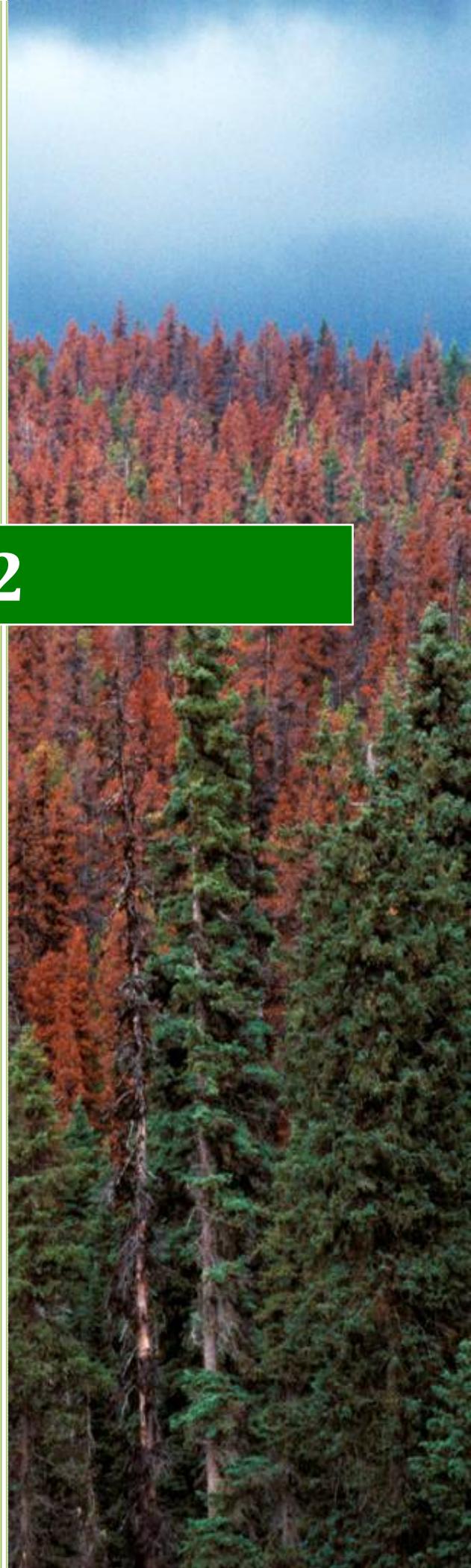


A History of the Battle Against the Mountain Pine Beetle

2000 to 2012



Introduction

The mountain pine beetle epidemic in B.C. is recognized as an unprecedented forest-altering event. As the most severe bark beetle infestation in recorded North American history, it has and will continue to impact the environment, the economy and a large segment of society. These facts have been recognized by the government of B.C. since 2001, when a new approach to sustained policy, funding and organizational action was taken to optimize the response to the epidemic. These actions have been taken in partnership with communities, First Nations, local and federal governments, and the forest sector.

This report provides a brief review of the history of the epidemic, and the provincial response to its impacts.

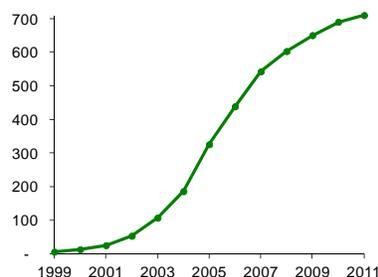
Genesis and State of the Epidemic

British Columbians expect wildfires to be quickly extinguished to conserve the ecological values of old pine forests and to protect life, private property, and the forest economy upon which so many rely. B.C.'s wildfire management program is internationally recognized for its effectiveness achieving these goals. During the last century, B.C.'s fire suppression program protected billions of young pine trees from wildfire, allowing them to grow to maturity far faster than the rate of their commercial harvest and natural mortality.

Prior to this sort of effective fire suppression, approximately 400 million cubic metres of mature pine was estimated to be growing in the Interior. When the current epidemic started, the Interior was estimated to hold approximately 1.34 billion cubic metres of mature pine suitable for breeding mountain pine beetle.

