

**BARK BEETLE
SURVEY REPORT**

UBC OKANAGAN CAMPUS GROUNDS

Eric Haupt
Forestry Consulting

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BARK BEETLE SURVEY REPORT - UBC OKANAGAN

A bark beetle survey was carried out on UBC Okanagan Campus forest areas including the forested eastern portion of Endowment Land during January 19 - 26, 2018. Pine trees including those around buildings were examined for new beetle attacks following the 2017 bark beetle flights. Douglas-fir trees were also examined. This report provides survey methodology, survey results and recommendations for control.

Survey Method

A walk through survey was done looking for any signs of foliage color change and evidence of new attack on pine and fir tree stems. Trees showing foliage color change as well as stems of trees with insect evidence such as pitch tubes, boring frass or woodpecker activity were checked for beetles by removing some bark and looking for insect evidence such as galleries, adult beetles and larvae. Galleries and insects were observed to determine if they were Western pine beetle (WPB) or Mountain pine beetle (MPB) and recorded. Similarly, Douglas-fir trees were checked for Douglas-fir beetle (DFB) attack. All pine and fir trees around infested trees for a minimum distance of 15 meters were closely examined for signs of beetle attack to ensure all infested trees were identified and marked for removal. All pine trees around buildings including trees with verbenone repellent pouches were closely examined as well.

Yellow flagging tape was placed around the boles of currently infested and older attacked trees. The numbers of attacked trees as well as diameter range and average diameters were recorded. Attack sites were plotted on a map. The number of attacked trees were noted on orange flagging tape and placed on a tree along with yellow tape at each currently infested site. In many instances, the sites were flagged with orange tape to a road, trail or forest edge and tie points established with orange and yellow tape.

Bark Beetles Observed

The survey indicated that WPB have attacked a very small number of trees. Five of the trees attacked were stressed trees due to equipment bark damage and rising pond level. The number of pine trees attacked are the lowest since the surveys commenced in 2006. The 2017 Lindgren funnel trapping resulted in the second lowest numbers collected since trapping commenced. Douglas-fir bark beetles have attacked two trees. Mountain pine beetles were not observed on the Campus this year.

Some of the attacked pines had little or no evidence of attack on the stems. The trees had to be examined very closely and in a lot of cases bark had to be removed to confirm that the trees were infested. It is possible that some trees could be infested higher up. Trees with significant browning due to needle disease may have secondary bark beetles such as Ips beetles attacking the weakened branches causing additional branch mortality.

Verbenone Repellent Usage

There were 200 verbenone repellent pouches placed on high value aesthetic trees around campus buildings and other important areas last summer. The trees with pouches and surrounding trees were closely examined during this survey. None of the repellent treated trees were attacked. The repellent use has been effective.

Present Infestations

Eleven pine trees at six sites were marked and recorded as having western pine beetle infestations. Also, one pine tree was identified as a suspect tree. The tree has considerable brown foliage with a good possibility bark beetles have attacked the upper portion of the tree stem. Many of the trees were older attack with brown foliage that likely have current beetle adults and larvae remaining in the trees. Five of the pine trees were attacked as a result of being stressed either by equipment tree damage or rising pond level. Attacked pine trees ranged from 1 to 3 per site with an average of 2 per site. The tree diameters ranged from 14 to 34 cm with the average being 20 cm.

Two Douglas-fir trees were marked and recorded as Douglas-fir beetle infestations. This is the second year that fir beetle attack has been observed on Campus. Douglas-fir beetle populations have been increasing in various parts of the province in recent years. One tree has brown foliage and the top half of the second tree is brown and suspected to have DFB. The two trees are at one site with diameters of 23 and 32 cm.

Refer to the attached data table and map for infestation details and locations.

Summary

The numbers of pine beetle attacked trees have declined to the lowest level since surveys commenced in 2006 with only eleven trees plus one suspect tree being identified and marked as having western pine beetles. Five of trees were attacked as a result of stress due to equipment stem damage or rising pond level. The infestations are from WPB with no evidence of MPB being observed during this survey.

The neighboring properties close to the Campus do not show any obvious evidence of pine beetle infestations. The pine beetle population in the area seems to be very low and near endemic at the present time.

Douglas-fir beetle infestation was found on Campus for the second year with two Douglas-fir trees being identified and marked as being infested. The insect should not be very problematic in future since Douglas-fir trees are a minority species on Campus.

Refer to the attached history of bark beetle survey results on UBCO Campus.

Recommendations

1. Control the spread of the bark beetles from the infested trees before April 15, 2018 by removing the trees from UBCO property and disposing of the infested portions of the trees in a manner that would destroy the insects prior to beetle flight. Remove the entire trees including branches and foliage from the attack sites for fire hazard and aesthetic reasons.
2. Avoid damage to trees that are to be saved in order to prevent tree stress and reduce risk of beetle attacks. Bark beetles are attracted to stressed trees.
3. Continue to monitor Campus trees for evidence of bark beetle infestations and remove infested trees.



Eric Haupt
Forest Health Consultant

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PINE BARK BEETLE SURVEY DATA SUMMARY.
UBC OKANAGAN - JANUARY 2018

GENERAL LOCATION	SITE	ATTACKED TREES		TREE DIAMETERS (CM)		INSECTS		ATTACK LEVEL	COMMENTS
		PINE	FIR	Range	Avg.	WPB	DFB		
North West	A	1			34	X		M	Mostly orange foliage with a tint of green. 23 m from trail.
	B	1			15	X		H	More recent attack. Some green foliage evident. 30 m from trail.
North Central	C	3		14-20	16	X		M	Older attack. Brown foliage. Some foliage has fallen. North of Valhalla residence.
North East	D	1			22	X		M	Brown foliage. Older attack. Located close to road.
	E	2 1 suspect		21-27	24	X		M	Older attack. Brown foliage. Two trees had some bark removed by construction equipment causing tree stress. Suspect tree has considerable dead foliage. With no evidence of beetle attack on lower stem.
South East	F	3		17-21	19	X		M	Mostly brown foliage with some green branches. Trees are on edge and within pond. Trees were stressed by pond water.
	G		2	23-32	27		X	M	One tree all brown foliage. Other tree has brown top half. Suspect upper portion of tree has been attacked by Douglas Fir bark beetles.
TOTALS		11 + 1 suspect	2						

LEGEND

- G - Trees with current beetle populations
- R - Red foliage trees - No current beetles.
- M - Moderate attack level
- H - Heavy attack level

HISTORY OF BARK BEETLE SURVEY RESULTS ON UBCO

<u>YEAR</u>	<u>ATTACKED PINE TREES</u> <u>(WPB AND MPB)</u>	<u>ATTACKED FIR TREES</u> <u>(DFB)</u>
2005	126 (also 139 old attack)	0
2006	168	0
2007	347	0
2008	357	0
2009	349	0
2010	263	0
2011	483	0
2012	156	0
2013	67	0
2014	22	0
2015	34	0
2016	15	3
2017	11	2
<hr/> TOTALS	<hr/> 2,398 (also 139 old attack)	<hr/> 5