

# Northwest Territories Forest Health Report

## – 2014 –

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### Summary

The Government of the Northwest Territories' department of Environment and Natural Resources (ENR) delivers forest health monitoring across the NWT. The 2014 surveys were conducted on July 8-9 and July 22-26 with assistance from the Canadian Forest Service. The aerial survey flight routes encompassed over **6000** km (Fig. 1) focusing on areas identified as high risk, i.e. along major rivers and waterways or uplands and hill slopes. Some areas between the Great Bear and Great Slave Lake, and along the Mackenzie River valley between Hay River and Fort Providence could not be surveyed because of limited visibility due to smoke. Overall, **405,206** hectares were mapped as affected by four major insect pests (Fig 2): Aspen Serpentine Leafminer (*Phyllocnistis populiella*) – 320,193 ha, Eastern Spruce Budworm (*Choristoneura freemani*) – 79,152 ha, Willow Blotch Leafminer (*Micrurapteryx salicifoliella*) – 4636 ha, and Forest Tent Caterpillar (*Malacosoma disstria*) – 1224 ha, while 1600 ha were affected by abiotic factors. Overall, there was over a threefold increase in total area affected by various forest health agents compared to the previous year.

### Tree mortality

1. Mortality caused by abiotic factors

June and July saw the extremely dry conditions across the whole Territories. These two months combined received only 30% of typical precipitation as per Canadian Climate Normals 1981-2010 which may have contributed to higher susceptibility of trees for pest attacks, and consequently to an overall increase in total area affected by insect pests compared to the previous year (141,268 ha in 2013). However, only 433 ha of Aspen Dieback along the Mackenzie River Valley near Fort Simpson and Tulita were identified as caused directly by climate related factors, i.e. drought or unstable water table (Fig. 2). It should be noted that these changes did not occur as

a result of the current year weather conditions but rather as a consequence of long term climate shifts in certain areas.

Red belt (or winter desiccation) was mapped in the mountainous regions of the Nahanni National Park totaling 1200 ha.

## 2. Mortality caused by insect agents

Approximately 1500 ha of spruce mortality caused by repeated severe defoliation by Spruce Budworm over the last 4-5 years were mapped along Mackenzie River near Tulita in Sahtu region (Fig. 2). These areas contain >30% of the stand mortality and are observed in mature timber along major rivers and waterways.

