lost work time, lost mobility or health, lost family time, lost production, permanent disability, or death. So how can we work towards combatting complacency? Stop Work Authority (SWA) is an excellent tool to implement throughout your organization (if there's not a policy already in place).

Thanks to OSHA, workers have a right to refuse dangerous work. This standard, along with SWA, grants you as a worker, at any seniority, the authority to halt operations any time something is unclear, conditions are unsafe, things don't seem right, there is confusion, conditions change, there's an emergency, and so on.

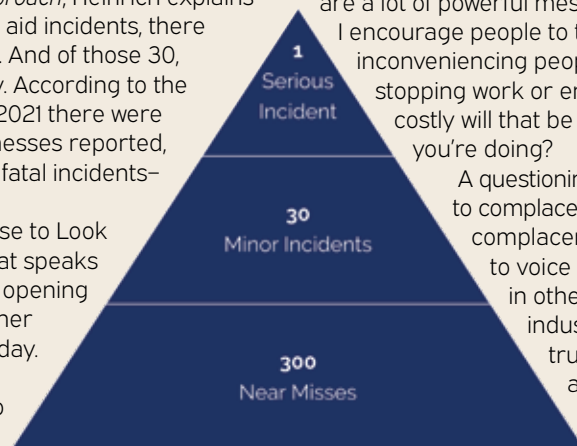
When it comes to complacency, I like to ask myself and others: "If you were faced with a hazard, would you want someone else to raise a red flag?" While we are all accountable for our own safety, we also have a moral

obligation to keep each other safe. It can be intimidating to speak up, especially if you're new to an organization or are surrounded by industry veterans. Organizations can help alleviate apprehension by implementing reporting methods, such as near-miss reporting, anonymous red flag reporting, and introducing peer safety representatives.

It's important to establish peer-to-peer relationships for this very reason. People are more likely to open up to a peer, such as a fellow field employee who knows the situation and the people involved.

The message I try to send to people is if you didn't say something, how will that feel if something happens? There are a lot of powerful messages surrounding the "what if?" I encourage people to think about what's more important: inconveniencing people for a couple of minutes by stopping work or encountering an incident. How costly will that be for someone's life and the work you're doing?

A questioning attitude can be an anecdote to complacency. Don't ignore the signs of complacency in yourself and don't be afraid to voice concerns when you see them in others. I encourage everyone in our industry to establish a relationship of trust, respect, and accountability with at least one person they can talk to when it comes to safety.



## RESOURCES

1. National Safety Council (2020), "Are You At Risk for Complacency?" 5-Minute Safety Talk. Available at <https://www.nsc.org/getmedia/d1fed8c8-a9a2-4676-93c1-230c6b80fb3b/complacency-safety-talk.pdf>.
2. Heinrich, H.W. (1969), *Industrial Accident Prevention: A Scientific Approach*, McGraw-Hill.
3. U.S. Bureau of Labor Statistics (2022), "Injuries, Illnesses, and Fatalities," U.S. Bureau of Labor Statistics. Available at <https://www.bls.gov/iif/home.htm>.
4. McCombs, J. (2021), "The Consequences of Complacency," ACRT Arborist Training. Available at <https://training.acrt.com/recent-news/the-consequences-of-complacency>.

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## Funding the Future Talent of Our Industry

By the Nelsen Money Scholarship Committee

Shortly after the death of Nelsen Money in 2020, the UAA created the **Nelsen Money Scholarship Fund**. Since its inception three years ago, five highly qualified students have been the recipients of the scholarship. Nelsen Money was a highly engaged member of the UAA for many years, including his time as the UAA President, many years leading the Western Regional UAA meeting, and chairing and leading the Editorial Committee to bring you this outstanding bi-monthly publication—the *Utility Arborist Newsline*. He was a mentor to many, helping them along their paths into utility arboriculture or traditional forestry and often providing helpful career perspectives and guidance. Nelsen paid it forward throughout his career, and this is the true foundation of the scholarship: to provide interested students with financial assistance to get them through today's expensive educational system. For all information on the scholarship, visit the UAA website at [gotouaa.org](http://gotouaa.org).

**Donations to the scholarship are key in order to continue the support of students** interested in urban forestry and utility vegetation management. The UAA encourages companies and individuals to donate to fund through the UAA. Two other opportunities to donate this year will be at the Trees and Utilities Conference held in Pittsburgh, Pennsylvania, on September 12–14. Scan the QR codes to donate to the fund as well as the 1st Annual Silent Auction. The silent auction will be held as a fundraiser for the Nelsen Money Scholarship as well as the Arbor Day Foundation's Reforestation Fund. Exhibitors on the trade floor will have the auction item at their trade-floor booth, and individual attendees will have a two-day opportunity to bid on any and all items. Again, all proceeds will help fund these very important programs, so please donate and bid on the items provided by the exhibitors. We look forward to meeting or exceeding our expectations! 🌳



# Nelsen Money

## SCHOLARSHIP PROGRAM

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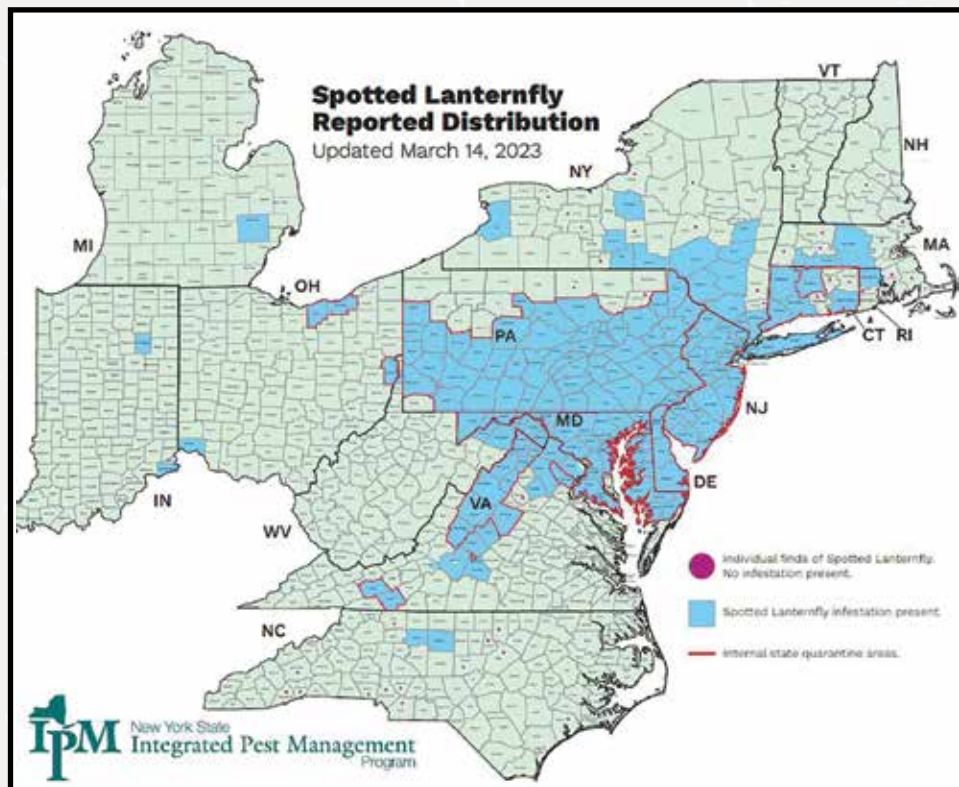




Spotted Lanternfly life cycle. Photo courtesy of Nancy J. Ondra.

# Spotted Lanternfly 101: A Guide for Utility Vegetation Managers

By Stephen Hilbert, Manager Technical Services, Asplundh Tree Expert



Reported distribution of Spotted Lanternfly. Image courtesy of the IPM New York State Program.

**T**he **Spotted Lanternfly (SLF)** (*Lycorma delicatula*) is an insect that is native to eastern China. As an adult it may look like a butterfly or moth, but the SLF is considered a plant hopper, which feeds on the sap of vegetation—primarily over 70 known tree species and grape vines. In September of 2014, the insect was found in Southeast Pennsylvania, about 60 miles northwest of Philadelphia. The initial egg masses were believed to be attached to a shipment of stone that arrived in 2012. Since then, the spread has continued to 13 states. Several states, such as Pennsylvania, Maryland, New Jersey, Connecticut, and Delaware, have statewide or nearly statewide reported distribution. Other states, such as New York, Massachusetts, West Virginia, Virginia, North Carolina, Ohio, and Michigan, only have several counties with reported infestations.

## LIFE CYCLE

The SLF overwinters in egg masses, containing 30–50 eggs per mass. They have one generation per year, as the



adult SLFs die after the first few freezes in the fall. Before a female dies, they lay up to two egg masses in protective areas, such as the underside of tree limbs, protective crotches, and just about any hard surface. This includes stones; outdoor furniture; vehicles, such as cars, trucks and train cars; kids' playsets; and just about any other outdoor items.

As temperatures start to warm up in the spring, the eggs hatch into the first instar nymphs, which are only about  $\frac{1}{4}$ " long with black and white spots. They are extremely small and are occasionally mistaken for ticks. As the insect grows into the second and third instars, they retain the black and white coloring. As the insect molts into its fourth instar, it changes to red coloring with black and white spots, and is about  $\frac{3}{4}$ " in length. With its final molt, it is about 1" long with black spots and pinkish-tan wings over its body. When it spreads out its wings, the Spotted Lanternfly is very colorful underneath. The first four instars, the insect crawls in the vicinity that it was hatched, but it can hitchhike on vehicles. Only adults have the ability to take flight.



Photo courtesy of Eric Clifton.

### CAUSE FOR CONCERN

Spotted Lanternflies are voracious feeders and will feed on a wide assortment of fruit, ornamental, and woody trees, with Tree of Heaven (*Ailanthus*) being a preferred host. As an introduced species, there are limited natural predators that can suppress SLF populations, unlike in their native range which has host of predators that can keep their populations in check. As the infestation grew in Pennsylvania, seemingly hundreds if not thousands of these insects could be on individual trees. They feed on the sap of trees with piercing/sucking mouthparts. Most healthy ornamental trees can withstand the feeding of the SLFs without much damage. The real concern comes from the agricultural industry, particularly fruit tree growers and vineyards. The adults are feeding when many fruits are coming into maturity, as the adults gather to feed and mate. According to studies by the Penn State Extension, it has been shown that crop yields decline significantly after SLF feeding. Clemson Extension has reported that the SLF has had a \$2.6 billion impact on the ornamental plant industry and a \$915 million impact on the fruit tree and grape industry. In addition to pulling the sap from the trees, their excretions still contain a significant sugar content, which leads to the formation of sooty mold that can cover leaves and cause a decrease in photosynthesis in impacted trees. The SLF does not bite or sting people, but their secretions can attract other insects, such as yellowjackets, paper wasps, and bald-faced hornets, which can be a concern for vegetation managers working on a tree infested with SLF. Even though they are called plant hoppers, the SLF can fly up to 3–4 miles from where they hatched on their own and the adults will hitchhike on vehicles, causing further spread. Couple this with the fact that the females will lay eggs on just about

anything. This can cause long-distance spread of the insect, which it is predicted to spread to California by 2033, according to a report published in *Nature*.

