

**Report on the First Forestry Commission Re-Survey of Woodlands  
2005 to Assess the Level of Incidence of  
*Phytophthora ramorum* and *Phytophthora kernoviae*  
in Woodlands in England and Wales**

Forestry Commission  
Plant Health Service

## Summary

Between August and September 2005, the Forestry Commission undertook the re-survey of 149 woodlands in England and Wales. These woodlands, in admixture with rhododendron and/or *Vaccinium*, had initially been surveyed between January and March 2004. The 149 woodlands were located in 141 10km grid squares. In 25 woods, 36 samples were tested using the Lateral Flow Devices (LFD's). From 8 woods 11 samples were taken and sent to the Central Science Laboratory (CSL) for testing. None proved positive.

## Background

*Phytophthora ramorum* is a fungus-like pathogen, which has been identified as the causal agent for the condition known as Sudden Oak Death. The first evidence of it in Britain was found during April 2002 on a viburnum but since then it has been found mainly on rhododendrons in nurseries and garden centres. In November 2003 the first evidence of an established tree having the disease was confirmed in Sussex. Further infections were subsequently confirmed on trees in historic gardens in Cornwall. To date (November 2005) a total of 54 infected trees have been recorded. Rhododendrons were present on all of these sites.

Between **December 2003 and April 2004** the first major Forestry Commission *Phytophthora ramorum* survey was carried out focusing on locations where rhododendron was found growing in admixture with trees. Britain was divided into high risk and low risk areas based on climate. A total of 1348 sites were identified for the survey of which 1217 were high-risk sites. In England, 395 sites were surveyed, in Wales, 310, and in Scotland 512. This was complemented by surveys on a further 131 low risk sites in England and Scotland.

A total of 335 samples showing symptoms of the disease were collected. Samples were sent either to the Central Science Laboratory (CSL) in York or the Scottish Agricultural Science Agency (SASA) in Edinburgh. All samples were tested and found to be NEGATIVE. The results of the survey have been published on the FC website ([www.forestry.gov.uk/planthealth](http://www.forestry.gov.uk/planthealth))

Significant areas of infection were identified in Cornwall and it was decided that the survey programme would continue in England and Wales only during **Summer and Autumn 2004**. 109 woods were surveyed in 94 10km grid squares. Samples were taken from 73 locations and none proved positive. During August 19 water bait samples were taken and 3 of these proved positive for *P. ramorum*. The results of this survey have been published on the FC website [www.forestry.gov.uk/planthealth](http://www.forestry.gov.uk/planthealth)

At this time it was agreed that we would not continue with a formal programme of surveys in Scotland, where Pest Risk Analysis indicated a low level of risk, although ad-hoc sampling would be carried out as part of surveyors' normal duties.

During the latter part of 2004, a second and previously unknown *Phytophthora*, now formally named *P. kernoviae*, was discovered in Cornwall, affecting rhododendron and some trees. A Management Zone was set up to contain the disease. A smaller outbreak was also discovered in South Wales and an infected nursery was also identified in Cheshire although this outbreak was eradicated. During 2005 as a result of intensive surveys by Plant Health & Seed Inspectorate (PHSI) of Defra further outbreaks of both *P. ramorum* and *P. kernoviae*, were discovered in Cornwall

In 2005, the ***Phytophthora* Programme Board** decided that, in the light of these continuing outbreaks, it was necessary to revisit all those high risk sites which were surveyed in 2004, over a 5 year period, with 20% of the total being surveyed annually. This would determine whether they were still disease free.

The 2005 survey revisited a total of 149 woods of which 19 had *Vaccinium*. Of these, 41 were Forestry Commission and 108 were privately owned.

### Objective of the Survey

The objective of the first survey was “to obtain an understanding of the distribution of the fungal pathogen *P. ramorum* on rhododendron growing in admixture with trees in woodlands across Britain, in order to inform policy development on eradication and containment, or alternatively, management of this potentially devastating disease.” This objective was still valid not only for the second survey, but also this re-survey. However, the increase in the number of *P. ramorum* outbreaks in Cornwall and in other parts of England and Wales, prompted the Programme Board to initiate a re-survey of the 2004 sites to ascertain if those high risk sites were in fact still disease free.