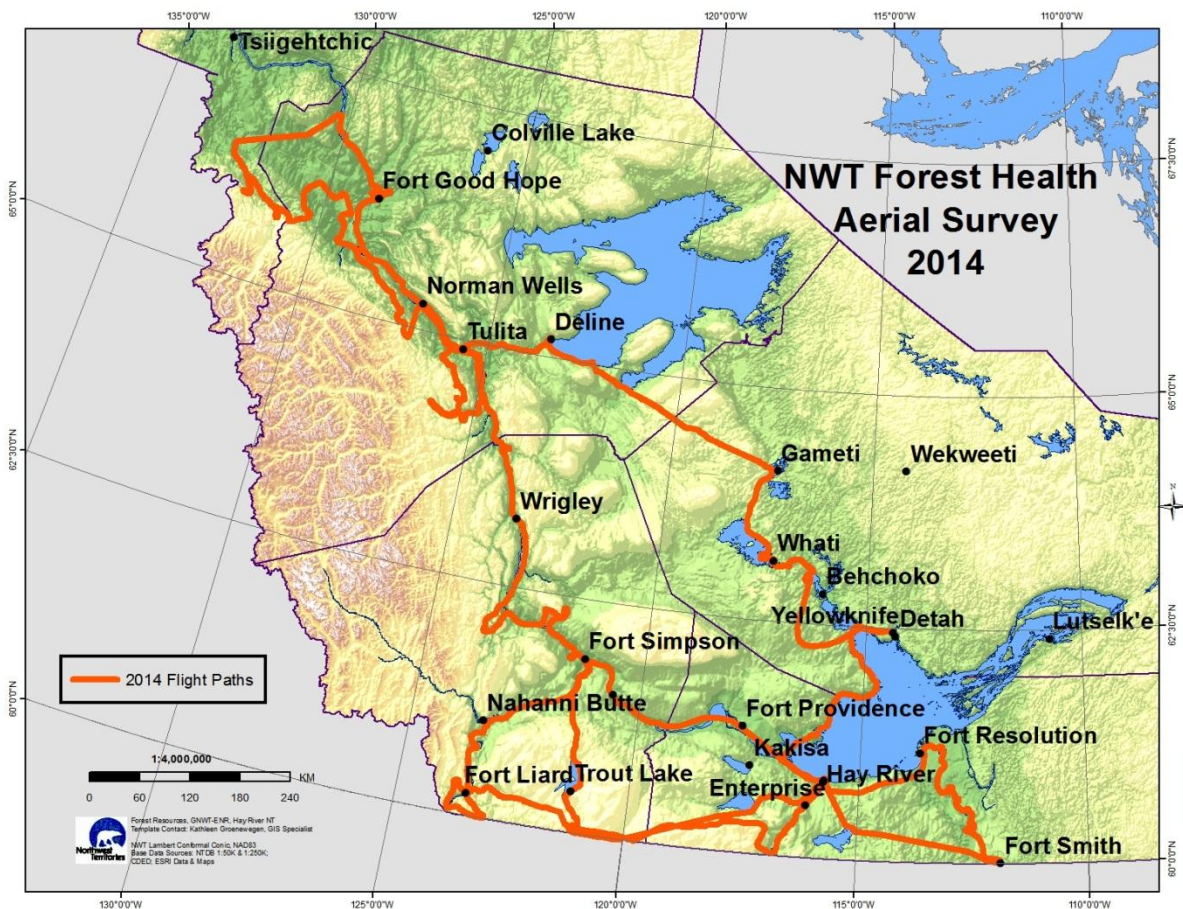


Figure 1. NWT aerial survey flight routes flown in 2014 covered over 6000 km.