Over most of the Interior, extreme winter weather (colder than minus 35 Celsius for at least several days or even weeks) historically killed most of the pine beetle population, limiting the duration of, and damage from, periodic epidemics. Such a wide-spread weather event has not occurred in the B.C. Interior since the winter of 1995/96.

The combination of abundant mature pine and the absence of killing frosts in winter enabled an explosive growth in the pine beetle population as shown below:

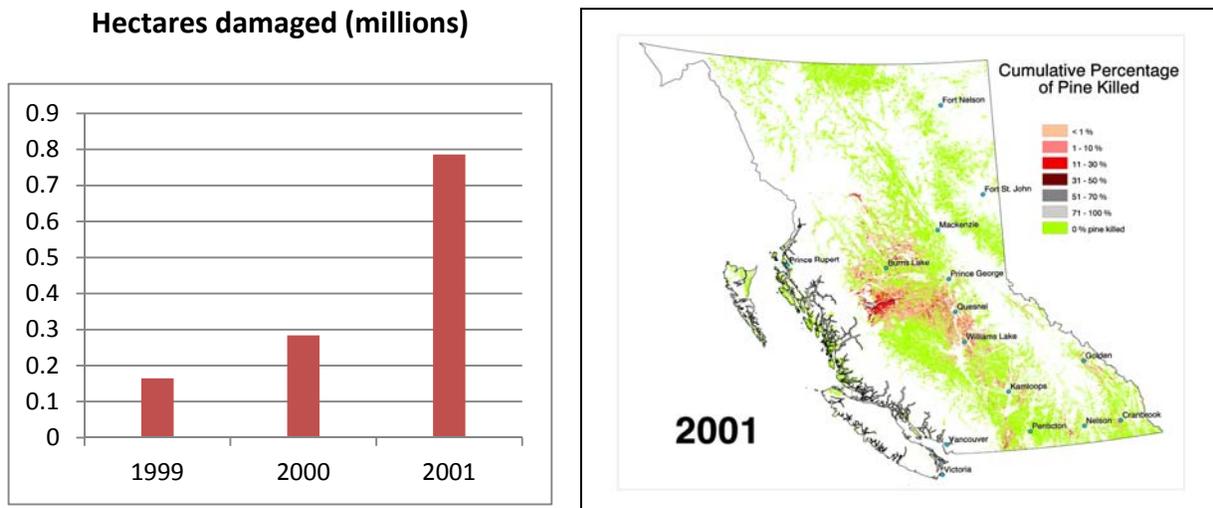


**Cumulative volume of
commercially valuable pine
killed since 1999
(millions of cubic metres)**

The epidemic has now killed an estimated 710 million cubic metres of commercially valuable pine timber, 53 per cent of all such pine in the province. The rate of damage has been slowing for several years, but is projected to grow to 58 per cent by 2017 (to 767 million cubic metres).

2001: A Strong Battle Plan

By 2001, the epidemic had damaged almost 800,000 hectares of forest with the worst damage occurring on the Nechako and Chilcotin plateaus, and the rate of geographic expansion was rapid, growing 480 per cent between 1999 and 2001.



In June 25, 2001, the Premier appointed the Government Caucus Task Force of the Mountain Pine Beetle, which tabled recommendations after community and public consultation. For technical analysis of best practices, the Province commissioned a report from R&S Rogers Consulting, which involved consultations with primary stakeholders). The Premier also received recommendations from the Pine Beetle Emergency Task Force of the Cariboo Lumber Manufacturers Association and the Northern Forest Products Association.

The recommendations from these sources were synthesized into an over-arching strategy, *'Mountain Pine Beetle Action Plan 2001'*. The Action Plan recommended fundamental changes in how the epidemic was managed. This included better coordination through the appointment of a provincial bark beetle coordinator, harvesting dead pine to capture economic value, adapting wildfire management practices, assessing impacts on land use plans, and increased government funding, from \$16.5 million in 2000/01 to \$36 million in 2001/02.

The 2001 Action Plan embodied the best expert opinion of the time and was designed to control the epidemic. Due to the size of the epidemic and expert opinion, the Action Plan acknowledged that total control of the epidemic would require a combination of human interventions and natural help in the form of killing frosts.

2001-2004: Responding to a Growing Battle

The Province and the forest sector implemented the *Mountain Pine Beetle Action Plan 2001*.

