

MOUNTAIN PINE BEETLE EPIDEMIC IN BC

June 2001 Brief

ISSUE

The Mountain Pine Beetle (MPB) has spread to 5.7 million hectares of BC's forests, making this most recent outbreak the worst in recorded history. It has caused substantial timber mortality, disrupted harvesting schedules and adversely impacted on non-timber values (e.g., tourism). Last year alone, the epidemic increased four-fold. One Canadian Forests Service (CFS) expert anticipates a doubling in the extent of this infestation over the next year if environmental conditions and preventative measures remain unchanged. There is growing concern over the potential impact of the infestation on the long-run supply of fibre to BC's Interior forest industry.

BACKGROUND

The MPB infests mature and over-mature Lodgepole pine (80 years +). Lodgepole pine make up 24 percent of the province's total growing stock and 50 percent of the BC Interior's growing stock. Since 1998, 41 million m³ of Lodgepole pine have become infested by the MPB. This represents about 4.5 percent of the 900 million m³ total stock of Lodgepole pine in the province.

The economic impact of this infestation will be felt through both the forgone revenues of lost timber yields and the indirect costs associated with forest degradation. It has been estimated that the infestation could affect the economic stability of more than 30 communities and 25,000 families dependant on Lodgepole pine forests for their livelihood. The infected BC Central Interior forest is the largest softwood lumber-producing region in Canada, with 28 dimensional lumber mills producing 5.4 billion board feet of lumber annually. BC's top commercially harvested timber, the Lodgepole pine, accounts for approximately 25 percent of BC's harvest volume. Timber losses are already estimated at \$312 million and stands having a total potential value estimated at \$3.4 billion is currently infected.

Infected timber has reduced monetary value because a blue fungus deposited by adult beetles stains the pinewood, reducing its value or even eliminating it from sale in some markets (e.g., Japan). Further, infected trees turn an unsightly reddish-brown, adversely affecting non-timber values such as recreation, landscape and aesthetics, cultural heritage, range, fish and wildlife and watersheds. Outbreaks also have long-term impacts. MPB damage hastens forest succession by changing the age of the pine component of forests. Infestations also bring operational problems, increasing harvesting costs and requiring extensive alterations to forest management plans. It also increases the risk of forest fires, since the dead trees left behind following an infestation dry out and become more susceptible to fire.

A variety of factors combined to allow this recent outbreak to spread to epidemic proportions. Primarily, five successive mild winters (a possible consequence of global warming) have not brought the sub -30°C temperatures that normally kill off the beetle larvae. Second, fire suppression over the last 40 years has created large tracts of mature

and over-mature lodge pole pine, the target of the MPB. Forest fires would have created a mosaic of trees of different ages and species that, in turn, would have impeded the beetle's spread. Forest practices are also partly to blame. Attempts to maximize land-base revenues have led to tree densities greater than 500 per hectare, even though densities below this threshold help reduce the buildup of beetle populations.

Mountain Pine Beetle Lifecycle

In the warmest months of the summer, the female pine beetle emerges from under the bark of an infected tree and takes flight in search of uninfected timber stands. Carried by winds, sometimes for kilometers, the beetles locate and bore into the bark of neighboring mature and over-mature lodge pole pines. After attracting males to their location through the use of pheromones (natural bio-chemical signaling agents emitted by the beetle), the female beetle builds an egg gallery, a corridor of eggs laid under the bark that runs the length of the tree. While laying their eggs, adult beetles deposit a blue stain fungus, which blocks the flow of water to the top of the tree's trunk. When the larvae hatch during July and August, they burrow into the phloem layer of the tree, further reducing the flow of nutrients to the tree. This parasitic behavior continues throughout the fall and winter - slowing in the colder months - until the spring, when the larvae mature to the pupae stage, and take flight in search of uninfected timber - repeating the cycle of the previous year.

Industry Action

Local forest producers are using their annual allowable cut allotments (which total 18 million m³) to harvest the infected areas, but the rate of infestation is outstripping the allowable cut in many areas. In 2000-2001, BC industry spent more than \$79 million and redirected approximately 3,400 workers in an effort to stem losses and slow the progress of the beetle epidemic. In addition, many of the infected areas are distant from logging roads or other transportation routes, hampering access. Effectively harvesting infected timber in these areas will likely require the construction of expensive access roads. There is also the concern that area sawmills lack the capacity to debark the harvested pine. Where this is the case, beetles could survive under the bark of felled trees until the summer, at which time they could spread to nearby forests.