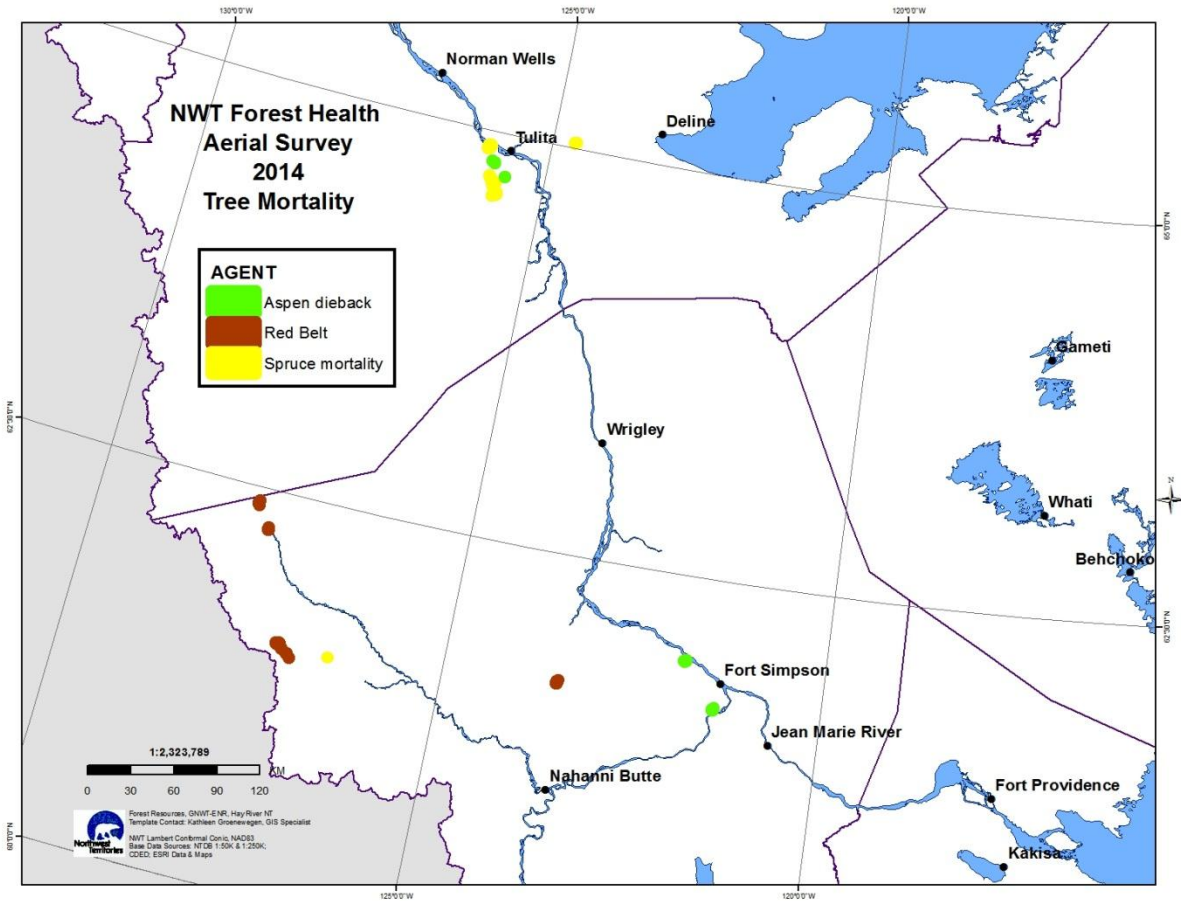


Figure 2. Hot spots of increased tree mortality resulting from abiotic factors (Red belt, Aspen dieback) and repeated long-term defoliation by Spruce Budworm (spruce mortality). Shown in the figure are locations of stands where mortality was >30% of the stand area.

## Insect Pest Activity

### 1. Spruce Budworm

Spruce budworm remains the most serious forest pest in the NWT, however, since 2005 its population stays at fairly low and stable levels. The total area affected by this pest in 2014 was 76 400 ha with majority of infestations occurring in the Sahtu region (over 37 000 ha) and smaller populations persisting along the Slave River area (approx. 14 000 ha), in the DehCho Region along Mackenzie River and on southern slopes of Ebbutt Hills (11 400 ha), and in the North Slave Region on islands of Lac La Martre near Whati and near Benchoko (3350 ha). Approximately 82% of all Spruce Budworm infestations in the NWT were mapped as severe, 17% as moderate, and only 1% as light.

