A Hitchhikers Guide to Forest Ecosystems: the firewood paradigm

Rory McIntosh, Ph. D.
Insect & Disease Expert
Saskatchewan Ministry of Environment

INVASIVE SPECIES WORKING GROUP
PNWER Annual Summit
Saskatoon, SK
July 22, 2019
The Global Village

- International trade major source of bioinvasion
- Forests in Canada are increasingly at risk.
- Pose threat to ecosystems and commercial and urban forest landscapes.
- Canadian Food Inspection Agency represents Canada’s International and National interests *(Plant Protection Act)*
- IPPC standards preventive measures (ISPM 15 ~ 56°/30)

Source: Wang, S., et al., 2018  Evaluating Bioinvasion risk
Accessed July 17, 2019
Invasives “fly under the radar”

• *T. fuscum* found in NS in 1999; early records confirm beetle had been misidentified in 1990...

  “Specimens collected in the park in 1990, originally identified as a related native species (*Tetropium cinnamopterum*) have also now been confirmed as *Tetropium fuscum*”.  
  Source:  
  https://www.exoticpests.gc.ca/es-details/insect/1000096

• *A. planipennis* found in 2002; tree ring analysis indicated that the beetle had been present in since the early 1990’s...

  “Data from tree ring analysis indicated that the beetle had probably been present in those areas since the early 1990’s.”  
  Source:  
  https://www.nrcan.gc.ca/forests/fire-insects-disturbances/top-insects/13395
Invasive Insect and Disease Strategy

“To minimize the risk, spread and establishment of harmful non-native species“

- Public education
- Legislation & Regulation
- Develop policies/standards
- Governance/Partnerships
- Monitoring & surveillance
- Critical pathways analysis
- Decontamination
- Research
Invasive Insect and Disease Strategy

“To minimize the risk, spread and establishment of harmful non-native species”

- Public education
- Legislation & Regulation
- Develop policies/standards
- Governance/Partnerships
- Monitoring & surveillance
- Critical pathways analysis
- Decontamination
- Research

- Early detection surveys
- Regulatory/Inspections
- Rapid aggressive response
- Incident command structure
- Eradication
- Delineation surveys
- Reporting & communication
Invasive Insect and Disease Strategy

“To minimize the risk, spread and establishment of harmful non-native species “

- Public education
- Legislation & Regulation
- Develop policies/standards
- Governance/Partnerships
- Monitoring & surveillance
- Critical pathways analysis
- Decontamination
- Research

- Early detection surveys
- Regulatory/Inspections
- Rapid aggressive response
- Incident command structure
- Eradication
- Delineation surveys
- Reporting & communication

- Public engagement
- Surveys and monitoring
- Suppression
- Regulation
- Cost: benefit analysis
- Reporting & communication
Invasive Insect and Disease Strategy

“To minimize the risk, spread and establishment of harmful non-native species”

- Long-term monitoring
- Annual control & management
- Cost: benefit analysis
- Reporting & communication

- Public education
- Legislation & Regulation
- Develop policies/standards
- Governance/Partnerships
- Monitoring & surveillance
- Critical pathways analysis
- Decontamination
- Research

- Early detection surveys
- Regulatory/Inspections
- Rapid aggressive response
- Incident command structure
- Eradication
- Delineation surveys
- Reporting & communication

saskatchewan.ca
Mountain Pine Beetle

Jasper National Park, Alberta
Mountain pine beetle: Why worry.....?

- Government of Canada & BC spent more than $956 million to fight MPB
- 1 million m³ of wood
- This pile is 13m high, 60m wide and 1.2 km long!
- Now consider BCs cumulative susceptible pine loss to MPB estimated at 723 million m³ (Walton 2012) = this pile multiplied by 700+!

Photo courtesy Alvesta Timber, Vida Oy. (Sweden)
Over the past decade Canada has prepared numerous MPB risk assessments.

- 2010 – MPB Risk Assessment (update)
- 2012-13 – Canadian Forest Service’s MPB Strategic and Research plan
- 2017 - MPB Response Plan (A strategic Approach to Slow the Spread of MPB across Canada.
- 2019 Risk Assessment of the threat of MPB to Canada’s boreal and eastern pine forests

http://cfs.nrcan.gc.ca/publications?id=39805
MPB Regulatory Controls

Designation under FRMA

The 2008 Minister’s Order restricting import, transport and storage of pine from AB, BC & USA is still in place

No import of pine forest products, with attached bark, without approval from the Forest Service.
1. SK&AB collaborative coordinated response
   - AB & SK MoA (2011-13; 2014-16; renewed again 2017-2020)

2. Strategic planning and response framework
   - Spread Management Action Collaborative (SMAC) - AB/SK/NRCan
   - Annual work plan developed at SMAC using current AB survey, susceptibility and DSS results & integrated with best current knowledge

3. Prioritize control actions
   - Areas of greatest risk to SK
Dutch elm disease
HISTORY OF DED in SK

• 1981. First detected in SK (Regina)
• 1990. Reappeared (Estevan)
• Moved from east to west along river valleys containing native American elms:
  - Cumberland Delta in NE
  - Souris River in SE
  - Qu’Appelle Valley
• Eradication attempted in 1990’s but not successful.
• DED prevalent throughout south/north eastern Saskatchewan.
• Provincial DED program has gone through many changes during last 20+ years.
Minister, officer or inspector may order owner or occupant to

- Take measures to destroy, control prevent spread.....
- Remove or dispose of trees.....

