Forest Management Branch

INFORMATION LETTER

Best Management Practices for Hauling and Milling MPB-Infested Pine

February 1, 2010

This document is intended to supplement the Mountain Pine Beetle Log Management Directive. As noted in the Directive, operators or individuals transporting MPB-infested pine volumes on public highways/roadways must either:

- Follow the protocols described in the Directive to ensure effective MPB control, or
- Propose operator-specific management plans to fulfil the intent of the Directive.

The purpose of this document is to provide operators with strategies to consider when developing operator-specific management plans to extend hauling/milling of MPB-infested wood into the standard no-haul period.

As noted in the directive, no-haul dates are specific to the MPB management zone that infested wood is moving *From* and *To*, and are as follows:

	To:				
From:		Inactive Holding Zone	Active Holding Zone	Leading Edge Zone	Area not designated
	Inactive Holding Zone	No restrictions	No haul July 1 – Aug 31	No haul June 16 – Sept 30	No haul June 16 – Sept 30
	Active Holding Zone	No restrictions	No haul July 1 – Aug 31	No haul June 16 – Sept 30	No haul June 16 – Sept 30
	Leading Edge Zone	No restrictions	No haul July 1 – Aug 31	No haul June 16 – Sept 30	No haul June 16 – Sept 30
	Area not designated	No restrictions	No restrictions	No restrictions	No restrictions

The following strategies are used most effectively in various combinations to reduce the risk of spreading MPB and improving control effectiveness with harvesting/processing.

When reviewing plans for approval, the Area Forestry Manager will consider the proposed strategies in relation to the risk of spread (i.e. MPB infestation levels, and stand susceptibility along haul routes and at mill/storage site location).

In-Block/Harvesting/Hauling Strategies

Sorting and segregating infested trees

As a portion of the trees harvested in a MPB-infested block are likely un-infested, operators may sort and segregate infested trees as part of the harvest operation. Infested trees are often identified by the presence of blue stain in the sapwood, pitch tubes, or possibly fading foliage. The infested trees can then have transport priority, thus leaving the un-infested portion of the block to be transported during the no-haul period.

Note: the effectiveness of this strategy relies on the operator's ability to recognize signs and symptoms of MPB-attack. Unfortunately the most easily recognizable symptoms, as mentioned above, are not always present.

In-block debarking

Removing bark of the infested trees prior to transport from the harvest location exempts operators from any hauling or milling restrictions required by the Directive.

As mentioned in the previous strategy, effectiveness relies on the operator's ability to recognize signs and symptoms of MPB-attack.

Haul sequencing

Annual harvest sequencing may incorporate a compartment or block stratification based on infestation levels. Infestation information could be gained through a variety of ground survey methods, and/or existing SRD ground/aerial survey data where available. Once compartments or blocks are stratified, harvesting would begin in blocks with the highest infestation levels, leaving compartments or blocks with the fewest beetles to be hauled into the no-haul period.

In situations where the lowest level of beetle infestation in the sequence is still high enough to pose a risk, additional mitigation strategies should be employed.

Uninterrupted transport and hot-milling

If infested wood is hauled during the no-haul period, drivers should be instructed to proceed uninterrupted (except for safety stops) to the mill once their load has been placed. This will reduce the probability of beetles emerging on route.

When infested wood is hauled to the mill just prior to, or during the no-haul period, it should be processed immediately to avoid build-up. No infested wood should be delivered to the mill when rapid processing cannot occur (e.g. prior to holidays or other scheduled shutdowns).

Monitoring beetle emergence/peak beetle flight

As the peak beetle flight may vary between years, and even between locations within a year, emergence can be locally monitored to pin-point and potentially shorten/adjust the standard no-haul period.

This method of monitoring MPB flight was adapted from the procedure developed by the British Columbia Ministry of Forests, and is summarized as follows:

1. Select a representative clump of 3 infested trees in the operating area. Additional sites may be required for large operating areas, or to account for large variations in elevation and aspect.
2. Use white latex to paint a 0.5 m^2 area of bark at 1.3 – 2.3 m.
3. Start twice per week examinations of the painted surface on June 1st, and when exit holes are noted, cross them off with a red permanent marker pen.
4. Hauling of infested wood should be controlled one week after the first beetle emerges.
5. Continue to monitor and graph exit holes twice per week. Hauling restrictions may be lifted once beetle emergence is <10% of that noted at the peak.
6. As there may be multiple spikes in the annual flight period, when emergence rises to >10% of that noted at the original peak, hauling should once again be controlled until emergence declines to <10%.
7. A companion monitoring system may be used to add confidence by taking phloem samples on the north and south side of nearby infested pines to assess brood development. The total number of larvae, pupae, and adults can be recoded and compared twice per week. A substantial increase in the percentage of newly developing adults should trigger the no-haul period.

Temperature monitoring

MPB generally have a flight temperature threshold of 18°C. If the temperature is predicted to be <18°C on a particular day, hauling of infested wood may occur unimpeded though that day. If the temperature is predicted to range from 18°C to 25°C, then hauling should only occur between 2300 and 0800 hours. If the temperature is predicted to exceed 25°C, the no hauling should occur on that day because 18°C can be exceeded during the night.

The temperature monitoring approach may be effective if:

- infested wood is hot-milled and not stockpiled in the log yard when 18°C is exceeded;
- temperatures are monitored at the mill site to temporarily terminate hauling if 18°C is exceeded; and
- the assumption is correct that temperatures can be accurately predicted up to 48 hours in advance by a qualified weather technician.

Mill Site and Storage Area Strategies

Log yard Pheromone trapping

The use of aggregation pheromones in a mass trapping program in and around the log yard is supported as a method to catch some emerging beetles. Such a mass trapping program should be viewed as a supplemental strategy to catch beetles that may emerge from log decks at the mill site in spite of the other strategies in place.

Trap catch data can also be used to supplement a beetle emergence/peak flight monitoring program, and to assess the effectiveness of other mitigation measures in place.

Pheromone trapping procedures are documented within the Log yard Management Standards for FRIAA.

Delaying beetle emergence from log decks

It is known that lower temperatures can delay beetle emergence. The late emerging beetles will often be out of sync with the majority of the MPB population thereby reducing the chance of successful mass attacks. The temperatures of logs in decks may be reduced by using a number of methods including:

- High piling - It is theorized that the higher logs are piled, the lower the overall temperature of the deck is kept.
- Log orientation - This is accomplished by orienting log decks so the butt ends are facing north. This may shade the ends of the logs that are most likely to contain the largest number of healthy beetles.
- Watering – Log decks may be kept cooler when wet, as heat is released from logs through the process of evaporation.
- Snow caching – Log decks are covered with packed snow and insulated with wood chips, bark or hog fuel. This technique not only delays emergence, but results from a recent trial in Grande Prairie showed 100% mortality of MPB within the deck after 16 months of storage (R. Keygier).

Mill Site Residue disposal

When knowingly hauling infested wood to the mill site (especially near or during the no-haul period), it is imperative that bark or other residue with bark attached (e.g. tops and buts) resulting from the processing be disposed of. Effective disposal methods include burning, processing with a wood waste grinder (hogger), heating to a temperature of 56.1˚C for a minimum of 30 minutes, fumigating with a registered insecticide, or burying to a depth of 1 metre.