Part of the strategy was to aggressively curtail the spread of the beetle rather than simply wait for cold weather. To that end, \$107 million was invested in limiting the spread of the epidemic by destroying infested trees on the leading edges of the epidemic and using small-scale harvests to remove small patches of infested trees. Full-scale commercial timber harvesting was used to remove larger, infested stands before the beetles could fly to new trees.

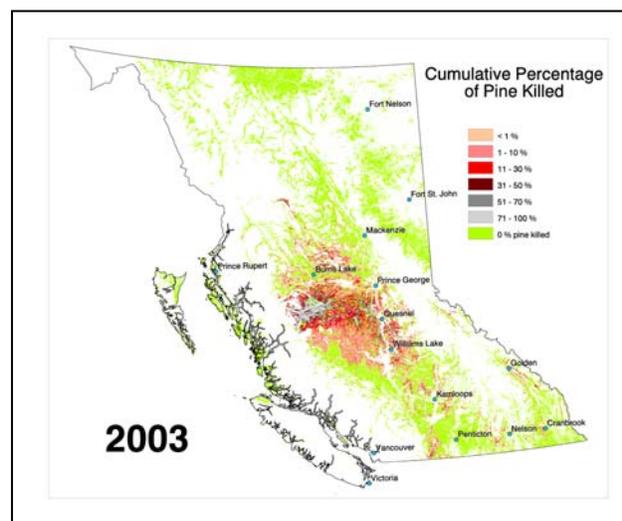
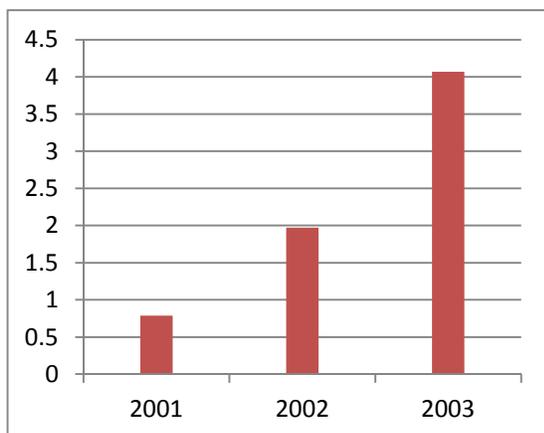
If the capacity of local mills to process beetle-attacked timber was exceeded, policy provisions were made to enable the trees to be hauled to other mills that could process them.

To facilitate recovery of the economic value of dead timber, the Chief Forester raised the allowable annual cut in nine timber supply areas and tree farm licences. These temporary increases created new economic opportunities, and several First Nations received timber harvesting tenures to assist in the beetle response.

In 2003, Crown corporation Forestry Innovation Investment worked with federal and industry partners to establish the China Wood Initiative to grow the China export market for lumber. This initiative proved crucial to the beetle response in future years.

As the Action Plan was implemented, mild winters continued, enabling continued explosive growth in the geographic size of the epidemic. By the fall of 2003, over four million hectares of forest had been damaged, a 517 per cent increase since 2001, with approximately 164 million cubic metres of commercially valuable timber killed since the start of the epidemic.

Hectares damaged (millions)



Recognizing the rapidly changing circumstances of the epidemic, and implications to the province, the Premier convened a special beetle symposium in Quesnel on November 23, 2003. Representatives of communities, First Nations, academia, industry and government discussed opportunities to adapt strategies in the growing battle with the pine beetle. Developing new forest products and markets, investing in rural economic development and tourism, and existing land use plans were discussed. The Chief Forester presented a new assessment of possible timber supply impacts from the epidemic, estimating an eventual loss of 7.8 million cubic metres per year from 12 areas under the heaviest attack at that time.

In response to the issues identified at the Quesnel symposium, on April 2, 2004 the Province issued the *Mountain Pine Beetle Update Action Plan 2004*. The update adapted the Action Plan to the changing nature and broadening implications of the epidemic. More emphasis was placed on fostering new and emerging forest-based enterprise, recovering value from damaged timber, and support for economic development and diversity in affected communities.

