Pest risk analysis in protecting commercial forests

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Overview

- FORM project
- Threats to Irish Forestry
- Horizon Scanning
- Pest Risk Analysis
  - Entry and Establishment
  - Impacts
  - Risk Management

FORM project

The FORM project (FORest Management) included a work package on PRA for Sitka spruce

Create a pest list (insects + diseases) for *Picea* globally

Write Pest Risk Analyses (PRAs) for top pest risks and also a pathway PRA

This presentation will mainly look at the application of PRA, but will draw upon what was learnt in FORM

Threats to Irish Forestry

- It is evident pests can have devastating impacts on forestry
- The island of Ireland remains free of some of the most damaging forestry pests in Europe
- PRA can help keep it that way

What is Pest Risk Analysis (PRA?)

> *The process of evaluating biological or other scientific and economic evidence to determine whether an* ***organism is a pest, whether it should be regulated, and the*** *strength of any* ***phytosanitary measures to be taken against it***

- Identify potential threats and assess:
  - Can they enter?
  - Will they establish and spread?
  - Will they be damaging?
  - How can we prevent introduction or limit damage?
- Pest focused or pathway focused

Why do PRA?

- Under international trade laws, phytosanitary measures against trade must be **technically justified**
- PRA is the accepted method to justify regulation of pests and pathways
- Pests can not be regulated at an EU level without a PRA
- A PRA scheme for Ireland has been developed

Horizon Scanning

- Horizon scanning is the process by which pest risk analysts identify potential new threats
- Analysts will look at many sources of information to monitor developments in plant health world wide
- Interested in new species, new locations and new hosts
- New trades can also lead to identification of new pest threats

Giant redwood clones in Cornwall

Written by Laura Cole Published in Forests

08 Apr 2015

Redwood grove in California Gary Saxe

One hundred saplings from one hundred of the world's tallest trees have been planted in Cornwall as part of a climate project to add more longevity to our greenery

Horizon Scanning

- It is important to check a range of sources
- Scientific literature
- Trade journals
- Social media
- Interception records

PRA – Assessing Entry

Identify the **pathways** the pest can enter on

Different pathways have different levels of risk

To enter a pest must **transfer to a suitable host**

Entry

- Identify the **pathways** the pest can enter on

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Entry – Hemlock Looper

- The hemlock looper (*Lambdina fiscellaria*) was a pest identified as a potential risk to Ireland and the EU more widely
- It is a serious North American defoliator, attacking a range of coniferous and broadleaved trees
- Western hemlock (right) damaged by hemlock looper feeding (Bruce Hostetler, USDA Forest Service)

Entry – Hemlock looper

- Mosses and lichens cleared from branches in the Pacific Northwest (left) and mosses and lichens of unknown origin on sale at a plant parts market in Paris, France (right, image credit Muriel Suffret).
- Eggs and pupae could be associated with this pathway
- What other pests could enter on this pathway?

Establishment

- Climate and host availability are the two most important factors influencing potential to establish
- As the climate changes pests that have in the past not been a threat to the island of Ireland may become an issue
- Nun moth (*Lymantria monacha*) has expanded its range 200 km north over the last 20 years

Nun moth (left, image credit Stanislaw Kinelski) and damage to Norway spruce right (image credit Jan Liska)

Establishment

- Host distribution – pest must be able to find new hosts to establish
- Some pests require more than one host to complete their lifecycle

Thekospora minima alternates between blueberry and Eastern hemlock

Impacts

- A pest can't be regulated at an EU level unless it has potential to cause impacts in country or region
- Again, climate and host availability can affect impacts, as well as current practises
- Sometimes susceptibility of native tree species is not known – projects that the IPSN can help

International Plant Sentinel Network

EAB (left, image credit By Pennsylvania Department of Conservation and Natural Resources was only a secondary pest on Asian ash trees, but was recorded killing American ash in China

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Impacts

- Impacts can be economic, environmental or social
- Pests and diseases can entirely change landscapes and ecosystems
- Social impacts are how a pest impacts on people and activities
  - Human and animal health impacts
  - Reduction in aesthetic value
  - Closing public spaces

Risk Management

- If the pest has potential to enter, establish and cause impacts – then you identify risk management options
- These will either be to help **exclude** the pest, or to help **reduce impacts** should it arrive
- Pests that hitchhike can be very difficult to exclude!

Brown marmorated stink bug (left) and elm zig zag sawfly (right) are both pests that hitchhike making them hard to exclude.

Risk Management

- Risk management measures need to have **minimal impacts on trade**
- Measures that are equivalent must be accepted
- Identify risk management options and assess their
  - Effectiveness – will it work?
  - Acceptability – will people implement it?
  - Feasibility – is it actually possible to implement?

Risk Management

Common phytosanitary measures include:

- Requiring material originate from Pest Free Areas or Pest Free Places of Production
- Specific treatments to kill the pest such as kiln drying or fumigation
- Removing part of the plant the pest is associated with
- Only moving a commodity at a specific time of year
- Producing from clean, certified material

Conclusions

- PRA is a valuable tool to help assess the potential risk a pest poses to an area, and identify appropriate measures to exclude it
- Under international trade laws, phytosanitary measures on trade must be technically justified
- Pests and diseases of commercial forestry can enter on a wide range of pathways
- Climate and host availability are the most important factors effecting establishment
- Impacts can be economic, environmental or social

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Thank you for your attention!