

A Hitchhikers Guide to Forest Ecosystems: the firewood paradigm

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

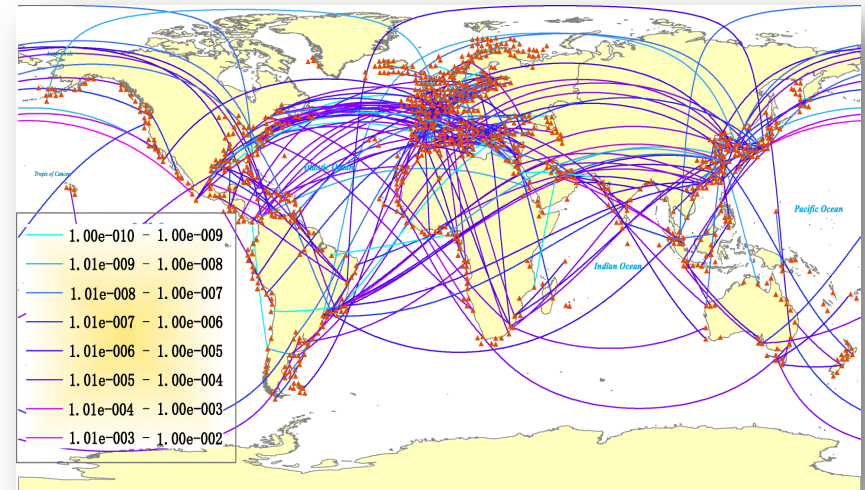
INVASIVE SPECIES WORKING GROUP
PNWER Annual Summit
Saskatoon, SK
July 22, 2019





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
<https://link.springer.com/article/10.1186/s12859-018-2272-5>
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...
- *A. planipennis* found in 2002; tree ring analysis indicated that the beetle had been present in since the early 1990's...

“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>

“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



PREVENT ENTRY

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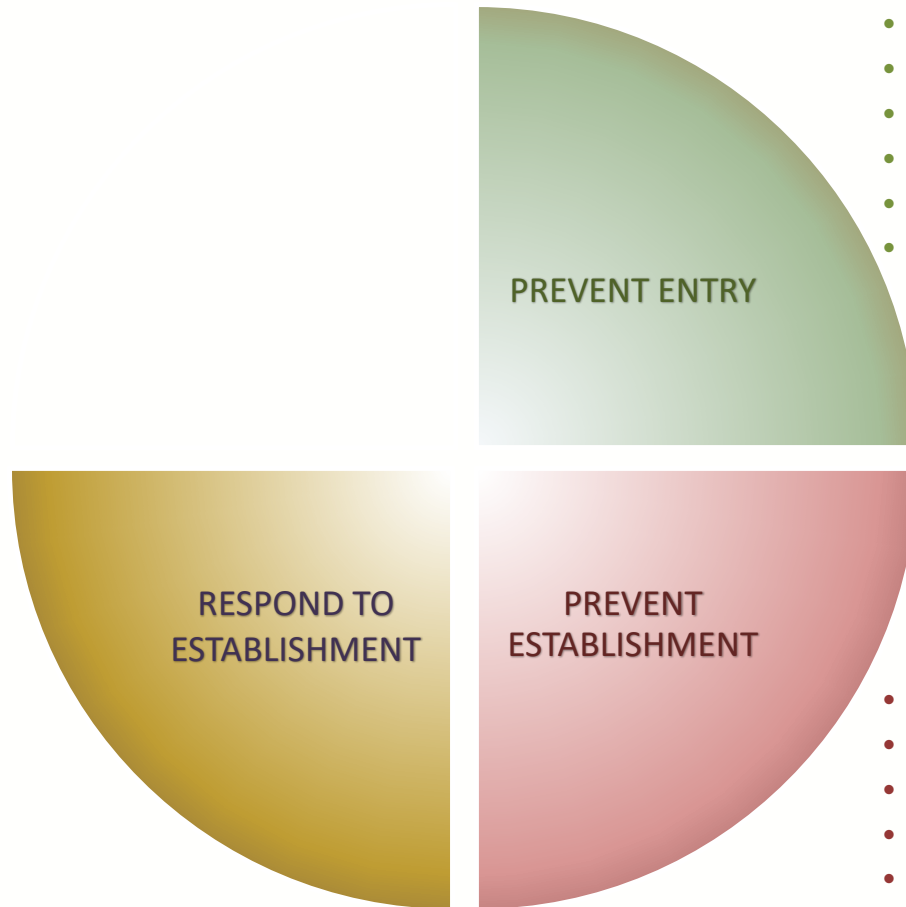
PREVENT ENTRY

