

Strategies for Reforestation and Timber Supply Mitigation after Mountain Pine Beetle

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On behalf of Jim Snetsinger
ADM Resource Stewardship Division/Chief Forester

CIF AGM, Huntsville Ontario
Sept 21, 2011



Ministry of
Forests, Lands and
Natural Resource Operations

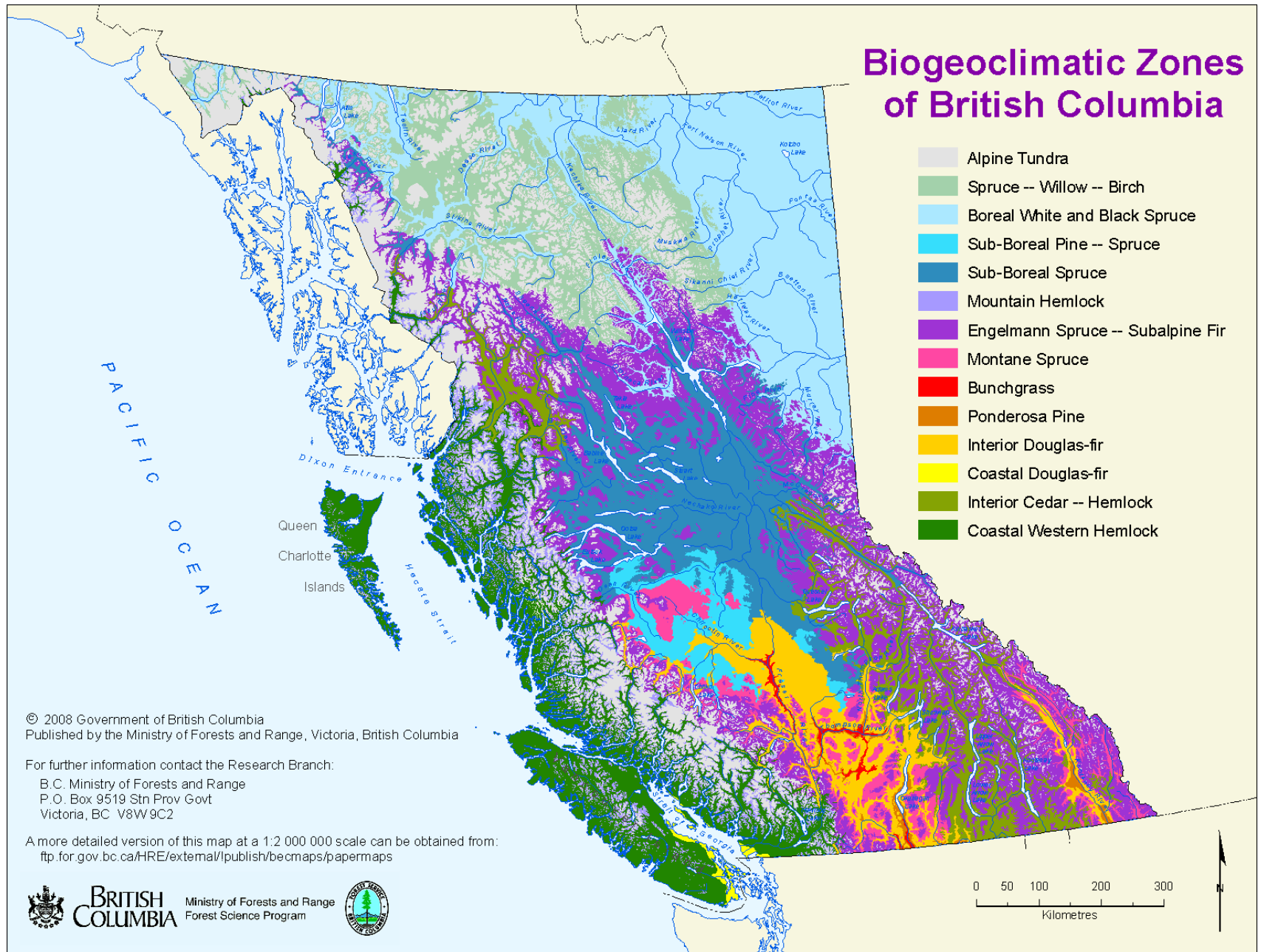
An aerial photograph of a forested landscape. In the upper left, a small lake is visible. Below it, a larger, irregularly shaped reservoir or pond is surrounded by a dense forest. The forest is composed of various shades of green and brown, suggesting different tree species or seasonal changes. The terrain appears to be hilly or uneven.

Outline

1. Observed Impacts
2. Assessment of the Impacted Area
3. Strategies to Mitigate the Impact
4. Conclusion

Biogeoclimatic Zones of British Columbia

-  Alpine Tundra
-  Spruce -- Willow -- Birch
-  Boreal White and Black Spruce
-  Sub-Boreal Pine -- Spruce
-  Sub-Boreal Spruce
-  Mountain Hemlock
-  Engelmann Spruce -- Subalpine Fir
-  Montane Spruce
-  Bunchgrass
-  Ponderosa Pine
-  Interior Douglas-fir
-  Coastal Douglas-fir
-  Interior Cedar -- Hemlock
-  Coastal Western Hemlock



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For further information contact the Research Branch:
B.C. Ministry of Forests and Range
P.O. Box 9519 Stn Prov Govt
Victoria, BC V8W9C2

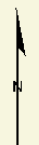
A more detailed version of this map at a 1:2 000 000 scale can be obtained from:
<ftp://for.gov.bc.ca/HRE/external/publish/becmaps/papermaps>



