

From olive groves to cargo holds: the dissident assemblages of invasive species



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Globalization and non-human mobility

- Massive increase in alien species introductions (animal, plant, microbe) over past 3 decades
- Impacts on health, biodiversity, ecosystem services, infrastructure, food production capacity and livelihoods.
- Invasive Non Native Species (INNS) cost British economy ~ £2 billion/year
- Non-human mobility linked to **global trade** and **climate change**
- Trade and transport routes = Pathways

"...the resulting unprecedented mixing of species across continents and ecosystems is surely one of the most profound manifestations of the Anthropocene"

(Potter and Urquhart, 2017: p61)



Pathways – Container Shipping

- ▶ Accounts for 90% of global trade
- ▶ 2014: 127.60 million TEUs (twenty-foot equivalent units) exported worldwide
- ▶ Pests in traded goods - e.g. rodents and insects in grain shipments
- ▶ Contaminants - e.g. bark beetles pests in timber and packing material
- ▶ Stowaways - e.g. aquatic organisms on ships hull and in ballast water



Zebra mussel (*Dreissena polymorpha*) – native to Black and Caspian seas. Spread to freshwater habitats throughout Europe and North America including the Great Lakes. Outcompeted native mussel species, damage to infrastructure incl. blocking water intake pipes for power plants.



Pathways – Live Plant Trade

- ▶ Increasing volume of live plants imported into EU:
 - ▶ 2013: €278 Million Live plant imports from rest of the world
 - ▶ 60% increase in value of trade over last 15 years
- ▶ Previously - exotic plants introduced and become invasive
 - ▶ e.g. Himalayan Balsam
- ▶ Now - Ornamental trees and shrubs as carriers of pests and diseases
 - ▶ e.g. Chalara ash dieback, Larch tree disease (*Phytophthora ramorum*), Oak processionary moth, Lily beetle, *Xylella fastidiosa***



- ▶ **Challenge of governing biosecurity and non-human mobility in a neoliberal world of free trade** – Maye et al, 2011; Tsouvalis, 2018

Invasive Assemblages

Composition of heterogenous elements into “*some form of provisional socio-spatial formation*” (Anderson and McFarlane, 2011: 124)

Key features:

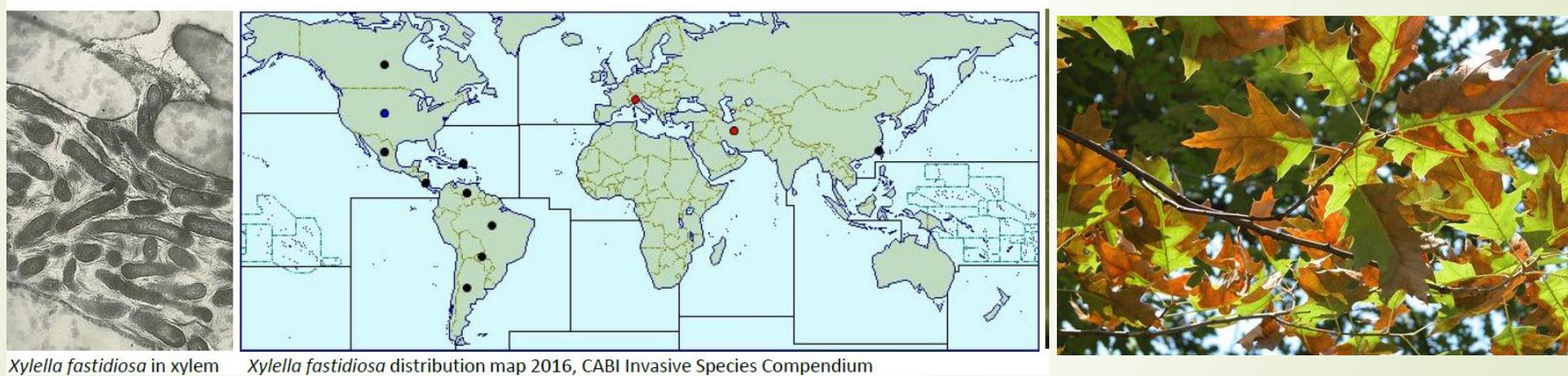
- Non-Human Agency – ‘lines of flight’
- Possibility and contingency
- Processes of assembling and disassembling
- Material and expressive components



Holding together of an assemblage is a provisional process, in which “*relations may change, new elements may enter, alliances may be broken, new conjunctions may be fostered*” (Anderson and Macfarlane 2011, 126)

