



## Ash tree disease in southern Sweden

### Introduction

Tailored inventories of known forest pests and diseases have been carried out in Sweden since 2007. These inventories have been used as a complement to the National Forest Inventory (NFI) where only the most common damage agents are monitored. The aims of the tailored inventory are to meet the information requirements from practical forestry and the community by providing data for operational decision making, linked to specific disease or pest events.

Since there have been several reports of severe fungal attack in stands of Ash, *Fraxinus excelsior*, the tailored disease inventory 2009 was focused on monitoring of Ash tree disease.

Ash is not a common tree species in Sweden, and is rarely used in commercial forestry. The area of Ash stands in Götaland is 10 000 ha of 4.9 milj ha forest area (2 ‰). The volume of Ash trees is 3.7 milj m<sup>3</sup>sk which is 0.4 % of the total timber volume (Skogsdata 2008).

### Material and Methods

The inventory was carried out in southern part of Sweden (Götaland), where the main populations of Ash tree in Sweden occur. The inventory was stratified by using data from NFI to locate stands with Ash trees. The NFI is designed as a stratified systematic cluster sampling with a combination of permanent and temporary plots, which are performed on a 5 year cycle (Ranneby et al 1987). Circular sample plots are clustered into survey tracts. The radii of the sample plots used in this study were 20 m. All Ash trees on the sample plot belonging to dominant or co-dominant social class were selected for assessment. Assessments of defoliation, amount of adventitious branching, dieback/shoot death and known damage symptoms were carried out (Wulff et al 2009). We have used defoliation to assess the symptoms and to estimate the extent of the Ash tree disease. Defoliation were assessed continuously from 0-100 % and based on the scoring the trees were assigned into three damage classes: class 0 insignificant damage ( $\leq 25$  % defoliation); class 1 slightly damage (26 – 60 % defoliation); class 2 severely damaged (61 – 100 % defoliation including dead trees).

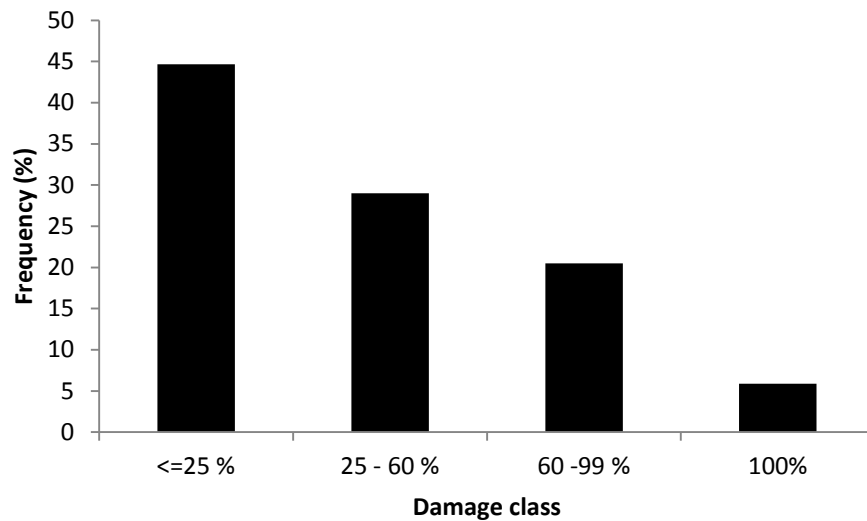
In total 74 plots on 64 survey tracts were surveyed. The numbers of Ash trees on sample plots varied between 1 and 31 and were add up to 539 trees. The fieldwork was carried out by one team during late June to the end of July.