Ministry of Forests and Range
Forest Science Program



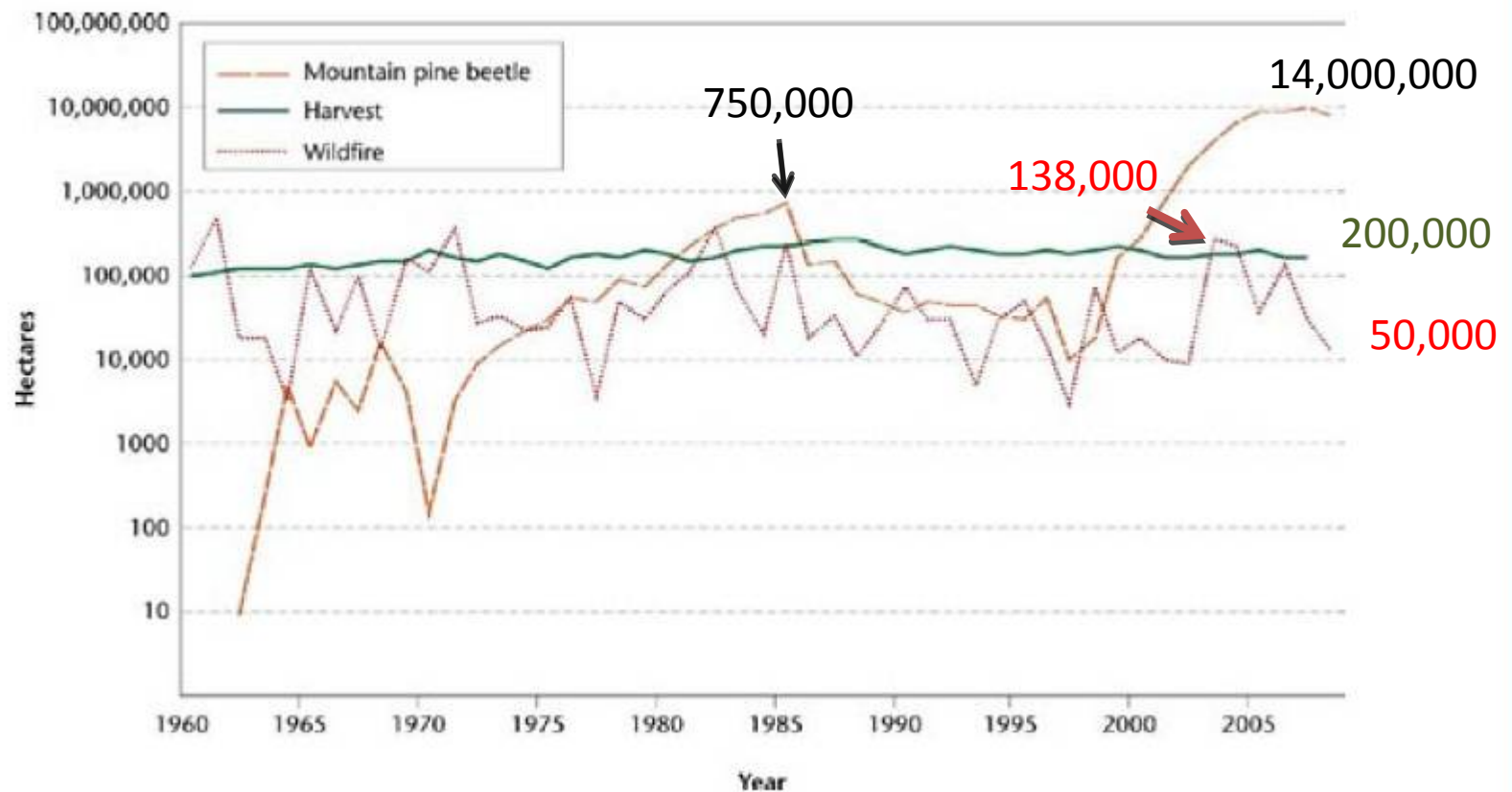
0 50 100 200 300
Kilometres



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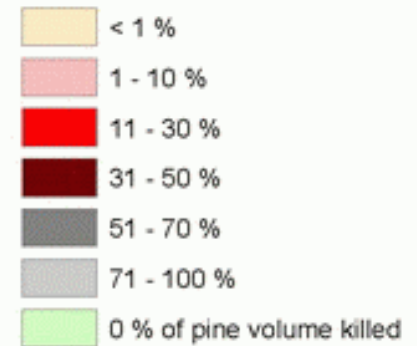
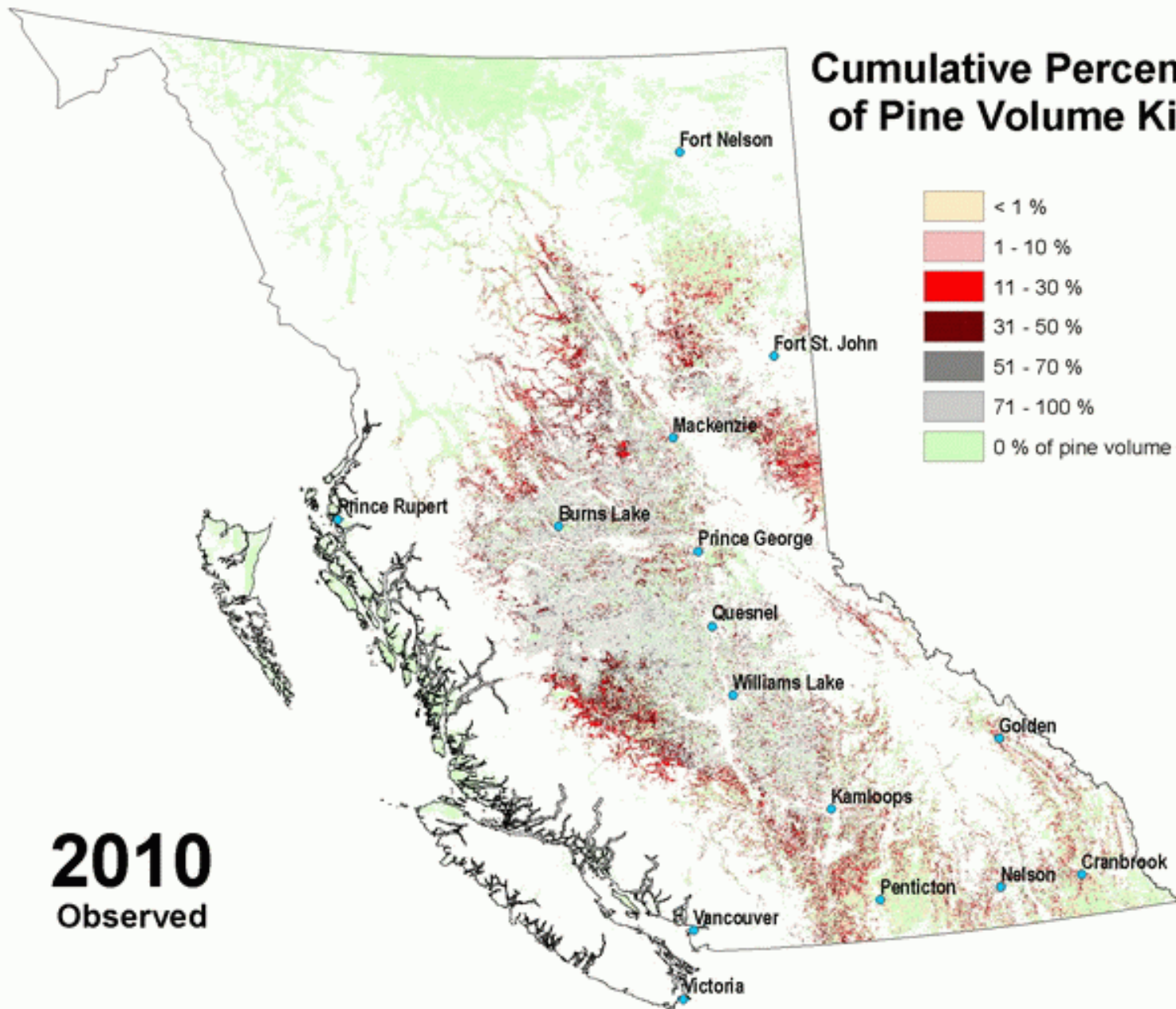
Main Dynamics of Disturbance in BC Forests

