Non-native Forest Insects and Diseases: Integrating Science and Policy

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A Forest Pest and Pathogen Initiative

**Goal:** To provide a scientific synthesis of ecological and economic impacts and to motivate policy action

**Approach and Activities**

- Assembled team of ecologists, economists, and policy experts
- Synthesis paper: in revision for the journal *Ecological Applications*

- Communication and outreach
  - Translation piece
  - Press kit and media roll-out
  - Briefings with influence leaders
  - Ongoing communication and outreach
The Problem:
Continued invasion by forest pests

All insects: 2.6 per year since 1850
Wood borers: 1.2 per year since 1985

From Lovett et al. in revision; data from Aukema et al. Bioscience 2010
The Problem:
Continued invasion by forest pests

From Lovett et al. in revision
Biological Pollution

From Liebhold et al. Diversity and Distributions (2013)
Ecosystem Disturbance

Canopy Species Eliminated

Wildlife Habitat Compromised

Productivity & Nutrient Cycles Altered

Communities Transformed

> 100 million trees killed in US

>30,000 trees killed in Worcester, MA
Economic Impacts

- Impacts of insects alone estimated in the billions of dollars per year (Aukema et al. 2011)
  - Forestry impacts small compared to urban and suburban impacts
  - Largest costs borne by homeowners and municipal governments
  - Costs include takedown and replacement of street trees and yard trees, lost property value
  - These estimates do not include introduced diseases
**Policy Options**
**Focus on Prevention of Establishment**

**WOOD PACKING MATERIAL**
- Phase out use of WPM
- Promote voluntary substitution of WPM by retailers
- Improve existing WPM treatment regulations
- Strengthen enforcement and penalties

**POINT OF ORIGIN**
- Monitor “sentinel trees” abroad
- Pre-clearance partnerships

**CLEAN PATHWAYS**
- Wood packing material
- Live plants

**PREVENT ESTABLISHMENT**
- Post-entry quarantine
- Integrated surveillance system
- Funding for rapid eradication

**LIVE PLANTS**
- Phase out import of live woody plants
- Switch to a “white-list” screening system or add all N. American woody genera to NAPPRRA list
- Certify “pest-free” retailers
- Strengthen enforcement and penalties
Science-Policy Linkage

• Improve quality of inspection data

• Enhance access to APHIS and CBP data by other government agencies and academic researchers

• Provide regular data analysis and reporting on effectiveness of policies

• Develop accessible global databases and information systems
Focus on Urban Forests

- Urban forests are both sentinels and beachheads for invasion
- Economic value of damage is greatest for urban and suburban forests
- Ecosystem services provided per tree are greater in urban and suburban ecosystems
- High potential for public engagement
Strategy for Impact

• Use science to build constituency and a coalition of engaged foundations, NGOs, municipal and state governments

• Use science to focus attention on strengthening existing US policies and programs

• Use media attention to prompt corporate conversations around clean packaging and clean plants

• Goal: To bend the invasion curve