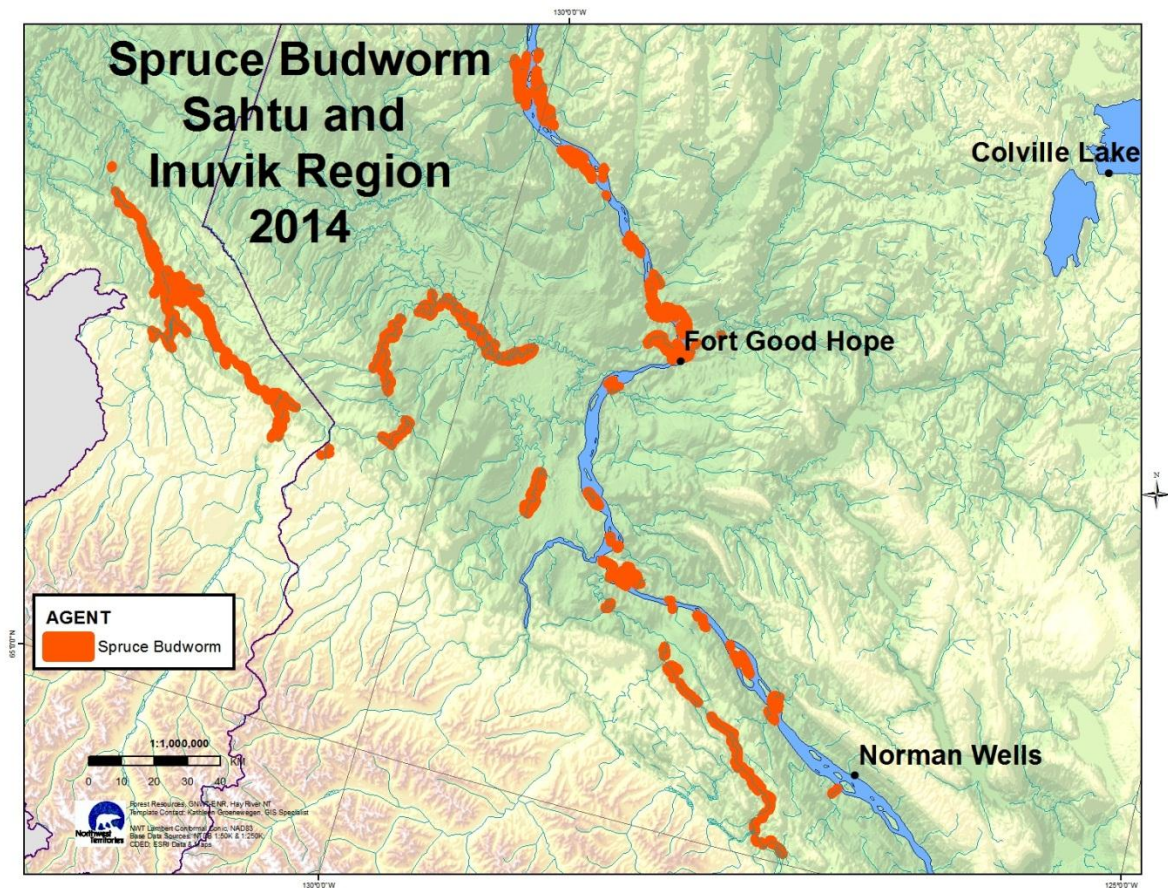


Figure 3. The most northern populations of Spruce Budworm along Arctic Red River in the Inuvik Region and along the Mackenzie River in Sahtu continued to persist with severe defoliation observed in 2014.

## 2. Aspen Serpentine Leafminer

The larva of this moth is a common pest in the northern North America and its population levels fluctuate significantly from year to year in the NWT. Over 266 000 ha were affected by Aspen Serpentine Leafminer in 2014 which is three times greater than the previous year. Majority of infestations occurred in the DehCho Region (195 000 ha) along the Mackenzie and Liard Rivers (Fig. 4). Other affected areas were mapped in the South Slave Region (6700 ha), Sahtu Region (2940 ha), and North Slave Region (1400 ha). Over 70% of infestations were considered severe and 30% moderate.