### CONTROLLING THE PEST

All hope is not lost though. In areas where the infestation first occurred, the populations of the SLF have significantly been reduced through observations of fruit and grape growers. It appears that in areas where the Spotted Lanternfly was first found in 2014, researchers have been observing the SLF being predated upon by spiders, bald-faced hornets, and birds. Also, there are options for insecticide control on ornamental trees and shrubs. One of the more interesting recent findings is that two naturally occurring soilborne fungi has been infecting the SLFs and causing their death. These two fungi are in the family of *Cordyceps*—which fans of the show *The Last of Us* will be familiar with their mode of action. These fungi infect and take over the movement of the host to propagate. In the case of SLF, the fungi cause the insect to climb high into a tree, open up its wings, and, in the last act, rain down spores on the SLF that have gathered to feed and mate, causing infection of those below. Studies are ongoing in utilizing mycoinsecticides that have already been in use for other pests as an effective tool in managing SLF populations.

### IMPACTS TO UTILITY VEGETATION MANAGERS

Unlike other invasive insects and diseases, such as emerald ash borer and Dutch elm disease, SLF has not been observed to cause large-scale mortality like those other pests. The impact on the utility industry comes in the form of quarantine restrictions and truck inspections. Each state has their own requirements for inspections and quarantines, and it is important to be compliant to help limit the spread of the insect and avoid any regulatory penalties. Quarantine requirements can be found at the USDA website (<https://www.aphis.usda.gov/aphis/resources/pests-diseases/hungry-pests/the-threat/spotted-lanternfly/spotted-lanternfly>). Utility vegetation managers need to be made aware of what is required of them, especially during large-scale storms when employees are potentially moving into and out of quarantine areas. The SLF may be more of a nuisance for vegetation managers compared to other invasives, but we need to maintain professionalism by understanding what this insect is, what is required working in areas with an infestation, and how it impacts others. 🌱



Spotted lanternfly killed by *Beauveria bassiana*. Photo courtesy of Eric Clifton.

# Managing an Ongoing Threat: Bats and White-Nose Syndrome

By Tricia Fry, PhD, Biologist; Amy Haeseler, BS, Biological Science Technician; Anne Ballmann, PhD, DVM, Wildlife Disease Specialist; and Tonie Rocke, PhD, Research Scientist, U.S. Geological Survey National Wildlife Health Center



**Figure 1.** Little brown bat (*Myotis lucifugus*) close-up of nose with fungus, New York, October 2008. Photo courtesy of Ryan von Linden, New York Department of Environmental Conservation.

Bats provide numerous ecosystem services to support biodiversity, agriculture, and human health. Along with the intrinsic benefits we gain from sharing our community with bats, they consume insect pests, including some which can carry plant and human diseases. This provides approximately \$3.7 billion worth of insect control for farmers, improves crop yields, and reduces crop losses, lessening the need to use pesticides. In addition, bat guano (droppings) can be used as natural fertilizer, providing nutrients to plants. However, in recent years, these bat-provided ecosystem services have been interrupted by the emergence of an unknown pathogen that appears as a white, powdery substance on the noses and wings of bats during winter hibernation (Figure 1).

To survive through winter, certain species of nonmigratory bats hibernate to survive prolonged periods of low insect-prey abundance. Starting in 2006, a growing number of dead bats were found in and around caves and mines where bats hibernate, most exhibiting this white substance around their noses. The substance was identified as a previously unknown fungus, *Pseudogymnoascus destructans* (*Pd*), which

occurs in cold, dark, and damp locations—conditions that coincide with desirable characteristics of bat hibernation sites.

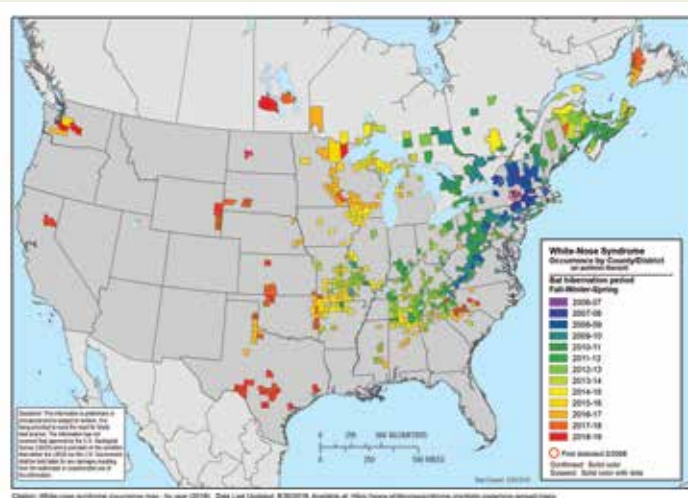
The fungus causes the disease called white-nose syndrome (WNS) by invading the skin of bats and causing them to rouse from hibernation more frequently during winter, depleting their winter fat reserves. The fungal infection can also cause dehydration, electrolyte imbalances, and death. Even if infected bats manage to survive through the winter, wing damage caused by the invading fungus can impede flight, making it harder for affected bats to capture food and avoid predators. Bat population declines from WNS have been severe, with reductions in the northeastern United States and Canada nearing 90%. In some locations, entire colonies of bats have been lost to WNS. Some bat species are even at risk of extinction due to WNS. For example, the Northern long-eared bat (*Myotis septentrionalis*) (Figure 2) was recently added to the U.S. Fish and Wildlife Service's Endangered Species list because of declines caused by the disease.

Humans cannot get WNS, but they can unknowingly transfer the fungus from one place to another and may have helped it spread across the United States and Canada (Figure 3). As no bat species are known to migrate between Eurasia and North America, it is likely that humans inadvertently brought the fungus to North America from Europe or Asia, where the fungus is thought to have originated. Bats in Europe and Asia appear to tolerate the fungus, and those bat populations have not been affected by WNS as severely as bats in North America.

Fortunately, WNS is not a threat to all North American bat species, and some species have remained disease free. However, species such as the once ubiquitous little brown bat (*Myotis lucifugus*) and other small bat species that hibernate are affected by WNS and have suffered drastic population declines.



**Figure 2.** Northern long-eared bat (*Myotis septentrionalis*). Photo courtesy of Al Hicks, New York Department of Environmental Conservation.



**Figure 3.** Map of the distribution of white-nose syndrome across the United States and Canada from 2006–2022. Photo courtesy of the U.S. Fish and Wildlife Service–White-Nose Syndrome Response Team.



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Although attempts to understand and study the disease have been a global effort, no cure for WNS has been found. To date, mitigation efforts have focused on following decontamination procedures to kill any fungus hitchhiking on equipment or gear that enters caves and mines or comes into contact with bats, strategies to conserve bat habitats, and even vaccination against the disease to limit the spread and effects of WNS to bats.

Until a better solution is found, preventing the spread of WNS is up to all of us. For people encountering bats, especially in caves and mines, proper decontamination processes are essential to protect bats. White-nose syndrome spreads mostly through bat-to-bat contact, but the causative fungus can persist and remain infectious for many years in suitable environments, even after bat populations have disappeared. Recreationists, including cavers and cave owners, and biologists are advised to decontaminate all gear, footwear, and clothing when moving between these locations. Outside of the winter hibernation period, many of the imperiled bat species rely on suitable forest habitat to forage and to provide roosts to raise their young. Forest management practices that include identifying and preserving roost trees are therefore important strategies for bat conservation. A useful resource on “Beneficial Forest Management Practices for WNS-affected Bats” (U.S. Fish and Wildlife Service–White-Nose Syndrome Response Team 2018) is available for free download at [whitenosesyndrome.org](http://whitenosesyndrome.org).

Recently, scientists at the University of Wisconsin–Madison and the U.S. Geological Survey, National Wildlife Health Center in Madison, Wisconsin, developed an edible, oral vaccine that may increase survival rates of bats exposed to the *Pd* fungus, potentially providing a mitigation strategy (Rocke et al. 2019). Research that involves feeding bats the vaccine and monitoring their health and return to hibernation sites or maternity colonies is ongoing.

While WNS is here to stay, it is not all bad news for bats and the ecosystem services they provide. In some areas where bats were hit hard by WNS, they are adapting to the disease and their populations are beginning to recover. In addition, continued surveillance efforts in the western U.S. and Canada to detect the fungus as soon as it arrives provide opportunities in those areas to prevent or minimize the devastating effects WNS has had on eastern North American bat populations. Protection of bat populations benefits from a cooperative approach that includes maximizing our understanding of the disease while protecting bats from other threats, including collisions with wind turbines and loss of critical habitat. Partnerships between scientists who study bats, wind energy companies, and the field biologists who are managing habitat near wind turbines provide a path forward for achieving our common goals of developing sustainable energy sources and conserving bats, a critical component of our ecosystem.

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# New England's Roadside Forest Is Under Attack

By Bob Allen, New Hampshire Vegetation Manager, Eversource Energy

New Hampshire is filled with natural attractions and is one of the most forested states in the nation. The White Mountains are well known but there are countless other forests throughout the state that provide us with exhilarating hikes and amazing vistas. In almost every direction you look there is arboreal beauty—conifer forests interspersed with white birch and sugar maples along virtually every road, and shady groves filled with stately beech and oak—that changes the landscape every month as they majestically evolve from bare to flower, then dense green foliage, culminating with a kaleidoscope of autumn colors before the cycle begins anew.

This annual fall display of New Hampshire trees is world-renowned, and their natural beauty attracts tourists and tree lovers from across the globe throughout the year. However, many of our native species are facing threats from invasive insects, diseases, and issues caused by climate change. There are also abiotic, damage-causing agents due to the increase in human population and activity, which puts more vehicles on the road. New Hampshire is loaded with dirt roads, but more people commuting in the state can mean increased requests for paved roads, which will help vehicular traffic but affect the roadside forest with the resulting growth in impervious surfaces—including less water availability, along with soil compaction. This is a recipe for declining tree health, which is what we have experienced over the last few years in the utility arboriculture and tree maintenance world—a challenge that is shared throughout New England and is likely to persist.



Spongy moth can defoliate groves of oak trees quickly, as seen here in Henniker, New Hampshire. *Photo courtesy of The Concord Monitor.*

As the largest utility in our region with customers across three states, addressing hazardous, dead, or dying trees is imperative for us at Eversource—not just to ensure reliable service for our customers but to also support public safety in our communities, while nurturing the natural and cultural resources that are essential to who we are as New Englanders. This monumental task requires the collaboration of utilities, communities, regulators, and other government and elected officials, as well as individual property owners—and public education about our shared responsibility is essential.