1960 - 2008

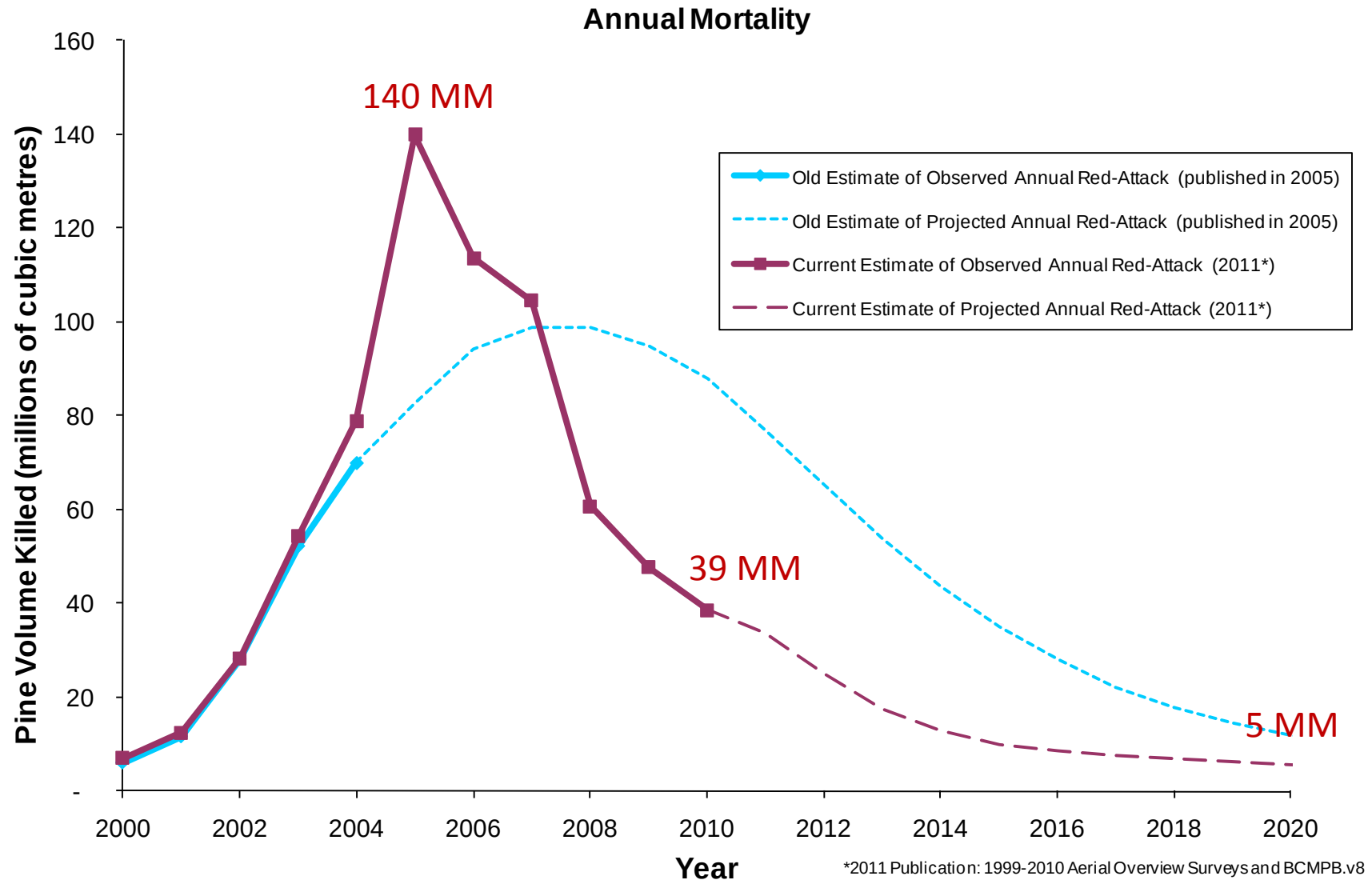


Cumulative Percentage of Pine Volume Killed

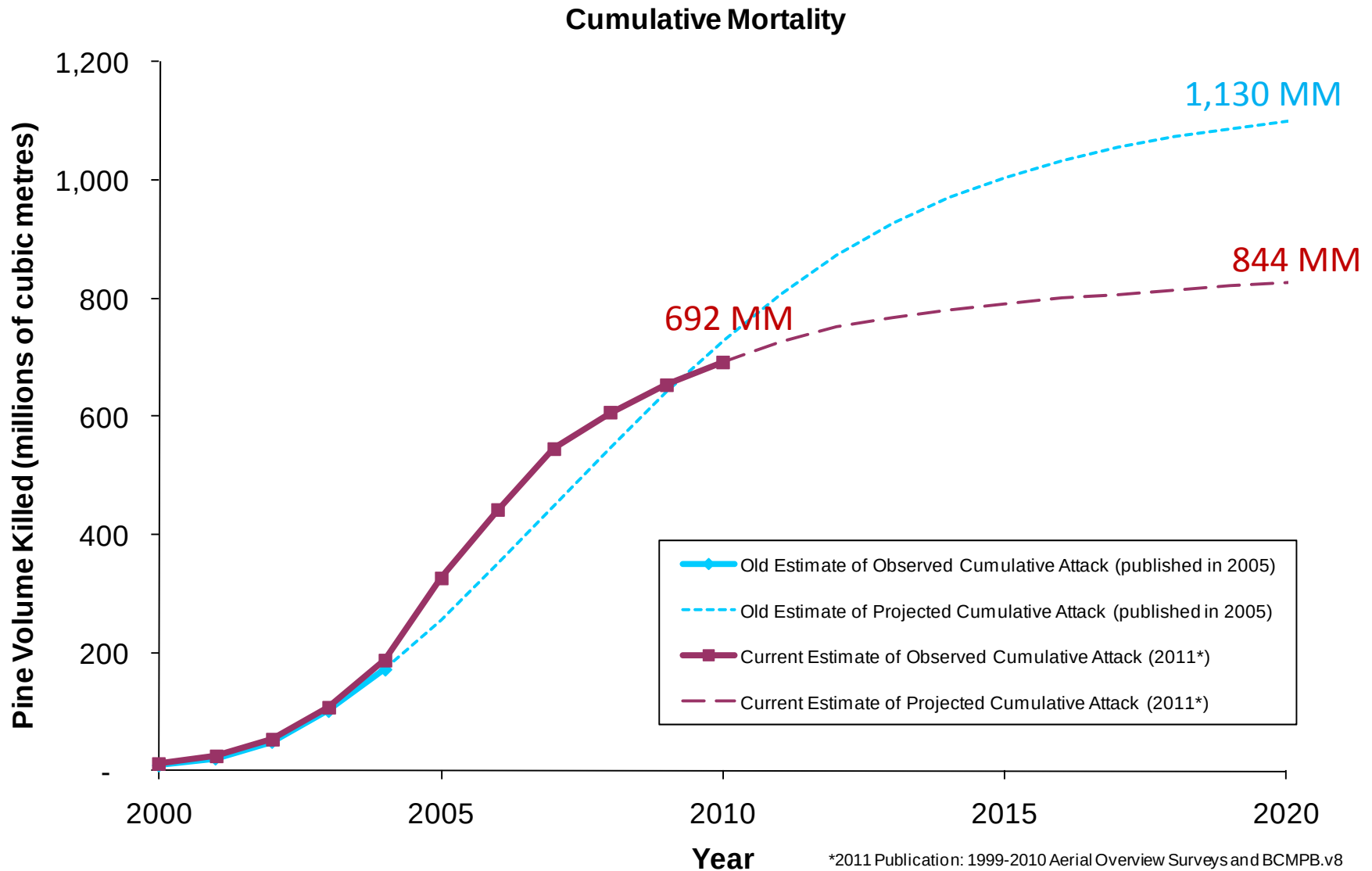
2010
Observed



Projected and Observed Impacts



Projected and Observed Impacts



*2011 Publication: 1999-2010 Aerial Overview Surveys and BCMPB.v8



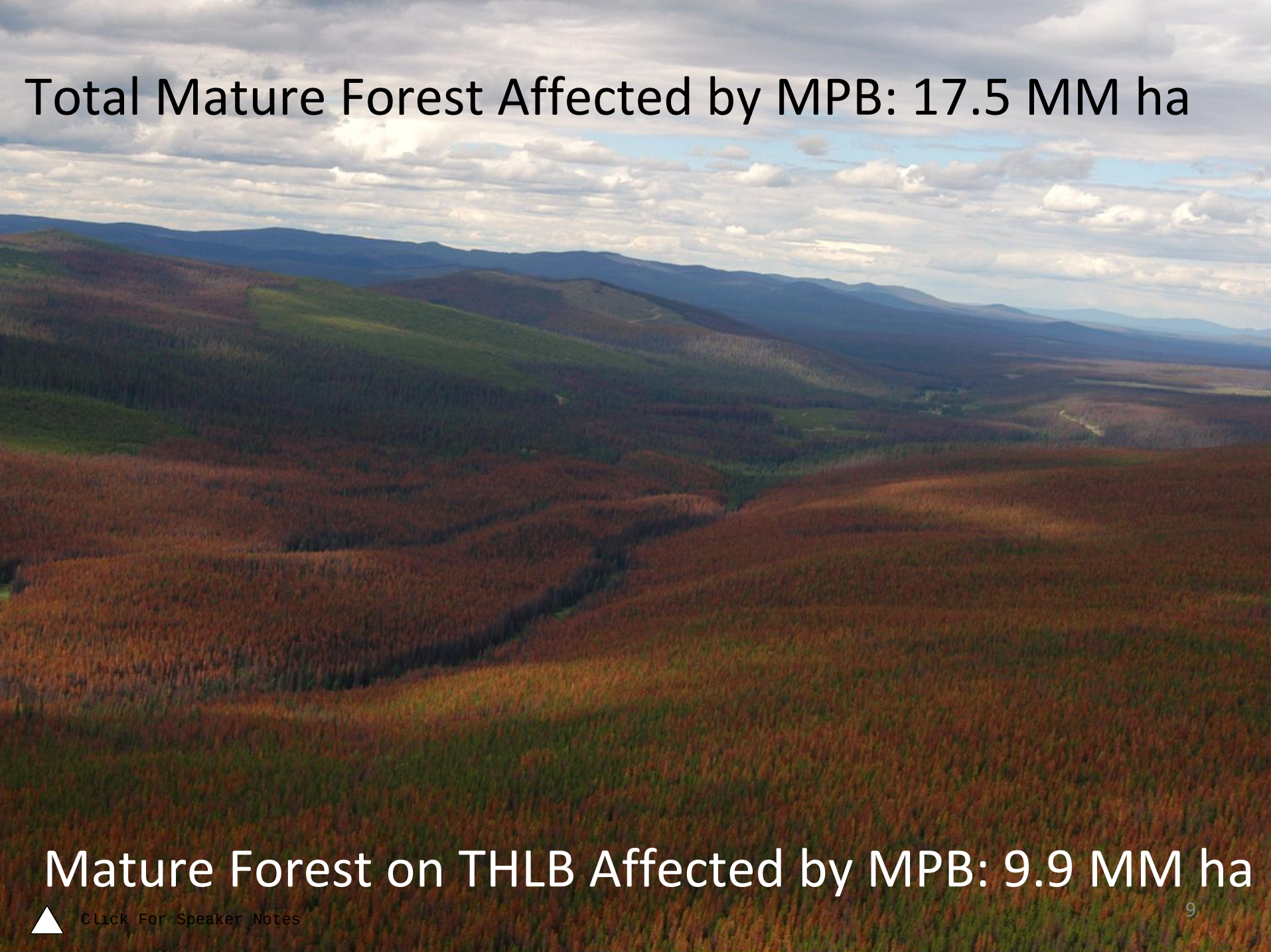
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Photo courtesy Alvesta Timber, Vida Oy. (Sweden)



