

National Forest Inventory Interim Statistics on the Health of Ash Trees in Great Britain

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In response to current concerns about the incidence and possible spread of Chalara dieback of Ash in Great Britain, caused by the fungus *Chalara fraxinea*, the Forestry Commission is releasing information relevant to this question that has been obtained to date from the field survey programme of the National Forest Inventory (NFI).

The information contained in this release covers three aspects of tree health of Ash observed and assessed by NFI surveyors as part of the assessments made on NFI survey sites:

- Observations on standing tree mortality;
- Assessments of the incidence of symptoms of crown dieback in standing live trees; and
- Regenerative activity in the form of the presence of seedlings and saplings on woodland sites.

This information is summarised from the results from a total of 6,896 one hectare squares surveyed between November 2009 and October 2012 in the NFI field survey programme. The results presented therefore relate to observations made on tree health over the last three years and will not fully reflect any changes to tree health that may have resulted from relatively recent incursions into the growing stock of a disease such as *Chalara fraxinea*. The survey sites cover the whole of Great Britain but, since the sites with currently completed surveys represent only a partial sample of the planned 15,000 sites to be surveyed in the first cycle of the NFI field survey programme, this partial sample is not fully balanced with respect to geographical and other factors. In particular, it is known that the sample sites that have been surveyed to date are over-representative of coniferous woodland areas under private sector management and ownership (i.e. non-Forestry Commission owned and managed). No attempt has been made to adjust the results reported here for such imbalances in the currently surveyed NFI field sample, so the quoted statistics should be interpreted as provisional and indicative only. It is planned to publish full results from the NFI field survey programme in 2015, after completion of the first cycle of the survey.

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The results reported for Ash are quoted together with those for the other four most prevalent broadleaf (non-coniferous) species in woodland areas in Great Britain, as determined by areas of individual species reported in the results of the National Inventory of Woodland and Trees (2003)¹, as well as for other broadleaves and for broadleaves as a whole.

Key Findings

The information reported here is intended to provide contextual information which may be used in conjunction with other more specific disease impact studies. The results show that:

- Among standing trees in woodland, Ash has a lower proportion of dead trees (3.5%) compared to that for broadleaves as a whole (7.2%).
- There is a lower incidence of crown dieback observed in components of Ash in woodland stands (1.2%) compared to broadleaves as a whole (2.0%).
- Ash is the largest contributor to regeneration of young trees in British broadleaved forest areas, accounting for more than 40% of all observed broadleaved seedlings and saplings.

Tree mortality

NFI surveyors section an NFI sample square into individual areas of woodland contained within the square, and assess the attributes of individual trees found within sample plots representing the stands of trees present in these sections. All standing trees of at least 4 centimetres diameter at breast height (1.3 metres from the ground) are assessed for attributes that include species and status (alive or dead).

Standing dead trees can occur as a result of several causes that will include physical damage, disease, or natural causes, including suppression by surrounding trees. A certain level of mortality is expected, and the existence of some dead material within woodland is considered to be a positive feature of woodland biodiversity. However, a higher than normal incidence of standing dead trees may indicate a problem with a particular species, such as a recent history of spread of disease causing increased mortality in the population of that species.

Table 1 summarises the results to date of these assessments in terms of the total number of trees assessed, the number of these that were recorded as dead, and the percentage of the total number of assessed trees that this represents. The results show that Ash has the second lowest proportion of standing dead trees of the five principal broadleaved species in Great Britain.

¹ National Inventory of Woodland and Trees: Great Britain, Forestry Commission Inventory Report, 2003

Table 1 - Tree mortality of individually assessed standing trees of broadleaved species

Species	Number of trees assessed	Number of dead trees	Percentage of dead trees
Ash	14,583	506	3.5%
Beech	8,828	249	2.8%
Birch	26,704	1,783	6.7%
Oak	9,332	595	6.4%
Sycamore	11,614	515	4.4%
Other broadleaves	89,812	7,912	8.8%
All broadleaves	160,873	11,560	7.2%

Source: National Forest Inventory

Incidence of crown dieback

Within woodland sections of surveyed squares, NFI surveyors analyse the stand to identify its storey structure. Storeys are sub-populations of trees in the stand that are differentiated by vertical separation. Within these storeys, individual “components” of the stand are distinguished as trees of a single species and similar age. A number of assessments are made by the surveyor of the attributes of these identified components, including the presence of crown dieback among the trees forming the component. Crown dieback is a symptom of necrosis within the crown of the tree. This may have several causes, including *Chalara fraxinea* infection of Ash.