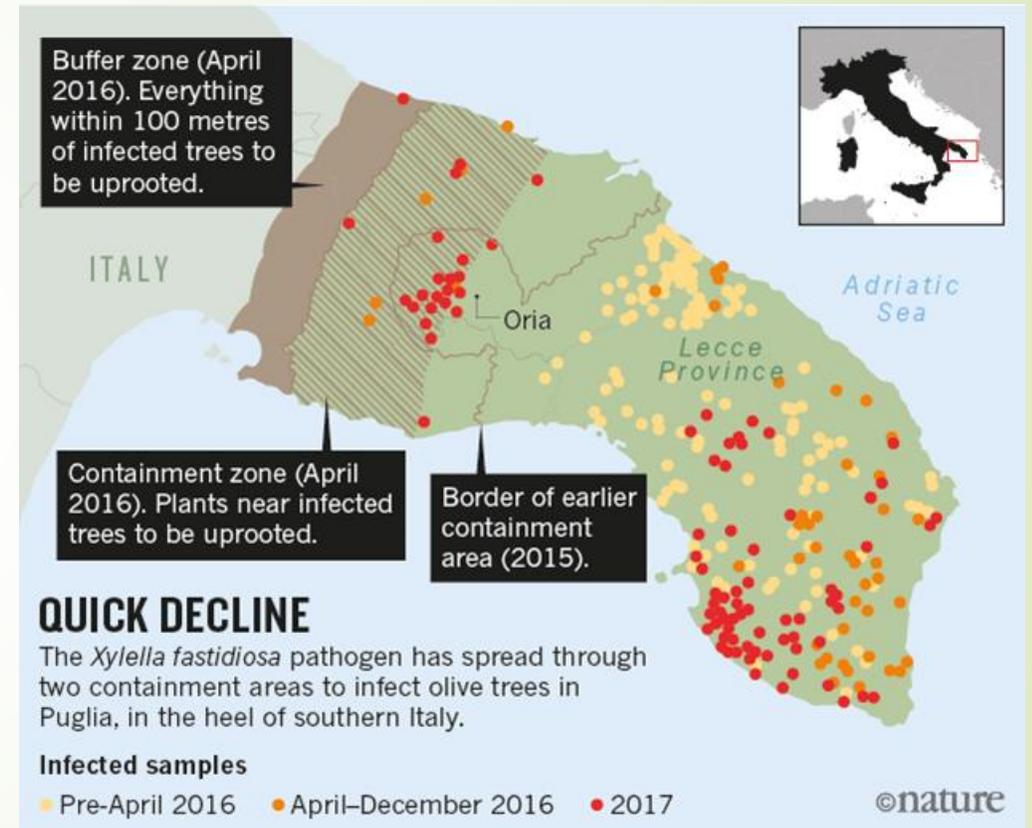
Xylella fastidiosa

- ▶ Bacterium - infects the water conducting tissues of plants (the xylem)
- ▶ Native to Americas – causes disease in citrus, coffee and grapevine
- ▶ Major outbreak in Italy in 2013. Since then detected in France (2015), Germany (2016), Balearic Islands (2016), mainland Spain (2017)



- ▶ Wide range of susceptible plants - 359 plant species across 75 families
- ▶ Crops, ornamental and wild plant species at risk - **Uncertainty**

Xylella in Puglia: Emergence



Xylella in Puglia: Non-human agency



Range of species susceptible to Xylella bacterium present



Philaenus spumarius (meadow spittlebug)



New host in Olive trees



High-density landscape

Xylella in Puglia

- Material
 - Decline in olive yields
 - Impact of farm incomes and livelihoods
 - Change in visual appearance of landscape
 - Reductions in tourist visitors to the region
- Expressive
 - Heritage landscape – ‘Monumental trees’
 - Olives central to regional culture and identity
 - Ancient olives farmed by generations of families
- Biosecurity assemblage
 - Multiple actors and logics - science, policy, environmentalism, emotion, conspiracy theory
 - Incoherence (*deterritorialization*) and inactivity