### Sampling Protocol & Timetable

For this survey the Forest Research’s Principal Statistician randomised all the sites which were surveyed between January and September 2004. From this randomisation (see **Appendix II**), a balanced spread of sampling points (woods) was produced. In the North of England, 17 woods were to be resurveyed, in Wales, 65, and in the South of England 59 including 7 in Cornwall where the pathogens are most prevalent (see **Appendix III**). Surveying would be carried out as per the original protocol produced by Dr Steve Lee in December 2003 and subsequently amended by Dave Tracy in 2005 and this was included in the **Survey Plan 01/05-06** which was produced by Dave Tracy which formalised the survey procedures. Woodlands in admixture with rhododendron and/or *Vaccinium spp.* were to be surveyed. Samples taken from suspect rhododendron and *Vaccinium* were to be sent to CSL in York for analysis after testing with the Lateral Flow Devices, developed by CSL, to ascertain if samples taken were showing the symptoms of *Phytophthora*. To check on the accuracy of the LFD’s some negative samples were sent to CSL for analysis. The survey was carried out between **August and September 2005**.

### Survey Data Summary

Table 1 summarises the results of the survey, which was carried out between August 2005 and September 2005

**TABLE 1**

<b>Type of samples</b>	<b>No. of samples taken</b>	<b>No. Positive</b>
Bark (Lime tree)	1	Nil
Rhododendron	10	Nil
<i>Vaccinium</i>	-	
Other	-	

## **Conclusion**

The woods re-surveyed throughout England and Wales gave a balanced spread across the country and the results of the survey indicated that, in the intervening 12 – 18 months since the last survey, no changes in the condition of the woods had occurred. While the absence of *P. ramorum* and *P. kernoviae* from the woods re-surveyed is encouraging, it cannot be assumed that both pathogens are absent from all woodlands. The continuing discovery of both pathogens in woodlands in Cornwall and South Wales indicates that a programme of re-survey and new survey work is likely to continue for the foreseeable future.

## **Next Steps**

In the area of greatest infection, Cornwall, a *Phytophthora kernoviae* Management Zone (PkMZ) was set up in December 2004. Currently a programme of containment through clearance of rhododendron has started at the sites with the highest risk of transferring the disease. Outwith the zone, Defra's Plant Health & Seed Inspectorate (PHSI) and the TSU have carried out further surveys of woodlands in Cornwall where woods are in admixture with rhododendrons and/or *Vaccinium*. The results of this "New Woods" Survey in Cornwall can be found in the Survey Report - Cornwall which can be found on the Forestry Commission's Plant Health website

[www.forestry.gov.uk/planthealth](http://www.forestry.gov.uk/planthealth).

During the next 4 years, it is intended that a further 150 sites will be resurveyed annually in England and Wales.

## **Acknowledgement**

The Forestry Commission wishes to acknowledge the full co-operation and support given to its surveyors by woodland owners or their managers who were approached for permission to survey their land.

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## **Appendix I - Survey Team Details**

Assessors from the Technical Services Unit (TSU) of Forest Research carried out the survey. These surveyors had undertaken training from Plant Health staff in January 2004 prior to the commencement of the first *P ramorum* survey or if new to the operation, have been trained by an operator who has had previous experience in this type of survey work.

### **TSU Survey Team Members:**

#### **Wykeham Fieldstation:**

Bill Riddick  
Lee Cooper

#### **Shobdon Fieldstation**

Martin Page-Jones

#### **Bush Fieldstation**

Steve Osborne

#### **Talybont Fieldstation**

Ben Griffin

#### **Mabie/Kielder Fieldstation**

Len Thornton  
Harry Watson  
James White

#### **Alice Holt Fieldstation**

Steve Coventry  
Doug Nisbet

#### **Exeter Fieldstation**

Barnaby Wylder

## Appendix II – Randomisation

Using a simple random sample the following breakdown was observed.

	Excluded	Include	Total
NX	1	0	1
NY	8	7	15
SD	32	6	38
SE	11	3	14
SK	6	1	7
SH	34	14	48
SJ	16	5	21
SM	6	2	8
SN	52	21	73
SO	34	13	47
SR	1	0	1
SS	10	4	14
ST	16	6	22
SW	14	4	18
SX	42	11	53
SS_E	22	12	34
SY_E	7	8	15
ST_E	22	10	32
SZ_E	6	2	8
SU	22	9	31
TQ	31	3	34
Total	393	141	534

For country this gave

	Excluded	Include	Total
North	58	17 (23%)	75
Wales	169	65 (28%)	234
South	166	59 (26%)	225
Total	393	141 (26%)	534

Indicating a reasonably balanced coverage.

## Appendix III – Map of Sampling Points (Woods in red)

