

Oct. 30, 2003

Ministry of Forests

TIMBER SUPPLY ANALYSIS MOUNTAIN PINE BEETLE INFESTATION

Description of Infestation

Mountain pine beetles exist naturally in mature lodgepole pine forests, at various population levels, depending on pine availability and weather conditions. They play an important role in the natural life cycle of these forests by attacking older or weakened trees, which are then replaced by younger, healthy forests. The beetle population levels in British Columbia's interior, however, have been increasing since 1994. There is no indication the spread of the infestation will slow significantly without sufficiently cold weather (-25 degrees C in the early fall or late spring, or sustained winter temperatures of less than -40 degrees C) to stop it; or unless the population collapses due to a shortage of mature pine.

Two major factors have been contributing to the increasing beetle infestation:

1. There are about 8 million hectares of mature and over-mature pine-leading stands (generally older than 80 years), which are most susceptible to attack by the mountain pine beetle.
2. Mild winters and hot, dry summers over the past decade have been conducive to the expansion of the beetle population. The milder winters have created conditions favourable to the spread of beetle infestation into higher elevations and more northern latitudes. Also in some areas, the drier summer conditions mean that trees are more drought-stressed, which increases their susceptibility to beetle attack.

Size of the Current Infestation

Since 1999, the ministry has used standardized aerial overview surveys to map the amount of 'red attack' in a given year. (Red-attack refers to trees that were attacked and killed in the previous year.) The preliminary analysis of the 2003 provincial aerial overview survey indicates that the 'red attack' has doubled when compared to the 2002 surveys. The 2003 red attack area covers an estimated 4.2 million hectares of mature pine, and the outer periphery of the epidemic was found to still be spreading. The 4.2 million hectares have been infested to varying intensity levels and hence not all of the trees within this area have been killed.

Management Strategies

Given the importance of lodgepole pine forests for social, economic and environmental values, the provincial government established the Mountain Pine Beetle Task Force in 1999 to manage and reduce the impact of the infestation. The task force is comprised of ministry and industry resource professionals. The government has recognized the seriousness of the infestation and in the November 2001 action plan directed that:

- Emergency management zones be established to promote faster response to dealing with infested timber;
- Regulatory efficiencies ensure efforts are effectively directed toward slowing the beetle; and

- A bark-beetle management co-ordinator – the beetle boss – work with stakeholders to develop and implement strategies for dealing with the beetle.

The ongoing control strategies and preventative actions have made a difference in some areas. However, while strategies have been aggressive and harvesting measures have been focussed on trying to reduce the spread of the infestation, stands of dead timber are being left behind.

Timber Supply Impact Study

Since the infestation is continuing to spread, the ministry has assessed the outcome of the beetle infestation in terms of the provincial timber supply. To undertake this assessment, the ministry examined 12 management units representing the more severely infested areas in south-central B.C., from Houston to Kamloops. The 12 units in the study were:

- Seven timber supply areas (TSAs) – Morice, Lakes, Prince George, Quesnel, Williams Lake, 100 Mile House and Kamloops
- Five tree farm licences (TFLs) – 5, 42, 49, 52 and 53

This analysis examined the potential impact of the beetle infestation generalized over a large area and the extent that it might spread over the next one to three years, given past trends and our current knowledge. The study also examined the Quesnel TSA in more detail to study the impact in a unit that has a large proportion of mature pine forests that is already heavily infested.

The 12 units cover about 10 million hectares of timber harvesting land base (THLB) or about half of BC's interior total THLB of 20 million hectares. The 12 units contain about 1.7 billion cubic metres of merchantable mature timber volume, of which two-thirds is pine.

The total provincial allowable annual cut (AAC for TSAs and TFLs), is currently about 74.4 million cubic metres per year. The total AAC in the 12 units is about 30 million cubic metres per year, of which 6.8 million cubic metres (AAC uplifts) is assigned to seven of the 12 management units for the purpose of managing the mountain pine beetle infestation.

Of the 4.2 million hectares of various intensities of 'red attack' estimated for 2003, about 80 per cent is located within the 12 units. If the infestation continues at its current rate, it could affect many of the mature pine-leading stands in the 12 units as well as other TSAs with mature pine.

Analysis Assumptions

The following key assumptions reflect the best estimate of beetle infestation dynamics over the 12 units:

- While final mortality rates will vary among units, it is possible on average across the 12 units that 50 per cent of the stands could be affected over the next one to three years. Therefore in the analysis, half of the 3.3 million hectares of susceptible pine stands were assumed to have been attacked and killed.
- Attacked and killed trees would take 15 years to deteriorate. This was based on an estimate of the merchantability of pine over a large area. In some wetter areas, merchantability may be less than 15 years and in the drier areas, it may be longer than 15 years.
- During the first 15 years, harvests were projected to consist on average of 60 per cent pine and 40 per cent other species. This percentage was based on the actual harvested species profile for 2002.

Highlights of Findings

While it is difficult to know the precise magnitude of the mountain pine beetle infestation and its impacts, analysis of the 12 management units projected a significant decline in timber supply after about 15 years from now, at a time when beetle-killed trees might deteriorate beyond merchantable condition (for more details see below, under Shelf Life). The projected reduction in mid-term timber supply (16 to 100 years from now) was 19 per cent relative to the pre-uplift AAC of 23.2 million cubic metres. At the uplift harvest level of 30 million cubic metres per year, about 200 million cubic metres of beetle-killed pine would not be harvested. In examining other scenarios, higher levels of mortality would have proportionately more impact on the mid-term timber supply.

Based upon the current high levels of beetle attack and the volume of mature pine in the Quesnel TSAs, the rate of mortality and resultant timber supply impacts after 15 years could be up to 29 per cent from the pre-uplift harvest level.

The analysis showed that mid-term timber supply reduction could be mitigated somewhat, or timber losses could be reduced, if:

- Harvesting is prioritized on the more severely infested stands;
- Harvesting is focused more on pine than other species;
- Infested forests are regenerated more quickly than assumed.

While this analysis did not specifically examine the efficacy of targeting ‘green-attacked’ timber (with live beetles) to prevent further spread, other types of analysis have demonstrated that at low to moderate population levels, harvesting can effectively slow or even stop the spread.

While the eventual extent of the infestation is uncertain and the deterioration rate of killed trees are beyond management intervention, the analysis shows that timber supply declines might be lessened if harvesting is focused on severely infested areas and where deterioration rates are more rapid and intense.

Shelf life – the length of time that standing killed timber retains its merchantability based on today’s economic structures – is an important factor in determining impacts. Harvesting of beetle-killed timber could potentially continue at levels above the projected mid-term levels. Research is currently underway to refine estimates of the merchantable life span of beetle-attacked pine and to investigate alternative wood products from beetle-killed timber. Findings could help to focus harvesting where deterioration rates are expected to be more rapid and to expand the harvesting potential.

Response

The B.C. government, industry and private landowners are aggressively responding to the current beetle infestation. As noted above, management strategies have demonstrated that preventative actions have made a difference in some areas. Under the leadership of the Mountain Pine Beetle Task Force, the Ministry of Forests and the industry are continuing to work together to ensure that all operational activities are aimed at the infestation. The task force is currently updating a strategic framework called the Bark Beetle Management Strategy Framework for B.C., which will be completed in fall 2003.

As well, the province has recognized the potential impacts to communities and has announced that a special symposium will be held this fall in Quesnel to identify social, economic and environmental concerns and to begin discussing solutions. The Ministry of Forests and Canadian Forest Service continue to collaborate on research and analysis to gain a better understanding of bark beetle infestation dynamics.

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