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SPICe Briefing
Ash Dieback: Questions and Answers

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This briefing provides background information on the tree disease ash dieback, which is caused by a fungus *Chalara fraxinea.* It considers how the disease is caused and spread; what is being done to tackle it; and what the environmental and economic implications might be.

The Scottish Parliament
Pàrlamaid na h-Alba

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EXECUTIVE SUMMARY

Ash trees were first recorded dying in large numbers from what has now been described as “ash dieback” in Poland in 1992, and the disease spread rapidly to other European countries. However it was not until 2006 that the fungus that causes the disease, *Chalara fraxinea* was described as a species by scientists.

The disease causes leaf loss and crown dieback in affected trees, and kills trees under 40 years within 2-5 years. Experience from Denmark shows that older trees can survive for a considerable time, some might not die, and some trees may be capable of developing resistance.

The first case of the disease in the United Kingdom was identified in England in February 2012 in a consignment of infected trees sent from a nursery in the Netherlands to a nursery in Buckinghamshire. The first signs of the disease in Scotland were picked up on 9 July 2012. A map on p.6 shows the distribution of infected sites as at 5 December 2012, including 28 sites in Scotland.

The disease is spread by fungal spores on leaves from June to October, peaking in July and August.

Ash make up around 1% of Scotland’s tree population, and ash is one of the main species in 11,700ha of woodland. This equates to 5% of broadleaved woodland in Scotland and 1% of all forests and woodland.

The UK Government introduced legislation on Monday 29 October 2012 which prohibits all imports and all movements of ash plants, trees and seeds. The UK Department for Environment Food and Rural Affairs (Defra), working with the Forestry Commission and the Scottish Government, has produced an interim control plan which sets out an approach to tackling the disease over the coming months. The ban on import and movement of ash will remain in place. Options for managing infected trees are being explored. Work by industry to develop a charter mark for plants of UK origin will be supported. Maps will be published showing important ash woods. Guidance on managing and adapting to the disease will be published, and further research, including into resilience is being carried out.

Plant health is a devolved matter. The Scottish Government’s Plant Health Service is responsible for policy issues; considering what controls should be in place; liaising and negotiating with other UK administrations and international organisations about changes to legislation and agreements. Forestry Commission Scotland is responsible for policy on and control of pests and diseases of forest trees and wood.

Ash trees have a high conservation value. Upland mixed ash woods are protected under the European Habitats Directive, and ash woods support a rich understory which can contain rare woodland flowers, and rare mosses and lichens grow on ash bark.

The timber of ash is very strong and has a wide range of uses. It also makes very good firewood. As well as the impact on nurseries who are unable to sell their stock of ash trees for

this winter’s planting season, the movement bans are also affecting forest and woodland owners who were planning to plant ash. The Scottish Government has commissioned an independent consultant, Dr Rick Worrell, to produce an initial assessment of the potential ecological and economic impacts of ash dieback in Scotland, which is expected to be published in early December.

In addition to ash dieback tree pests and diseases which have recently spread to the UK include two moths whose caterpillars defoliate oak and pine trees, and several strains of *Phytophthora* fungus which affect a number of tree species and other plants. Increased global trade in plants and plant products is the main reason for increased risk of new tree diseases spreading, together with the changing climate - warmer winters and changes in rainfall and storm patterns increase the risk of pest establishment and spread.

A Tree Health and Plant Biosecurity Taskforce has been established to review the UK's strategic approach to tree health and biosecurity. Its final report is due to be published early in 2013. The task force includes members from Stirling, Aberdeen and St. Andrews Universities.

WHAT IS ASH DIEBACK AND WHAT ARE ITS EFFECTS?

Ash trees were first recorded dying in large numbers from what has now been described as ash dieback in Poland in 1992, and it spread rapidly to other European countries. It was not until 2006 before the fungus' asexual stage, *Chalara fraxinea*, was first "described" as a species by scientists.

The disease causes leaf loss and crown dieback in affected trees, and it may lead to tree death. The fungus has infected many species of ash, but with differing intensities. Common ash (*Fraxinus excelsior*), which is the species native to the UK, is the most severely affected species. Young trees are particularly vulnerable to *C. fraxinea* and succumb to disease rapidly.