The updated Action Plan empowered the Minister of State for Forestry Operations to lead the Action Plan on behalf of government. The Deputy Ministers' Committee on Environment and Resource Development was directed to support the Minister of State by ensuring a co-ordinated approach across government.

A Minister's Community Advisory Group, with a term of April 2004 to April 2006, was established to represent key stakeholder groups and provide advice on the Action Plan. Members included representatives from communities, First Nations, forest industry, the scientific community, logging contractors, environmental sector and the federal government.

In addition, a Director of Economic Diversification was assigned to support communities as they worked to diversify their local economies, and a Provincial Bark Beetle Coordinator continued to manage the Action Plan.

Other major policy initiatives implemented during 2001-2004:

- The *Forest Act* was amended to enable government to designate mountain pine beetle salvage areas and to enable forest licences within the salvage area to be restricted to priority areas of beetle-killed timber.
- In 2004, the Province established the *Northern Development Initiative Trust Act* with \$135 million. The Act included provisions for the Trust to invest in pine beetle response.
- In 2004, the Province made a formal request to the Government of Canada for a financial contribution to the pine beetle response. Based on the 2004 Action Plan Update, a number of large timber harvesting licences were offered, designed to encourage the manufacture of new forest products.

2005-2007: Building Partnerships in the Fight

Between 2004 and 2005, the epidemic killed an additional 140 million cubic metres of commercially valuable pine and expanded by nearly two million hectares. As the epidemic grew, the complexity and scope of impacts grew in economic, environmental and social terms.

To adapt to the changing circumstances, the Premier in 2005 designated the issue a cross-government priority, directing each ministry with response capacity to make provisions in its service plan.

The Lieutenant Governor in Council appointed an Assistant Deputy Minister to work across government and lead a new Mountain Pine Beetle Emergency Response Team. That team was bolstered with three Community Economic Development directors to work with communities whose economies could be impacted by the epidemic.

The Province continued to improve the Mountain Pine Beetle Action Plan with another update in 2005. Recognizing the growing complexity of the epidemic, the Action Plan was broadened to include seven objectives:

1. Encourage immediate and long-term economic sustainability for communities.
2. Maintain and protect worker and public health and safety.
3. Recover the greatest value from dead timber before it burns or decays, while respecting other forest values.
4. Conserve the long-term forest values identified in land use plans.
5. Prevent or reduce damage to forests in areas that are susceptible but not yet experiencing epidemic infestations.
6. Restore the forest resources in areas affected by the epidemic.
7. Maintain a management structure that ensures effective and coordinated planning and implementation of mitigation.

The Province forged new partnerships for a stronger response to the growing complexity of the epidemic. On March 18, 2005, B.C. and Alberta announced a partnership to fight the epidemic along its eastern leading edge, agreeing to jointly plan and execute control measures on the shared border.

In March 2005, the Government of Canada transferred \$100 million to B.C. to aid in the fight against the pine beetle. Funding was deployed in accordance with priorities agreed to with Canada, including: community diversification, reducing fire hazards near communities, wood products and biological research and development, helping the cattle industry repair destroyed fences, forest inventory and ecosystem restoration, rehabilitating parks and recreation areas, and limiting the spread of the epidemic.

In early 2007, the federal government announced it would invest through its own agencies an additional \$200 million in pine beetle mitigation in B.C. Federal priorities included limiting the spread of the epidemic east into Alberta and the boreal forest, community economic diversification, recovering economic value from dead timber, and road and airport transportation infrastructure.

On April 8, 2005, the Province announced the start of funding for the Cariboo-Chilcotin Beetle Action Coalition to invest in the development and implementation of economic, environmental and social strategies to address epidemic impacts. The coalition included participants from the municipalities of Quesnel, Williams Lake, 100 Mile House, the Cariboo Regional District, First Nations, the conservation/wilderness tourism sector, and the forest industry.

On September 16, 2005, the Province and Canada announced the start of funding for the Omineca Beetle Action Coalition, which included representatives of communities from Valemount to Mackenzie and west to Smithers.

On April 5, 2007, the Province and Canada announced support for the Southern Interior Beetle Action Coalition, which includes community and First Nations representatives from Merritt south to the U.S. border.