Provincial Action

The BC Government contributed \$18 million to fight the epidemic in 2000-01. In response to pressure by Interior producers represented by the Northern Forest Products Association (NFPA), on June 25, 2001 the provincial government declared MPB-infested forests in the BC Interior to be an emergency zone. The provincial government and area producers hope this declaration will allow them to qualify for \$500 million in federal funding over ten years for road construction, logging, chipping, replanting and related scientific work. Research has shown that beetle management has a positive economic impact; a study carried out on behalf of the province in 1993 showed that a \$4.5 million

beetle management program resulted in a net benefit of \$72 million in stumpage and lumber value recoveries.

In addition to increasing the funding to fight the beetle threat, the declaration will remove the administrative red tape that forest companies face when attempting to quickly harvest patches of beetle-infested trees. BC Government officials approved an increase of almost 40 percent in the annual limit on logging in 1.6 million hectares of forests around Quesnel. A similar increase is being considered for the Burns Lake area. Stumpage fees will also be lowered in infested areas. The reduced fee is intended to compensate forest companies for the additional costs associated with logging infested pine trees. Of concern in this regard are the ongoing negotiations surrounding the Canada/US Softwood Lumber dispute. The provincial government is anxious to ensure the reduced fees are not viewed as a subsidy to the industry, as this could create problems for Canada on the softwood lumber front.

A provincial government task force was also announced June 25, 2001. A private consultant, R & S Rogers Consulting Inc. and four northern Liberal MLA's (led by Cariboo North MLA John Wilson) have been commissioned to develop a comprehensive strategy for managing the epidemic. The consultants plan to compile a preliminary report in five weeks, based on discussions with first nations, forest companies and local politicians. The final plan is to be completed by mid-September.

Potential Solutions

The last major MPB infestation occurred in the 1970's. That beetle population was eventually destroyed by strategic clear cutting and, more importantly, two back-to-back cold winters in the mid-1980's. The Scripps Institution of Oceanography predicts a warm El Nino event over the winter and spring of 2001-2002, making it unlikely that cold weather will offer relief from the epidemic, at least not in the next year to 15 months. Given this, techniques to fight the infestation include:

- **Pheromone baiting** – Luring beetles into trees baited with a synthetic hormone that mimics the scent of a female. This technique helps contain the beetle in a single area.
- **Sanitation harvesting** – Removing single infested trees to control the spread of beetles to other areas.
- **Fell and burn** – Felling and burning beetle-infested trees to prevent the beetles from spreading. This is usually done in winter to reduce the risk of starting forest fires.
- **Pesticide** – Injecting infested trees with the pesticide MSMA, which kills beetle larvae.
- **Snip and Skid** – Removing groups of infested trees scattered over a large area.
- **Mosaic burns** - Controlled burning of a concentration of infested trees that are contributing to high beetle populations in an area. This also serves to reduce fire hazard.

These short-term, preventative measures offer solutions on a localized scale and help reduce the rate of spread. However, to bring this epidemic under control, CFS expects

that 95 percent of the beetle population would need to be eliminated, unlikely in the absence of a major killing frost weather event. In addition, there are complicating factors that must be weighed in formulating control strategies, such as the recent suggestion by some environmentalists that “defensive clear-cutting” is simply an excuse to harvest timber on a scale that would not otherwise be permitted.

Currently, researchers are considering longer-term solutions to the epidemic including the possibility of large-scale burn-offs of infested forests, or possibly the introduction of predator species, but these solutions are considered only speculative at this stage. Use of aerial insecticides is not considered a viable option since the beetles are largely located under the bark of the trees, which protects them from exposure to aerial insecticides. Nor are insect sterilization programs considered viable due to the sheer number of beetles. The best long-term solution currently available is thought to be the thinning of existing unaffected forests and replanting of infested areas to provide lower tree densities. Increasing the distance between trees from the current 2-3 meters to a spacing of 4-5 meters is thought to reduce the efficacy of the pheromone messaging system used by the beetles to attract mates at breeding time.

Prepared by:

Policy & Planning
Western Economic Diversification
BC Region
Tel: (604) 666-1314