Ash dieback has affected a high percentage of ash trees in continental Europe, most notably in Scandinavia (including Denmark, which has an estimated 90 per cent of ash trees infected) and the Baltic States.

Trees cannot recover from infection, but larger trees can survive infection for a considerable time and some might not die (current experience from Denmark). It is thought that some trees have or are capable of developing genetic resistance to the disease. The Forestry Commission states that:

- Trees under 10 years of age are likely to die from C. fraxinea in 2-10 years
- Trees under 40 years old will die in 3-5 years if also infected with honey fungus[1], and likely more rapidly if the tree is already debilitated
- For mature trees more than 40 years old, there is no direct evidence of tree deaths just from C. fraxinea to date, but there is little comprehensive survey data from Europe on which to base firm conclusions

There is no evidence that *C. fraxinea* can spread to tree species other than ash or that it is harmful to the health of people or animals.

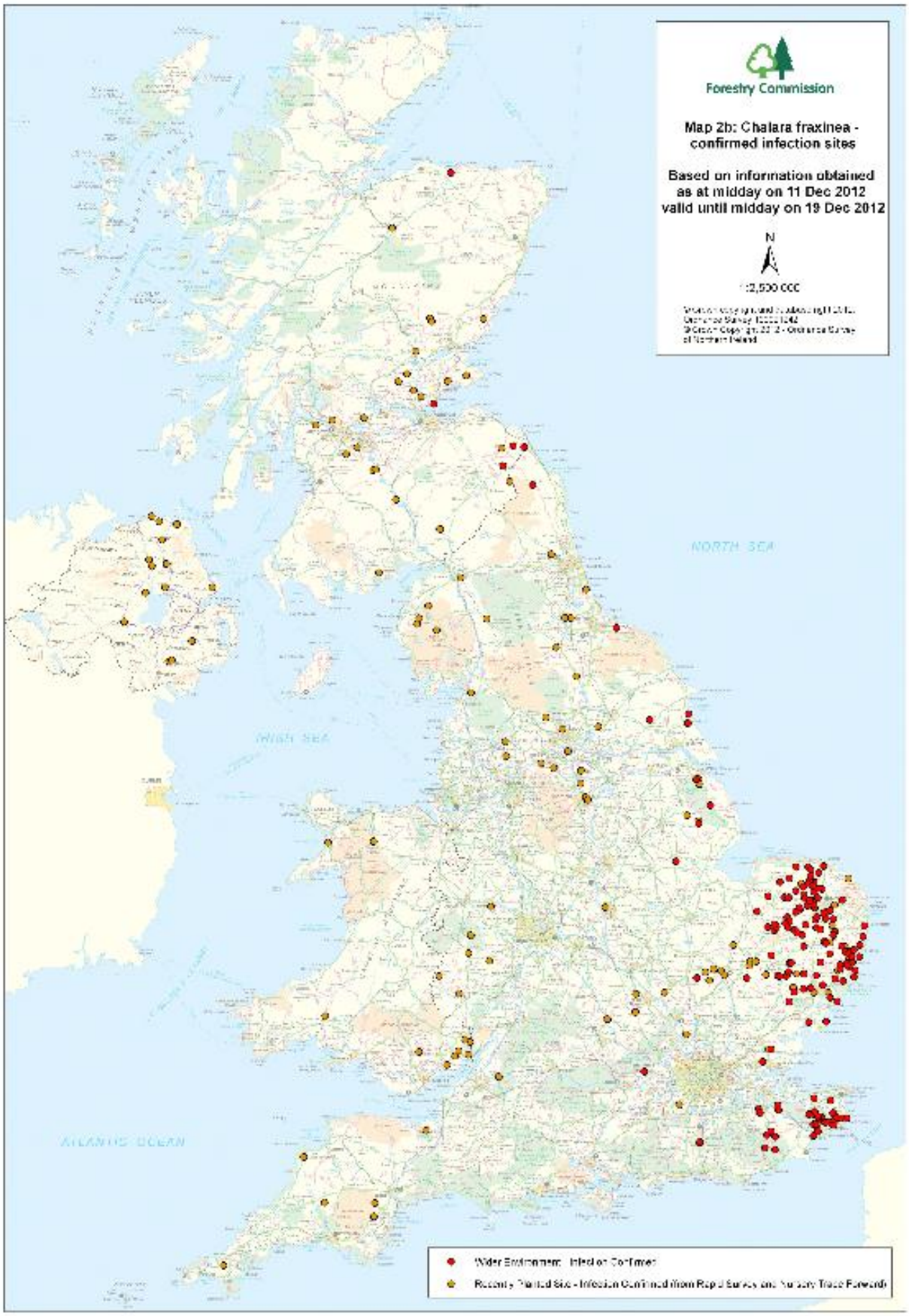
As leaf loss is the main symptom it will be difficult to identify affected trees during the autumn and winter months. The Forestry Commission (2012a) has produced a pictorial guide which shows the effects of the disease on different ages of tree.