PREVENT
ESTABLISHMENT

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

Invasive Insect and Disease Strategy

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- Public engagement
- Surveys and monitoring
- Suppression
- Regulation
- Cost: benefit analysis
- Reporting & communication

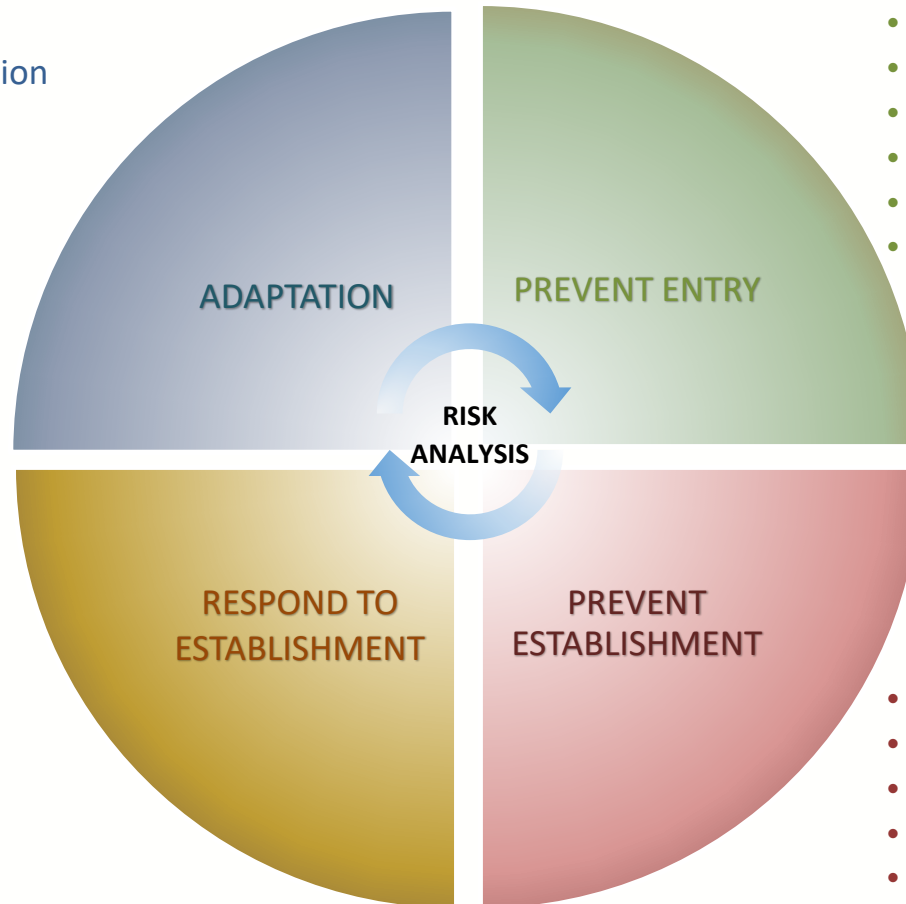
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Invasive Insect and Disease Strategy

“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
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- Monitoring & surveillance
- Critical pathways analysis
- Decontamination
- Research



- Public engagement
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Mountain Pine Beetle



Jasper National Park, Alberta



Mountain pine beetle: Why worry.....?