Table 2 summarises the results to date of the incidence of crown dieback noted by surveyors in components of broadleaved species. These show Ash to have the lowest observed rate of crown dieback among the five principal broadleaved species in Great Britain.

Table 2 – Incidence of crown dieback in standing components of broadleaved species

Species	Number of assessed components	Number of components with crown dieback	Percentage of components with crown dieback
Ash	8,310	103	1.2%
Beech	5,120	86	1.7%
Birch	8,683	210	2.4%
Oak	5,234	199	3.8%
Sycamore	5,662	123	2.2%
Other broadleaves	38,061	702	1.8%
All broadleaves	71,070	1,423	2.0%

Source: National Forest Inventory

Regenerative activity

Regenerative activity is an indicator of the current health of the population of a tree species, since it is unlikely that diseased adult trees will successfully flower and produce seed from which young trees will grow. The presence of good numbers of live young trees also indicates that this section of the population was likely to be in good health at the time of observation.

In each woodland section, the incidence of planted and regenerated saplings and seedlings is recorded in the NFI field survey along a straight line of up to ten metres in length, fully contained within the section. Seedlings are defined as young trees of up to 0.5 metres in height, and saplings as young trees greater than 0.5 metres in height and less than 4 centimetres diameter at breast height. Numbers of seedlings that were within 0.5 metres of the line and numbers of saplings within one metre of the line were recorded along the line, up to a maximum of 5 per metre, or as “more than 5” when the number exceeded this limit.

Table 3 summarises the results to date for broadleaved species in terms of the combined total of saplings and seedlings. This is expressed as total numbers of saplings and seedlings per hectare, calculated using weights corresponding to the areas of the sections from which the samples were drawn. Where the number of saplings or seedlings exceeded 5 in a one metre length of a line, a count of 6 was assigned. This will cause some under-estimation of the total number of young trees present, but is counter-balanced by the likelihood that only a portion of such localised dense populations of young trees will be viable in the long term.

Two statistics are shown for each species. The first column shows the average number per hectare of seedlings and saplings of the species or tree type across all sections that the surveyor has classified as broadleaved woodland. It is therefore an estimate of the average density of seedlings and saplings of the species across all broadleaved woodland. The second column shows this average for the subset of sections in which seedlings or saplings of the given species were found. It thus indicates the intensity of regeneration in areas where regeneration of the relevant species is seen to be occurring.

These statistics show that Ash is the most prevalent species in the population of seedlings and saplings in broadleaved woodland, contributing over 40% of all broadleaved saplings and seedlings found in this type of woodland. They also show that, on sites where regenerative activity of the relevant species is occurring, Ash displays the highest intensity of regeneration of the five principal broadleaved species.

Table 3 – Average number of broadleaved saplings and seedlings per hectare

Species	Average in sections of broadleaved woodland	Average in sections where seedlings and saplings of species is present
Ash	988	10,421
Beech	62	2,345
Birch	182	5,301
Oak	67	3,246
Sycamore	266	6,447
Other broadleaves	767	Not applicable
All broadleaves	2,333	Not applicable

Source: National Forest Inventory

Note: Due to reductions in the base area on which the averages are calculated, these averages are substantially higher when the calculation is restricted to only those sites where regeneration activity is occurring.

Further information

For more information about the latest situation on Chalara dieback of ash, including a map of confirmed sites, please visit:

www.forestry.gov.uk/chalara.

For further information on the NFI, including contact details, please visit:

www.forestry.gov.uk/inventory.

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