

Mountain Pine Beetle

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British Columbia Forest Facts

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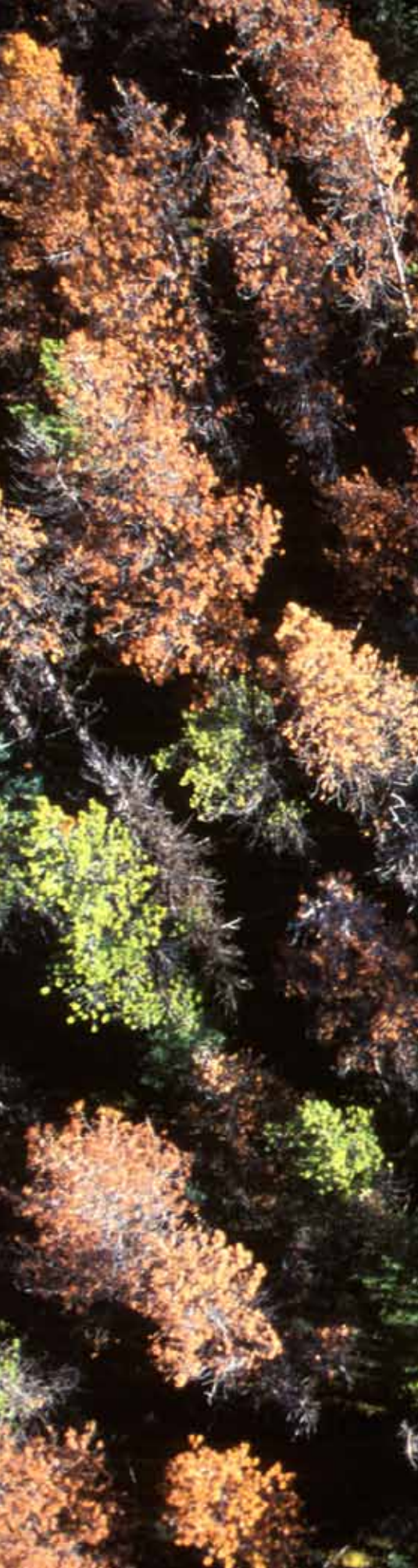
The mountain pine beetle has always been a natural element of British Columbia's interior pine forests. Normally, cold temperatures, forest fires and natural predators keep populations in check. However, an abundance of mature lodgepole pine, combined with recent mild winters and uncharacteristically hot, dry summers, have led to an unprecedented epidemic.

It is estimated that the cumulative area of provincial forest affected to some degree by the current outbreak is now more than 16 million hectares in British Columbia – one-quarter of the province's forest land.

British Columbia continues to look for ways to capture the economic value of trees affected by this epidemic while respecting other values.

While the epidemic has peaked in many regions and is slowing down, it may increase again slightly as it moves into pine forests in the northeast and southern interior. After 2012, it is expected to subside rapidly – by 2020, the current outbreak will essentially have ended. As the epidemic progresses, British Columbia forest managers are learning more about it so they will be better prepared to address future localized outbreaks.





MOUNTAIN PINE BEETLE

Mountain pine beetles affect pine trees by laying eggs under the bark. The beetles introduce a bluestain fungus into the sapwood that prevents the tree from repelling and killing the attacking beetles with tree pitch flow. The fungus also blocks water and nutrient translocation within the tree. The joint action of larval feeding and fungal colonization kills the host tree within a few weeks of successful attack. When the tree is first attacked, it remains green. Usually within a year of attack, the needles will have turned red. This means the tree is dying or dead and the beetles have moved to another tree.



BRITISH COLUMBIA'S RESPONSE

British Columbia has a wide-ranging response to the mountain pine beetle epidemic. It is addressing issues such as harvesting, processing, marketing, and impacts on the future timber supply and communities.

Investing for the Future

Since 2001, the British Columbia and Canadian governments have committed close to \$1 billion in funding to support pine beetle efforts within British Columbia – both to battle the epidemic and to support communities in affected areas.

British Columbia alone has provided \$439 million to mitigate future impacts and support economic development within the region affected by the epidemic. As of spring 2010, \$160 million had been invested through the Forests for Tomorrow Program to reforest parts of the epidemic area that are not the responsibility of the forest industry.

Capturing Economic Value

Current information indicates wood from beetle-affected trees will retain its commercial value for eight to 12 years after the tree has died. This so-called 'shelf life' is dependent on a number of factors, including economic and stand site conditions. The trees remain commercially viable longer under drier conditions. In areas where it is wetter, the trees tend to rot at the base and fall faster, especially if they are larger.

British Columbia's chief forester has increased allowable harvest levels in areas affected by the beetle to encourage forest companies to focus on these areas. Since the start of the outbreak in 1999, about 45 per cent of the mature pine trees harvested in British Columbia were affected by the beetle infestation.

The Ministry of Forests and Range expects the current mountain pine beetle epidemic will kill approximately 65 per cent of the provincial merchantable pine volume by 2016. Mortality will then slow substantially, and the epidemic will essentially be over by 2020 with 67 per cent of the pine volume killed.