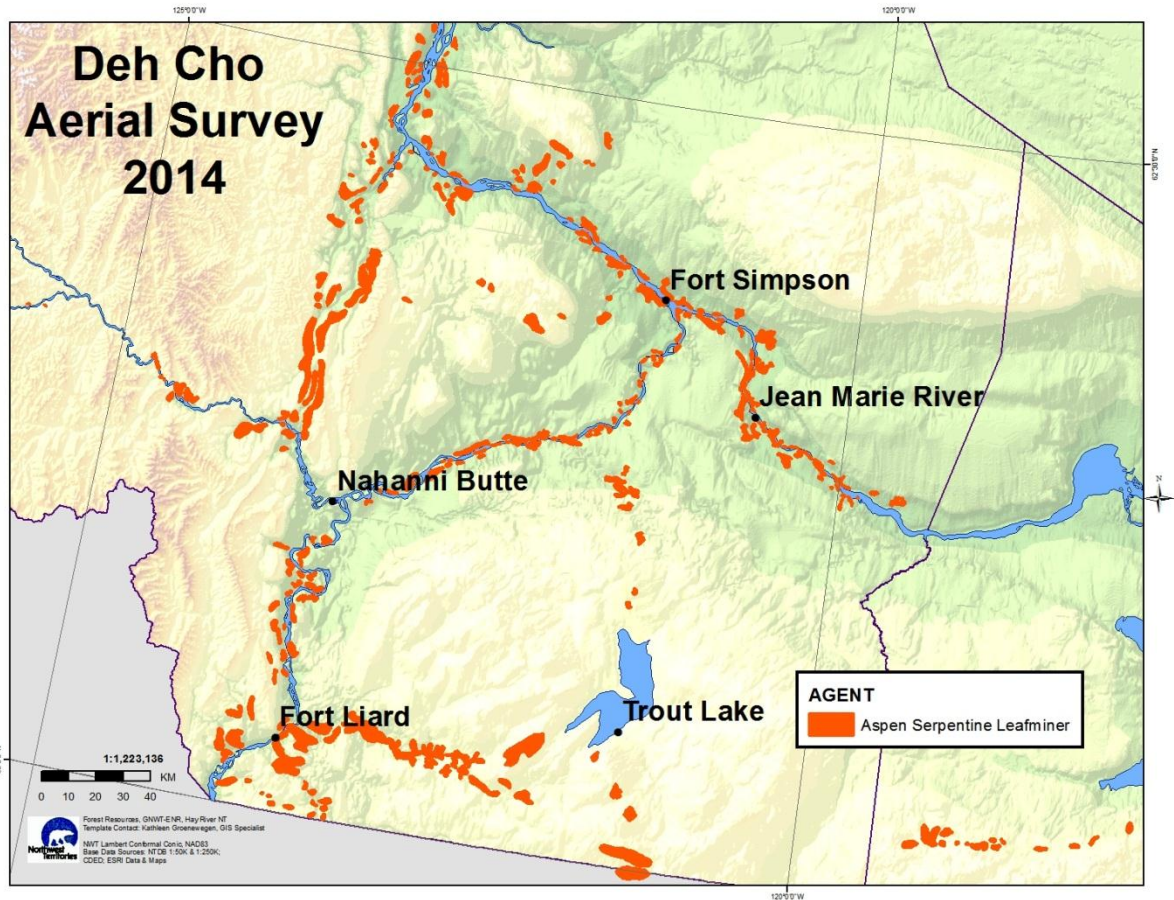


Figure 4. Aspen Serpentine Leafminer is the dominant insect pest in the DehCho Region.

### 3. Willow Leaf Blotch Miner

Willow Leaf Blotch Miner is a moth known to affect several species of willows found in the NWT. The leaf miner larvae create areas of necrotic blotches on the upper surfaces of the willow leaves which can result in complete defoliation of the tree. Willows are well adapted to disturbances and can usually recover well unless defoliated for several consecutive years. Over 4600 ha in total were mapped as affected by Willow Leaf Blotch Miner which is approx. a 1000 ha decrease compared to the previous year. Majority of infestations occurred in the South Slave Region along the Slave River (2700 ha). A few isolated patches were observed in the DehCho Region (870 ha), Sahtu (870 ha) and in the North Slave Region (200 ha).

#### 4. Forest Tent Caterpillar

The Forest Tent Caterpillar is native to North America affecting mainly trembling aspen. Defoliation results from larval feeding that begins about the time aspen buds begin to break in early spring. The risk of aspen mortality is minimized because these trees refoliate 3 to 6 weeks after defoliation, however, stressed trees tend to be more susceptible to decay, boring insects, and their stem growth can be reduced as much as 90% of annual normal growth. Forest Tent Caterpillar has not been observed in the NWT for the previous 5 years with some extensive infestations in the Liard River area in late 90's. In 2014, 1225 ha were mapped as a moderate to severe defoliation by the FTC along the Slave River (Fig. 5).

