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Spatial extent of MPB infestation and impact on forests.  
By Marvin Eng, BC Forest Service

Each year since 1999, the BC Forest Service has conducted a Provincial Aerial Overview of Forest Health (<http://www.for.gov.bc.ca/hfp/health/overview/overview.htm>). That survey showed that the current mountain pine beetle epidemic has grown from 0.2 million hectares in 1999 to approximately 10 million hectares in the summer of 2005.

Table 1. Area affected by year.

Year	1999	2000	2001	2002	2003	2004	2005
Area Affected (millions of ha)	0.2	0.3	0.8	2	4	7	10

The total area affected annually has increased dramatically over the past 7 years but the epidemic has not affected all of the area equally. For example, Table 2 shows that of the 10 million hectares affected in 2005 there were over 2 million hectares where there was just a “trace” infestation (<1% of the stems attacked).

Table 2. Area affected by infestation severity in 2005

Severity	Trace	Low	Moderate	Severe	Very Severe
% of stems killed	<1	1- 10	11- 29	30 – 50	>50
Area affected (millions of ha)	2	3	3	1	1

The area affected is expressed with low precision. The information is collected by sketch mapping and visual interpretation of the percent of stems affected and this method is not precise. However, the forest health overview is the only source of information that is available for the entire province on an annual basis.

Since 2003 we have been using the forest health overview as the basis for estimating the cumulative impact of the infestation on British Columbia’s pine forests and to parameterise a model that projects the future extent of the infestation (<http://www.for.gov.bc.ca/hre/bcmap/>). We estimate that in the summer of 2005 approximately 20% of the total mature pine volume in British Columbia was killed and could be seen to be dead (red or grey trees). Based on our model we believe that it is likely that another 10% of the total mature volume was killed during the summer of 2005 (green attack). Based on the behaviour of the outbreak to date, our model projects that the outbreak will kill 80% of the susceptible mature pine by 2013.

Nearly 20 million hectares of forest in BC (approximately 1/3 of the total forest) contain some pine component in the dominant canopy. Of those, 4.5 million hectares is pure pine. In the remaining area, pine is mixed with other species, and in 5 million of those hectares, pine represents less than 25% of the canopy. Clearly, the effect of the infestation will be much more dramatic in forests with a high percentage of pine in the canopy and there will be large areas of forest with pine where there will be little or no negative effect on forest values of interest.