Trading Blows:
Can we control invasive species through trade agreements?

Twenty-first Century Ecosystems: Systemic Risk and the Public Good

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Summary

- Darwin and invasive species
- Trade and invasions
- World Trade Organization
- Problems with the WTO approach to invasives
- The way forward
Definitions: Invasive alien species (IAS)

- **Invasive**
  - proliferate and spread
  - harmful to environment, economy or society

- **Alien**
  - Have moved from one geographic area to another in which they did not previously occur

- A major global threat to biodiversity, food security, and human health
Many statements on IAS in *Origin of Species*

Darwin focussed on invasions to explain discrepancies in fossil record

See Ludsin and Wolfe 2001 *BioScience* 51(9) 780-789
Darwin and species translocation

- Movement around the globe - Darwin’s emphasis was natural dispersal e.g.
  - Bird guts
  - Oceanic currents
Pathways of invasion – Darwin’s focus

- **Accidental**
  - Wind
  - Water
  - As passengers
    - On/in animals
    - in trade

- **Intentional**
  - Ornamentals
  - Pastures
  - Pets
  - Forestry species
Pathways of invasion – the present danger

- Accidental
  - Wind
  - Water
  - As passengers
    - On/in animals
    - in trade

- Intentional
  - Ornamentals
  - Pastures
  - Pets
  - Forestry species
For example, ballast water

- Between 3 – 10 billion tonnes discharged per year
  - > 7,000 spp. in transit at any one time
- From 1975-2005
  - Sea cargo tripled
  - Air cargo increased 6 fold

(Acknowledgments: Lynn Jackson)
World Trade Organization

- Ecological implications e.g.
  - Exports of GMOs
  - Undercutting environmental protection legislation
  - Undercutting sustainable harvesting
  - Movement of species, threat of IAS
World Trade Organization – SPS agreement

- Administers various agreements relevant to invasives, especially the Sanitary and Phytosanitary (SPS) Agreement
Despite the bad press......

- SPS Agreement allows countries to take strong biosecurity measures
  
  See Burgiel et al 2006

- Many countries, e.g. Australia, have such measures in place
- What is lacking is international cooperation
- Approach is adversarial, yet the problem increasingly demands an adaptive, cooperative approach
Sources of guidance for SPS Agreement

- International Plant Protection Convention (IPPC) - standards for plant health
- Office International des Epizooties (OIE) - standards for animal health and animal diseases that impact human health
- Codex Alimentarius Commission – food safety standards
- What is missing? Some examples of guidance not currently explicitly drawn on:
  - CBD “Guiding Principles” on IAS 2002
  - IMO’s convention on ballast water and sediments
Risk is approached mechanistically in the SPS agreement

- Tends to assume the risks can be quantified;
- Requires Members to ensure that exclusion measures are ‘based on scientific principles’ and are ‘not maintained without scientific evidence’;
- Yet invasions are difficult to predict - low prevalence and high uncertainty (e.g. Smith et al. 1999 *Biological Invasions* 1: 89-96)
Invasion quirkiness 1 – similar species behave very differently

- Rubbervine a major weed in N. Australia
- Two closely related species introduced at the same time into home gardens
- Only Cryptostegia grandiflora became invasive
- Cryptostegia madagascariensis remained behind
Invasion quirkiness 2: previously harmless species become invasive

- Camels
- Rabbits
- Cane toads
Invasion quirkiness 3: Lag phases

Darwin Botanical Gardens - first record of *Mimosa pigra*
Accurately predicting risk is beyond the limits of science here…

- We can retrospectively explain, but hardly predict, the outcome of most species’ introductions
- Ensuring that exclusion measures are ‘not maintained without scientific evidence’ is near impossible for invaders in natural ecosystems
- Need for precautionary approach – acknowledge uncertainty
Summary of issues with WTO/SPS agreement

- Adversarial where adaptive/information sharing approach is needed
- Lacking in biodiversity/invasives context
- Mechanistic approach to risk rather than precautionary

Time to change our ways
The way forward: improving the working of the SPS agreement

- Expand SPS committee membership to include biodiversity expertise and ecological knowledge - e.g. CBD to join
- Shift to precautionary approach - acknowledge uncertainty rather than mechanistic risk models in agreement
- Adaptive management - allow evolution of regulatory actions in response to new information – defer to national decisions/local knowledge
- Build capacity for information exchange and learning on biological risks within SPS committee.
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Further reading