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Total Mature Forest Affected by MPB: 17.5 MM ha

Mature Forest on THLB Affected by MPB: 9.9 MM ha



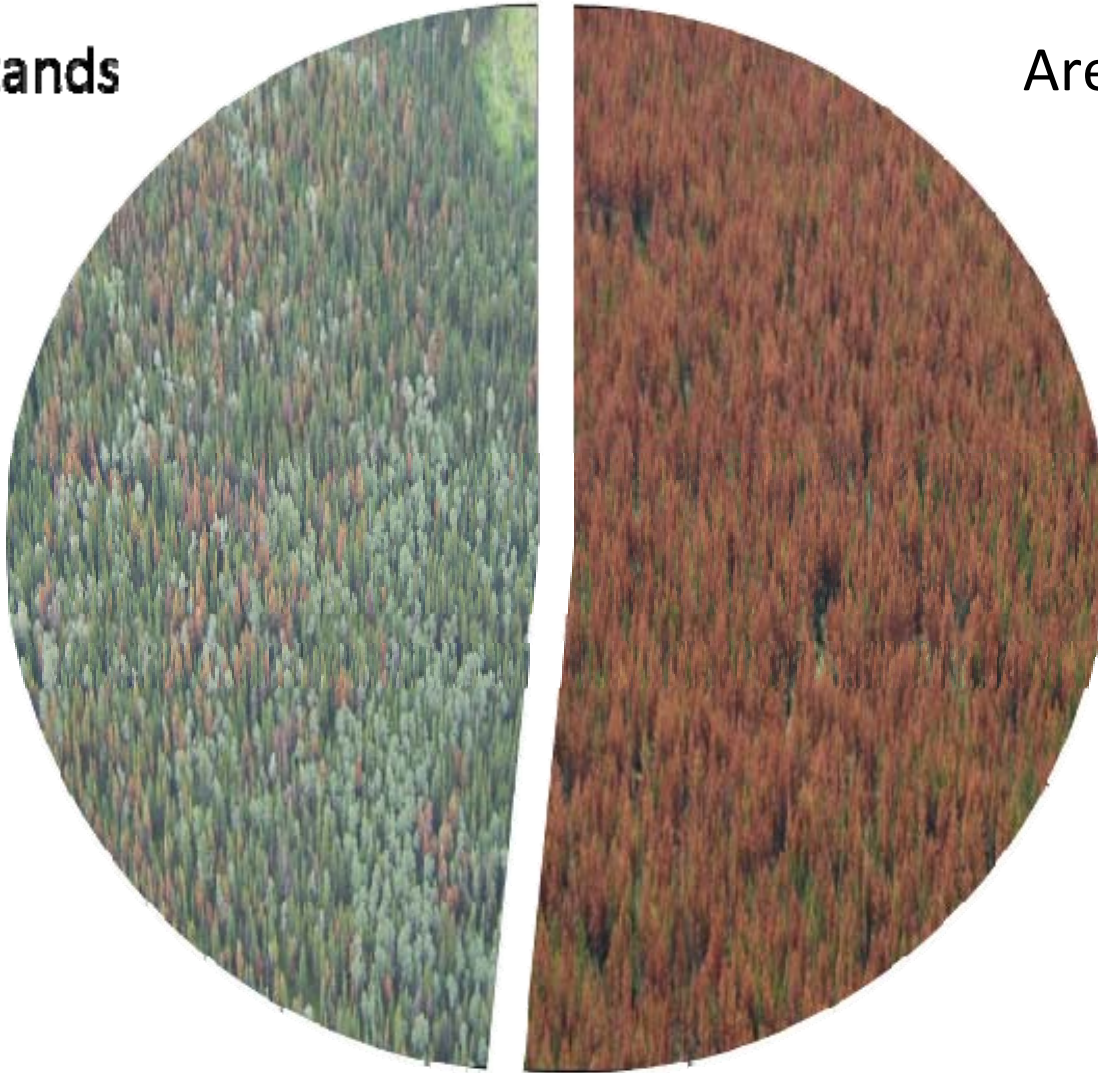
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Timber Harvesting Landbase: 9.9 MM ha



Timber Harvesting Landbase: 9.9 MM ha

**Area with stands
<50% pine:
4.8 MM ha**



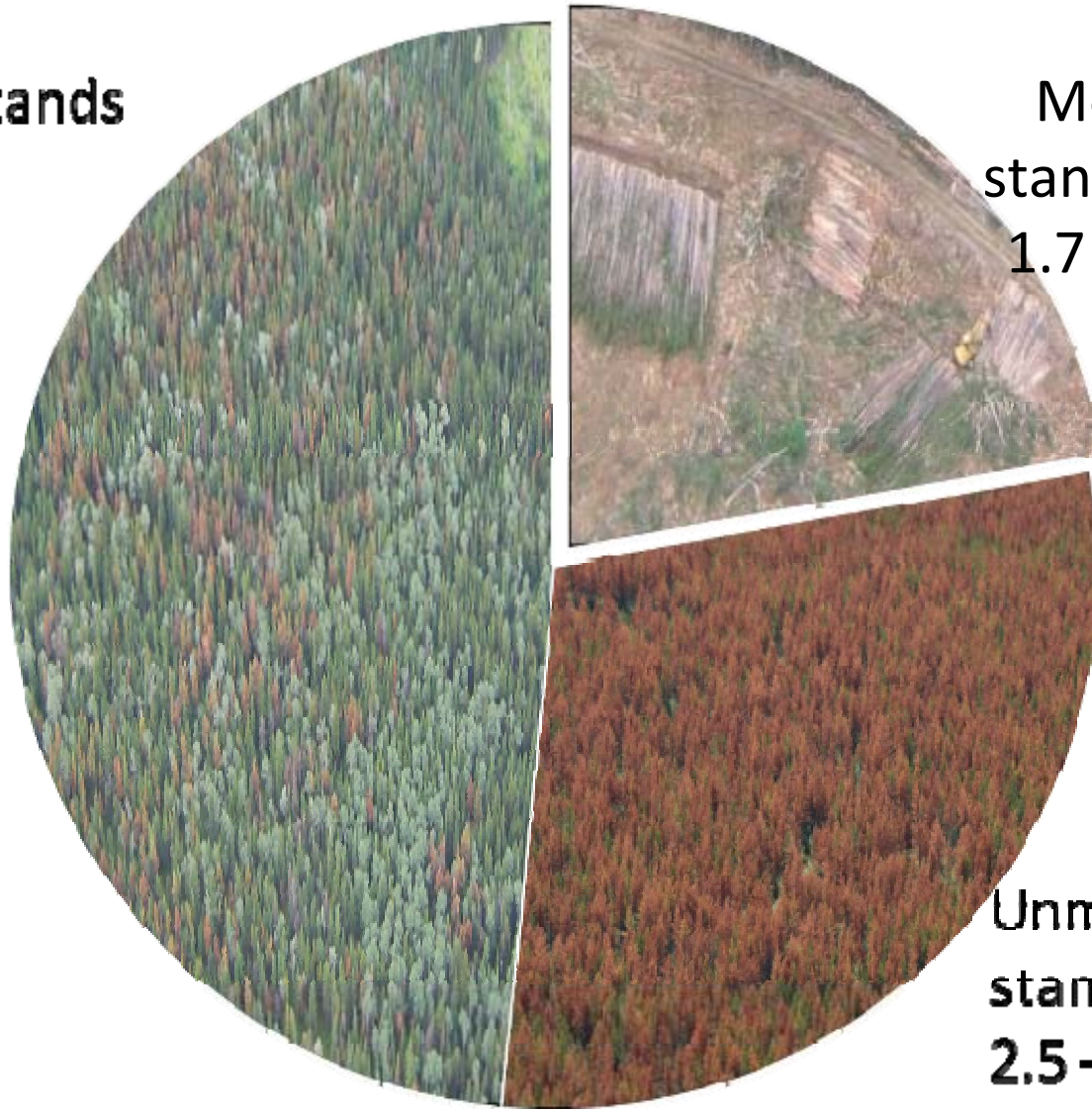
**Area with stands
>50% pine:
5.1 MM ha**



