

Introduced Forest Insects and Pathogens: Scientific Synthesis and Policy and Management Solutions

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- Introduced forest pests are the most serious and urgent threat to the health of Northeastern forests
- Current federal policies are not providing adequate protection against importation of new pests, but policy options are available for mitigating the problem.

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<http://www.nsrcforest.org>

Project Summary

Rationale: The introduction of invasive insects and diseases represents a major disturbance in forests of the Northern Forest region. Currently the trees of the region are affected or threatened by hemlock woolly adelgid, beech bark disease, emerald ash borer, Asian longhorned beetle, and a long list of other insects and diseases that have been imported from other continents. While there has been a substantial amount of research on the biology and ecological impacts of some of these pests, and new research is beginning to quantify their economic impacts, there has been little attention focused on how to strengthen national policies to prevent the introduction of damaging pests and pathogens to the United States.

Methods and Outcomes: We undertook an initiative to summarize and synthesize the ecological and economic impacts of introduced forest insects and pathogens, and to list potential policy options for the solution of this problem. To do this, we assembled a team of forest scientists, economists and policy advisors, and convened a workshop on the effects of introduced insect pests and tree pathogens on U.S. forests. We also examined various policy solutions aimed at minimizing future introductions. With our collaborators, we prepared a synthesis publication for the peer-reviewed scientific literature. We coupled this with a communication and outreach effort designed to reach media, the public, and government policy makers. Beneficiaries of this information include individuals and corporations that own forest land, as well as public land managers, government policy makers, conservation organizations, and members of the general public who appreciate and expect healthy forests.

Background and Justification

- Introduced forest insects and diseases are a serious threat to the Northern Forest region but have received relatively little attention in the federal policy arena
- Most media stories about pests focus on the local effects, rather than the global causes of pest invasions
- Many individual research studies in the last decade have examined the ecological and economic impacts of pests, but this research has not been brought together or synthesized

Methods

- Assembled a team of 20 ecologists, entomologists, economists, and policy advisors
- Held workshop to discuss outline of a synthesis paper and to review policy options
- Produced peer-reviewed synthesis paper
- Facilitated media engagement with the issue upon release of the paper

Workshop participants at the Cary Institute in May 2014



Results/Project outcomes: 1

Published a peer reviewed synthesis paper that is the most comprehensive analysis of the forest pest issue to date.

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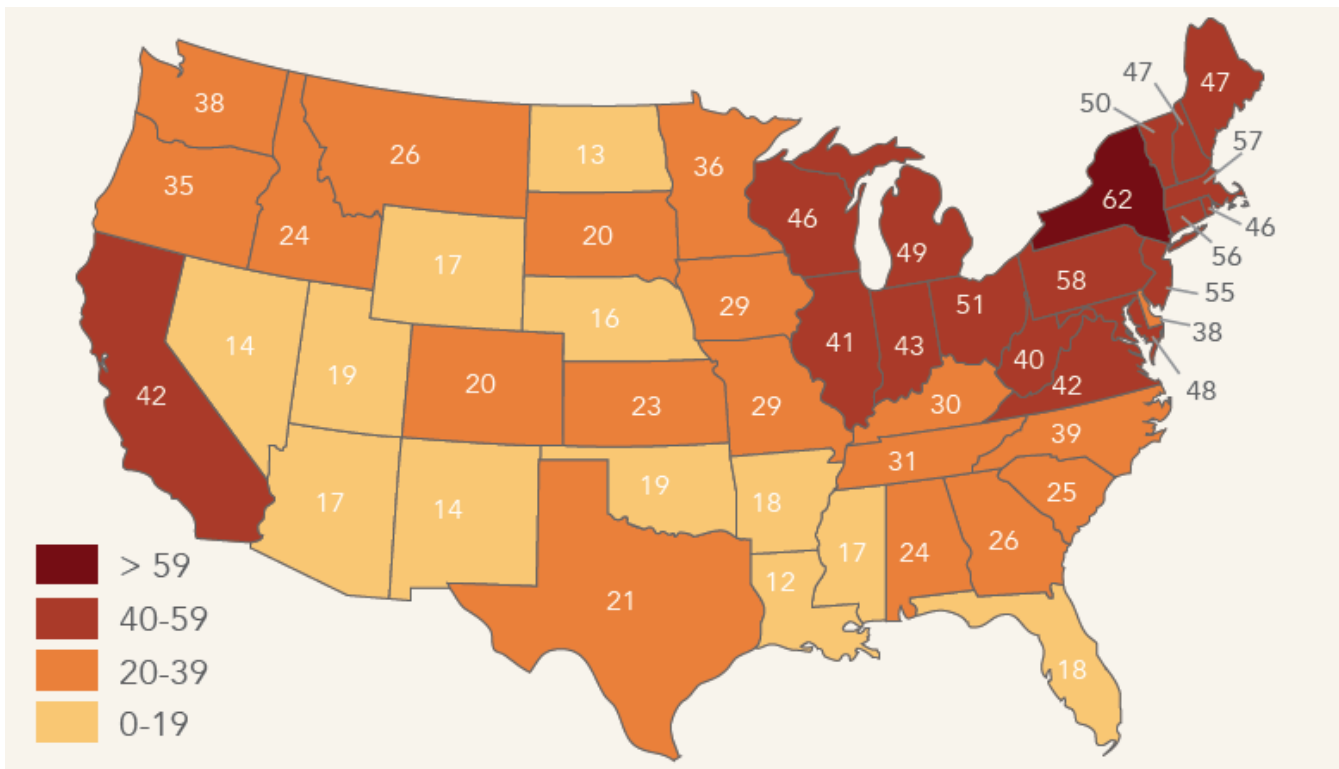
Nonnative forest insects and pathogens in the United States: Impacts and policy options

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Results/Project outcomes: 2

Main messages of study

1. Imported forest pests are the most pressing and underappreciated forest health threat in the U.S. today. All states are affected, but the Northeastern states are hit particularly hard.