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Ash trees exhibit "blonding" on the bark due to woodpeckers searching out the emerald ash borer. Photo courtesy of NY State Cooperative Extension.

The New Hampshire Division of Forests and Lands is a strong partner in those efforts, and their 2022 New Hampshire Forest Health Newsletter offers a comprehensive overview with statewide data and stark images that offer helpful insight. And at Eversource, we're working every day with municipalities, schools, property owners, and others to "plan before you plant," offering tours of our public utility arboreta, providing resources like our guide with 30 recommended trees under 30-feet tall, and advancing other educational partnerships.

### ■ NEW HAMPSHIRE'S ROADSIDE FOREST

The dominant deciduous tree species in our roadside forest include sugar and red maple; white, gray and sweet birch; ash; cherry; poplar; and oak. For conifers, it includes white pine, hemlock, spruce, and fir. While New Hampshire doesn't have the most fertile soil, these species all regenerate easily in our climate. The softer, fast-growing species, such as poplar, red maple, gray birch, and cherry, all compose the pioneer forest in the Granite State, and all can grow to the height of our overhead lines within our regular 4-5-year maintenance cycle.

### ■ SPONGY MOTH

The mature or "climax" forest community is typically oak and beech, and oak has been particularly hit hard by the Spongy Moth caterpillar (*Lymantria dispar*) in recent years. This insect has cyclical population explosions, oftentimes after successive drought years, because one of the natural enemies of this pest is a fungus. And, as you can imagine, droughts are not conducive to fungi. We therefore saw defoliation in several areas of the state in 2022, totaling 50,000 acres. While a healthy oak can re-foliate after the caterpillar feeds, the stress that process adds to a tree is potentially harmful and builds over time—if a tree goes through defoliation two years in a row, it may not survive. This will leave standing dead roadside trees that pose public safety risks as well as threaten electric reliability. Furthermore, fast-growing (and often invasive) species regularly fill the void left by the canopy "hole" caused by the dead tree.

### ■ WHITE PINE NEEDLE DISEASE

The logging and timber industry is an important sector of New Hampshire's economy, especially in the northern areas of the

state, and disease and insect threats to the most marketable species are a serious concern. Our tallest and most abundant native conifer, White Pine (*Pinus strobus*), is under serious threat, like many of these species, and has several unique diseases and insects that are affecting it. These diseases are now catalogued under the acronym "WPND," or White Pine Needle Disease.

### ■ EMERALD ASH BORER

Emerald ash borer (*Agrilus planipennis*) is an invasive pest that has been in the United States since the 1990s. Believed to have arrived in pallet wood on a shipping container, this buprestid beetle has killed tens of millions of ash trees. The beetle larvae bores into the tree through the bark and feeds in the cambium layer. As the adult beetle emerges from overwintering, they eat their way out of the tree, leaving a telltale D-shaped exit hole. Ash trees of all ages are affected and usually die a quick death. Unfortunately, most owners are not aware that their ash trees are infested initially, which can be signaled by woodpeckers searching for tasty beetle larva meals, pecking away at the bark of ash trees, changing the bark's color and appearance. This is known as "blonding," due to the color of the bark changing from gray to yellow.

### ■ HEMLOCK PROBLEMS

Hemlock (*Tsuga canadensis*) is suffering from two different invasive species insects—Hemlock Woolly Adelgid (HWA) (*Adelges tsugae*) and Elongate Hemlock Scale (*Fiorinia externa Ferris*)—that both reduce the vigor of the tree. Instances when both are on one tree will usually combine to kill the tree, and this has happened often in Southern New Hampshire.

The Woolly Adelgid has been in New England since the late 1980s, believed to have arrived on the winds of Hurricane Gloria in 1985. Its presence is established throughout New England, appearing in Massachusetts, Connecticut, Rhode Island, and the southern portions of New Hampshire, Maine, and Vermont. The wooly or cottony bundle under the needles is indicative of infestation, and HWA has piercing mouthparts that "suck the juice" out of the hemlock needles and inhibit the needle's ability to add to the health of the tree.

Hemlock Looper (*Lambdina fiscellaria*), a native pest, feeds on needles and has been cyclical in its population in Northern New England, and Elongate Hemlock Scale is an armored scale that feeds by inserting its threadlike mouthparts into the needle, causing plant growth to slow and yellowing and premature dropping of needles.

When Hemlock Looper infests a tree, tree mortality usually happens quickly over one growing season. The death of roadside Hemlocks causes immediate reliability concerns and can also have a longer impact. Hemlocks, when healthy, can suppress the establishment of fast-growing brush species. But after they succumb, there is a new area for invasive species to colonize with less competition for nutrients and sunlight.

### ■ BEECH LEAF DISEASE

The newest emerging threat in the Northeastern Forest is Beech Leaf Disease (BLD), which has been observed over the last several years, though it wasn't until 2022 that its causal agent was identified: a problematic critter in the nematode family. While there are many graduate students studying tree insects and diseases, the field of forest foliar nematodes is



relatively scant in research. Therefore, it wasn't an obvious choice when diagnosing the recent beech mortality. However, it was determined that the nematode feeds inside the bud prior to budbreak, causing interveinal "banding" of the leaves. This banding reduces the area of the leaf available for photosynthesis, which in turn reduces tree vigor. The nematode feeds on both American and European beech. There are treatments being developed for use on specimen trees, but the forest population will not be an easy fix.

The probability is high that we will lose a significant amount of our forested beech trees once the nematode is established. Beech is also a significant landscape, park, and cemetery tree, and the case-by-case decisions that will need to be made for saving this beautiful species will have both short- and long-term implications, including financially. While it is rare that we have to maintain roadside beech trees for electric reliability, the trees that will be planted as replacements could bring about different challenges. As the statewide forest health coordinator, Kyle



Beech leaf disease damage can be identified by the interveinal "banding," as shown here. *Photo courtesy of NY State Cooperative Extension.*

Lombard, said, "Beech Leaf Disease is the next elephant in the room when it comes to overall tree health problems in New Hampshire, and that room is already pretty crowded."

## ■ HOW UTILITIES ARE RESPONDING

With the prevalence of hazardous trees along our roadside forest increasing, and threats to tree health and, consequently, greater risks to electric reliability and public safety likely to persist, utilities based in New England have increased their risk tree budgets over the last few years. In New Hampshire, Eversource's vegetation management budget is split almost equally between normal cyclical maintenance and tree removal or reliability work. The dramatically increasing volume of standing dead ash, oak, and hemlock this decade has required an increased focus on tree removals, and larger bucket trucks, backyard lifts, grapple saw booms, and cranes are all common to see across the New England electric system daily. This new equipment brings efficiencies to the work as well as additional challenges, such as the training needed for safe operations. Furthermore, like many industries, we're seeing workforce challenges, as the number of new qualified candidates in the field is decreasing. When I attended college, there were 62 students in my arboriculture major. Forty years later, there are two. If we do not have enough developing talent entering the craft, then equipment improvements will continue to be the industry focus—because there will always be a new insect or disease that will wreak havoc on our roadside forests.

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## 2023 Richard E. Abbott Safety Scholarship Recipient: Jordyn McNiel

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Jordyn McNiel

We showcase our commitment to safety and the development of our employees through our organization's Richard E. Abbott Safety Scholarship—a \$1,000 award that is granted annually to an employee who is seeking to further their career development and commitment to safety.

For as long as ACRT Lead Arborist Jordyn McNiel can remember, safety has been an integral part of her life, including being named as one of this year's Richard E. Abbott Safety Scholarship recipients.

When she joined ACRT in April 2020 at the height of the COVID-19 pandemic, McNiel took an interest in health and safety protocols. She pushed to learn more, stepped in as an Area Safety Representative (ASR), and became the co-chair of the group shortly after.

When deciding how to allocate her award, McNiel polled a handful of operations managers throughout the company, including Operations Manager David Leary—someone she looks up to. With their input, McNiel decided she wants to further her career by gaining an additional certification or attending an industry event.

Leary shared, "Jordyn has exemplified her determination and self-motivation by taking advantage of advancement and career opportunities within an exceptionally short time frame. She has thrived in becoming an engaged safety leader who is committed to the growth of our culture of safety. She is the epitome of a dedicated employee making the best of developmental opportunities to enhance the furtherance of her career."

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**H**azard and risk mitigation has been a favorite topic in safety for quite a long time, and is likely to remain so for many years to come. A hazard is, of course, something that can cause damage or harm, whereas risk is generally defined as the *probability* of said harm. Words are important, and the two concepts are often confused or incorrectly used interchangeably. The list of hazards inherent in our industry seems to grow daily, while risk mitigation seems somewhat stagnant or misguided. Even the best companies hover around a 2.0 incident rate. Hazard identification is straightforward enough, as virtually anything can present as such, given timing and circumstances. Perhaps our perception of risk could use some refinement. Sadly, there is no Auto-Tune or M-Tronic Quick-Tune for such things. I propose we examine some of the industry traditions and customs that may be weighing us down.

Organizations like OSHA and ANSI have basically worked miracles toward the goal of safety in our industry. We've got chip-truck loads of standards—but we are still getting injured. Struck-by injuries remain stubbornly high, often from the felling of trees. For some, the solution is to ban the felling of trees over a certain height. Is that really the best solution? It hardly seems reasonable to expect someone to make 50 cuts aloft with adeptness, but not trust them enough to make four cuts on the ground. An opposing argument might be strong if only

## Cutting Down on Risk: Examining Exposure From the Roots Up

*By Erik Sveum, Safety Supervisor, Wright Tree Service*

traditional felling is factored. Nonetheless, it makes for a good “would you rather?” kind of situation: you can sustain an injury aloft (alone) with essentially no supplies OR get hurt on the ground where there are many people and supplies. Do we have to pick one?

Enter the bore-cut-trigger method (BCT), which allows the faller to precisely establish the hinge and use their path of egress with a good deal more leisure than that of traditional felling, greatly reducing exposure. The term “escape route” was changed to “path of egress” because the former implied a degree of FEAR (Forsake Everything And Run). Though first developed a few decades ago, BCT hasn't gained the popularity one would expect, particularly among the logging community from whence we've adopted so many practices. We should work to encourage this superior practice and shed the undue deference to traditions and bravado of the past.

To pick on felling a bit more, failure to measure proper distances remains a problem. Though several methods are available to quickly estimate with great accuracy, the fallible human eye alone remains the default. One of the foundational gifts of science is taking human perception out of the equation. The stick method works well enough when employed in calculating the height for straight trees on flat ground, but it avails us little in finding 1.5x height with any accuracy. A simple angle tool on a smartphone can do the trick, with 45 degrees being the height, 33.7 degrees for 1.5x height, 26.5 degrees for 2x. It is difficult to fathom another profession in which eyeballing is so readily accepted, even in scenarios that are rather far removed from life and death.