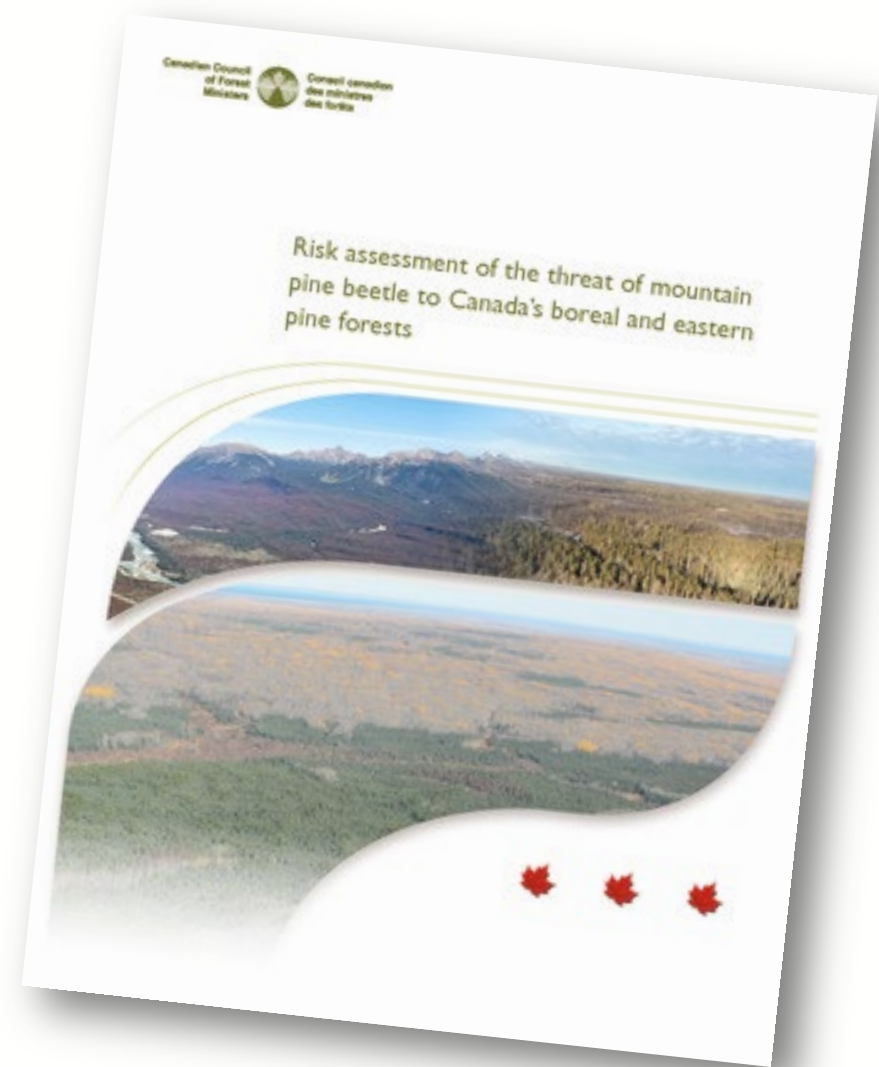
Photo courtesy Alvesta Timber, Vida Oy. (Sweden)

- 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+!

Mountain pine beetle Risk Analysis

Over the past decade Canada has prepared numerous MPB risk assessments.