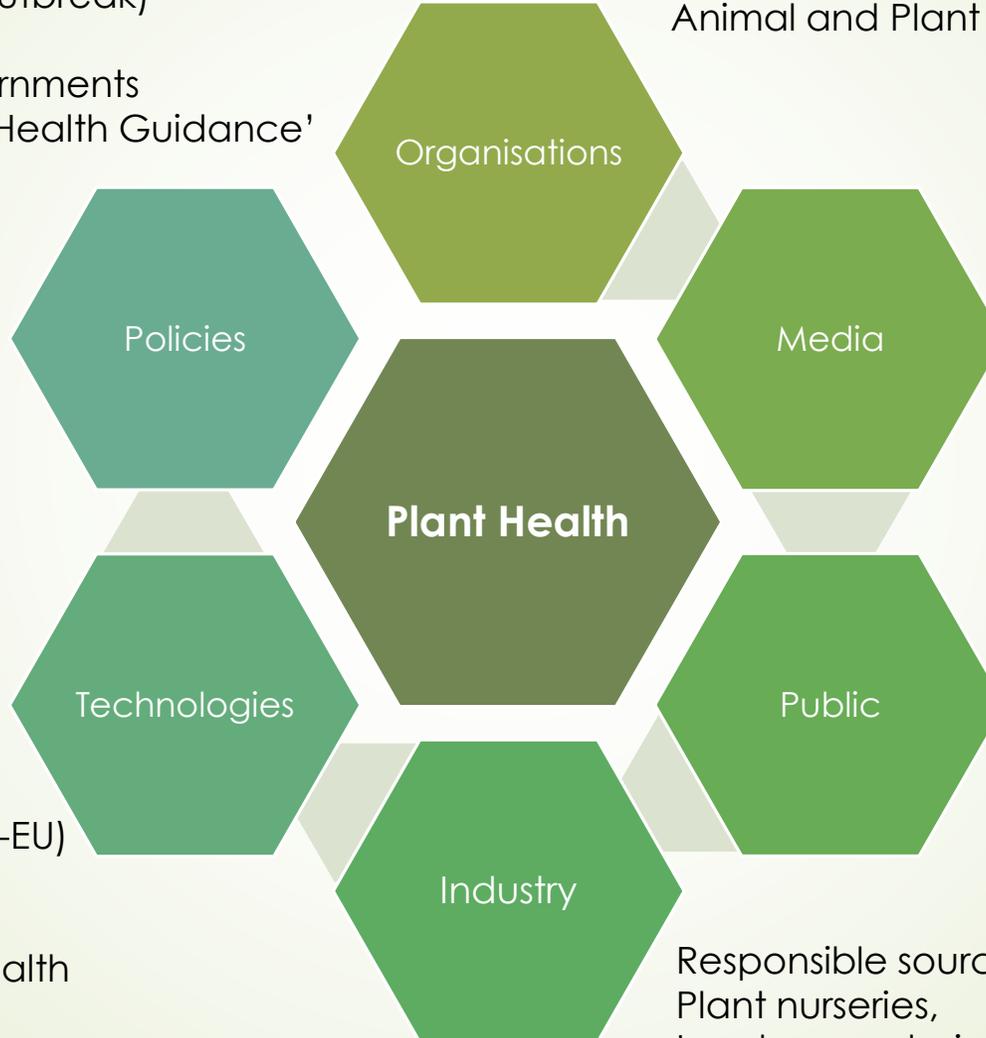
Xylella in the UK – possibility spaces

- ▶ **How could *Xylella* arrive in UK?** (Pathways – plant trade, show gardens, tourists' luggage)
- ▶ **Which subspecies of *Xylella* would thrive in the UK?** (Constrained by climate, but *Xylella fastidiosa* subsp. *Multiplex* can tolerate colder conditions)
- ▶ **Which plant species would it affect?** (host plants incl. native species like Oak and non-native garden plants e.g. rosemary, lavender, oleander, plus unknown others)
- ▶ **How would it impact the health of these plant species?** Changing ecosystem relations
- ▶ **How will it change relations within other assemblages?** e.g. forestry, agriculture, landscape, gardens



Forestry Commission, Woodland Trust, NRW
Royal Horticultural Society (RHS)
 Horticultural Trade Association (HTA)
 Strategic Biosecurity Alliance (Prince Charles)
 Animal and Plant Health Agency

EU Emergency measures
 (Interception, Outbreak)
 UK Government
 Devolved Governments
 Defra 'UK Plant Health Guidance'
Brexit?



Public Awareness campaign:
 Press coverage
 Social media
 Posters
 TV e.g. GW



Consumers
 Responsible tourists
 Gardeners
 Citizen scientists
 (e.g. OPAL)



Responsible sourcing of plant material:
 Plant nurseries,
 Landscape designers
 Horticultural shows (e.g. RHS Chelsea)

Risk Ratings and Current Mitigations

| Unmitigated Risks | | show / hide | |
|-----------------------------------|---|-------------|--|
| Likelihood [1 - 5] | 0 | 4 | |
| Spread [1 - 5] | 0 | 3 | |
| Impact [1 - 5] | 0 | 3 | |
| Value at Risk [1 - 5] | 0 | 5 | |
| Likelihood x Impact [1 - 25] | 0 | 12 | |
| UK Relative Risk Rating [1 - 125] | 0 | 60 | |

| Current Mitigations | | show / hide | |
|--------------------------------|--|-------------|---|
| Key mitigation for pest | | | |
| EU regulated pest | | | |
| Regulation | | | ✓ |
| Surveillance | | | ✗ |
| Industry Scheme | | | ✗ |
| Contingency Plan | | | ✗ |
| Awareness | | | ✓ |
| Research | | | ✓ |

Surveillance
 laboratories
 Plant passports (EU/non-EU)
 Pesticides
 Plant breeding
 Metrics e.g. UK Plant Health
 Risk Register

Conclusions

- ▶ Assemblage approach highlights:
 - ▶ Emergence of invasive species threats
 - ▶ Non-human mobility brings Change (actual/possible) to existing relations
 - ▶ Biosecurity as Process, involving diverse practices, rationalities and policies
 - ▶ Non-human agency part of the response

Thanks for listening.