WHEN WAS ASH DIEBACK FIRST FOUND IN SCOTLAND AND WHERE?

Chalara fraxinea fungus was first identified in England in February 2012 in a consignment of infected trees sent from a nursery in the Netherlands to a nursery in Buckinghamshire, and confirmed in March 2012. The first signs of the disease were picked up in Scotland on 9 July 2012.

The map overleaf shows locations where the disease has been detected as at 11 December 2012. The orange dots show sites where infection has been found in recently planted ash trees (23 sites in Scotland, including one case at a tree nursery). The red dots are sites where infection has spread to ash trees which have not been planted recently (5 sites in Scotland).

[1] One of the ways that Chalara fraxinea causes tree death is that the lesions which it causes in tree bark form a site for infection by other harmful fungi such as honey fungus



Source: Forestry Commission

HOW IS ASH DIEBACK SPREAD?

The disease is spread by fungal spores. Infection starts primarily on leaves, and is progressive over time, with dieback and stem lesions usually manifesting in the next growing season. Leaf symptoms are typically detectable within two months of infection.

Spores are produced on fungal fruiting bodies which form on leaves from June to October, peaking in July and August. Wind-blown spores cause the disease to spread up to 20-30 km per year. On occasions, spores may disperse much further in very strong winds and storms, and spore dispersal from mainland Europe into England is possible. Longer distance spread occurs via movement of infected plants e.g. nursery stock. There is a low risk of dispersal on clothing or footwear or via animals or birds. If they have been properly treated, wood products will not spread the disease.

Ash dieback is believed to have entered England on ash for planting imported from nurseries in Continental Europe. However, the discovery of older trees in East Anglia, Kent and Essex with no apparent connection with plants supplied by nurseries, also raises the possibility that the disease has spread naturally, most likely by wind-borne spores being carried across from Continental Europe.

There is a lower risk of *C. fraxinea* spreading over the winter because there is now a ban on ash plant and seed imports into the UK, restrictions on plant movements through Statutory Plant Health Notices, and spore production is not expected to resume until June 2013 (Forestry Commission).

HOW MANY ASH TREES ARE THERE IN SCOTLAND?

Ash make up around one percent of Scotland's tree population, and ash is one of the main species in 11,700ha of woodland. This equates to 5% of broadleaved woodland in Scotland and 1% of all forests and woodland (Scottish Parliament 2012).[2]

WHAT IS BEING DONE TO CONTROL IT?