- 2007 – Initial Emergency Risk Assessment.
- 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



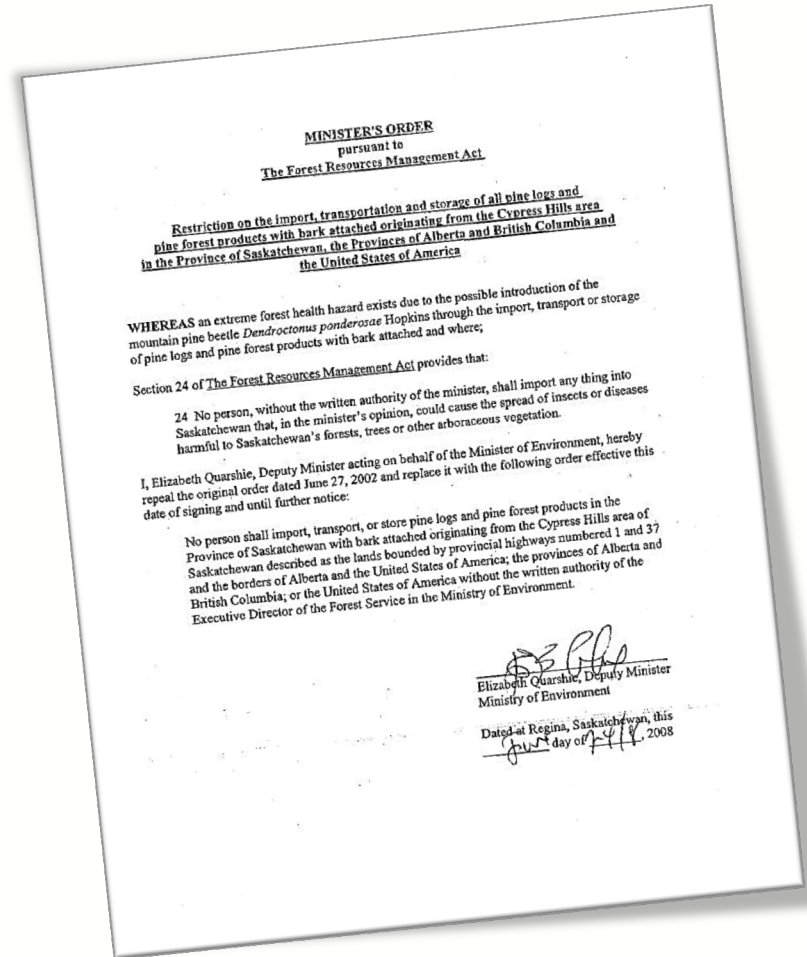
Designation under *FRMA*



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.



