



## **Drone detects insect damage from spruce bark beetle**

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A drone and a multispectral camera were used to detect insect damage in Finnish forests. The image interpretation application was able to identify trees where spruce bark beetles nestled. Source: Timberbiz

The new forest health data can be used to plan forest management and timely silvicultural work and harvesting.

The spruce bark beetle is estimated to become more common in the northern forests as the climate warms. Stora Enso Forest division's drone was able to detect spruce bark beetle exposure much faster and more efficiently than the human eye.

Research flights were conducted in in South Karelia, Finland in the vicinity of Lappeenranta in 2019, and the research results were recently finalised.

The spruce bark beetle prevents the normal flow of water from tree's root system to the top of the spruce, which causes the tree to die upright before long.

A multispectral camera connected to the drone identified the trees whose fluid circulation was disturbed. In the image, the exposed trees appeared in different colours than the healthy trees.

This enables the observation of spruce bark beetle damage even in a large forest area, says forest specialist Saana Pulkkinen, from Stora Enso Forest division, who did her thesis as part of the research.

The study showed that the observation of spruce bark beetle exposure made by drones and the image interpretation application was reliable. It also turned out that the larger the tree in question, the easier it was to detect the exposure.

In addition, the image interpretation application was programed to identify spruces from the other tree species: identification was 97% correct.

The findings of the application were confirmed by a field trip.

“This was still research work and testing, but we can already now rely on our image interpretation application when it identifies an unhealthy or damaged tree. At some points, the application was still cautious in its interpretations, but the situation will improve as we get more data on the forests that have been photographed. Based on the research results, the health classification of trees was 86% correct,” Ms Pulkkinen said.

“Drone research is part of a bigger development stream that we call precision forestry. Precision forestry will offer new opportunities to monitoring forest, management decisions optimization and increasing the value for forest owners and the industry,” said Mikko Juhola SVP, Innovation & Development, Stora Enso Forest division.

In addition to Finland, forest research flights and image interpretation have been performed in Sweden and the Czech Republic. Health information on thousands of conifers has been accumulated on flights.

Cooperation between various forest units will ultimately benefit forest owners not only in Finland, but also in other countries. As a first step, Stora Enso intends to utilize image interpretation data to locate spruce bark beetle damage.

Going forward, data accumulated from the forest can also be used in forest plans and inventories.

“We will continue development work so that in the future we can provide drone scanning as a service to forest owners. Already now, some of our forest experts use the drone in their own work, for example in seedling monitoring,” Mikko Juhola said.

Source: <https://www.timberbiz.com.au/drone-detects-insect-damage-from-spruce-bark-beetle/>