The three beetle action coalitions have proven to be a valuable forum for engagement between all levels of government in the response to the epidemic. The coalitions are now focused on investing in economic development projects suited to their respective regions.

Starting in 2005, the Province and the Government of Canada worked to establish a partnership with the First Nations Forestry Council to collaborate on addressing impacts to First Nations communities. Using the New Relationship as a guide, the Province entered into a series of financial contribution agreements, eventually totaling \$12.5 million, to enable the First Nations Forestry Council to work with approximately 100 First Nations communities in the epidemic zone. Wildfire protection, cultural sustainability and environmental sustainability issues were addressed.

In 2006, the Province and First Nations established the First Nations Mountain Pine Beetle Initiative to work directly with the provincial Mountain Pine Beetle Emergency Response Team.

On April 14, 2005, the Premier announced an additional \$50 million would be entrusted to the Northern Development Initiative Trust, which included \$30 million to help communities mitigate the economic impacts of the pine beetle epidemic.

Also in 2005, the Province established the *Southern Interior Development Initiative Trust Act* and enabled \$50 million to be used to mitigate beetle epidemic impacts as deemed appropriate by the Board of Directors.

Responding to the extreme wildfires experienced in 2003, and the subsequent Filmon review of those events, the Province ramped up its partnership with the Union of BC Municipalities, First Nations Emergency Services Society, Parks Canada, and Indian and Northern Affairs Canada to accelerate the planning, permitting, funding and treatment of wildfire fuel management risks near communities.

The Province and Government of Canada sustained the focus on wood product and market research and development with funding to research institutions and universities. The Province provided \$1.4 million and partnered with the University of British Columbia and the forest industry to attract a world-class Wood Research Chair to bring together architectural, engineering, wood science and technology students to further the design, development and uses of structural wood products, particularly using pine beetle wood.

An additional \$1.5 million was provided to UBC, Thompson Rivers University and FPInnovations to conduct 25 beetle-related research projects.

The Province also provided the University of Northern British Columbia \$2.5 million to establish a world-leading research laboratory, named EvaluTree, to find further uses for mountain pine beetle wood and fibre.

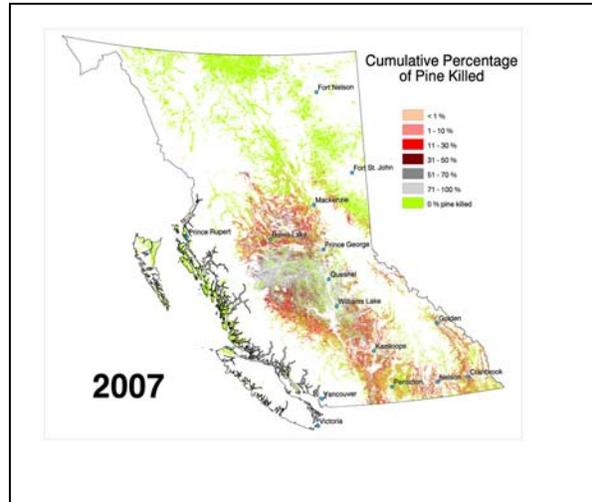
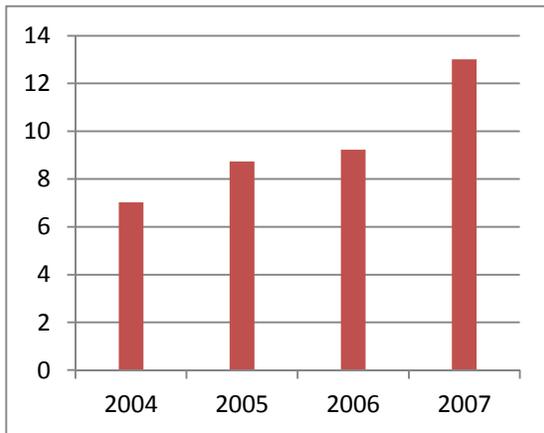
A significantly higher level of logging truck traffic was shortening the life of paved highway surfaces. In 2006, the Province began a \$30 million per year investment program to restore highways impacted by increased log hauling. \$10 million was provided to local governments to repair similar damage to municipal roads.