Consider a bank, a deli, or the humble gas station. To be a patron of these services is to expect a high degree of accuracy from said services. Why, then, is a visual guess accepted in arboriculture when it comes to felling? Inherited hubris, perhaps, and so much unneeded risk.

Let us strike home again on struck-bys and consider pole tools. Suppose there is a loose branch (hanger) low in the tree. What do you grab? A pole, right? It is a little higher up than you thought, so what do you do to reach it? Well, the shortest line is directly underneath it. Not too sharp a move for what should be obvious reasons, scarcely distinguishable from cartoonishly cutting a limb on the wrong side of where one is sitting. As arborists, we use ropes in many clever ways, but we sometimes fail to utilize them when we should. We typically get hurt by being too close to energy being released—electrical, potential/kinetic (gravity), or otherwise. Ropes allow us to apply force at a distance. Why not use a throwline to pull the hanger? Who among us couldn't use more throwline practice anyway? Why not use a rope to trip a snagged tree on lines, as opposed to exposing oneself to the release of that energy?

Of pole tools, why are we not securing/covering them in the tree or using a loop runner to stabilize the pole and save our lumbers? It is hard to imagine another profession in which precarious placement of dangerous tools is done so flippantly. You don't see law enforcement just tossing their chambered sidearms or tasers up on the dash of their squad cars, do you? When was the last time you witnessed a health care professional store a hypodermic needle high up on an unstable shelf? Yet the best we've

been able to do is try to point the sharp side away from us. Ancient nonsense, self-created hazard, and an all-too-common (yet somehow accepted) risk that could be virtually eliminated by a simple carabiner, a loop runner, and five minutes of training.

Though not traditionally discussed in terms of risk, employee turnover is a massive problem in our industry. Turnover impacts revenue as well as injuries, and new folk are far more likely to

be hurt. So how much do we know about why people leave?

Unfortunately, we don't have industry-specific data, though resources allocated to finding out would







Pruners and pole tools. Loop runners represent a low-cost item that solves many more problems than they could ever create. *Photo courtesy of Travis Farling.*



no doubt be quickly recouped. For the interim, we're forced to work with what we do have, much like our field personnel. A general 2021 Pew Research study found that the top three reasons employees gave for leaving their employer were wages, lack of opportunity for advancement, and being disrespected. In many regions, line clearance arborist pay is well above minimum wage, though as a rule, higher pay equates to higher-caliber employees, generally. We also know there are plenty of opportunities to advance in the industry, particularly if relocation is factored in, though ill-earned advancement is as widespread a problem as it is an undiscussed risk.

That leaves us with what I suspect is the principal reason for folks leaving the job: a sense of being disrespected.

Human resources/sensitivity training will only go so far, so what else can we do? We can demonstrate commitment and respect by investing in proper training and quality gear. While not a panacea, investing in the employees' well-being can go a long way. Words of praise are all the inspiration some folks need, but by and large, investment in training and gear goes a good deal further toward expressing that much-craved respect. Not trinkets, but tools. Not cheap tools, but *good* tools. Not stand downs or

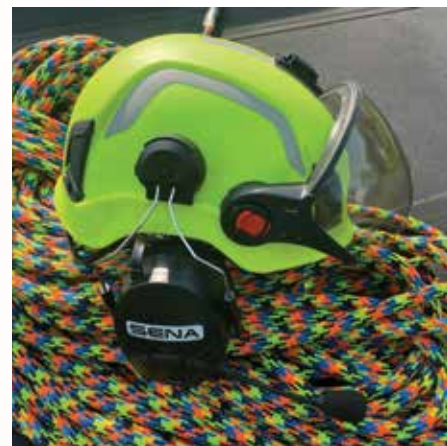
pizza parties, but hands-on, paid training. Even simply keeping equipment on hand for replacement can do wonders for morale.

That's not to say that employees shouldn't be held accountable when mistakes are made, but the punishment need not be continuing to use a cut rope or defective carabiner because its replacement is waiting for approval or on backorder. To not take employee safety seriously is nothing short of an affront and one of the most egregiously disrespectful actions (or inactions) imaginable. Such blatant insult can easily fester into malcontent, which can then deleteriously affect decision making. To deny or argue against these premises is an exercise in casuistry. If retention rates remain low when the above things are accounted for, then does it not reflect much more upon the character of the organization or industry than that of those whom we hire?

We also need to give greater consideration to how standard and policy changes impact production. If the risky-but-speedy practices of x, y, or z are no longer permitted, the cost for that line mile or unit may need to go up. We cannot expect the line clearance arborist to conjure up a solution or make sacrifices elsewhere—possibly at the cost of safety. One-handing of chainsaws and splitting of lines has gone out of style (and for good reason), but what did we do to replace those practices? Our traffic control needs have increased, as

there are more drivers on the road than ever before and said drivers are more distracted than ever before. We have trended toward more paperwork/data collection as well, with more elaborate briefings and work plans, etc. These incremental steps toward safety certainly serve the greater good, but they are seemingly seldom accompanied by a sober assessment of the cost of doing so. As a result, the push for increased production can undermine any serious commitment to safety. Until another incident. Which leads to more rules. Identidem.

As an industry notorious for parsimoniousness, perhaps contractors and utility providers alike would do well to revisit that philosophical tradition. If we are to improve, closer examination is to be paid to our industry's status quo. What was often considered common sense in decades past is considered foolish these days. Some of the things we think are safe today will be considered ridiculous folly tomorrow. Let us reflect carefully on which things those might be. 🌲



Helmets and comms systems. Little else says commitment like good communication systems. *Photo courtesy of Gary Thacker.*



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Sarah Lilley

Rich Hauer

## Establishing Healthy Trees through Inventory, Development, and Collaboration

By Sarah Lilley, Supervisor of R+D, and Rich Hauer, Director of Urban Forestry, CNUC

**A**s a utility arborist, isn't it nice to hear good news about your industry? Too often it seems as though the constant change is moving in a negative direction—reduced budgets, employee retention and recruitment challenges, public dissatisfaction with utility work, environmental change and tree mortality, and UVM programs seeming to be under the microscope. While it seems like “Code Red” is the status quo, there are actions utilities can take from the inside to improve their UVM programs now, with outside collaborations they can utilize to facilitate maintenance in the future.

More and more, utilities are realizing the benefits of two industry trends: (1) having an encompassing, accessible, and accurate tree inventory, and (2) promoting professional development within the UVM program. Starting with tree inventories, they first need to encompass the information useful to the program. At its most basic, a tree inventory should include the location of work to be done and what needs to be done. Inventories which include more information, such as the vegetation species, size, and notes on its condition, provide program managers the ability to monitor vegetation growth more accurately, measure workload, schedule work, and track budgets.



Inventories also need to be accessible to all who use them. The information is not serving its purpose if certain employee groups don't have the equipment, training, or clearance to view it. Beyond having the capability to view and edit data, employees need to feel empowered to do so, whether through user-friendly design or encouragement from management. At a recent meeting of the Tree Wardens Association of Connecticut, a question was asked regarding what benefits a tree inventory provided, beyond the knowledge that the local tree warden kept in their head. While the breadth of knowledge that a tree warden with decades of experience has should not be minimized, that information is not easily accessible to other employees or the public and, in fact, relies on one person to store and disseminate the information. Accessibility allows for program transparency and empowerment of employees to complete their duties.

Finally, the information housed in a tree inventory needs to be accurate in order to be useful. Accurate data allows the program manager to correctly anticipate the type and volume of work required on their system. Data should be reviewed for accuracy and updated with every program employee who sets foot on a property. Audits are helpful to ensure data correctness, but the best first line of defense is employees who are knowledgeable, who receive adequate training, and are encouraged to pursue professional development.

The professionalism of UVM employees

is paramount as utilities come under scrutiny for their practices and program results. A knowledgeable employee is able to identify vegetation issues and the correct action to take to remediate the issue, while also being able to communicate efficiently with property owners. Becoming an ISA Certified Arborist is recognized as one of the first and most important steps in the professional development ladder. This was reflected in responses to the 2019 industry survey (Hauer and Miller 2021), which stated that 82.5% of UVM department heads were ISA Certified Arborists.

However, it is essential that further pursuit of knowledge be encouraged beyond this arborist certification. For example, respondents to the 2019 industry survey reported that only 20.6% of UVM department heads held the ISA Tree Risk Assessment Qualification. Yet 81% of vegetation-caused outages were caused by off-ROW trees (34.4%), whole tree failures (27.2%), or broken branches (19.4%)—all failures which the Tree Risk Assessment Qualification prepares one to identify. Besides additional ISA certifications and qualifications, professionals in UVM can become active in their local UAA or ISA chapters, state arborist associations, or related organizations.

With all of the environmental, budgetary, and public concerns that utility arborists face, a close ally can be found in municipal arborists. Both utility and municipal arborists are tasked with the same primary objective:



*Photo courtesy of Sarah Lilley.*

the safety of their constituents. And while utility arborists do love trees and encourage their responsible growth, it is a secondary objective of municipal arborists to promote the planting and maintenance of trees. A community's trees are recognized as being critical infrastructure, assisting with stormwater infiltration, cleaning urban air, calming traffic, reducing energy use, and so much more.

In fact, urban trees are currently enjoying an upswell of support, being named as green infrastructure which needs to be adequately funded and proactively managed. Just like UVM program managers, municipal arborists are being asked to complete and maintain accurate tree inventories and to be more active in the management of their trees.

This support for trees in communities was observed recently within the graduating members of the 2023 Green Communities Leadership Institute (GCLI). The GCLI brought together utility arborists, municipal foresters, and many other champions from across the country to engage in discussions and learning opportunities on change management, community engagement and equity, and identifying leadership strategies and shortcomings, among many other topics. Along with the many learning and networking opportunities that occurred at GCLI, it allowed



*2023 GCLI Cohort. Photo courtesy of Lance Davisson.*



an opportunity to take the pulse of municipal-utility relationships. Just like utilities, municipalities run the gamut of having no developed tree inventory to having regularly updated inventories that are accessible to the public (Hauer and Peterson 2016). While the communities represented at GCLI have an established municipal forester, many communities do not have a separate forester position, often lumping public tree management in with their public works departments.

A unique distinction between utility and municipal tree management is that proactive urban tree management has historically been seen as a luxury that is not funded through traditional methods. Instead, tree planting and young tree maintenance is all too often only funded when an energetic local tree champion pursues grant opportunities and coordinates volunteer labor to make it happen. However, some communities represented at GCLI gave a glimpse of the future: they were able to quantify the stormwater benefits that trees provide as a way to fund their urban tree programs.