Alberta & Saskatchewan Partnership



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

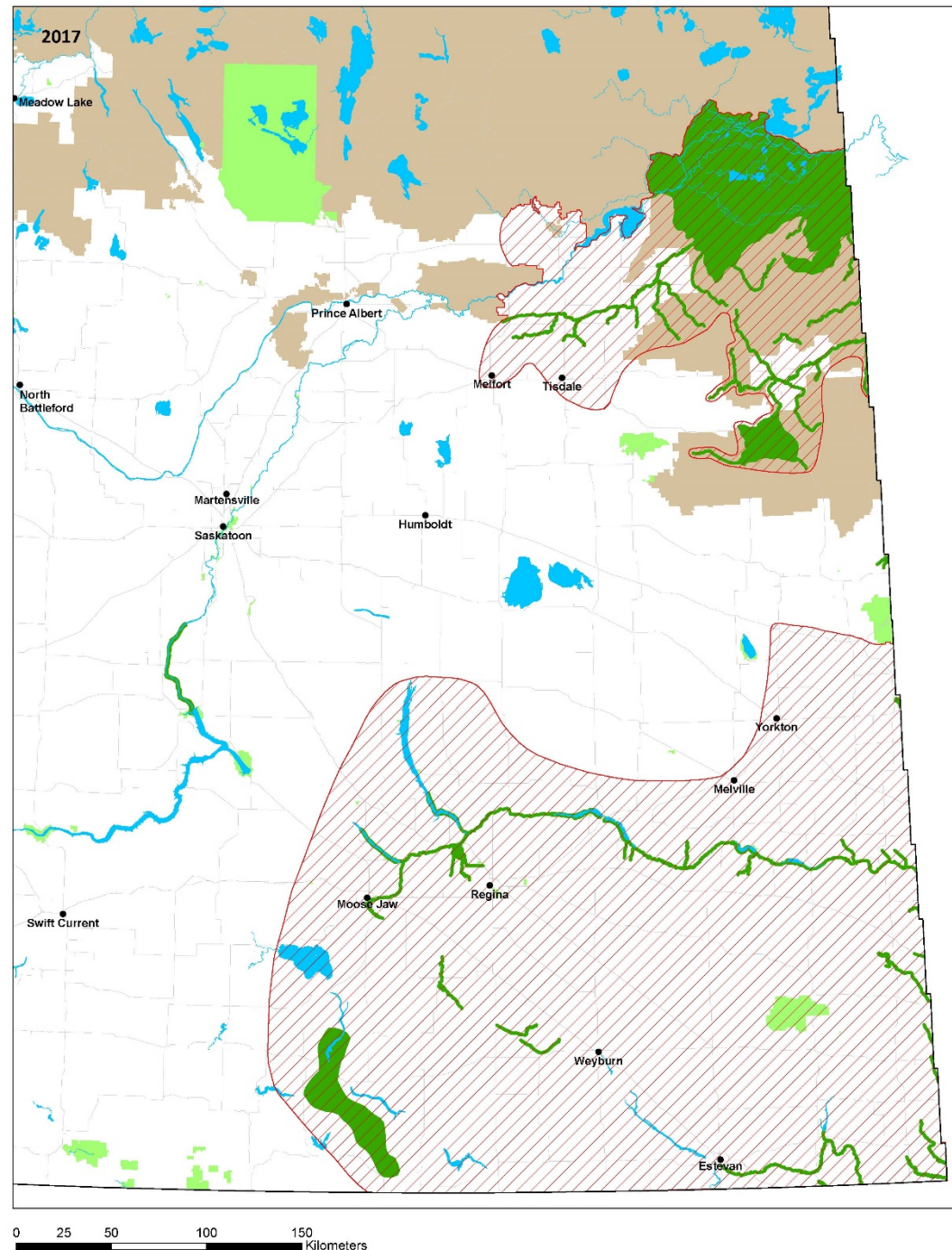


Dutch elm disease



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.



Legislation – *The Forest Resources Management Act*

TO THE HONOURABLE THE LIEUTENANT GOVERNOR IN COUNCIL

Minister, officer or inspector may order owner or occupant to

- Take measures to destroy, control prevent spread.

1. Section 63 of *The Forest Resources Management Act*, S.S. 1996, c.F-19.1, provides, in part, as follows:

"63(1) If the minister determines that there are on any lands insects or diseases that are causing or are likely to cause damage to forests, trees or other arboraceous vegetation, the minister may make an order requiring the owner or occupant to:

- (a) take measures to control the insects or diseases in a manner specified by the minister; or
- (b) dispose of the trees or vegetation in a manner specified by the minister.

(3) The minister may take any action that the minister considers necessary to control or prevent damage to forests, trees or other arboraceous vegetation from insects or diseases on any lands where:

- (a) the minister considers it in the public interest to take immediate action; or
- (b) the person who is served with an order made pursuant to subsection (1) fails to comply with the order within the specified time.

(6) In subsections (1) and (3):

- (a) "any lands" means any lands within those areas specified by the Lieutenant Governor in Council;
- (b) "insects or diseases" means those insects and diseases specified by the Lieutenant Governor in Council.

2. It is desirable and in the public interest to specify those lands identified below, which harbour the insects and diseases or may harbour insects and diseases identified below, which cause or are likely to cause damage to forests, trees or other arboraceous vegetation.

- 2 -

3. The lands and insects or diseases that require specification are as follows:

- (a) All lands South of the 55th Parallel, in the Province of Saskatchewan.
- (b) the Native Elm Bark Beetle (*Hylurgopinus rufipes*), European Elm Bark Beetle (*Scolytus multistriatus*), and Dutch Elm Disease (*Cetacocystis ulmi*).