During 2005-2007, the Chief Forester temporarily increased the allowable annual cut in nine more timber supply areas and tree farm licences.

In 2007, the Chief Forester published an updated estimate of the potential loss of mid-term timber supply that could result from the epidemic. Based on the larger geographic scale of the epidemic, the estimate was approximately 12 million cubic metres per year.

The Forests for Tomorrow program, with funding of \$161 million, was announced in spring 2005 to mitigate this loss of timber supply by planting new trees, increasing forest fertilization, and spacing and removal of unwanted vegetation from plantations.

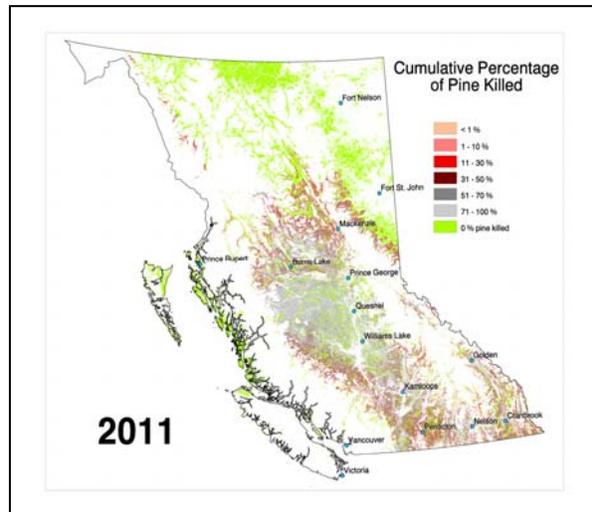
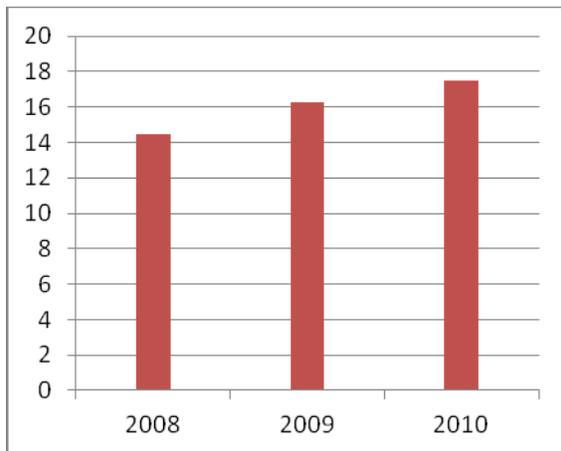
Hectares damaged (millions)



2008 to 2012: Sustaining the Fight, Preparing for the Future

The geographic size of the epidemic has continued to expand. The last expansion observed in 2011, resulting from the 2010 flight of the beetle, brought the epidemic to 18.1 million hectares, having killed an estimated 710 million cubic metres of commercially valuable pine.

Hectares damaged (millions)



Since 2004, the annual volume of timber killed has been in steep decline, signalling that the biological aspect of the epidemic is beginning to end. The greatest economic and social impacts of the epidemic still lay ahead however, and the Province, communities and industry have continued to adapt to the epidemic and prepare for the future.

In 2008 and 2009, the three community beetle action coalitions (Cariboo-Chilcotin, Omineca and Southern Interior) each completed their strategies to mitigate existing and future impacts

of the epidemic. In total, the coalitions completed 24 sector strategies or, in the case of the Southern Interior, made a series of 24 recommendations. The Province has provided funding to the coalitions to begin implementing their recommendations, most recently with \$9 million announced in April 2011.

By 2008, the 10th year of the epidemic, the forest sector had made significant capital investments in mills to adopt the best technology to process an increasing amount of beetle-attacked pine. The forest sector had shifted its timber harvest substantially into dead pine. This sustained shift of harvest conserves unattacked timber for the future, a management strategy first recognized in 2001. The forest industry will continue to focus on salvaging the dead pine until it is no longer economic.

Forests for Tomorrow, now part of the Land Based Investment Strategy, continues to invest in measures to increase the mid-term timber supply. Since inception in 2005, \$236 million has been invested by Forests for Tomorrow.