The UK Government introduced legislation on Monday 29 October 2012 to implement requirements to protect Great Britain's ash trees against the threat from the *Chalara fraxinea (C. fraxinea*) fungus. The Northern Ireland Executive and the Irish Government have introduced similar legislation. The legislation restricts imports of ash plants and seeds to those originating in pest-free areas. Since no pest-free areas have yet been declared for *C. fraxinea*, this effectively means a total ban on imports and movement of ash trees and seed for planting within Great Britain until a pest-free area is declared. The Forestry Commission website has a set of FAQ which explains exactly what the legislation permits and prohibits:

The legislation:

- Prohibits all imports of ash plants, trees and seeds into Great Britain until further notice (because no pest-free areas are established)
- Prohibits all movements of ash plants, trees and seeds within Great Britain until further notice (because no pest-free areas are in place)

[2] SPOR 30 Oct 2012, col 12696

- Continues to permit logs, woodchips and firewood, which pose a very low risk of disease transmission especially when they are kiln dried, to be imported from EU countries. In the unlikely event that this material is found to contain infection, action such as destruction will be ordered

- Continues to permit movements within Great Britain of all ash timber, which poses a very low risk of disease transmission

- Continues to permit imports of sawn ash timber from certain countries abroad under existing regulations […]

The Minister for the Environment and Climate Change, Paul Wheelhouse MSP gave further information (some of which has now been superseded by events) on action undertaken in Scotland in answers to an oral question posed by John Scott MSP on 30 October 2012:

> Ash dieback has been identified on one site in Scotland's national forest estate, and all the plants have been removed and destroyed. A second planting site in Scotland is now under investigation. There has also been one confirmed nursery infection in Scotland. All infected trees are to be destroyed by the end of October.
>
> […]
>
> Surveys are under way of all other nurseries and planting sites that have plants from potentially infected sources since 2007 and of ash sites that were identified as having potential health issues during the national inventory survey and the native woodland survey of Scotland. Earlier in October, the Forestry Commission Scotland issued a briefing that advised woodland owners and managers of the threat from Chalara dieback of ash. Advice is also being provided on alternative species that are suitable for planting on native woodland sites (Scottish Parliament 2012).

A written question from Claire Baker MSP answered on 12 November 2012 asked the Scottish Government what actions it and the Forestry Commission Scotland had taken since learning about the threat of the Chalara fraxinea fungus and the first confirmed case in Scotland. The Minister for the Environment, Paul Wheelhouse MSP, gave the following response:

> "Chalara fraxinea fungus is one of a number of new tree and plant health threats which have emerged as significant risks over recent years.
>
> In 2011 Forestry Commission and the Department for Environment, Food and Rural affairs published an Action Plan for Tree Health and Biosecurity which focuses on four key areas: protecting the UK; practical actions; public and stakeholder engagement and research opportunities and evidence priorities.
>
> Forestry Commission Scotland and the Scottish Government were closely involved in developing this action plan and have taken forward a number of specific actions including increasing the resources allocated to tree health work, improving awareness and understanding on biosecurity measures and running seminars and tree health days to alert woodland managers to the potential threats.
>
> In addition Scottish Government horticultural inspectors have been checking ash trees during plant inspections at Scottish nurseries and garden centres since May 2012 and in established gardens as part of the wider plant health inspection programme."[3]

[3] S4W-10759

A summit on how to control ash dieback in Scotland was held on 13 November 2012. A Forestry Commission (2012b) news release set out the main points of a strategy to deal with the outbreak:

- Provide advice on management of mature infected ash trees
- Identify mature ash that are resistant to the disease and could be used to propagate and develop new strains of ash to restock Scottish woodlands.
- Investigate woodland management and forestry techniques that could help slow down the spread of the disease and lessen its impact.
- Identify isolated locations around Scotland that are protected from windborne spread of spores and use them as a refuge for ash in Scotland.
- Develop a feasible, practical, achievable and affordable approach to dealing with infected young ash on newly planted sites
- Continue to survey in towns, cities and in the countryside surrounding infected sites

The news release also states that:

> With the disease now present in the wider environment, eradication – which would involve the wholesale destruction of mature ash trees and woodlands and widespread damage to the wider ecosystem - is not a realistic option.

The Minister for the Environment and Climate Change came to the Rural Affairs Climate Change and Environment Committee's meeting of the 28 November to answer questions about the work the Scottish Government is doing in response to the outbreak (Scottish Parliament Rural Affairs Climate Change and Environment Committee 2012).