The undersigned has the honour, therefore, to recommend Your Honour's Order do issue, pursuant to Section 63 of *The Forest Resources Management Act*, specifying all lands south of the 55th parallel in the Province of Saskatchewan as harbouring or likely to harbour, the Native Elm Bark Beetle (*Hylurgopinus rufipes*) and European Elm Bark Beetle (*Scolytus multistriatus*) which cause and spread Dutch Elm Disease (*Cetacocystis ulmi*).

Designation

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

RECOMMENDED BY: Harne Sath
Minister of Environment and Resource Management

APPROVED BY: D. Hufsch
ACTING President of the Executive Council

ORDERED BY: John E. M. Wick
Lieutenant Governor
REGINA, Saskatchewan

DED Regulations

No person may store, use, market or transport any elm tree for use as fire wood 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.



Caronport



Grand Coulee



Last Mountain Lake

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 a 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

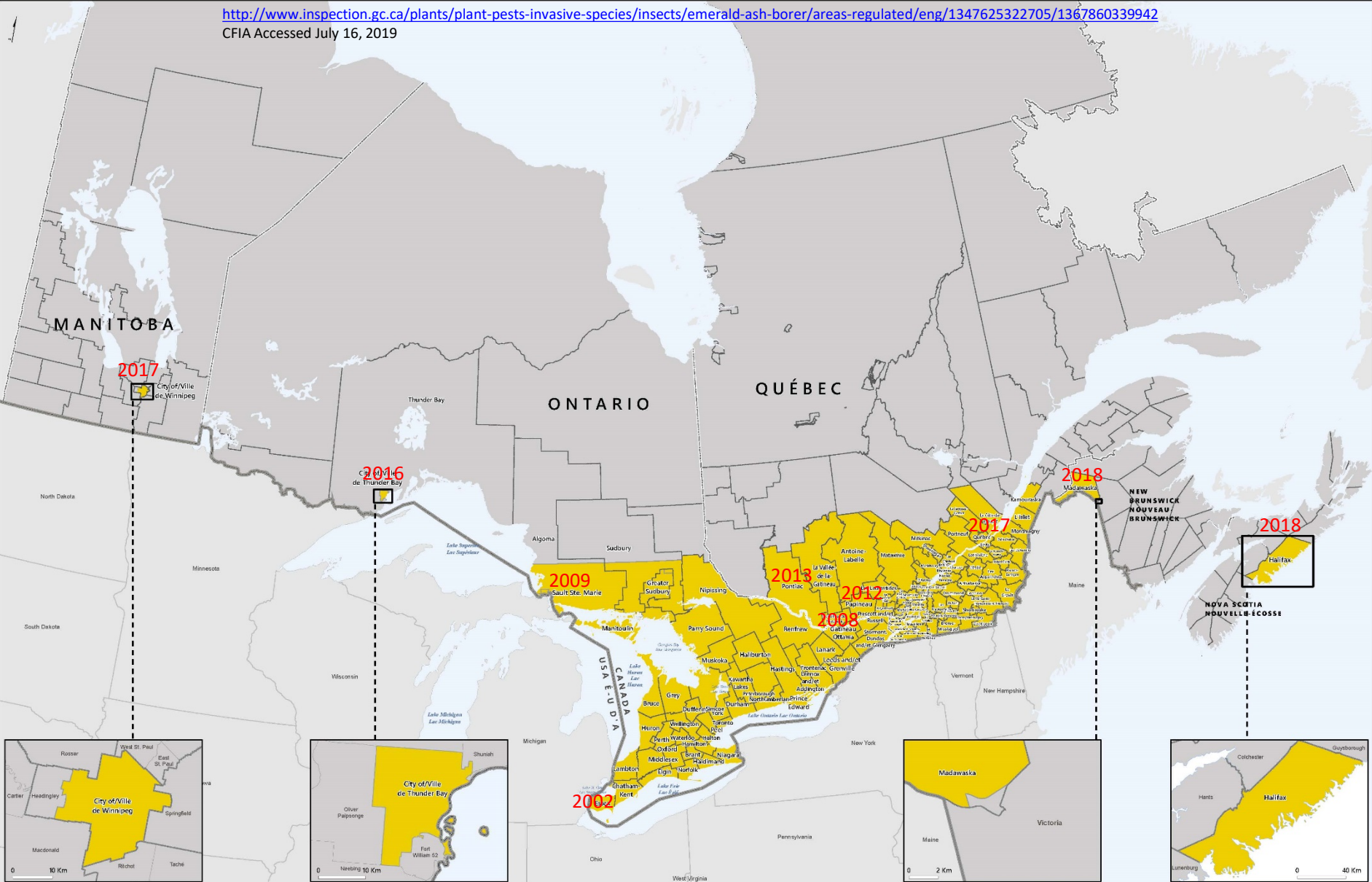
- In Canada the removal and replacement costs to municipalities are estimated to range from \$524 - \$890 million.