Timber Harvesting Landbase: 9.9 MM ha

**Area with stands
<50% pine:
4.8 MM ha**

**Merchantable
stands >50% pine:
1.7 – 2.6 MM ha**



**Unmerchantable
stands >50% pine:
2.5 – 3.4 MM ha**



Timber Harvesting Landbase: 9.9 MM ha

Mature stands

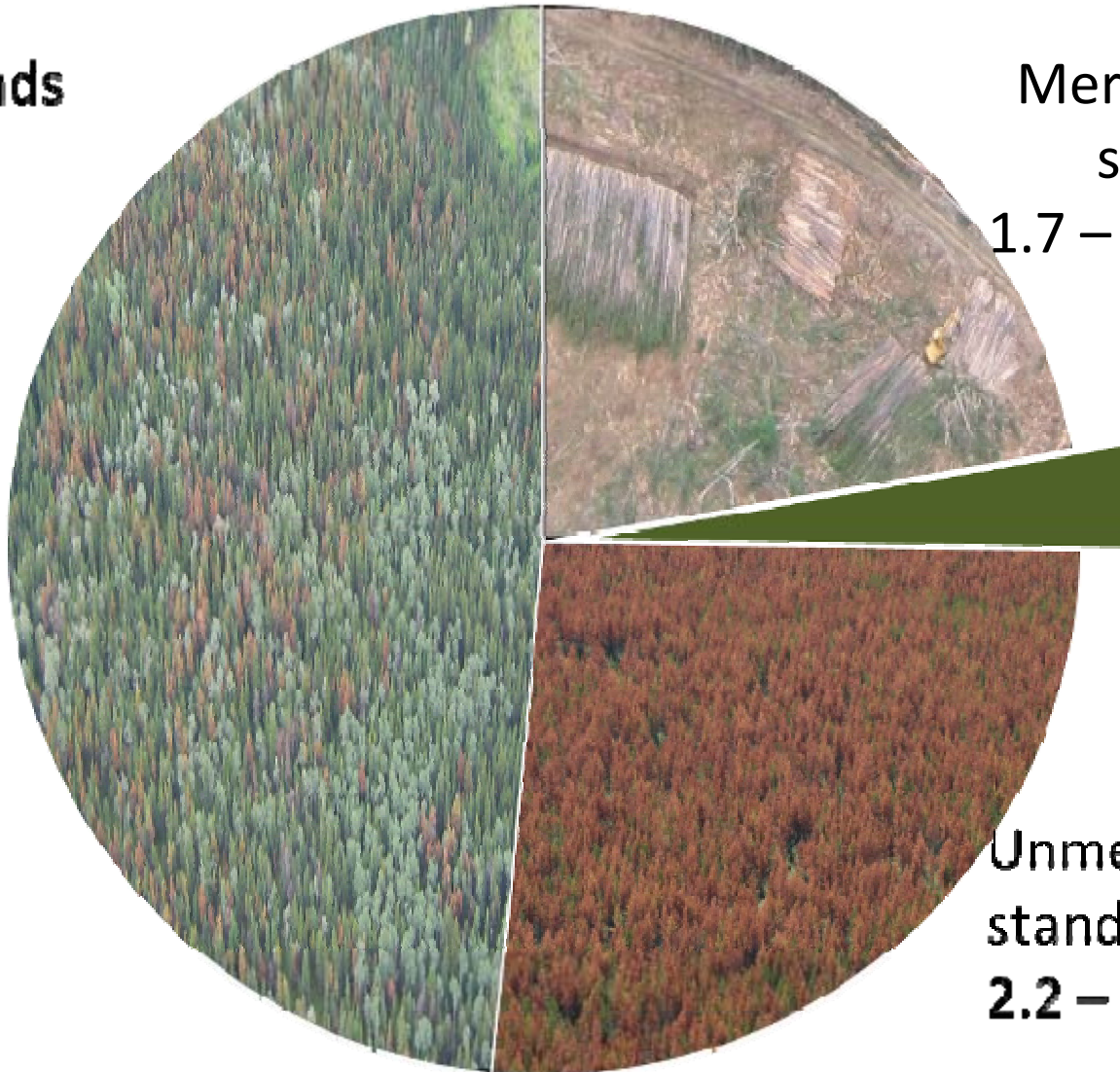
<50% pine:
4.8 MM ha

Merchantable
stands :