The House of Commons Environment Food and Rural Affairs Committee is holding an inquiry into the way the ash dieback outbreak has been dealt with and the UK Government's approach to detecting and managing threats to tree and plant health.
On 6 December 2012 Defra (2012) published an interim Chalara control plan. The plan has been developed in coordination with the Forestry Commission and the Scottish Government (Scottish Parliament 2012d). The plan sets out actions to tackle *Chalara fraxinea* over the next few months, in order to meet four objectives as follows:

Objective 1 - reducing the rate of spread

- Maintain the ban on import and movement of ash trees
- Explore options for a targeted approach to management of infected trees by end March 2013
- Initiate research on spore production at infected sites
- Work with partners to publish targeted advice on movement of leaf litter

Objective 2 – developing resistance

- Work across Europe to share data and experience on resistance to Chalara
- Work with research councils and other bodies in the UK to identify and prioritise research needs on resistance and ensure those needs are met.

Objective 3 – encouraging citizen, landowner and industry engagement in surveillance, monitoring and action in tackling the problem

- Fund a pilot study to accelerate the development of the ObservaTREE, a tree health early warning system using volunteer groups
- Develop a plant health network of trained people to support official surveillance and detection
- Support work by industry groups to develop a charter mark for plants of UK origin
- Continue to work with the Open Air Laboratories (OPAL) consortium to develop the OPAL survey on tree health for launch in May 2013
- Support a biosecurity themed show garden at next year's Chelsea Flower Show

Objective 4 – building resilience in woodland and associated industries

- Publish silvicultural guidance on adapting to Chalara
- Publish maps showing the distribution of important ash across Great Britain
- Work with the horticulture and nursery sectors on long-term resilience to the impact of Chalara and other plant health threats

A House of Commons Library Standard Note (Downing 2012) provides further details of Government action to tackle *Chalara* including a timeline from the first discovery of the disease to the present and funding for research into tree diseases.

WHAT IS THE DEVOLUTION POSITION AND WHO IS RESPONSIBLE?

Plant health is a devolved matter. The Scottish Government's Plant Health Service is responsible for policy issues; considering what controls should be in place; liaising and negotiating with other UK administrations and international organisations about changes to legislation and agreements. It also carries out inspection, monitoring and surveillance activity and provides scientific advice and support.

Forestry Commission Scotland is responsible for the policy on and control of pests and diseases of forest trees and wood, working closely with Forest Research for scientific advice and support on this.

Due to the nature of plant diseases the Scottish Government and Forestry Commission Scotland work closely with counterparts in Defra and the other devolved administrations and with the Forestry Commission in England and Wales. The Food and Environment Research Agency (FERA), which is an agency of Defra, also has an important role in developing plant health policy and advising on disease risk and control strategies.

WHAT ARE THE ENVIRONMENTAL AND ECONOMIC IMPLICATIONS?

A briefing note produced by the Scottish Wildlife Trust (2012) highlights the environmental value of Scotland's ash trees:

> Ash trees have high conservation value and are one of the commonest native broadleaved trees found in Scotland. They are a key component of native woodlands and an important feature of our landscape, being present as field trees and in hedgerows. As their leaf structure lets light penetrate to the ground in woods, they support a rich understory which can contain rare woodland flowers such as dark red helleborine and whorled Solomon's

seal. The alkaline bark of old ash trees support important lichens and mosses. Upland mixed ashwoods are protected under the European Habitats Directive.

Clare Baker MSP asked the Scottish Government whether it would compensate landowners who had to destroy ash trees, and the Minister for the Environment and Climate Change gave the following response:

> In line with the policy of successive Governments, the Scottish Government does not currently plan to pay compensation for plants and trees lost through pest and diseases or the measure required to eradicate them. Nursery owners are advised of the need to ensure all stock is disease free prior to importation to the UK.[4]

A briefing note produced by Confor (2012) has some information on the commercial importance of ash grown in the UK and the implications of the disease:

