

## Douglas-fir Bark Beetle at Otway

### Background

Most of the major coniferous tree species in the central interior of B.C. (spruce, pine, sub-alpine fir, Douglas-fir) can be affected by unique species of bark beetle. Spruce stands in the Bowron Valley were hit by an infestation of spruce bark beetle in the early 1980's. Spruce stands north east of Prince George and in the Mackenzie area are being hit today. The mountain pine beetle devastated lodgepole pine stands throughout B.C. in the late 1990's and early 2000's. Pine trees at Otway were killed by mountain pine beetle and the ski club coordinated a salvage logging operation over 10 years ago. Sub-alpine fir (balsam) can be killed by balsam fir bark beetle.

Douglas-fir bark beetle has been active throughout the central interior for over 10 years, however, the beetle attack usually tends to take out small groups of trees rather than entire stands. Douglas-fir stands at Otway and throughout the Nechako River valley are currently experiencing some attack by bark beetle. If you ski the upper trails at Otway - Hickory Wing, Up the Creek, Sawmill Loop, you may have noticed the Douglas-fir trees with red foliage but they are most visible from some of the mountain bike trails - Java, Freeway, Roller Coaster and Dirt Bag. Many of the attacked trees have been marked with plastic flagging ribbon.

There are a number of contributing factors for the current Douglas-fir bark beetle activity:

- Susceptible host i.e. old growth stands of Douglas-fir. Beetle are attracted to older fir because their thick bark offers insulation during our cold winters. As well, the growth rate in older trees has leveled off and they don't produce as much pitch which would otherwise drown out beetle boring into them.
- A very dry summer in 2014. Drought stressed Douglas-fir produce less pitch and are more susceptible to beetle attack.
- Heavy winds and blowdown in other areas of the Nechako River valley - Douglas fir beetle are attracted to and thrive in fresh blowdown and populations can increase if down trees are not salvaged or disposed of.

Bark beetles are part of these forested ecosystems, they are natural phenomenon, so one might ask "why are we concerned about Douglas-fir bark beetle at Otway?" The answer to that question is that, for many people, old growth stands of fir contribute to their recreational experience. They have aesthetic or scenic value. As well, trees that are killed by the beetle will eventually fall down and create a trail maintenance issue and increase the risk of wildfire.

### Bark Beetle control options - what's in the toolbox?

1. Sanitation logging - harvest infested trees before the beetle emerge the following spring. Beetle in the trees are destroyed when then go through a sawmill

2. Trap trees - usually used in conjunction with sanitation logging. Trap trees are healthy trees that are felled prior to the beetle flight and have the same effect as blowdown. Once infested with beetle they must be removed with logging operations or bucked up and burned.
3. Fall and burn infested trees before the next beetle flight.
4. Anti-aggregate pheromones (bubble caps) - these are installed on healthy "high value" trees and they basically "tell" the beetle that this tree is already occupied. They act as a repellent.
5. Funnel traps with pheromone lures - the beetle are attracted to the trap by the pheromone lure and the silhouette of the funnels. They fall into a cup at the bottom of the funnels which is full of plumbing antifreeze.

After consideration, the ski club decided that sanitation logging was not feasible at this time (difficult steep - gullied terrain, possible damage to ski trails which would have to be used by heavy logging equipment, possible damage to mountain bike trails, and disruption to four season recreation activities. As well, falling and burning large fir trees (60-80 cm in diameter and close to 40 metres in height) is very expensive (\$200 per tree or more).

#### What have we done to date?

- 2017

- 1) Detection - club members, in cooperation with experts from the Ministry of Forests, ground located and flagged infested trees in 2016 and 2017. Aerial detection was carried out in the summer of 2017. Detection maps were produced by the Ministry of Forests. Ground detection indicated that very few healthy fir trees were being attacked. Most of the evidence for current attack (fresh boring dust in the bark) appeared to be on trees that were initially attacked in 2016 so we are hoping that the beetle population is declining.
- 2) Anti-aggregate pheromone bubble caps were installed on 40 high value healthy fir trees located along ski and bike trails
- 3) 5 funnel traps with pheromone lures were installed (1 at the old biathlon cabin, 3 in the race maze just below Northern Lights, 1 on Top Dog).

- 2018

- 1) Detection - a more thorough ground survey was carried out in late March by Spectrum Resource Group - a local forestry consulting company. The Ministry of Forests paid for the survey. The survey located 111 trees attacked by beetle in 2017 and 148 trees attacked in 2016. The ratio of attack (111/148) turns out as 0.75 to 1. That's a good thing and supports our observation from last year that the beetle population might be in decline. Additional ground work by club members in early October located only 5 trees with any evidence of attack in 2018.
- 2) Anti-aggregate pheromone bubble caps were installed on 50 high value healthy fir trees located

along ski and bike trails

3) 6 funnel traps with pheremone lures were installed just below the top section of Northern Lights. These funnel traps were maintained weekly during the beetle flight period . All bubble caps and funnel traps were removed in August.

- 2019

1) Detection - informal walk-thru surveys were carried out on bike trails during the beetle flight period. Very little new beetle attack was observed.

2) Anti-aggregate pheremone bubble caps were installed on 100 trees throughout the mature fir stands.

3) 6 funnel traps with pheremone lures were intalled below the top section of Northern Lights. There were fewer beetles caught in the traps this summer compared to 2017 and 2018. All bubble caps and traps were removed in August.

#### What's planned for 2020?

So for next year we plan on the following activities:

1) Continue informal ground detection and monitoring.

2) Continue with the anti-aggregate pheremones - install 200 bubble caps.

3) Install one funnel trap (for beetle population monitoring)