In addition to funding trees based off the recognized and quantifiable benefits they provide, there is currently a huge

influx of funds into urban forestry, particularly in historically disadvantaged areas. The 2022 Inflation Reduction Act (IRA) makes available up to \$1.5 billion to plant and maintain urban trees, with preference given to proposals exhibiting collaboration and tree equity. The first round of applications for IRA were due June 1, with awards to be announced this summer.

Due to the push for equity in tree planting, new trees will be sited in locations where they have not existed before. It is imperative that utilities have a voice in recommending where these trees are planted, to ensure they do not interfere with overhead conductors in the future. Utility foresters should make connections now with municipal foresters, creating dialogue on what each group needs and how they can help each other. A utility that makes these connections benefits by having a positive, proactive presence in their community as new trees are put in. Beyond creating partnerships and collaboratively encouraging professional development, utilities and municipalities may learn a thing or two from each other about how to best manage their trees.



Photo courtesy of Jason Allen.

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Image from the FirstEnergy TOP model, which was created using outage history; inspection records; weather history; and data related to soil, slope, etc. to inform VM decisions.

## FirstEnergy Distribution Vegetation Analytics

**F**irstEnergy's service territory encompasses some of the most densely forested areas in the Midwest and Mid-Atlantic regions, with terrain varying from urban areas to flat agricultural land to rugged mountainous conditions more than 3,000 feet in elevation. These widely varying conditions make vegetation management a challenge. To help enhance reliable and safe electric service, the vegetation management team, along with the FirstEnergy Digital Factory, began exploring new and emerging technologies to help operations leverage remote sensing data and machine learning software to drive better VM decisions.

Throughout this yearlong collaboration, the Tree Outage Prediction (TOP) model was created. Tree Outage Prediction is a supervised learning model informed by several internal and external data sets that identifies patterns within feature variables using decision tree methodology. The model then

calculates the risk likelihood of a tree-caused outage down to the span level within a distribution circuit. The prediction model, coupled with proper industry BMPs, is intended to strengthen operational decisions, reduce tree-caused outages, improve cost benefits, and strengthen overall performance in vegetation management. The TOP model was initially piloted in 2022 to get operational feedback and validate results.

Ultimately, the TOP model is a tool that aims to achieve a net improvement in reliability related to tree-caused outages. Going forward, FirstEnergy is evaluating whether higher-resolution imagery is needed, as well as integrating the tool with a new work management solution currently under development. The aim is to keep moving forward as a technology-driven vegetation management leader in the industry. 🌳

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# Impacts of Climate Change on Vector-Borne Diseases: Are We Prepared?

By Anand Persad, PhD, Director of Research, Science, and Innovation, ACRT Services. Photos courtesy of ACRT Services.



**W**hat do insects like mosquitos, fleas, lice, and ticks have in common? They're all classified as vectors by the World Health Organization (WHO). The World Health Organization defines vectors as "living organisms that can transmit infectious pathogens between humans, or from animals to humans." On a global scale, the WHO reports that every year there are more than 700,000 deaths from vector-borne diseases, such as the West Nile virus, malaria, dengue, yellow fever, and more.

While these diseases may not be currently prevalent in the United States as they are in other parts of the world, when subjected to the impacts of climate change, there is potential for more dynamic and even migrating vector populations.

## CLIMATE CHANGE AND ITS IMPACTS

As the climate continues to change, we'll likely begin to see invertebrate vectors adapting to potentially more favorable weather conditions. Take the impact of flooding coupled with increasing temperatures, for example. Chances are we will begin to see rising sea levels, backed-up brackish (slightly salty) water and freshwater levels, and generally higher water levels in inland areas. This will lead to areas with saturated and increased moisture levels, the rise of vectors, and possibly the increasing spread of vector-borne diseases.

For example, the more mosquitoes that inhabit an area, the greater the potential for mosquito-borne outbreaks, such as West Nile, dengue, and malaria. Additionally, as human populations increase in high-density urban areas, the chance of vector-borne diseases also increases.

Warmer temperatures also create the perfect environment for these insects to multiply faster. In turn, it may be easier for vectors to maintain high populations, bolstered by shorter life cycles, and increase the number of generations per year. Even if temperatures rise by half to one degree over the next decade or so, it will still be in favor of rising vector populations.





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According to the human impact report "Climate Change: The Anatomy of a Silent Crisis," published by the Global Humanitarian Forum, currently "over half a billion people are at extreme risk to the impacts of climate change, and six in 10 people are vulnerable to climate change in a physical and socio-economic sense."

The human impact report also shares "the number of those severely affected by climate change is more than ten times greater than, for instance, those injured in

traffic accidents each year, and more than the global annual number of new malaria cases."

### WHAT'S TO COME

Looking to the future, the Global Humanitarian Forum anticipates the number of affected individuals to double—if not more—within the next 20 years, noting "one in ten of the world's present population could be directly and seriously

affected" by vector-borne diseases.

In the green industries, it's important to consider the impact of increasing vectors, disease incidence, the effect on green workspaces, and our physical and mental health. We must consider and understand that employees are subject to encounters with ticks, for example, thus increasing the likelihood of becoming infected with Lyme disease (among other diseases and illnesses) by working outdoors daily.

There is an imbalance when studying climate research. There isn't an abundance of studies that showcase the parallels between climate change and the potential impact on our health caused by the spread of vector-borne diseases. It's fair to question whether these risks will take a toll on employees' mental health or even lead to attrition within the workforce. That's why our Research, Science, and Innovation team at ACRT Services is looking at the correlative imbalances between climate change and vector migration.

### ACCLIMATING TO CHANGE

As vectors continue to adapt to climate change, so must our workforce—especially those in the southern tier of the United States.

Think about warm, humid places like Florida. As the climate continues to mimic a tropical environment, we will likely see more vibrant vector populations and diseases that have historically been tropically based now begin to appear with increasing frequency, such as yellow fever, dengue, and malaria.

### HOW TO PROTECT YOURSELF WHILE OUTDOORS

It's impossible to reverse climate change overnight, but it is possible to better protect ourselves, especially while outdoors. An infographic provided by ACRT outlines several ways to protect yourself from pesky pests, including mosquitos, bees and wasps, ticks, chiggers, spiders, and other stinging insects. Keep the following best management practice recommendations in mind to reduce your exposure to insect bites.

Apply both repellents and insecticides, or approved alternatives, regularly and follow the instructions found on the label. The Centers for Disease Control and Prevention (CDC) recommends using an EPA-registered insect repellent with

## BUZZ OFF! Protect Yourself From Pesky Pests

It's a wild world out there, and you may encounter some dangerous critters in the field. But proper protection can help fend off these threatening insects and arachnids.

### MOSQUITOES

**Threat**  
Carriers and transmitters of West Nile Virus  
Bites can result in a range of symptoms, from flu-like conditions (West Nile fever) to potentially life-threatening disease (West Nile encephalitis or meningitis)

**Prevention**

- Keep skin covered as much as possible
- Avoid use of scented lotions, perfumes/cologne
- Use repellents with DEET or Picaridin; spray on skin and outside of clothing

### BEEES & WASPS

**Threat**  
Allergic reaction

**Precaution/Treatment**

- Verify any bee allergies via skin testing and consider immunization
- Carry sting kit (EpiPen®) if necessary
- Carry identification notifying hypersensitivity
- Keep sweet items covered, such as soft drinks, ripened fruit
- Avoid use of scented lotions, perfumes/cologne
- Keep an eye out for insect entry/activity, being particularly cautious near likely nesting habitats (such as white firs in the Sierras)

**DON'T MOVE RAPIDLY**  
This often provokes attack

**DON'T SWAT**  
Wasp venom contains pheromones, signaling nearby wasps to swarm

Remove any bee stingers as quickly as possible—the longer the stinger remains in the skin, the stronger the reaction can be

### TICKS

**Threat**  
Blacklegged ticks are carriers and transmitters of Lyme Disease (Borrelia burgdorferi)  
Without treatment, bacteria from an infected tick bite can spread to joints, heart and nervous system  
Ticks latch onto skin, requiring careful removal

**Prevention**

- Use repellents with DEET or Picaridin on skin
- Use Permethrin as extra protection FOR CLOTHING/GEAR USE ONLY!
- Wear light colors to make ticks more visible; check for ticks every 2-3 hours
- Wear long sleeves and pants, tucking pants into socks or shoes

**Removal**

- Using tweezers, grasp mouthparts as close to skin as possible. Gently pull straight out.
- After removal, disinfect the bite and wash hands. Contact doctor with any concerns. If possible, capture insect for proper identification.

**DON'T SQUEEZE!**  
Body of tick may contain infectious fluids

### CHIGGERS

**Threat**  
Chiggers are NOT known to carry disease  
However, bites can cause irritation comparable to cases of poison ivy  
Scratching or breaking bites may cause secondary infection

**Prevention**

- Chiggers are found in low, damp areas with rank vegetation
- Most numerous in early summer when grass, weeds and vegetation are at their heaviest
- Laundry clothes immediately after leaving a chigger-infested area
- To relieve itching, apply ointment of benzocaine, hydrocortisone, calamine lotion or others as recommended by a pharmacist or doctor

### SPIDERS & STINGING INSECTS

**Threat**  
Insect stings or bites require quick action  
Brown recluse spiders, fire ants, scorpions  
• Tissue-destroying bites; watch for marked swelling or discoloration  
Black widow spiders  
• Neurotoxic bites may not cause swelling or discoloration

**Prevention/Treatment**

- Apply ice to site or immerse affected body part in ice water until a physician can be reached
- If possible, capture insect for proper identification

Get more tips and information to work safer at [ACRT.com/articles](http://ACRT.com/articles)

Source: OSHA Safety Presentation 2015

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one of the following ingredients: DEET, picaridin (known as KBR 3023 and icaridin outside the U.S.), IR3535, oil of lemon eucalyptus (OLE), para-menthane-diol (PMD), or 2-undecanone.

Be sure to apply a pesticide, such as Permethrin, to your outerwear, including footwear and work gear. Clothing that is pretreated with Permethrin is also available for purchase.

If you're having trouble determining what to apply, consider using the United States Environmental Protection Agency's search tool to help choose the repellent product that is right for you.

Wearing the appropriate type of clothing provides an additional barrier to prevent ticks (and other insects) from reaching the skin. Light-colored clothing makes spotting ticks easier but does not prevent them from getting on you. Tucking pants into socks along with tucking shirts into pants reduces the areas ticks can reach the skin.

Conducting frequent body checks throughout the day, followed by a full-body check at the end of each shift, will allow you to find any ticks that may have

reached your skin before they can attach.

Despite the intimidation of climate change and the dangers that may accompany it, many of these vector-borne diseases are preventable through research, protective measures, and education.