1.7 – 2.6 MM ha

Forest for
Tomorrow:
0.3 MM ha

Unmerchantable
stands > 50% pine:
2.2 – 3.1 MM ha



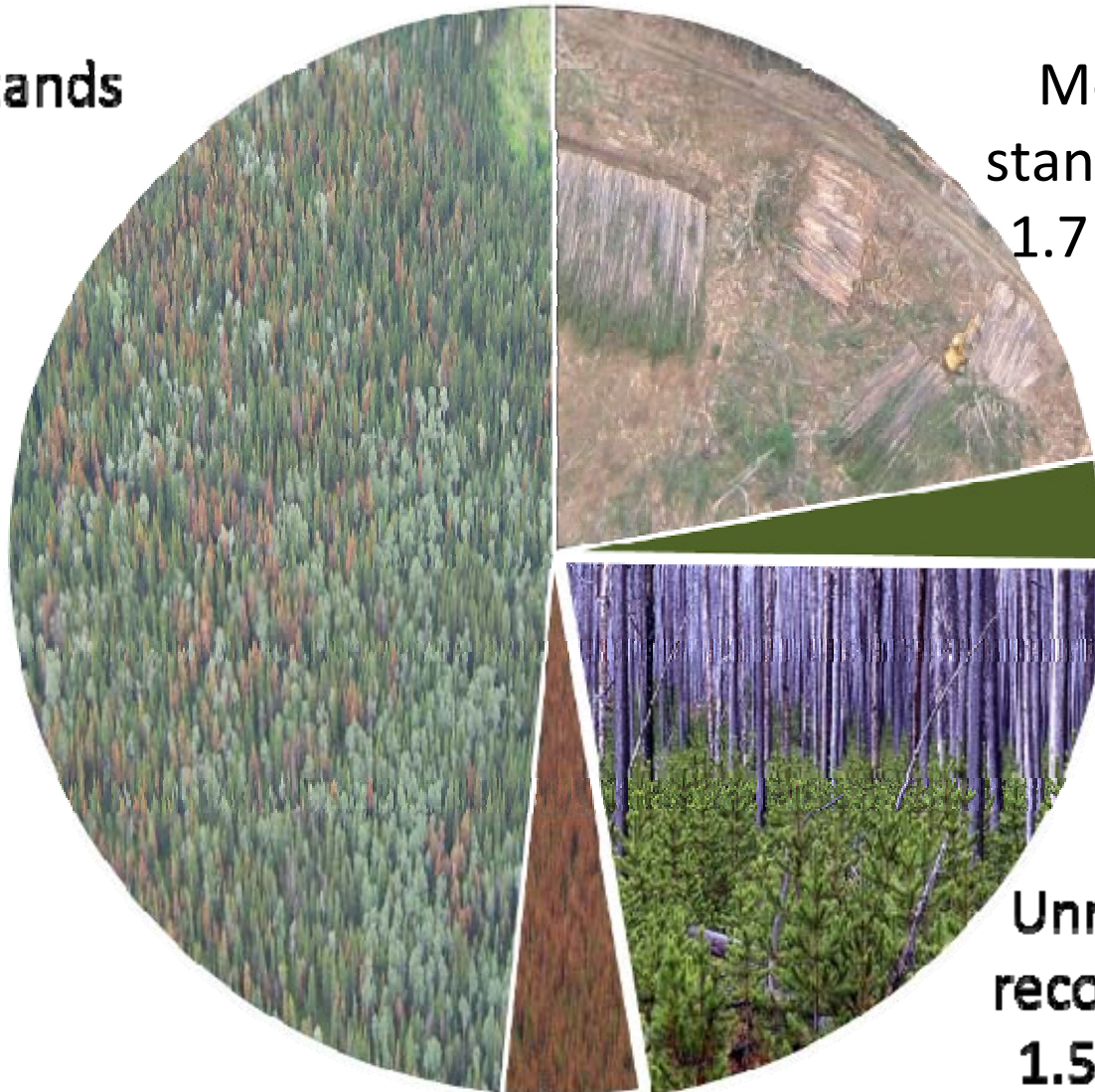
Timber Harvesting Landbase: 9.9 MM ha

**Area with stands
<50% pine:
4.8 MM ha**

**Merchantable
stands >50% pine:
1.7 – 2.6 MM ha**

**FFT
0.3 MM ha**

**Unmerchantable
recovering stands:
1.5 – 2.5 MM ha**



Secondary Structure



Canopy and sub-canopy secondary structure



Photo D. Ransom

No secondary structure



Understory subalpine fir



Understory lodgepole pine



Timber Harvesting Landbase: 9.9 MM ha

**Area with stands
<50% pine:
4.8 MM ha**

**Merchantable
stands >50% pine:
1.7 – 2.6 MM ha**

**FFT
0.3 MM ha**

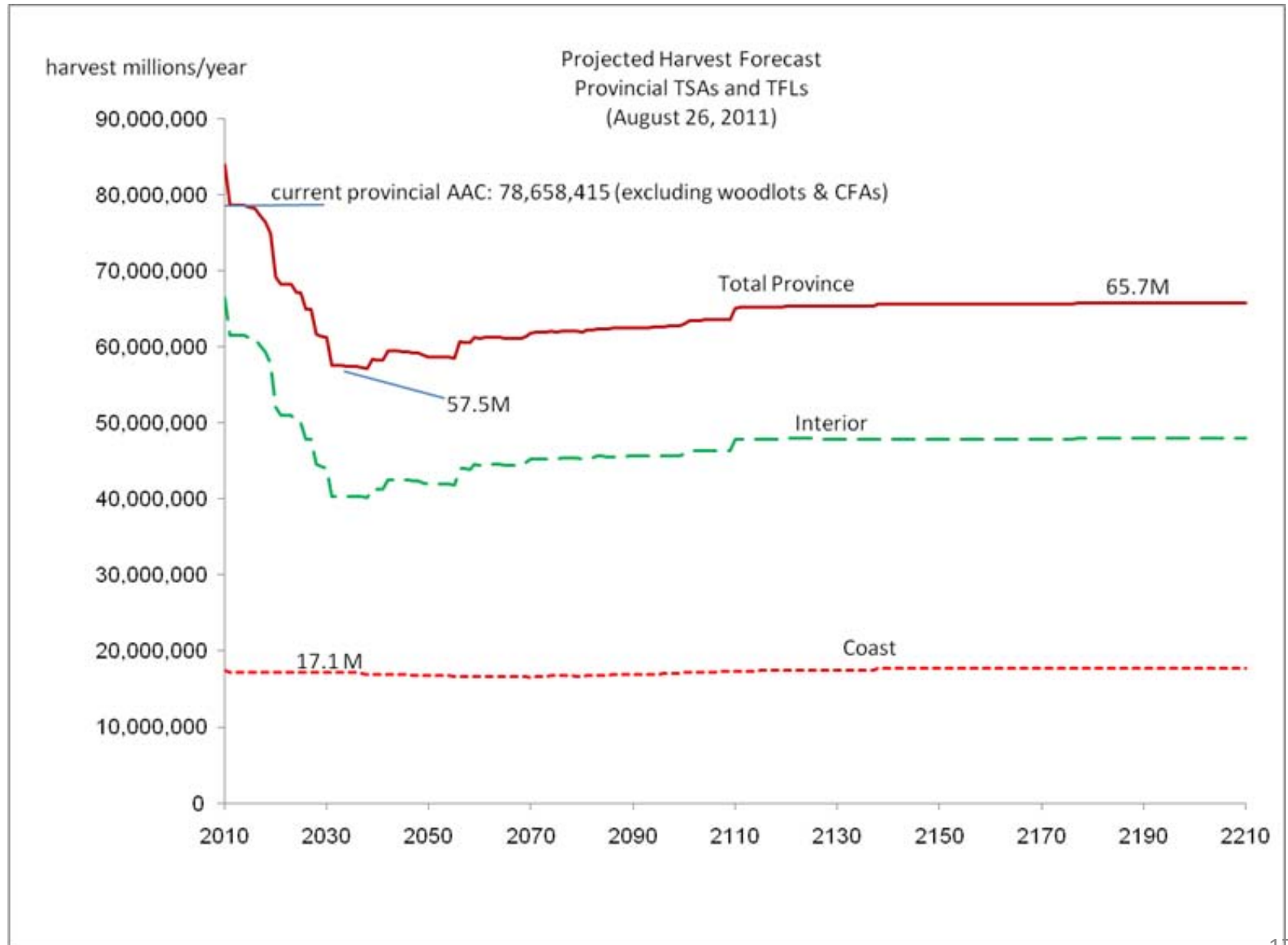
**Other impacted areas:
0.45 – 0.72 MM ha**

