



Nonnative Invasive Forest Species

A Position of the Society of American Foresters

Initially adopted by the Society on March 3, 2012 and revised in 2017. This position statement will expire in 2022 unless, after subsequent review, it is further extended by the SAF Board of Directors.

Position

The Society of American Foresters recognizes that invasive species present one of the most significant and urgent threats to America's forests, costing billions of dollars each year to our commercial, recreational and agricultural sectors. SAF supports a multi-tiered approach to invasive species management that includes prevention, eradication, control, and forest restoration. Management approaches should focus on practices that build greater resiliency and resistance to invasive species within forest ecosystems to ensure sustainable forests for future generations. SAF encourages federal agencies, states, counties, and municipalities to be cognizant of threats from invasive species in their budgets and priorities to ensure that eradication and control of invasive species is an important element of their operations.

Issue

The introduction of invasive species poses serious risks of widespread damage to forests, particularly urban forests where most Americans reside. Invasive species management strategies typically call for actions to prevent, eradicate, or control invasive species to minimize negative ecological, economic, and social impacts. However, the costs associated with responses climb exponentially with the duration of the invasion. Given the mounting challenges of increasing introductions of new invasive species through global commerce, uncertainty of risk and the scarce resources available to meet the enormous costs of eradication and control, a realistic vision is needed to address the risks to the future health of our nation's forests.

Background

Nonnative invasive species are defined through Executive Order 13112 as “an alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health” and includes animals, plants, and microorganisms (National Invasive Species Management Plan 2008- 2012). Invasive species have caused or pose risk of widespread ecological and economic impacts to forests in the United States (Moser et al. 2009). Although aggregate cost estimates of damage to forests caused by invasive species are lacking, recent analyses of 455 nonnative invasive forest insect species have shown that only 62 have caused noticeable impact. However, there are disproportionate risks associated with certain insect groups and a smaller percentage of species (Aukema et al. 2011). For instance, wood-boring insects such as the Asian longhorned beetle and emerald ash borer, which typically kill the host tree, are estimated to cost \$1.7 billion to municipalities and \$830 million in reduced residential values each year. Foliage feeders and sap feeders were estimated to result in lower annual expenditures and loss of property values. The majority of costs are borne by local governments and residential property owners. Losses of timber were estimated at much lower values, suggesting that invasive forest pests have, at least historically, impacted mostly urban forests.

While many nonnative species are not invasive, some become invasive primarily because they lack competitors and predators that would control their populations or are provided opportunities for invasion via high levels of disturbance and increases in resource availability (Davis et al. 2000). In some cases of plant species (for example introduced crop species), invasive species can have positive benefits (e.g. providing avian habitat), but generally most unintended ecological impacts tend to be negative (Russell, J.C. and Blackburn, T.M., 2017).

Regardless of risk and uncertainty, accidental introductions through global commerce and transport are expected to continue via various pathways including shipping and packaging material (Koch et al. 2011). The rate of introduction between the years of 1860 to 2006 is reported as one damaging insect or pathogen every 2.1 to 2.4 years and is projected to increase (Aukema et al. 2010).

Federal agencies as directed by Executive Order and the National Invasive Species Management Plan 2008-2012 have recognized that prevention is the “first line of defense” and most cost effective, versus the cost of management response. Current international standards help to regulate global commerce and prevent invasive species introductions though the effectiveness varies by taxa and species. While these regulations result in increased shipping costs, the benefits will likely outweigh the costs.

If prevention is not successful, early detection and rapid response are usually recommended since they can be successful and cost effective in eliminating a recently introduced invasive species. Eradication requires a significant amount of resources and commitment and has limited success, but there are cases where it works and technology for eradication is improving (Liebhold et.al 2016, Tobin et.al. 2014). Control techniques, which are focused on reducing impacts and slowing the spread of an invasive species tend to be costly, because they usually require constant maintenance so should not be seen as a substitute for prevention measures. In some cases, there may be unintended consequences from the use of the control

technique. For example, biological control agents may cause other ecological disruptions or the removal of host tree species may result in a forest ecosystem that is less resistant and resilient to future invasive species invasions.

While invasive species strategies typically address actions that prevent or manage the invasion, it will be increasingly necessary to manage for forests that are more resistant and resilient to potential impacts. Methods to increase the resiliency of ecosystems to disturbances caused by invasive species are relatively poorly understood and will depend on additional research into ecological vulnerability, the application of silvicultural methods, and best management practices.

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