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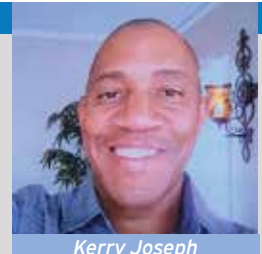
## ABOUT THE AUTHOR

Dr. Anand Persad is the Director of the Research, Science, and Innovation (RSI) team at ACRT Services. He has an extensive background in arboriculture, invasive species, tree biomechanics, pollinator health, wetland restoration, avian studies, and more. He is the Research Committee Chair for the UAA, Chair of the International Society of Arboriculture (ISA) Science and Research Committee, and actively works with city, state, and federal organizations in taking innovation and technology from development to implementation. He holds a PhD in invertebrate ecology/entomology from the University of the West Indies. In 2021, he was recognized as the recipient of the ISA L.C. Chadwick Award for Arboricultural Research as well as the Award of Achievement by the Ohio Chapter of the ISA.

This article was previously published in *T&D World*. 📖

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Kerry Joseph

## 2023 Richard E. Abbott Safety Scholarship Recipient: Kerry Joseph

**T**here's nothing more important than sending people home safe at the end of each day. One way we demonstrate our commitment to safety and the development of our employees is showcased through the Richard E. Abbott Safety Scholarship—a \$1,000 award that is dedicated to ACRT Services' founder. The Scholarship is granted annually to an employee who is seeking to further their career development and commitment to safety.

Losing his father in a car accident in 1990 was an eye-opening experience for Kerry Joseph. For the last three decades, he has prioritized safety all around. Joseph's dedication to getting his peers home safely every day and his

embodiment of our culture of safety are why we are proud to announce Joseph as one of the 2023 Richard E. Abbott Safety Scholarship recipients.

"I always knew I wanted to chart a path for safety. Things could have been different if my father just clicked his seatbelt—one time he didn't, that's all it took. I don't want anyone to ever get that knock on the door and watch their mother collapse from the news," said Joseph, a senior supervising utility pre-inspector at ACRT Pacific.

He serves as ACRT Pacific's Lead Area Safety Representative (ASR) and sits on the ACRT Pacific Safety Committee.

Joseph plans to use this award to pursue Certified Safety Professional®

(CSP) and Certified Environmental and Safety Compliance Officer (CESCO) certifications to further his career and safety efforts.

ACRT Pacific Safety Manager and Tribal Liaison MK Youngblood shared, "[Joseph] is the epitome of what a safety scholarship recipient should be: hardworking, loyal, and safety-conscious, with a willingness to learn."

Robert O'Brien, an ACRT Pacific operations manager, also shared, "After Joseph became an ASR, I saw a fire ignite within him. He found his niche and it was safety."

Learn more about ACRT Pacific and our safety philosophy at [pacific.acrt.com](https://pacific.acrt.com). 📖

# Ticks, Wasps, Fire Ants, and More

The Heat is on with  
Pests This Summer



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By Noel Matthews, Health and Safety Coordinator, The Davey Tree Expert Company

**A**s the temperatures continue to rise, so does the presence of pests. From blacklegged ticks to wasps and hornets, there are a variety of insects and pests whose level of activity increases during this stage in the summertime. Although these pests are often in their natural habitat, the presence of these creatures can pose a risk to workers out in the field. Contracting tick-borne diseases, such as Lyme disease, and experiencing dangerous allergic reactions from bee stings are all too common when encountering these types of pests.

Here's the "need to know" on preventing vector-borne illness, insect stings, bites, and the application of first aid when encountering our two- to four-legged neighbors out in the field.

## ALL THINGS TICKS

Spring has sprung, summer has begun—and so has tick season. Exposure to ticks can occur all year round, but in the warmer months (April–September) ticks are the most active. Lyme disease, Southern Tick-Associated Rash illness (STARI), Rocky Mountain spotted fever

(RSMF), and tularemia are just a few of 20 diseases that are transmitted by ticks in the United States. Although the signs and symptoms of these tick-borne diseases can often overlap, the severity of symptoms between the diseases can range from mild to life-threatening.

## Tick-Borne Diseases

Many tick-borne diseases can have similar signs and symptoms, and even some that overlap. So, it is important to know the most common signs and symptoms of tick-borne diseases and how they differ. The most common tick-borne diseases and the signs and symptoms to look out for are:

- Fever or chills
- Headache
- Fatigue
- Muscle, tendon, and joint pain—the severity and onset of these symptoms can vary depending on the type of disease and if it is in its early stage or late stage

Despite the overlap in symptoms with so many different types of tick-borne diseases, the health effects that occur

can range from mild to life-threatening within days. One of the hallmark differences used to differentiate between tick-borne disease is the distinctive skin rashes that can occur.

## Lyme Disease

Lyme disease is one of the most common vector-borne diseases in the United States. Caused by the bacterium *Borrelia burgdorferi*, Lyme disease is transmitted to human beings through the bite of an infected blacklegged tick. Although most cases of Lyme disease can be cured through the use of antibiotics in its earlier stages, it can progress with the infection spreading to the heart, nervous system, and joints when left untreated.

- Rash: A circular "bull's-eye" rash called erythema migrans may appear within three to 30 days at the site of the tick bite, typically before the onset of fever. It is usually the first sign of infection and occurs in 70–80% of cases. It is important to note that the appearance of this rash can vary significantly from person to person, and may even be absent entirely.



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### Southern Tick-Associated Rash Illness

Southern Tick-Associated Rash Illness, or STARI, is a bacterial disease caused by the bite of an infected lone star tick, that presents as a red, expanding rash similar to the “bull’s-eye” lesion present in Lyme disease.

- **Rash:** The rash develops at the site of the tick bite. The bacterium that causes STARI is unknown and has not been linked to any of the arthritic or neurological symptoms consistent with Lyme disease.

### Rocky Mountain Spotted Fever

Rocky Mountain spotted fever, or RMSF, is the deadliest tick-borne disease in the world. The serious and sometimes deadly bacterial infection is caused by the bite of a tick infected with the bacterium *Rickettsia rickettsii*. Rocky Mountain spotted fever is most often transmitted by the American dog tick that is found in the Eastern, Central, and Western regions of the U.S., but can also be carried by the Rocky Mountain wood tick and the brown dog tick, found in different regions of the country.

- **Rash:** Small, flat, pink macules that can appear on the forearms, wrists, palms of hands, soles of feet, ankles, and the torso. This rash can vary significantly from person to person, regarding its appearance, location, and the time of its onset. The red-to-purple spotted rash that occurs with RMSF is typically not seen until at least the sixth day of symptom onset and occurs in 35–60% of RMSF patients. About 10% of people with RMSF never develop a rash.

### Tularemia

Tularemia is a tick-borne disease caused by the bite of a tick infected with the bacterium *Francisella tularensis*—which is highly infectious, as it can enter the body through the skin, eyes, mouth, or lungs. Tularemia is most often transmitted by the American dog tick, the wood tick, the lone star tick, and deer flies.

- **Rash:** The most common form of tularemia presents as a skin ulcer found at the site of the bite where the tick or deer fly entered the body. The ulcer is typically accompanied by swelling in the regional lymph glands found in the armpit or groin.

### PREVENTING TICK BITES AND TICK-BORNE DISEASES

Reducing exposure to ticks and preventing tick bites are your best methods of defense when it comes to preventing tick-borne illness. Here are a few tips to keep in mind that will help you prevent tick bites when out in the field.

- Wear long pants and be sure to tuck your pant legs into your socks and tuck your shirt under your belt.
- Avoid sitting directly on the ground or on stone walls, as they contain the moisture that ticks need to survive.
- Use insect repellants containing DEET and permethrin. The most effective combination is to apply DEET to the skin and spray permethrin on outer clothing.
- Check yourself for ticks at least twice a day.
- At the end of the day, take a shower

and be sure to thoroughly shampoo your hair within two hours of coming indoors.

- Do a final, full-body check for ticks at the end of the day. Be sure to use a mirror to see areas such as your back and check carefully for nymphal ticks, as they are about the size of a poppy seed.

### Tick Removal

When finding a tick attached to the skin, removing the tick from the skin as soon as possible is imperative in preventing tick-borne diseases, as it takes more than 24 hours for an infected tick to begin transmitting pathogens. Here is the proper method of safely removing an attached tick from the skin.

1. Using clean, fine-tipped tweezers or tick-removal tweezers, grab the tick as close to the surface of the skin as possible.
2. Pull upward with steady and even pressure. Be sure not to twist or jerk, as this could cause mouthparts of the tick to break and be left embedded in the skin. If this occurs, remove the mouthparts with tweezers, if possible. If not, allow the skin to heal.
3. After removing the tick, carefully clean and disinfect the area of the tick bite with soap and clean water or rubbing alcohol.
4. Dispose of the tick by putting it in alcohol, placing it in a sealed bag/ container, wrapping it in tape, or flushing it down the toilet. Never crush a live tick with your fingers.







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### STING SAFETY: BEE, WASPS, HORNETS, AND FIRE ANTS

Insects that sting or bite can pose a significant hazard to workers out in the field. The stings or bites of insects such as bees, wasps, hornets, and fire ants have health risks that range from experiencing mild discomfort to having a life-threatening reaction to the bite or sting if a worker happens to be allergic to the insect's venom. Here are a few steps on how to prevent insect stings and bites and the first aid steps you should take in the event of a bite or sting.

#### Preventing Bee, Wasp, and Hornet Stings

- Wear light-colored, smooth-finished clothing.
- Avoid using perfume, cologne, or perfumed soaps, shampoos, and deodorants.
- Wear clean clothing and bathe daily, as sweat may aggravate bees.
- Remain calm and still if a stinging insect is flying near, as swatting may cause it to sting.
- If several stinging insects attack you at once, run to get away from them, but avoid jumping into water, as some bees like to hover over water.
- Keep work areas clean and free from discarded food.
- Carry an epinephrine auto-injector if you have a history of reactions to insect bites.

#### First Aid

- Have someone stay with the worker in case of an allergic reaction.
- Wash the site with soap and water.

- Remove the stinger by wiping gauze over the area or by scraping a fingernail over the area—**never** squeeze or use tweezers, as this can release more venom into the skin.
- Apply ice to reduce swelling.
- Do not scratch the site of the sting, as it may increase swelling, itching, and infection risk.

#### Preventing Fire Ant Stings and Bites

- Be careful not to disturb or stand on or near ant mounds.
- Use caution when lifting items off the ground, as they may be covered in ants.
- Always properly check the area before working, as fire ants can be found on trees or in water.

#### First Aid

- Rub off the ants quickly, as they will attach to the skin using their jaws.



- Consider using antihistamines and follow the directions on the packaging (drowsiness may occur).
- Take the worker to an emergency medical facility if they begin experiencing chest pain, nausea, severe sweating, shortness of breath, swelling, or slurred speech.