**Unmerchantable
recovering stands:
1.5 – 2.5 MM ha**

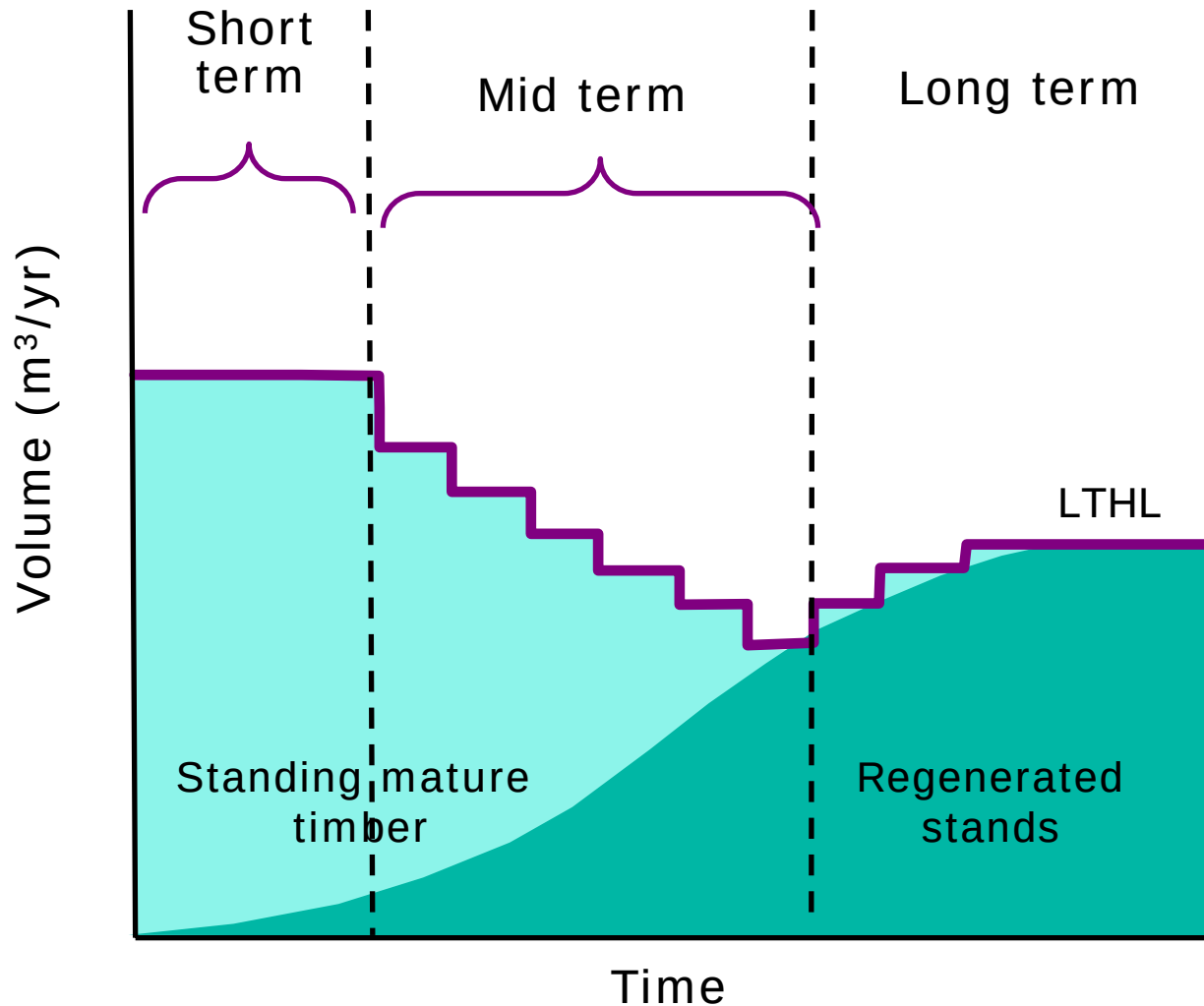


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MPB Effects on Timber Supply



Timber Supply Mitigation Strategies



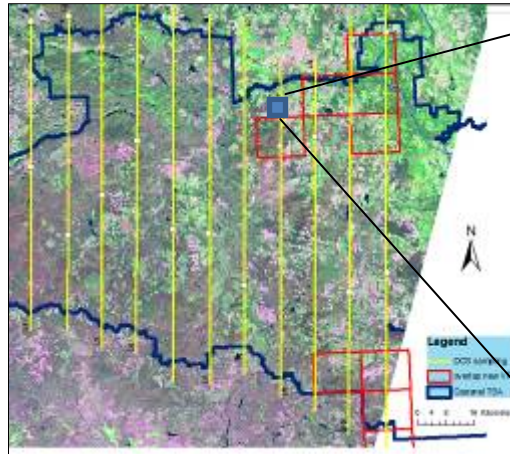
1. Strategic planning, surveys, forest inventory updates, mapping
2. Re-establish fast growing plantations
3. Rehabilitate where needed
4. Silviculture treatments such as fertilization, spacing, brushing
5. Ensure diversity
6. Capitalizing on new information, opportunities and technology



Inventory Investments

Landscape Vegetation Inventory (LVI)

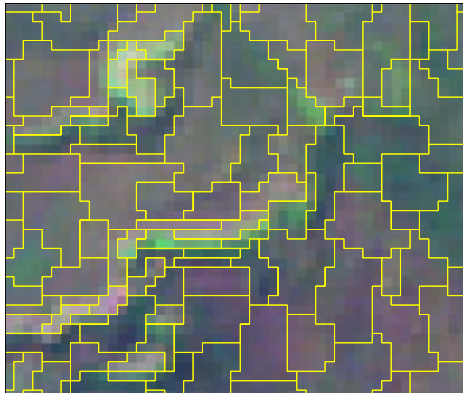
SAMPLING



2908 photo samples



MAPPING



INITIAL SEGMENTS

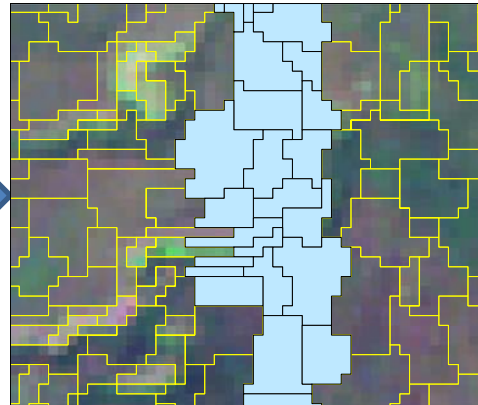
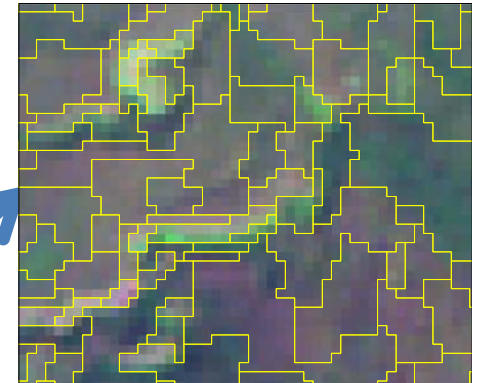
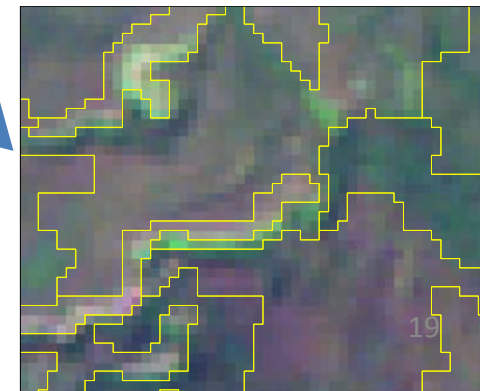


PHOTO INTERPRETED
SAMPLES

MAPPING
OPTIONS

MATCHING UNKNOWN TO KNOWN



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Silviculture Investments

Since 2005, FFT has:

- Invested nearly \$200 MM in reforestation activities
- Planted over 54 MM seedlings on more than 45,000 ha
- Ground-surveyed 400,000 ha impacted by wildfire and MPB

In 2011/12 FFT will:

- Plant 14 MM seedlings
- Sow 20 MM seedlings
- Survey 290,494 ha
- Site prepare 5,152 ha
- Brush 548 ha
- Layout 8,674 ha
- Write prescription for 13,987 ha
- Fertilize 24,000 ha
- Space 2065 ha

Forests for Tomorrow

Strategically reforesting areas impacted by the **mountain pine beetle** and **large wildfires** to provide multiple benefits for future generations.

Program Objectives

- Accelerate the recovery of the timber supply and environmental values
- Carbon sequestration and Green House Gas (GHG) reduction
- Ensure young stands are free growing and healthy
- Ensure licensee plantations damaged by fire are restored

Multiple Benefits of FFT Reforestation

- Productive capacity of the Province's forests restored
- Carbon sequestration and Green House Gas (GHG) reduction
- First Nations engagement, business and employment opportunities
- Riparian, watershed and ecosystem restoration

FFT Activities

- Strategic planning, consultation, information sharing
- Surveys, forest inventory update, mapping
- Core collection and seed acquisition
- Access development and maintenance
- Danger tree assessment
- Site preparation
- Tree planting and seedling protection
- Brushing and weeding
- Monitoring, surveys and operational trials
- Ecosystem restoration
- Fertilization

Partners in Delivery

- BC Timber Sales
- Communities
- First Nations
- Forest Analysis & Inventory Branch
- Forest Districts
- Forest Practices Branch
- Forest Regions
- Licensees
- Ministry of Community Development
- Ministry of Environment
- Recipients
- Third Party Administrator (Pricewaterhouse Coopers LLP)

Forests for Tomorrow Accomplishments

Activities	Accomplished 2005-2009	Current 2008-2009	Future 2010
Planting (ha)	9,233	7,000	29,110
Seedlings	8 M	7 M	17 M
Surveys (ha)	232,500	110,000	105,000
Brushing (ha)	1,787	TBD	TBD
Fertilization (ha)	11,815	TBD	TBD
Funding (\$)	136 M	44 M	54 M

Proportion Dead and Live Pine and Current and Projected Volumes by Timber Supply Area (2007)

Challenges:

Treatment Areas - FFT treatment areas must be carefully selected with due consideration to all other interests in the MPS impacted landscapes. Silviculture strategies developed with local knowledge from Districts, First Nations, recipients, licensees and others guide regional and management unit activity plans. FFT uses Geographical Information Systems (GIS) to spatially identify potential areas for FFT investment. A return on investment is evaluated for each potential area. A Multiple Accounts Decision Analysis (MADA) tool helps decision makers find areas where reforestation will benefit timber supply and environmental/social values such as community watersheds.

