

## **2016 Annual Report: Forest Health and Adaptation in Alberta Summary**

The 2016 Forest Health and Adaptation Annual Report summarizes data collected during provincial aerial and ground surveys to assess the extent and severity of biotic and abiotic forest damage agents. This report also includes details regarding the management of insects and diseases that occurred in Alberta's forests. Summaries of forest genetics research; seed science, collection and storage; as well as policy development are included in this report. The report also outlines the Ministry of Agriculture and Forestry (AAF) Forestry Division's involvement with collaborative projects and include those led by the Canadian Forest Service, Canadian Food Inspection Agency and projects focused on gene conservation.

Mountain pine beetle continues to be the primary bark beetle causing tree mortality in Alberta. Single tree cut-and-burn control operations removed 91,997 MPB-infested trees, a slight increase from 2015. Aspen defoliators were responsible for 83 per cent of the disturbance observed during aerial overview surveys and forest tent caterpillar was the primary defoliator. Large aspen tortrix and aspen twoleaf tier defoliation increased compared to 2015, while spruce budworm populations continue to decline. AAF mapped eastern larch beetle and spruce beetle infestations to a limited extent in 2016.

In 2016, AAF-owned and cooperative seed orchards produced low to moderate cone crops. The Alberta Tree Improvement and Seed Centre continued to receive new seedlots for registration and storage while tree, shrub, grass, and forb seed were withdrawn from the seed bank for reclamation and reforestation projects. Seedlings and grafted materials were propagated for various internal and external projects. Whitebark and limber pine seed longevity research continued in 2016, as did trials to investigate better propagation methods for beaked hazelnut.

AAF continued to conduct applied forest genetics research in 2016. Projects included collaborations with Tree Improvement Alberta, the Universities of Alberta and British Columbia, and the Canadian Forest Service. In 2016, AAF released the amendments to Forest Genetic Resource Management and Conservation Standards and drafted a new directive "Mandatory use of improved seed for reforestation". The purpose of the directive is to increase the deployment of improved seed from controlled parentage programs in Alberta.

Invasive plant surveys were conducted on Forestry Division dispositions and Canada thistle, common tansy, scentless chamomile, ox-eye daisy, perennial sow thistle and tall buttercup were the most commonly observed plants. In 2016, almost all prohibited noxious infestations were controlled and overall, greater than half of the infested survey area was managed. Biological control was successfully employed to manage infestations of hound's tongue, scentless chamomile, and yellow toadflax.

Please see the 2016 Annual Report: Forest Health and Adaptation in Alberta for further detail.

Table 1. Summary (in hectares) of Alberta forest disturbance agents mapped during aerial overview surveys.

	2015	2016
<b>Bark beetles</b>		
Eastern Larch Beetle	918	6,583
Spruce beetle	1,405	10,465
<b>Total bark beetles</b>	<b>2,323</b>	<b>17,048</b>
<b>Defoliators</b>		
Aspen serpentine leafminer	--*	--*
Aspen two-leaf tier	536	18,786
Bruce spanworm	3,564	--
Forest tent caterpillar	1,586,486	525,135
Large aspen tortrix	54,444	213,316
Linden looper	--	--
Spearmarked black moth	--	--
Spruce budworm	51,750	19,265
Unknown	--	859
Willow leafblotch miner	--*	--*
<b>Total Defoliators</b>	<b>1,696,780</b>	<b>777,361</b>
<b>Diseases</b>		
Armillaria root disease	--*	--*
Lodgepole pine dwarf mistletoe	--*	--*
Pine needle cast	20	36,097
Other	--	--
<b>Total diseases</b>	<b>20</b>	<b>36,097</b>
<b>Other</b>		
Dieback	23,657	115,728
Flooding	5,457	2,415
Foliar damage	--*	34,000
Hail	1,419	1,050
Mechanical - unknown	--	--
Mortality	--*	144,693
Windthrow/blowdown	1,204	1,338
Winter desiccation	15,341	7,766
<b>Total Other</b>	<b>47,078</b>	<b>306,990</b>
<b>Total Disturbance</b>	<b>1,746,201</b>	<b>1,137,496</b>

\*Observed on the ground but not formally assessed from the air.