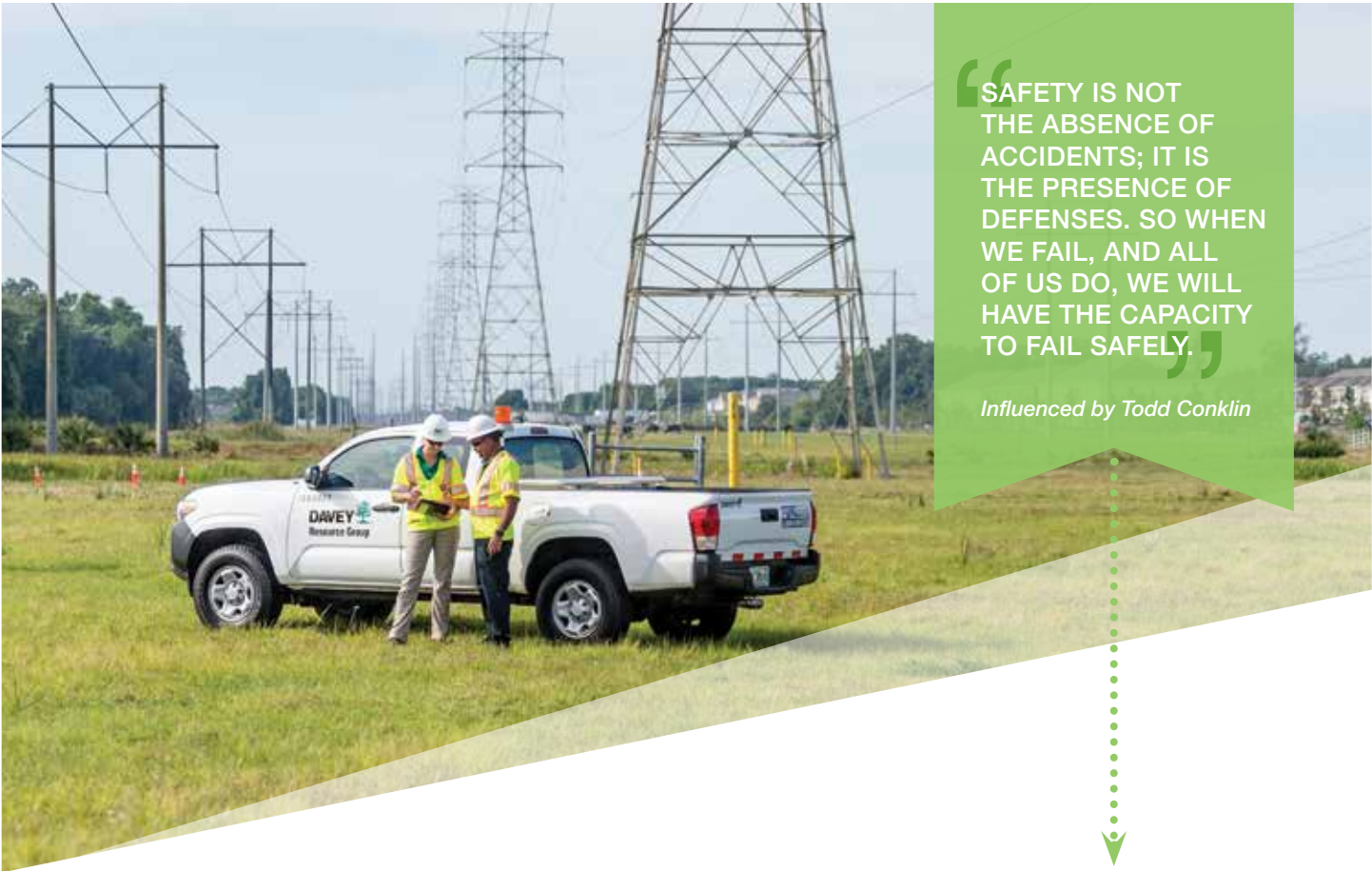
### INCIDENT REPORTING: CULTIVATING A CULTURE OF LEARNING AND TRUST

Whether it's experiencing several tick bites after sitting on a wet stone wall or getting bitten after mistakenly stepping on fire ant mound, reporting these types of incidents to your manager is imperative to improve safety in the field. Reporting incidents and submitting close calls allow the opportunity for both the employee and manager to learn and correct errors that may lead to severe incidents. For insect bites and stings, this can mean emphasis on a thorough job site assessment and communication amongst crews when hazards are identified at a particular location.

Remember, an insect bite or sting is an OSHA recordable if its treatment goes beyond basic first aid. For example, if an employee gets stung by a bee and must use their prescribed epinephrine pen. Severe incident reporting involves in-patient hospitalization and may result from more severe reactions to bites or stings.

At their best, insect bites and stings are unpleasant. At their worst, they can be life-threatening. Prepare for the warm season by starting a conversation around the importance of prevention and early intervention for insect bites and stings. 🐝





“SAFETY IS NOT THE ABSENCE OF ACCIDENTS; IT IS THE PRESENCE OF DEFENSES. SO WHEN WE FAIL, AND ALL OF US DO, WE WILL HAVE THE CAPACITY TO FAIL SAFELY.”

*Influenced by Todd Conklin*

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## PROFESSIONAL PROFILE



## Kieran Hunt

**M**y career path started in college at Rutgers University in New Jersey. I initially was in the Exercise Science and Physiology Department because I liked working with people. I always had a desire to work outside as well, and after a conversation with an advisor, he recommended I go into ecology. In examining the various facets of ecology, I was drawn to vegetation management, because vegetation management has a huge impact on improving any ecosystem. Additionally, a background in VM is much more transferable across many different industries. To further develop my skills, Dr. Grabosky recommended an internship with Paul Cowie Associates, an urban forestry consulting firm between my junior and senior year of college. This led to a tenure of three-and-a-half years with Cowie, managing the intersection of the urban forest and people in the greater metro New York City area. As the sole arborist working on land development plans, future career growth was limited with the relatively small firm. I was exploring options, and after I attained my New Jersey Licensed Tree Expert Certification, an opportunity with Asplundh Tree Expert, LLC presented itself within utility vegetation management.

My first position with Asplundh was as a work planner. Working in the very densely populated Northern New Jersey area, I was expecting many challenges from homeowners regarding the work that needed to be performed to maintain the electric grid. The opposite was true! The utility that I was contracted with has a strong cycle in place, and much of the work involved was pruning regrowth as most of the reclamation that was done in previous cycles. Many homeowners were expecting the line clearance work to be performed and were appreciative that the trees were being pruned to maintain the flow of power. That is the best part of UVM: having a direct impact on peoples' quality of life.

One thing that I would like to see as an improvement in UVM is the deployment of





intelligent management systems. Many electric utilities have invested heavily in intelligent, GIS-based technology in efficiently managing the hard assets of the electric grid (poles, switches, etc.), but have not deployed those same technologies to increase the efficiencies in UVM.

In my current role with Asplundh as Digital Engagement Lead, I work to build digital work management solutions for managing vegetation around the utility infrastructure. There are so many benefits if we rethink how we manage vegetation, such as increased efficiencies and workforce diversification. By not utilizing a management platform that collects all the data for the work that a utility is already doing, it is difficult to imagine how much room for improvement an intelligent management system can bring to the table managing vegetation on the electric grid. Managing vegetation as an asset will have huge benefits for the communities that utilities serve. Although there may be a learning curve deploying these technologies, the gains in efficiencies come in leaps and bounds once deployed. In addition to managing vegetation

“One thing that I would like to see as an improvement in UVM is the deployment of intelligent management systems.”

assets intelligently, there can be a benefit to deploying this type of technology to the hard assets of utilities. The opportunities in this space are limitless right now because with years of experience deploying UVM work management solutions

internationally, we're well-positioned to support North American utilities that are just now beginning to see the possibilities this technology provides—and it is only going to continue to grow.

There are a few people that I would consider mentors who have influenced where I am today. First is Dr. Jason Grabosky, professor at Rutgers, who helped me get the internship at Paul Cowie and Associates. My next mentor is Paul Cowie, owner of the company where I interned and was my first step in my career. Finally, Geoff Kempter at Asplundh has been a fantastic mentor for me in utility vegetation management.

A few fun facts about myself include serving as the Environmental Chair and on the Events Committee for the UAA, and Chair of the arborist exchange program for Society of Municipal Arborists. Recently, I climbed a 300-foot-tall cliff in the Catskill Mountains of New York. 🌲

## WE EMPOWER TREE CARE PROFESSIONALS.

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TREE Fund exists to serve. But we cannot serve without your support. Visit [treefund.org](https://treefund.org) to learn more about how you can empower the science that underpins your work.



## SPOTLIGHT ON THE ENVIRONMENT

# Bats and Disease: Emerging Challenges Facing ROW Managers

By Roy Van Houten (PWS, CE, CPESC), Director-Energy, Wetland Studies and Solutions, Inc. and Dan Williams, Project Developer, Davey Resource Group

As stewards of millions of acres of land, right-of-way managers are facing increasing and emerging challenges to ensure compliance with state and federal regulations. These regulations govern responsible infrastructure, development, and maintenance. Rights-of-way are essential for delivering reliable energy directly to end users, ensuring regional flow of energy that drives our economy. They also enable seamless travel of countless vehicles throughout the United States. Rights-of-way are not without challenges and require planning and vigilance to coexist with the ecosystems found within. Rights-of-way act as natural travel corridors that inherently cause flora and fauna to congregate in high densities. Native and non-native pests and diseases, compounded by a changing climate, are adding new stresses to ecosystems. These confounding pressures make the management of ROWs anything but routine. Bats and trees are good examples of existing ROW management factors which are changing and, as a result, demand increasingly innovative solutions to cost-effectively address with available resources.

Whether performing new construction, periodic maintenance, or hazard tree removal, one disease that has had a direct impact on how we manage our ROWs is white-nose syndrome. White-nose syndrome has killed millions of bats throughout the U.S., and thus has triggered the U.S. Fish and Wildlife Service to list several species of bats as both threatened and endangered. Part of these listings includes time of year restrictions (TOY), which govern when trees utilized by bats can be legally taken



Photo courtesy of Davey Resource Group

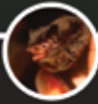



down. These TOY restrictions greatly reduce the “window” in which ROW managers can remove trees, and thus may delay projects and alter maintenance schedules and cycles.

Mobilizing for work, budgeting, and contracting new construction, rebuilds, or routine operations/maintenance requires a detailed understanding of how managing for species on conservation concern can impose constraints on project planning and execution. Time of year restrictions vary by state (and even within the state) and depend on if a project is within a swarming area, a non-swarming area, or a year-round resident area. For example, Virginia and Maryland are home to a variety of species of bats, but tree clearing TOY restrictions differ depending on the status of the species. While many bat TOY restrictions begin June 1, the TOY restrictions for the federally endangered Indiana bat (*Myotis sodalis*) and the federally endangered northern long-eared bat (*Myotis septentrionalis*) begin April 1.