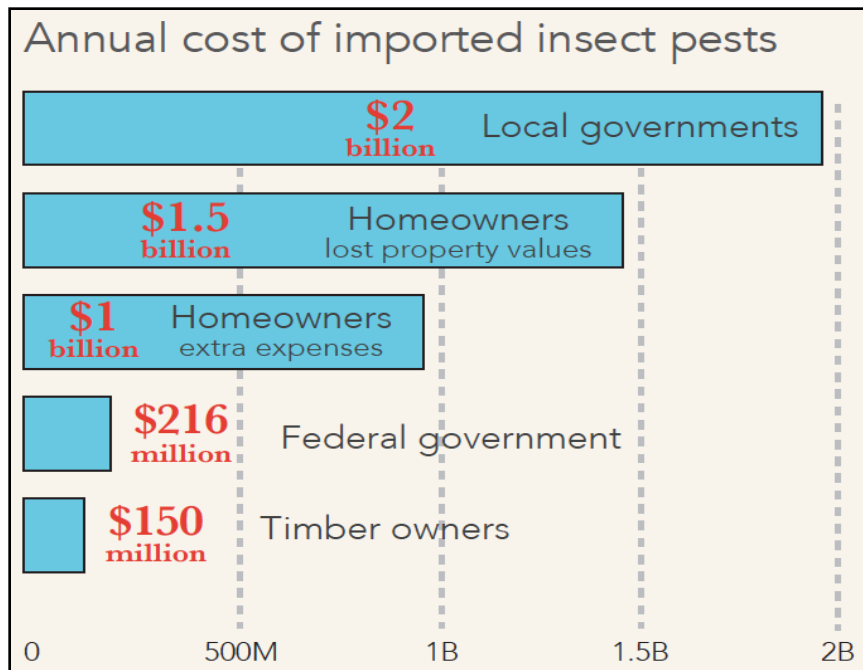


Number of imported forest pests by state. Data from US Forest Service.

Results/Project outcomes: 3

Main messages of study (continued)

2. Ecological impacts are severe and play out over decades or centuries. Introduced pests are the only forest threat that can effectively eliminate an entire tree species in a matter of decades.
3. Economic impacts are over \$4 Billion per year annually for the nation, and fall mostly on local governments and homeowners.



Data from J. Aukema et al.
2011, PLOS One 6(9): e24587

Results/Project outcomes: 4

Main messages of study (continued)

4. Current polices to prevent new introductions are helpful but are not sufficient in the face of burgeoning global trade. Many policy options are available for dealing with this problem.
5. Policies should focus on prevention of importation of new pests, and on the major pathways of pest introduction, which are solid wood packaging material (such as crates and pallets) and live plants imported for the nursery trade.

Solid wood packaging material



Live woody plants for landscaping



Results/Project outcomes: 5

Outreach: Media

- Outreach goal was to raise the profile of the forest pest issue to inform and motivate policy action.
- Outreach involved preparation of press materials, developing interview messages, distributing materials to media outlets, holding a web-based media briefing.
- Release of the paper in May 2016 received coverage from over 300 media outlets, including the Boston Globe, NY Times, Washington Post, Associated Press, and Newsweek. Local media throughout the Northern Forest region covered the story.
- As hoped and planned, the coverage focused on the economic and ecological impacts of pests, and policy solutions to the problem.



The Boston Globe

Damage from invasive forest pests costs billions a year, study finds

The Washington Post

Invasive insects are ravaging U.S. forests, and it's costing us billions

Results/Project outcomes: 6

Outreach: Federal Government

- Project leaders presented results at two Congressional briefings (May and July 2016). Briefings were very well attended.
- Briefings were followed by meetings with Congressional and federal agency staff to discuss study findings and policy options.



Our team meeting with staff of Senator Patrick Leahy of Vermont in Washington to discuss the study. From L to R: Marissa Weiss and Kathy Fallon Lambert (Harvard Forest/ Science Policy Exchange), Leah Gouty (Leahy staff), Gary Lovett (Cary Institute), Rebecca Turner (American Forests)

Implications and applications in the Northern Forest region

- The forest pest problem in the Northern Forest cannot be solved by action within the region. Federal action is required to strengthen defenses against the importation of new pests.
- This project raised the profile of this issue by synthesizing the available scientific information and informing policy makers in Washington about the seriousness of the problem and possible policy options for reducing importation of damaging pests.

Future directions

- We will continue to work with partner organizations to advance policy solutions to this issue.
- We will serve as a scientific and technical resource for Congressional committees that are crafting legislation to help deal with the problem.

List of products

- **Peer-Reviewed Publication**

Lovett, G.M., M. Weiss, A. Liebhold, T.P. Holmes, B. Leung, K.F. Lambert, D.A. Orwig, F.T. Campbell, J. Rosenthal, D.G. McCullough, R. Wildova, M.P. Ayres, C.D. Canham, S.L. LaDeau, and T. Weldy. 2016. Non-native forest insects and pathogens: Impacts and policy options. *Ecological Applications* 26:1437-1455.

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