EMERALD ASH BORER REGULATED AREAS OF CANADA

LIEUX RÉGLEMENTÉS POUR L'AGRILE DU FRÊNE AU CANADA

<http://www.inspection.gc.ca/plants/plant-pests-invasive-species/insects/emerald-ash-borer/areas-regulated/eng/1347625322705/1367860339942>
 CFIA Accessed July 16, 2019



0 100 200 400 Km
 0 100 200 400 MI
 Map Projection Canada Albers Equal Area Conic | Projection cartographique conique équivalente d'Albers Canada

Areas regulated | Lieux réglementés

Yr/An : 2019
 Mo/M : 06

© 2019 The Canadian Food Inspection Agency (CFIA), Mapping and GIS Services, London, Ontario. | L'Agence canadienne d'inspection des aliments, Cartographie et services SIG, London, Ontario.

EAB Risk Analysis



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

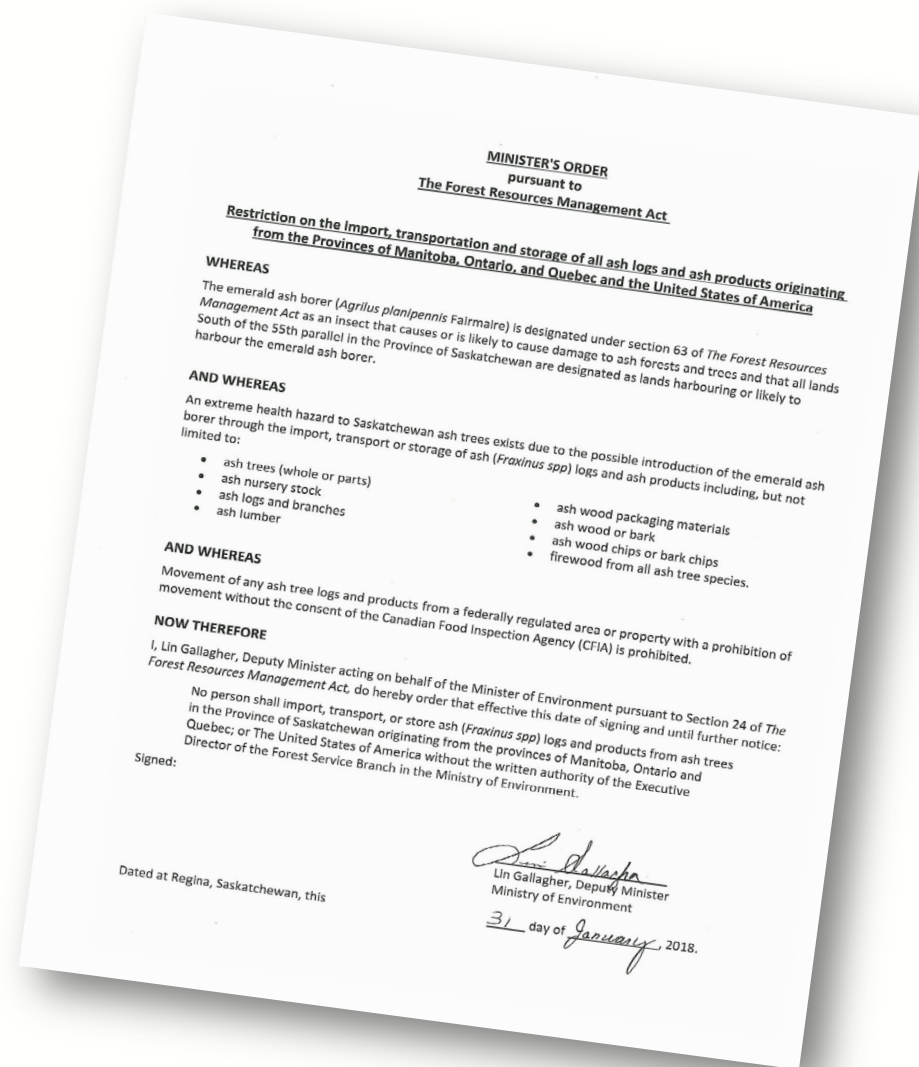
- preventative measures
 - Early detection
 - Efficacy monitoring/detection
 - Efficacy treatment efforts
- In each determine **evidence** and **uncertainty**