Diseases and pests have altered the composition of the U.S. forests over the past few centuries. Dutch elm disease and the chestnut blight were two pathogens accidentally introduced to the U.S. in the early 1900s, and they all but wiped out native elm and chestnut trees. More recently, pests such as the Asian long horned-beetle, emerald ash borer, and spotted lantern fly are examples of threats now taking hold in the U.S. and present yet another challenge as they negatively impact native vegetation. Unfortunately, even with increased control measures, our trees will more than likely face additional disease and pest challenges in the future.

Tree resilience is also being degraded. While tree diseases are prevalent throughout the U.S., trees have been able to live with the presence of these diseases for millennia. However, due to environmental factors such as drought, extreme heat, and flooding, trees are now more frequently being adversely affected. If weakened enough, the tree may ultimately succumb to common pathogens and diseases.

As noted by Lori Chamberlin with the Virginia Department of Forestry, a good example is “Oak decline,” defined as the gradual failure in tree health resulting from the interaction between three groups of stress factors: predisposing, inciting, and contributing. Predisposing factors weaken the tree over time and often have to do with site conditions (e.g., poor soil, topography, density, advanced tree age, or prolonged periods of drought). Inciting factors (e.g., frost, drought, or defoliating insects) are shorter-term. They may initiate decline through reduced growth and stored food reserves or cause dieback. Contributing factors are secondary insects or diseases that ultimately kill the already weakened tree. While the phenomenon is not new, the extent and pace of decline is

BAT TIME OF YEAR RESTRICTIONS VIRGINIA & MARYLAND				
Species				
	Indiana Bat	Northern Long-Eared Bat	Little Brown Bat	Tri-Colored Bat
Status	Federally Endangered	Federally Endangered	State Endangered in VA	State Endangered in VA
Tree-Clearing Prohibited	April 1 - November 14 Within 5.5 miles of known hibernacula	April 1 - November 14	Any time of year Within 0.25 miles from known hibernacula	
	April 15 - September 15 Further than 5.5 miles from known hibernacula	December 15 - February 15 and April 15 - July 30 in the Coastal Plain of VA south of the James River	June 1 - July 31 Within 150 feet of known occupied maternity roosts	
Tree-Clearing Allowed	November 15 - March 31 Within 5.5 miles of known hibernacula	November 15 - March 31	Any time of year Further than 0.25 miles from known hibernacula	
	September 16 - April 14 Further than 5.5 miles from known hibernacula	February 16 - April 14 and July 31 - December 14 in the Coastal Plain of VA south of the James River	Any time of year Further than 150 feet of known occupied maternity roosts  August 1 - May 31 Within 150 feet of known occupied maternity roosts	
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evolving, as well as the land cover response.

Understanding implications of these ecosystem changes on how ROWs have traditionally responded to management practices will enable better planning in the face of change and meeting the goals of our management plans. The shift in focus from compliance-based management to environmental stewardship and sustainability provides opportunities to create management plans that aim to increase biodiversity and ecosystem services. Ecological knowledge and ecosystem expertise may be all that is needed on top of your existing program. Routine vegetation monitoring is critical to identifying tree decline and management intervals. Good baseline data, timely condition updates, and early detection along with knowledge of environmental restrictions provide ROW managers more time to develop integrated management plans which comply with TOY restrictions, conform with tightening budgets, and maximize production of limited tree crews.

Bats, tree diseases, invasives, and pests are just a few of factors ROW managers must deal with on a daily basis. In the context of other rapid changes to our energy and mobility ROW networks, good on-the-ground data and understanding of how separate ROW elements affect each other are core components of smart solutions. Connecting these dots can be accomplished while building on existing ROW management approaches and finite resources.

A "One Team" approach, with the combined knowledge of the vegetation management and ecological teams, is critical to ensuring projects stay on budget and on schedule. 🌱



A vibrant illustration of various wildlife including a bee, a bird, a butterfly, a hummingbird, and a squirrel, all gathered around a large, textured, brown, rock-like shape. The background is a mix of green foliage and purple flowers. The text "Compatible Species Specialist" is at the top in a bold, green font. Below the illustration, the website "www.growwithtrees.com" is visible. At the bottom, the "GROW WITH TREES" logo is displayed in large green letters, followed by the tagline "planning, training, and reporting compatible vegetation management" in a smaller green font. A QR code is located on the right side of the graphic.

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## SPONSOR SPOTLIGHT



David Jollymore

## The New Regional Manager—Canadian Division: David Jollymore

**L**ucas Tree Experts is excited to introduce David Jollymore as the new Regional Manager for our Canadian Division.

Jollymore graduated in 2000 from the University of New Brunswick with a Bachelor of Science in forestry. He began his career working for FirstEnergy as a utility forester and supervisor in their Pennsylvania and Ohio Districts, overseeing both their distribution and transmission forestry programs. In 2007, Jollymore returned to his home province and began working as a system forester with Nova Scotia Power. In 2014, he joined Lucas Tree as the Operations Manager

in Atlantic Canada, where he continues to advance his career.

Jollymore's industry experience and focus on team building has allowed him to create positive relationships with our customers and a positive safety culture. He resides in Halifax, Nova Scotia, and when not at work, Jollymore is very active with industry-related boards and committees, volunteering his time with youth sports, and spending time with his family.

"I am very excited about the opportunity to help Lucas Tree diversify and increase our footprint across Canada," said Jollymore, when asked

about the promotion.

Lucas Beane, COO, commented, "We are excited for Dave to grow our operations safely throughout the Canada provinces. He is an excellent team builder with a long list of achievements and successes, and we look forward to our future potential under his leadership."

Lucas Tree Experts is a third-generation family business that opened in 1926 in Bangor, Maine. The company is currently headquartered in Falmouth, Maine, and provides vegetation management services to utilities in nearly 20 states and provinces in Eastern United States and Canada. 🌱

## OPINION EDITORIAL

# Our Stewardship Responsibility to Slow the Spread of Non-Native Pathogens, Plants, and Insects

By Carolyn G. Mahan, PhD; Professor—Biology and Environmental Studies; Penn State Altoona

I write from the limestone Nittany Valley of Pennsylvania, nestled in the northern Appalachian Mountains. These ancient mountains, covered with expansive forests, once formed the great eastern wilderness dominated by old-growth forests containing 150-foot-tall white pines and hemlocks. Indigenous People shaped the landscape through their use of fire, hunting, and settlement patterns. However, it was the European's ax and, later, chainsaw that removed the virgin timber. At present, the forests in our mountains are second- or even third-growth trees. The vegetation diversity of the Appalachian landscape is further amplified by regular, seasonal disturbances (e.g., ice storms, rock falls, fires, high winds) that create early successional habitats that appear and disappear on the landscape. These disturbances periodically remove large trees, allowing forbs, grasses, shrubs, and heaths to take their place. This is the landscape where I conduct my research and work with industry to mimic the early successional, disturbance-mediated habitat on transmission and roadside rights-of-way.

My research has demonstrated that the Appalachian landscape is diverse and resilient—surviving past human-induced change. Often a walk through the forest will uncover the remains of past industries. Iron works, charcoal flats, small-gauge railroads, abandoned coal mines, and acid mine drainage are all evidence of human-based disturbance. Yet, still the mountains and the forests endure.

Today, non-native pathogens and diseases, invasive plants, and exotic insects imperil the Appalachians and may be the most formidable threats to date. Each year, new diseases are documented. Some, like Lyme disease, Rocky Mountain spotted fever, anaplasmosis, and Powassan are carried by ticks and affect humans and wildlife alike. Others are viruses that spread quickly through their host populations. For example, West Nile virus has decimated wild bird populations. Avian flu threatens domestic poultry and migratory birds. Chronic wasting disease, caused by a prion—a misfolded protein—is fatal within two years to its host, white-tailed deer and elk. Other pathogens are fungal. White-nose syndrome is caused by a fungus, *Pseudogymnoascus destructans*, that infects skin of the muzzle, ears, and wings of hibernating bats. The bats die by the thousands, and native bat populations have

declined 95% in the last decade.

Also, within the last few decades, non-native insects have decimated native trees. Gypsy moths defoliate oaks, causing mass die-offs along the Appalachian ridges. Emerald ash borer has all but eliminated white and green ash trees from our forests. The loss has been so dramatic that Louisville Slugger baseball bats are now made from maple, not ash. The hemlock woolly adelgid has weakened and removed eastern hemlocks from the southern Appalachians—increasing the temperature of mountain streams that were once shaded by this conifer. Spotted Lanternfly is non-discriminating in its diet and will eat the foliage of maples, black walnuts, fruit trees, and crops (grape vineyards and hop fields are favorite haunts).

Finally, non-native plants continue to spread across the landscape. Garlic mustard, Japanese knotweed, Japanese stiltgrass, bush honeysuckle, purple loosestrife, and mile-a-minute weed are species found in my research plots over the years. These species outcompete native grasses, forbs, and shrubs—our vacciniums, viburnums, asters, jewelweed, reeds, and rushes. The loss of these native plants, in turn, leads to declines in pollinators and changes the overall ecosystem function.

Yet, I am not without hope that these natural communities might still endure. For example, researchers recently learned that a fungus native to the Appalachians is lethal to the invasive Spotted Lanternfly and our native mice quickly learned to devour the larva of gypsy moths. Our deep limestone caves provide protection for bats from white-nose syndrome, and some bird species (e.g., American robin, Northern cardinal) may develop resistance to West Nile virus. We can do our part to stop or slow the spread of non-native pathogens, insects, and plants by reducing disturbance to soil, cleaning equipment thoroughly, and controlling invasive plants through selective treatment.

We can create stable, early successional plant communities that resist invasion by non-native species, while also being compatible with utility and transportation ROW. My hope is the Appalachian landscape—and other American landscapes—will persist with careful stewardship, management, and natural resilience. 🌱



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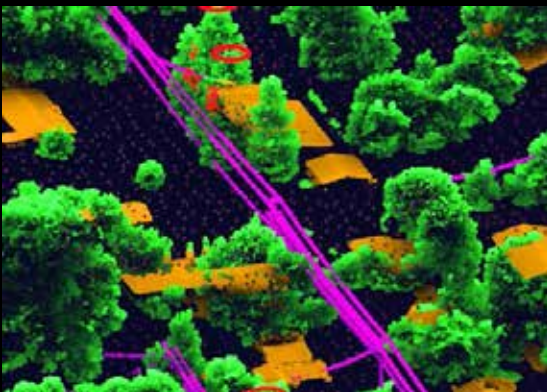




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