Climate Change - A changing climate means that the forests will experience changes in temperature and precipitation leading some different tree species to be better suited than others. FFT is working with the MPB Climate Change and Forest Carbon Unit and others to ensure that good decisions are made in light of climate change. FFT will monitor the success of trees planted to understand how they are responding under different conditions.

First Nations Participation - FFT is working to increase the amount and quality of First Nations engagement in the program. First Nations are invited to participate in strategic planning as well as take advantage of opportunities for employment in silviculture activities such as surveying and planting.

Adaptive Management - There are many unknowns about reforestation in mountain pine beetle impacted areas. FFT is employing adaptive management - a systematic process for continually improving management policies and practices by learning from the outcomes of operational programs.

Return on Investment - FFT silviculture treatment decisions are designed to ensure a positive net return to the investment.

www.forestsfortomorrow.ca



Young Pine Stands

An aerial photograph of a forest landscape. A light-colored, winding road or path cuts through a dense forest. The forest is composed of various types of trees, with some areas showing vibrant autumn colors (orange, red, and yellow) and other areas showing green. The terrain appears to be hilly or uneven. The overall scene is a mix of green and autumnal hues, suggesting a transition in the forest's composition.

About 4% (80 000 ha) may have been very severely impacted



Ensuring Diversity

- Chief Forester's 2005 *Guidance on Landscape- and Stand-level Structural Retention in Large-Scale MPB Salvage Operations*
- Climate based seed transfer program for reforestation with species adapted to future climatic conditions
- MPB seed planning impact and opportunity mapping
- Minimizing monocultures by planting more than one species

Wildfire Risk Reduction

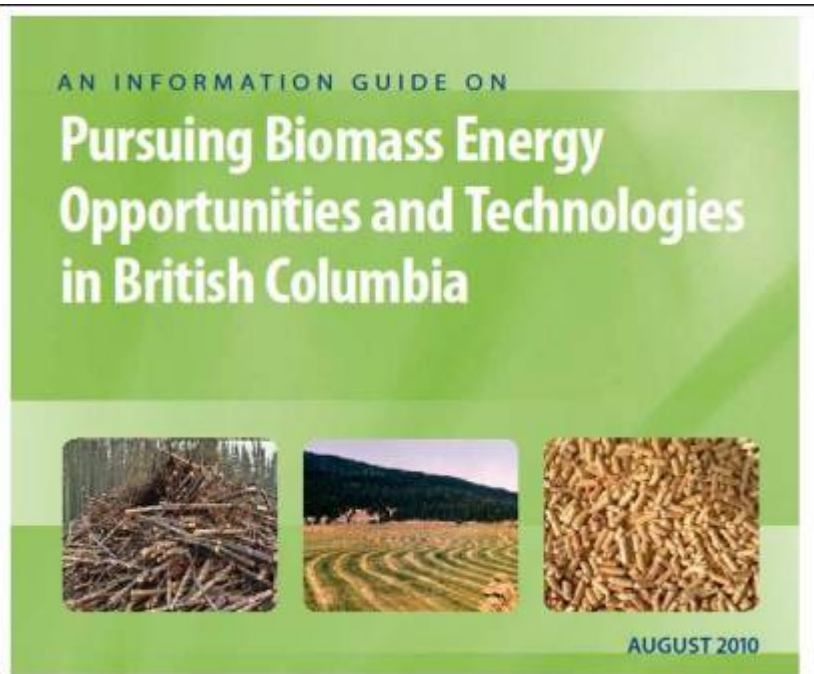


Reducing wildfire risk in community interface through fuel management and mitigation strategies with local government and First Nations

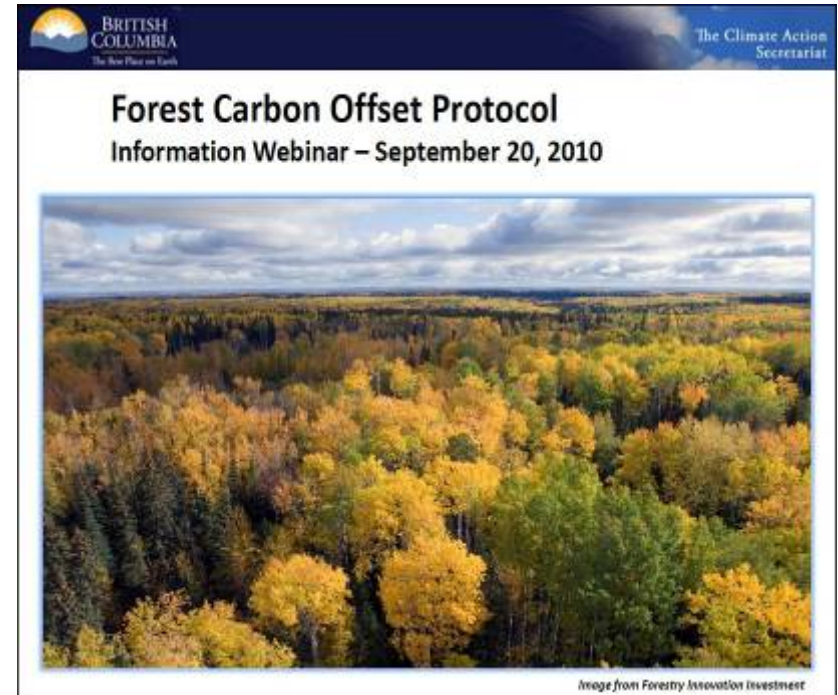


Capitalizing on New Opportunities

Bioenergy



Carbon Trading



Ongoing research

silviculture, forest health, fire, growth and yield, climate change, hydrology, soils, tree improvement, wildlife



Support for Beetle Action Coalitions



\$3 million each over the next 3 years for continued action in fighting the impacts of MPB and developing and funding projects that will stimulate economic development and job creation



Conclusion

- MPB has impacted 17.5 MM ha of mature pine forests and 9.9 MM ha of the Timber Harvesting Landbase.
- This mortality in our pine stands has significant implications for our mid-term timber supply.
- As a result examining mitigation strategies is a high prior for our ministry.

Conclusion

Strategies to mitigate the impact on timber supply include:

- Strategic planning, forest inventory updates, monitoring and mapping to help identify problems and opportunities and to keep abreast of any significant changes
- Re-establishing fast growing plantations and ensuring young stands are free growing and healthy
- Rehabilitating where needed to get non-satisfactorily regenerated sites back into production
- Investing in silvicultural treatments for immature stands to reach merchantability earlier
- Ensuring diversity, restoring damaged ecosystems and fire proofing to prevent future catastrophic losses
- Supporting the community-based Beetle Action Coalitions and capitalizing on new opportunities, information and technologies

Acknowledgements

Thanks to the many staff of Resource Stewardship Division who contributed information, especially:

Resources Practices Branch

- John McClarnon, Kelly Osbourne, Monty Locke and Lorne Bedford

Forest Analysis and Inventory Branch

- Albert Nussbaum, Adrian Walton and Xiaoping Yuan

Tree Improvement Branch

- Lee Charleson, Leslie McAuley and Susan Zedel



Questions?