Innovative and Efficient Use of Fibre

Technological advances and industry experience gained in milling wood from beetle-attacked trees have helped extend the shelf life of standing dead trees.

The timber can be used for anything from standard framing lumber to value-added wood products. The beetles carry a fungus that leave a blue or grey stain but this has no effect on the wood's strength properties. Through the collective efforts of forest companies, trade associations, research institutes and academia, new and innovative product applications continue to be investigated and developed.

The epidemic is also creating new opportunities for communities through the emerging bioenergy industry and through development of new and innovative uses for beetle wood, including value-added opportunities such as:

- Glue-laminated (glulam) products treated with a copper co-biocide preservative such as ACQ prior to gluing into a finished product. The result is superior to conventional pressure-treated products, where only the shell or envelope of the product receives the chemical treatment. Its durability and resistance to insect attack and decay makes the glulam product better suited to applications such as highway guardrails where wood use has traditionally been limited.
- Cross-laminated timber (CLT) panels is an engineered wood product that is still in

development. It is created by face-gluing lumber in successive perpendicular layers, then laminating it in a press to form a massive solid wood panel. These can be used in situations where designers would traditionally use steel, concrete and masonry.

Future Forest Productivity

Forest companies are legally required to reforest sites they log on public land within a specified time period. This allows faster regeneration and rehabilitation of beetle-damaged forests, reduces the risk of severe wildfire, and provides economic opportunities. The focus on harvesting the standing dead pine allows other healthy species to remain in the forest to help support values such as biodiversity, wildlife habitat and water, and to supply lumber mills 20 to 50 years from now.

On average, almost 200 million tree seedlings are planted annually on public forest land in the province. The survival rate for seedlings has improved immensely – it is currently 93 per cent.

The Ministry of Forests and Range is also taking additional steps to increase forest productivity – with silviculture, including fertilization, and by establishing managed forests with a shorter rotation. Through its Future Forest Ecosystems Initiative and associated tree species composition guidance from the Chief Forester, it is helping forest professionals manage for species diversity to avoid forest health risks and provide resilient stands that can adapt to a changing climate.

Natural disturbances by insects, disease and wildfire break up a uniform forest, creating a variety of habitats that benefit the overall diversity and health of the forest ecosystems. In some regions, a replacement forest of spruce and fir is sometimes growing beneath the dying pine trees and in 20 years it may be hard to tell there was ever an epidemic.

Future Timber Supply

Ministry projections estimate that in the mid-term, 20 to 50 years from now, the timber supply in British Columbia's Interior will be 33 million to 41 million cubic metres a year. While this is lower than the harvest level before the epidemic, it is close to the 40 million cubic metres harvested in the Interior in the 2008/09 fiscal year.

As lumber demand increases and prices increase, forest companies may move operations to areas that were previously uneconomic to harvest.



iHouse made of Cross-laminated timber



EXCELLENT ENVIRONMENTAL CHOICE

As trees grow, they absorb carbon dioxide and store it. When they decompose or burn, much of the stored carbon is released back into the atmosphere, mainly as carbon dioxide. Wood products are an excellent environmental choice for new construction or renovations because managed forests are efficient carbon sinks as long as they are regenerated, and wood products store carbon for decades, or longer.

As environmental awareness grows, building professionals are using wood for green

construction designs because it minimizes the use of energy, water and materials, and reduces impacts on human health and the environment. Wood is a high-performance and versatile choice for buildings of all sizes.

Wood from trees affected by the mountain pine beetle is no exception – in fact there is added value in using this fibre for wood products rather than leaving the trees in the forest to decay or burn and release carbon dioxide to the atmosphere.

EXAMPLE: THE RICHMOND OLYMPIC OVAL

The Richmond Olympic Oval is an excellent example of how wood from forests affected by the mountain pine beetle can be used in new, innovative applications – and deliver environmental benefits.

The roof of the Richmond Olympic Oval – the crown jewel of the 2010 Winter Olympic and Paralympic Games venues – is an innovative design employing beetle-affected wood. The 33,000-square-metre Oval's superstructure was constructed almost entirely from wood, and its unique, innovative roof system is made up of glulam beam arches and prefabricated one-of-a-kind "WoodWave" panels.

The wood used in the Oval will make a significant contribution to its environmental performance by storing carbon for the life of the structure. Using wood from affected trees for the Oval roof also demonstrates British Columbia's confidence in the quality of the resulting wood products.

"The Oval roof demonstrates mountain pine beetle wood is a good material and can be attractive," says Greg Scott, director of major projects at the City of Richmond. "While it won't address the epidemic directly, showcasing the use of the wood will hopefully encourage its application elsewhere."

In total, the roof system uses about one million board feet of 2x4 spruce-pine-fir dimension lumber – primarily from trees affected by the mountain pine beetle. This is in addition to one million board feet of Douglas-fir lam-stock lumber in the glulam beams and about 19,000 sheets of four-foot-by-eight-foot Douglas-fir plywood in the roof panels.



About 50% of wood products exported from Canada come from British Columbia's sustainably-managed forests. This publication is part of the 'Forest Facts' series, published by Forestry Innovation Investment. Visit www.naturallywood.com for details.

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British Columbia wood. Sustainable by nature. Innovative by design.