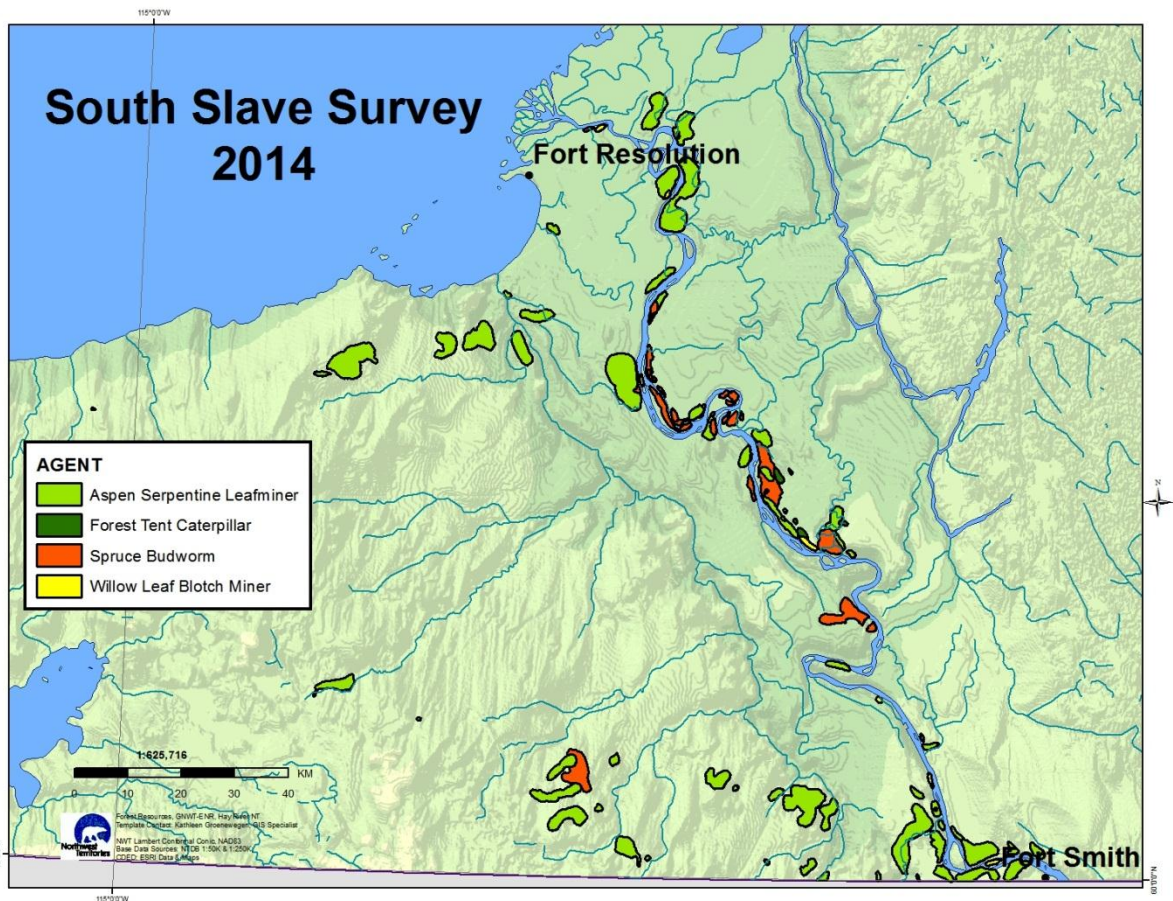


Figure 5. Areas along Slave River have been affected by several insect agents. The 2014 survey found isolated infestations of Forest Tent Caterpillar totaling 1225 ha.

## Update on the Mountain Pine Beetle Situation in the NWT

Mountain Pine Beetle (MPB) was confirmed in the southern NWT in 2012 for the first time. Modest winter survival was confirmed in March 2013 when the attacked trees were cut and burned. No baiting occurred in this and following years.

Mountain Pine Beetle Pest Risk Analysis for the NWT pine forests was completed in 2013 as one of the proactive measures undertaken by the ENR to better understand the risks associated with this pest. The analysis assessed the overall risk of establishment and spread of the MPB into NWT pine forests as low in the short term and medium in the long term. Climate warming is considered a key factor that will contribute to potential expansion of MPB in the NWT.

In 2014, the ENR continued to monitor for the MPB activity in the southern NWT by dedicating a special aerial survey along the NWT – AB border focusing on locating potential infestations. No signs of Mountain Pine Beetle activity were noted in areas previously infested as well as other pine dominated stands along survey routes. In addition, the stand where the MPB was first discovered in 2012 was found to be completely burned in the 2013 fire season. No other locations affected by the MPB were found across the NWT in 2014.

The ENR participates actively in the National Forest Pest Strategy (NFPS) which is a national level program aimed to create the platform for the most efficient use of knowledge and technology to manage forest pests in a proactive integrated way. Currently, the ENR is actively involved in the Action to Slow the Spread of Mountain Pine Beetle across Canada, one of the flagship programs under the NFPS.