

# Forest health — not just a buzzword

Callery pear, aka Bradford Pear

Asian longhorned beetle

**Forest health.** It's a term that can be difficult to define, as it has different meanings depending on the management goal for that piece of land. At the same time, it tends to be somewhat easy to know if you're standing in a healthy or an unhealthy forest. Healthy forests are usually more "alive", for lack of a better word. There are birds singing, critters are scurrying about, and a diverse collection of living things is all around you. Unhealthy forests, on the other hand, just feel...off. Like it's too quiet – almost creepy, sometimes.

From an official forestry perspective, a healthy forest is simply one that meets its management objectives and contributes to a sustainable environment. In some cases, a healthy forest is full of living trees, and produces loads of logs for the mill. In other cases, a healthy forest has both live and dead trees. In fact, both of these scenarios can be desired.

Unfortunately, a healthy forest doesn't come without effort, as many factors can quickly degrade a forest environment. The theme of this quarter's issue is Forest Health and this issue will contain articles on several things that can negatively impact forest health and resilience, including invasive species, fire, and management. While it's difficult to say which is worse or more impactful, it's not hard to say that each of these factors can be extremely detrimental in

their own way.

Invasive species are prevalent across the U.S. as plants, insects, and fungi. Millions of dollars and countless hours of labor are spent managing invasive species every year. Most invasive plants were brought to the U.S. on purpose, either as horticultural selections or potential forage for livestock. While most invasive plants don't directly kill trees, they do cost land managers lots of time and money. The Callery pear tree, for instance, is an invasive tree present across much of the eastern U.S. These trees have large thorns that can puncture tires and injure livestock, and can grow in nearly any environment – from dense woods to open fields. Callery pear trees grow in thick patches, and once they get established they are incredibly difficult to remove. This tree comes from the Bradford pear tree, which was once widely planted across much of the country as an ornamental street tree owing to its pretty flowers, colorful fall foliage, and tolerance of urban conditions. While it's no longer widely planted, the damage has been done.

Several shrubs were similarly introduced for horticultural or landscape purposes, including privet,



honeysuckle, and buckthorn. Cogongrass is another detrimental invasive species, only this one was introduced as a potential forage for livestock. After it was discovered that livestock wouldn't eat it, plantings weren't adequately eliminated, and it is now one of the worst invasive grasses in the Southeast. The USFS writes more about this invasive weed in this issue.

Invasive insects and fungi can be just as detrimental – or even more so – than invasive plants because their presence and activity usually results in direct killing of trees. Unlike invasive plants, invasive insects and fungi typically arrive by accident as stowaways on cargo or in solid wood packing material. Pests like the emerald ash borer, redbay ambrosia beetle and laurel wilt, and Asian longhorned beetle all likely arrived by accident via cargo. Since its discovery in the early 2000s, the emerald ash borer has nearly wiped out an entire genus of trees! *Fraxinus* (the ashes) are the preferred host, and their survival is tenuous at best, but being aided by scientists. Trees in the family Lauraceae, which include redbay and sassafras, are being wiped out by the redbay ambrosia beetle and laurel wilt, with no end in sight. The Asian longhorned beetle doesn't spread as quickly as other invasive insects, but its damage causes trees to break apart, creating extremely dangerous conditions, especially in urban forest areas.

Many of the invasive insects and fungi in the U.S. come from Asia, and there are good reasons for this. First, China is the largest import partner for the U.S. Think about how many things have a little “Made in China” sticker on them – they're all over! The sheer volume of goods coming into this country presents a formidable challenge to inspection agents trying to protect our natural resources. Second, the climate across much of Asia is incredibly similar to that here in the U.S. Coupled with very similar forest types in both areas (which means similar hosts are present in the U.S. as the pest used in its native land), and any time a pest arrives in the U.S. from Asia, it is met with similar environmental conditions. That in and of itself isn't a big deal, but also consider that none of the natural enemies of that pest in its native land are present in the new land. So, a pest that comes from Asia to the U.S. finds a similar climate, similar forest type, all without the normal natural enemy complex to keep it in check. It's a perfect storm!

**If you use Facebook and have more than just a passing interest in forest health and invasive species you might want to join the Forest Health & Invasive Species Outreach & Education Facebook group or the Southern Forest and Tree Health Diagnostics group. When on your Facebook page, search for either of these groups to learn more.**

Managing forests takes time, effort, and experience, and unfortunately poor or improper management can lead to poor forest health. Poor forest health can, in turn, lead to increased chances of bark beetle attacks, as shown in the northeastern U.S. in this issue and is well known throughout pine forests of the U.S. Poor forest health, which leads to bark beetle attacks, typically results in tree mortality. And while the presence of dead trees doesn't increase the chance of a wildfire starting, the increased fuel can certainly increase the intensity and duration with which that fire burns. There is a measurable link between forest health and wildfires – good forest management will decrease the chances of a wildfire, or prevent them altogether! Good forest management can also lead to a myriad of additional benefits (check out the story about improved oak health in New England).

There's a reason the slogan “healthy forests, healthy lives” is promoted by those of us in the forest health community. Healthy forests impact our collective and individual lives in many positive ways, and scientists and managers are working hand in hand to help battle detrimental factors that limit or degrade forest health. I hope you enjoy this issue focused on several forest health, and think about how you might help keep our collective forests healthy.



Dr. David Coyle is an Assistant Professor of Forest Health and Invasive Species at Clemson University. He is a member of the Society of American Foresters and the Entomological Society of America, is the Past President of the North American Invasive Species Management Association, and is a permanent member of the South Carolina Invasive Species Advisory Council.