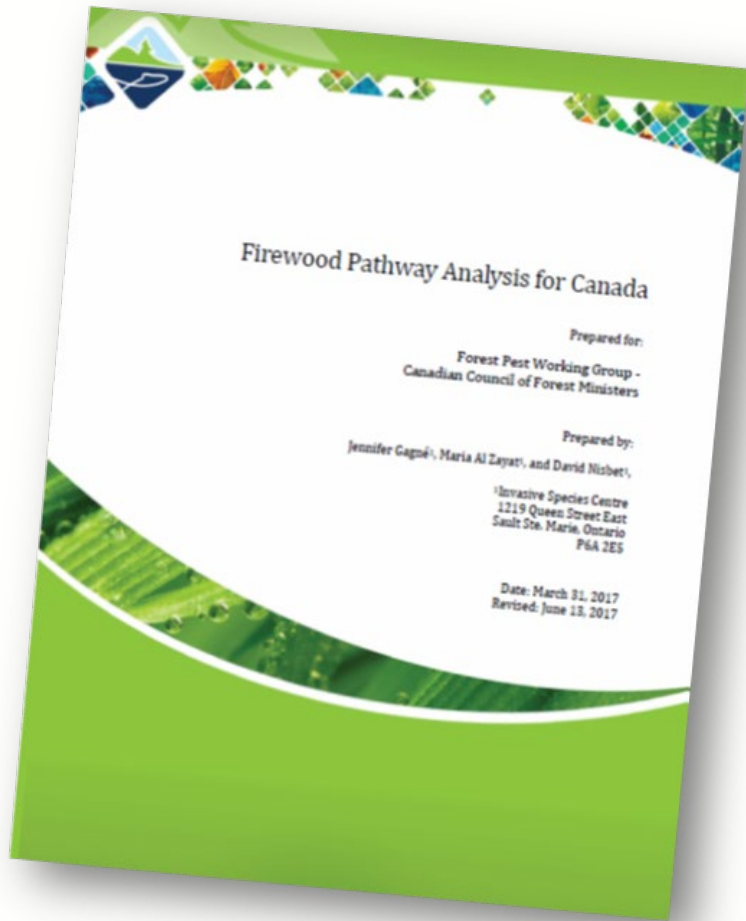
Regulation – Emerald Ash Borer



- 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



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 Pathway Analysis for Canada – Invasive Species Centre. 2017
<https://www.cfm.org/english/coreproducts-forestpests.asp>

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

CLEAN + DRAIN + DRY YOUR BOAT



BUY LOCAL BURN LOCAL



saskatchewan.ca