

# Invasive species, climate change and diseases: the elephant in the forest

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*Based on material provided by Sarah Taylor,  
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# Overview

Biosecurity – a set of precautions that aim to prevent the *introduction* and *spread* of harmful organisms

- Range of threats:
  - pathogens (insect pests and diseases)
  - Also mammals and plants
- How does this interact with changing climate
  - Expectation that will get worse



# Mammal pests

- Grey squirrel – introduced from USA c1876-1926
  - Displaced native red squirrels (competition, pox)
  - Major damage to broadleaved crops
- Deer, native and introduced
  - Major changes to structure composition of woods
  - Major cost to foresters
- What next: wild boar, raccoon dog?



# Invasive plants

## Rhododendron spread

- Takes out lower layers
- Makes woods inaccessible
- Carrier of Phytophthora
- Costly to control

## Balsam

- Conservation issue only?



# Insect pests

- Direct damage and as vectors for disease
  - Agrilus, Scolytus
  - Bark beetles on spruce
- Potential human hazard (OPM)

Keeping out?

- Adequacy of Port inspections?
- Natural spread

Control

- Pesticides may not be acceptable



# Diseases and syndromes

- Dutch Elm Disease
- *Phytophthora ramorum*
  - threat to oak
  - then moved to larch
- Acute Oak Decline
- Ash Dieback



# Lessons?

- DED/SOD/AOD – sudden change in character
  - Avoid complacency
  - Document the effects
- Generally in country well before detected
  - Need improved detection systems, Citizen Science
- Sanitation felling limited value once established, often just delaying the inevitable
- Final death of trees may be from secondary agents, e.g. Armillaria
- Ideally keep out – high cost to be effective, but low compared to real costs of dealing with diseases



# Climate change interaction

- Trees more likely to be put under stress
  - More susceptible to impacts
  - Impacts may be wrongly assigned
- Conditions for existing pests and pathogens may improve
  - Reduced winter mortality of mammals
  - Spread north, e.g. OPM
- Introduction of new tree crops may bring in disease as well





# Ways forward

- Increasing recognition of the problem
- Need for coordinated approaches
- Proactive and predictive
- Need to bring public on board



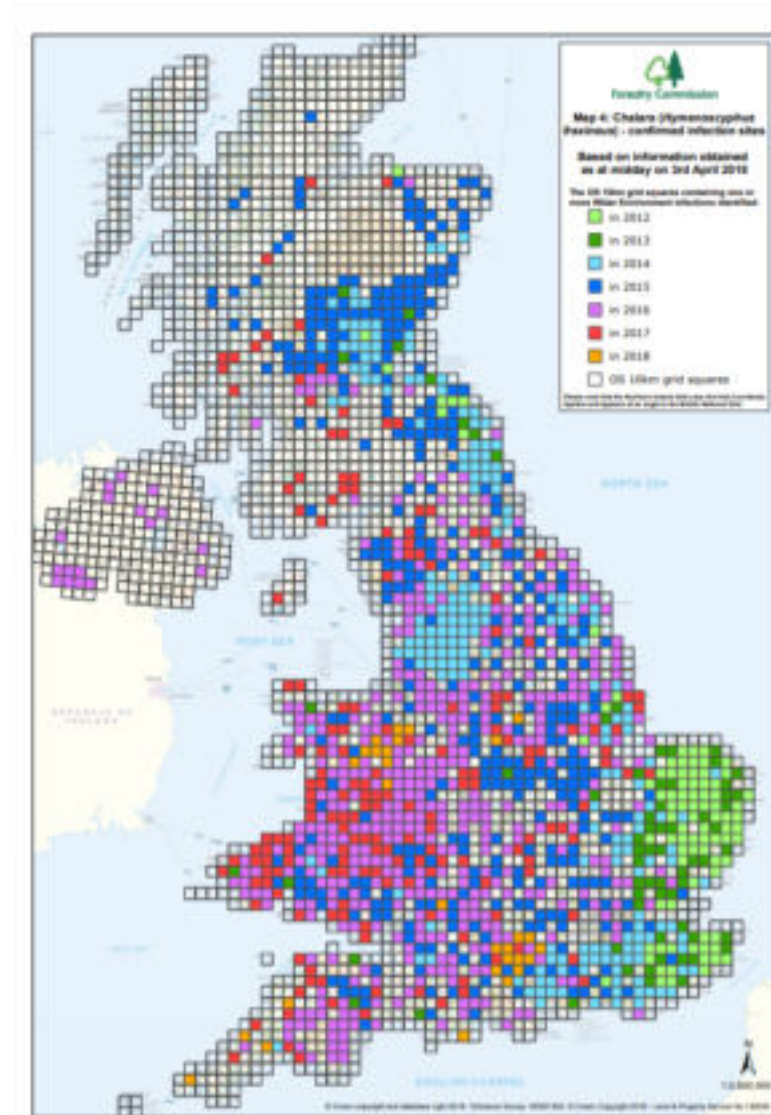
# Public reactions

- Ignore (don't see it as issue, don't take action)
- Oppose (concerns about killing mammals, rhododendron attractive flower)
- Accept in principle, take issue with practice (large scale fellings, restrictions on access)
- Over-expect: assume threats can be controlled and no change will happen
- Become involved through Citizen Science



# Conclusions

- The problems ain't going to go away
- Get ready for the next wave
- Biosecurity/control measures can slow spread but seldom guarantee complete safety
- Learn to live with problems
- Risk management
- Costs of dealing with disease huge
- So justifies stringent control?



# Thank you