In 2008, the collapse of the U.S. housing market, historically B.C.'s largest customer for lumber, caused a severe downturn in the forest sector. This downswing hampered the salvage of dead pine timber.

However, the China Wood Initiative, started in 2003 by a provincial/federal/industry partnership, has grown B.C.'s lumber exports to China to over 7.3 million cubic metres in 2011, a 1,300 per cent increase over 2003. Several mills in the beetle zone ship their entire production to China.

The amount of dead pine now exceeds that which can be recovered for lumber. In 2008, the Province announced its Bioenergy Strategy with \$25 million to establish a provincial Bioenergy Network for greater investment and innovation in B.C. bioenergy projects and technologies. The Bioenergy Network encourages the development of pilot and demonstration projects with industries and communities in key biomass resource areas.

From 2008 to 2010, wood pellet production increased from 950,000 tonnes to 1.2 million tonnes.

In 2008 and 2010, BC Hydro offered contracts to purchase power from biomass through its two-phase Bioenergy Call for Power, including projects that will use wood fibre from dead pine timber, creating employment in construction and operation of plants.

There are rock formations in the central part of the Interior with potentially valuable minerals. However they are hidden under deep glacial soils and are difficult to explore. In 2008, the province funded Geoscience BC to provide data about these deposits for prospectors to use to

narrow their searches. This is expected to trigger higher investment in mineral exploration, and lead to new mine developments in the epidemic zone.

Summary of Provincial and Federal Investments in Epidemic Response

Since 2001, British Columbia has committed \$884 million to battle the beetle and mitigating future impacts:

- \$185 million for the Northern Development Initiative Trust to help northern economic diversification communities diversify their economies -- \$30 million specifically for beetle mitigation. To date, \$32.9 million of this fund has gone to 101 projects, leveraging \$205.5 million in total funds.
- \$50 million for the Southern Interior Development Initiative Trust to help communities create new opportunities for economic growth.
- \$236 million invested since 2005 in Forests for Tomorrow silviculture to improve long and mid-term timber supply.
- \$121 million to mitigate the impacts of increased logging traffic on roads:
 - \$90 million for rehabilitating highways.
 - \$21 million for maintaining and upgrading forest service roads.
 - \$10 million for rural municipalities to restore roads.
- \$25 million for Geoscience BC to explore central Interior mineral potential.
- \$58 million for research, fire mitigation and administrative funding.
- \$129 million for spread control since 2001.
- \$71 million for energy development and infrastructure in beetle communities.
- \$9 million to the three Beetle Action Coalitions for mountain pine beetle mitigation.

Since 2002, the Government of Canada has committed \$340 million and made a commitment for an additional \$800 million.

- \$200 million for a Mountain Pine Beetle Program (announced in 2007) with forestry and economic diversification components:
 - \$100 million for spread control, wildfire protection, and value recovery.
 - \$100 million for supporting economic growth and job creation, and transportation infrastructure improvements.
- \$100 million transferred from the federal government to the Province in 2005/06 for investment in a number of priorities such as protecting communities from wildfire, forest inventory, economic diversification for communities, spread control, developing new product uses for beetle wood, range repairs, ecosystem restoration, and mitigating impacts in parks and protected areas.
- \$40 million (2002) for research, remediation of federal and private forestlands.

Closing

B.C. has been battling the mountain pine beetle epidemic since the year 2000. From 2001 through 2004, the focus was on limiting the spread of the infestation and harvesting infested and susceptible pine stands. Not content to wait for frosts and winter cold spells that normally control the beetle, the Province took other steps to control the beetle's spread. However the infestation continued to spread dramatically to 2007.

Throughout last decade, government and industry concentrated on salvage harvesting, to recover maximum economic value, and the reforestation of the dead stands. The provincial and federal governments invested hundreds of millions of dollars in mitigating the infestation's impacts, in developing new markets for beetle-killed lumber, and in creating economic strategies for the future.

At the same time, the forest industry invested in adapting its harvest and milling technologies to the ever-changing forest resource, using the knowledge and experience gained from a significant, but much smaller, beetle infestation that hit the Cariboo-Chilcotin in the mid-1980s.

These actions have placed the industry, government and communities in the best position to address the next phase of the epidemic, as harvest and milling activities inevitably start declining.