Why are invasive species important to Canada?

In 2002, a metallic green beetle was detected in the Windsor area of Ontario. Since then, the beetle has infected up to 200,000 trees in Canada. The arrival of this species resulted in economic costs and environmental destruction.

This is only one example amongst many that explains why Canada has delegated responsibility for invasive species to a government agency: the CFIA.

Eradication

- the complete elimination of a species from a sufficiently isolated geographic area in order to prevent reinvasion (Zamora et al. 1989; Myers JH et al., 1998)
Project Objectives

• Survey responses to failed species eradication cases in other industrialized countries
• Determine pros and cons of each adopted strategy

Methodology

• Identification of foreign government agencies involved in species eradication policy
• Web-based research on specific cases of failed species eradication and their follow-ups
• Contacting foreign agencies for additional cases and information
• Comparison and analysis of cases

Case Study 1
Citrus Canker (USA)

General Information

• Bacterial pathogen from Southeast Asia-India
• Causes lesions on fruit and premature leaf and fruit drop
• Transmission via
  • Landscaping equipment, infected or exposed plants, windborn rain, irrigation, flooding, insects, birds and animals
History in the USA

• First arrived in Florida in 1910, three unsuccessful attempts at eradication lead to the implementation of the USDA’s Citrus Canker Eradication Program (CCEP) in 2000
• The Citrus Health Response Plan (CHRP) was put into place in 2006

Eradication Strategy and Failure

• The CCEP’s principle goal was to achieve complete eradication of Citrus Canker
• Used manual removal, chemicals and burning
• Replaced previous 125 foot radius rule by a 1,900 foot rule (based on scientific research)
• Lawsuits delayed the program between 2002 and 2004, when the Florida State Supreme Court over-rode citizens’ complaints
• 2004 hurricane season caused spreading, USDA responded by accelerating the speed of the program
• 2005 hurricane season caused further spreading, the USDA took the issue to international specialists, the recommendation was to terminate the program
Response to failure

• The USDA puts together a multidisciplinary team to create the CHRP

• The CHRP will provide guidance for early detection and minimizing incidence and build-up of Citrus Canker

Pros and Cons

• Economic
  • Cons
    • If the CCEP was achieved, the citrus industry could have returned to its full economic potential
    • CHRP requires continued funding
    • CHRP lowers the fruits’ marketability
  • Pros
    • Citrus infected fruit can still be sold to the juice industry (90% of Florida market targeted)
Pros and Cons (Cont’d)

• Social
  • Cons
    • With the CHRP the aesthetic value of trees on private properties diminishes
    • CCEP: lawsuits
  • Pros
    • Citizens can make their own decisions regarding their trees

• Environmental
  • Cons
    • CCEP: tree cutting releases carbon emissions
  • Pros
    • CHRP stops the cutting of numerous trees

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Case Study 2
Skeleton Weed (Australia)

General Information

• Deep rooted perennial weed
• Seeds spread by wind, clothing, produce and livestock merchandising and commercial modes of transportation
• Currently found along the North American coasts, Southern AU and in WA’s wheat-belt
• Considerable impact on agricultural land by strongly competing with cereal and wheat crops for moisture and nutrients
• In highly infested crops, losses of up to 80% have occurred
History in Australia

- First identified at Coursing Park in the State of New South Wales, Australia, in 1917
- Imported to the State of Victoria with animal feed in 1934
- By 1963, the weed reached Ballidu in Western Australia

Eradication Strategy and Failure

- Began in 1973, following the discovery of large infestations
- Carried out by the Department of Agriculture and Food of Western Australia
- Funded through a levy on grain production, program cost between 1973 and 2002: AU$ 56M
- Methods used included pesticide use (Tordon 75D), containment and crop rotation
- In 2002, a review panel recommended abandoning state-wide eradication efforts
Response to failure

- Transfer of the program to individual landholders’ control
- Publishing documents outlining the best weed management practices
- Further research on chemical management of the weed

Pros and Cons

**Economic**
- **Pros**
  - Cost-benefit analysis indicates it was best to abandon eradication program
- **Cons**
  - No international sources consulted

**Social and Environmental**
- **Pros**
  - New management program unpopular amongst grain growers
- **Cons**
  - Environmental consequences due to pesticide use

Case Study 3
Dutch Elm Disease (New-Zealand)

General Information

- Fungus originating from Asia
- Blocks elm tree vessels, which causes leaves to wilt and death of the tree within one season
- Spreads via beetle vectors, pruning or equipment
**History in New-Zealand**

- Detected in Auckland in 1989, arrived via timber trade
- An eradication program in place from 1989-2005
- Management program put into place in 2006
- In 2007 program handed over from federal gov. to TLA’S (Territorial Local Authorities)

**Eradication Strategy and Failure**

- Put in place in 1989 by MAFBNZ (Ministry of Agriculture and Forestry, Biosecurity New-Zealand)
- Methods used
  - Control areas, field surveys, beetle trapping, host removal, elm database, communication
- Coordinated by a multidisciplinary committee (DED control advisory committee), including representatives from MAFBNZ and TLA’s
- The eradication program was stopped in 2005 following an New-Zealand’s worst pests
Response to failure

- The program was revised, its aim shifted from eradication to management, the program structure remained the same.
- In 2006, a budget review concluded that there was insufficient funding to continue the program in 2007.
- MAFBNZ offered 3 choices to TLA’s:
  - Economic
    - Cons: The new program potentially allows the DED, if this were to happen the immense
    - Pros: Elms are not significant in NZ forest industry.
    - The money previously used for DED can be on species of greater economic concern.
  - Social
    - Cons: The eradication program responded to citizens’ concerns, where as the new program leaves people unsure of what’s to happen with their Elms.
    - Elms grow well in urban environments and can have a positive impact on both people and the environment (Dwyer, et al., unknown).
Discussion

• Proper education of implicated citizens and industries
• Sufficient financing and thorough economic analysis
• Early detection and containment of the invasive species
• Policies that adjust to the changing scientific, economic and social factors
• Multidisciplinary committees to review and elaborate the new control strategy, Politics in Science

• Transfer of responsibilities, and smooth and quick transitional period

Figure 1. Simple Population Dynamics Model (modified from: DAFWA, 2002).
Conclusion

Each of the points raised in the discussion may help to inform the development of a standard Canadian response strategy to failed eradication.

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