> Its timber is one of the toughest and a natural shock absorber. The wood can take a hard blow without splintering and so is used where strength and flexibility are needed.
>
> Used for tool and sport handles: hammers, axes, spades, hockey sticks and oars. The attractive grain, the strength and the way it can be easily bent means that ash is also widely used for furniture. Old uses include skis, tent pegs, horse drawn coach and cart building and agricultural implements.
>
> Ash can also be grown as “coppice” - very good for firewood having a high calorific value and charcoal.
>
> Over 70 million plants for forestry planting are annually produced in the UK currently (by both Forestry Commission and private nurseries), whilst approximately 10 million plants are imported for forestry planting annually. Some plants are exported by UK nurseries however the bulk is planted within the UK. There are a number of reasons for this, including: uncertain demand from year to year, making nursery production difficult to plan; faster growing conditions abroad.
>
> If a woodland owner was planning to plant ash that will need to be either delayed or changed. All movements of ash plants are currently banned within the UK, so unless the owner is going to use his own plants grown on the site, it will not be possible to plant ash under the current restrictions.

The Scottish Government has commissioned an independent consultant, Dr Rick Worrell, to produce an initial assessment of the potential ecological and economic impacts of Chalara in Scotland. Dr Worrell’s report is expected to be published in early December (Scottish Parliament Rural Affairs Climate Change and Environment Committee 2012).

WHAT ARE THE RISKS OF OTHER NEW TREE DISEASES?

The Forestry Commission’s website has a page on tree pests and diseases which lists fifteen major tree pests and diseases already present in the UK. In addition to ash dieback, tree pests and diseases which have recently spread to the UK include:

- Oak processionary moth and the Pine tree lappet moth, whose caterpillars defoliate oak and pine trees

[4] S4W-10802

- *Phytophthora ramorum* a fungus which affects larch trees and a range of other plants; *Phytophthora kernoviae* which affects a similar host range to *Phytophthora ramorum* but not larch; *Phytophthora austrocedrae* which has been found on juniper, Nootka cypress and Lawson's cypress, and *Phytophthora lateralis* which evidence suggests only affects Lawson's cypress (a tree used in gardens but not in commercial forestry) in the UK

The page also includes a file which lists other pests diseases present in the EU for which there is threat of them spreading to the UK. These include insect pests like the spruce bark beetle, ash borer beetle and pine nematode.

In October 2011 the UK Parliamentary Office of Science and Technology (POST 2011) published a four page note which looks at the risk to UK trees from invasive diseases and pests.

WHY ARE NEW TREE DISEASE OUTBREAKS OCCURRING AND WHAT IS BEING DONE?

The Defra and Forestry Commission (2011) Action Plan for Tree Health and Biosecurity, published in October 2011, explains that there are two main reasons behind an increased risk of tree pests and diseases spreading to the UK: increased global trade in plants and plant products; and climate change:

> In the last few years, a number of new tree and plant pests and pathogens have emerged as significant risks. Threats to tree health have increased with the globalisation of trade generally with a marked increase in the volume and diversity of plants and plant products entering the UK. This has increased the likelihood of plant pests and pathogens also being introduced, spreading through gardens and woodlands and potentially causing serious damage to either our native flora or commercial crops. Predicted climate change effects, such as warmer winters and changes in seasonal rainfall and storm patterns, may also increase the risk of pest establishment, spread and impact.

A Tree Health and Plant Biosecurity Taskforce has been established to review the UK's strategic approach to tree health and biosecurity. The task force includes members from Stirling, Aberdeen and St. Andrews Universities. It published an interim report on 30 November 2012 which made a number of recommendations:

- Develop a prioritised UK Risk Register for tree health and plant biosecurity
- Strengthen biosecurity to reduce risks at the border and within the UK
- Appoint a Chief Plant Health Officer to own the UK Risk Register and provide strategic and tactical leadership for managing those risks
- Review, simplify and strengthen governance and legislation
- Maximise the use of epidemiological[5] intelligence from EU/other regions and work to improve the EU regulations concerned with tree and plant biosecurity
- Develop and implement procedures for preparedness and contingency planning to predict, monitor and control the spread of disease
- Develop a modern, user-friendly, expert system to provide quick and intelligent access to data about tree health and plant biosecurity

[5] Epidemiology is the study of the causes, distribution, and control of disease

- Identify and address key skills shortages

The final report of the task force is due to be published early in 2013.

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