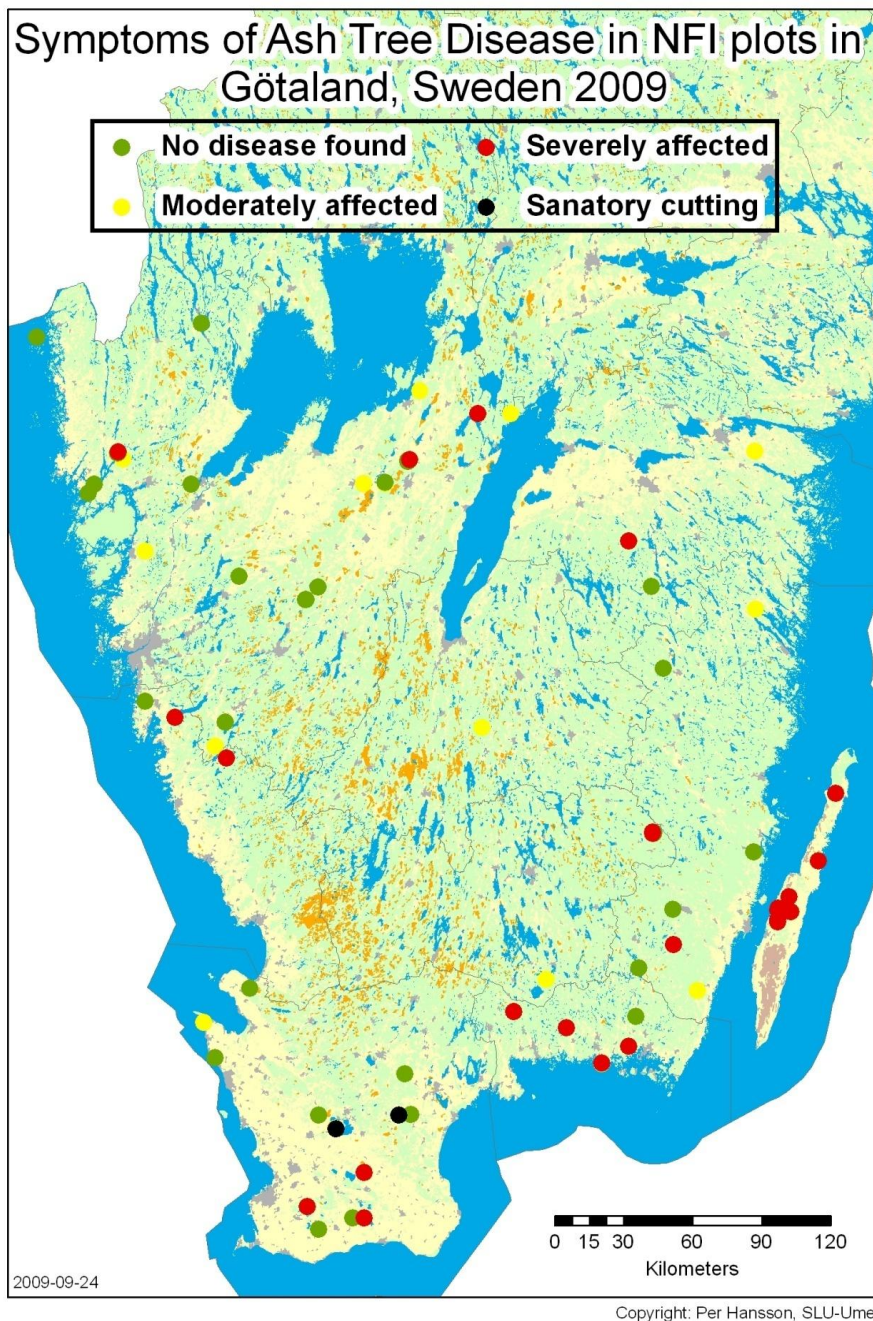
## Results

More than 50 % of bigger ( $\geq 10$  cm dbh) Ash trees showed significant crown defoliation (Figure 1). About 25 % of the trees were severely damaged or dead. Furthermore, a significant part of smaller trees was recently killed.

The symptoms of Ash tree disease occurred in the entire investigated area, but showed a tendency to be more severe in the SE part of Sweden (Figure 2). Gotland was not included in this study. However, there have been several reports of severe disease from this island.



*Figure 1. Frequency of Ash trees bigger than 10 cm dbh in different defoliation classes.*



*Figure 2. Occurrence of Ash trees on NFI plots in Götaland with different share of severely damaged trees 2009. Severely affected plots means >25% severely damaged trees (class 2) on the plots. Moderately means that severely damaged trees (class 2) were found on the plot.*