Designation
- Lands South of 55th Parallel
- Insects
- DED fungus

Legislation – The Forest Resources Management Act

RECOMMENDED BY: Minister of Environment and Resource Management

APPROVED BY: ACTING President of the Executive Council

ORDERED BY: Lieutenant Governor

REGINA, Saskatchewan
DED Regulations

No person may store, use, market or transport any elm tree for use as firewood or for any other purpose without authorization.

• Authorization is not required to transport elm wood to the disposal site for the municipality in which the tree is located.
Emerald Ash Borer
Emerald Ash Borer

**WELL ESTABLISHED IN N. AMERICA**
- EAB first detected in 2002 in Windsor/Detroit now established throughout eastern half of NA. Currently found in 35 US states (& DC).

**DIFFICULT TO DETECT**
- Tree ring analysis often show the beetle can be present for at least 6 years prior to discovery.

**KILLS ALL SPECIES OF ASH**
- Green, white, black, pumpkin and blue Ash will all be killed – Note Mountain “ash” is not ash.

**ASH IS ABUNDANT AND EXTREMELY IMPORTANT IN URBAN FORESTS ACROSS THE PRAIRIES** – In the “wake” of Dutch elm disease, ash has largely replaced elm across Canada.

**HUGE ECONOMIC IMPACT**
- In Canada the removal and replacement costs to municipalities are estimated to range from $524 - $890 million.
EMERALD ASH BORER REGULATED AREAS OF CANADA
CFIA Accessed July 16, 2019

LIEUX RÉGLEMENTÉS POUR L’AGRILE DU FRÈNE AU CANADA
Pest Risk Analysis for Northern Ontario and Manitoba (2015)

1. RISK ASSESSMENT
   - Likelihood/consequences of introduction
   - Review EAB biology and management,
   - Climate suitability
   - R&D current knowledge
   - Host availability
   - Rate of spread - predict arrival in PRA area
   - Impacts (FN, Urban; woodlot)

2. RISK RESPONSE
   - preventative measures
   - Early detection
   - Efficacy monitoring/detection
   - Efficacy treatment efforts
   • In each determine evidence and uncertainty

https://www.ccfm.org/english/reports_articles.asp
January 2018 SK MoE invoked regulatory measures to prevent the spread of EAB under the authority of The Forest Resources Management Act (FRMA)

Insect and Lands designated

Minister’s Order signed January 31, 2018

Provides supporting legislation in addition to Federal The Plant Protection Act

- Regulatory support for SK Municipalities and communities
- Enable restriction of movement of high risk materials that originate outside the CFIA regulated areas.
- Provides powers of inspection and disposal

Regulatory Measures

The emerald ash borer (Agrilus planipennis) is designated under section 65 of The Forest Resources Management Act as an insect that causes or is likely to cause damage to ash trees and that all lands affected by the pest are designated as lands harboring or likely to harbor the emerald ash borer.

An Order in Council dated January 31, 2018

The Order in Council under Section 65 (1) of The Forest Resources Management Act, provides an Order that restricts and prohibits movement of ash trees and ash products, including: whole ash trees, ash logs, ash branches, ash leaves, ash seeds, ash wood chips, ash bark, ash wood packaging materials.

Minister’s Order

Minister’s Order dated January 31, 2018, under Section 65 (1) of The Forest Resources Management Act, provides an Order that restricts and prohibits movement of ash trees and ash products, including: whole ash trees, ash logs, ash branches, ash leaves, ash seeds, ash wood chips, ash bark, ash wood packaging materials.

Regulatory Measures

Enables restriction of movement of high risk materials that originate outside the CFIA regulated areas.

Provides powers of inspection and disposal.

saskatchewan.ca
Firewood: an international problem

- Firewood pathway
- National firewood pathways analysis (CCFM, 2017)
- Characterized the risk
  - Risk Assessments
  - International & domestic movement
- National scale Risk Mitigation
  - Regulatory
  - Certification/Treatment
- Gap Analysis
Firewood message

“BUY LOCAL BURN LOCAL”

- Don’t bring it with you - check with parks or campgrounds before you go for their rules about firewood know the law

- Use local or certified heat-treated (kiln-dried) firewood

- Know where firewood comes from 80 Km rule

- Use it all up. Burn it all at that location
Way Forward

• Continue partnerships and support efforts of CFIA and Municipalities
• Address uncertainties through research
• Communication, extension and outreach
• Ensure Minister’s Orders are communicated as broadly as possible
• Continue to address high risk pathways (primarily Firewood) to limit introduction of pests
• Ensure monitoring and compliance
• Collaborate across branches/ministries for consistent unified approach
saskatchewan.ca