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Plant Health
Agency

Use of water sampling, pheromone and other trapping used for plant health inspection.

A UK perspective

Paul Beales

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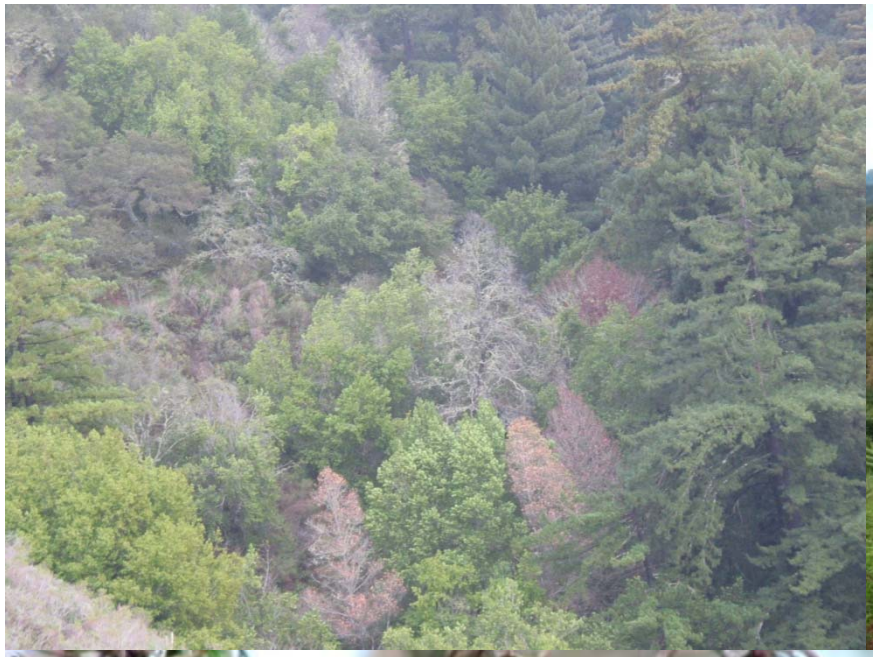
A UK perspective

- Oomycete
- Fungal
- Insect

Fishing for
Phytophthora



Why ?

Detection of symptoms

Drawbacks:

Experienced surveyors

Limited area

Inaccessibility sites

Method development

Bait Materials:

Rhododendron

Camellia

Hebe

Pine Needles

Lupin Radicles

Agar pieces - Various

Applicator:

Bags

Swim Feeders

In vitro tests :

Detection:

Time : 3 days

Concentration : 1 zoospore per litre

Water temperature : 0 – 25 °C

Storage :

At least : 1 month in fridge

6 months in freezer

Pilot Study Findings:

- Baits were robust and suitable for purpose.

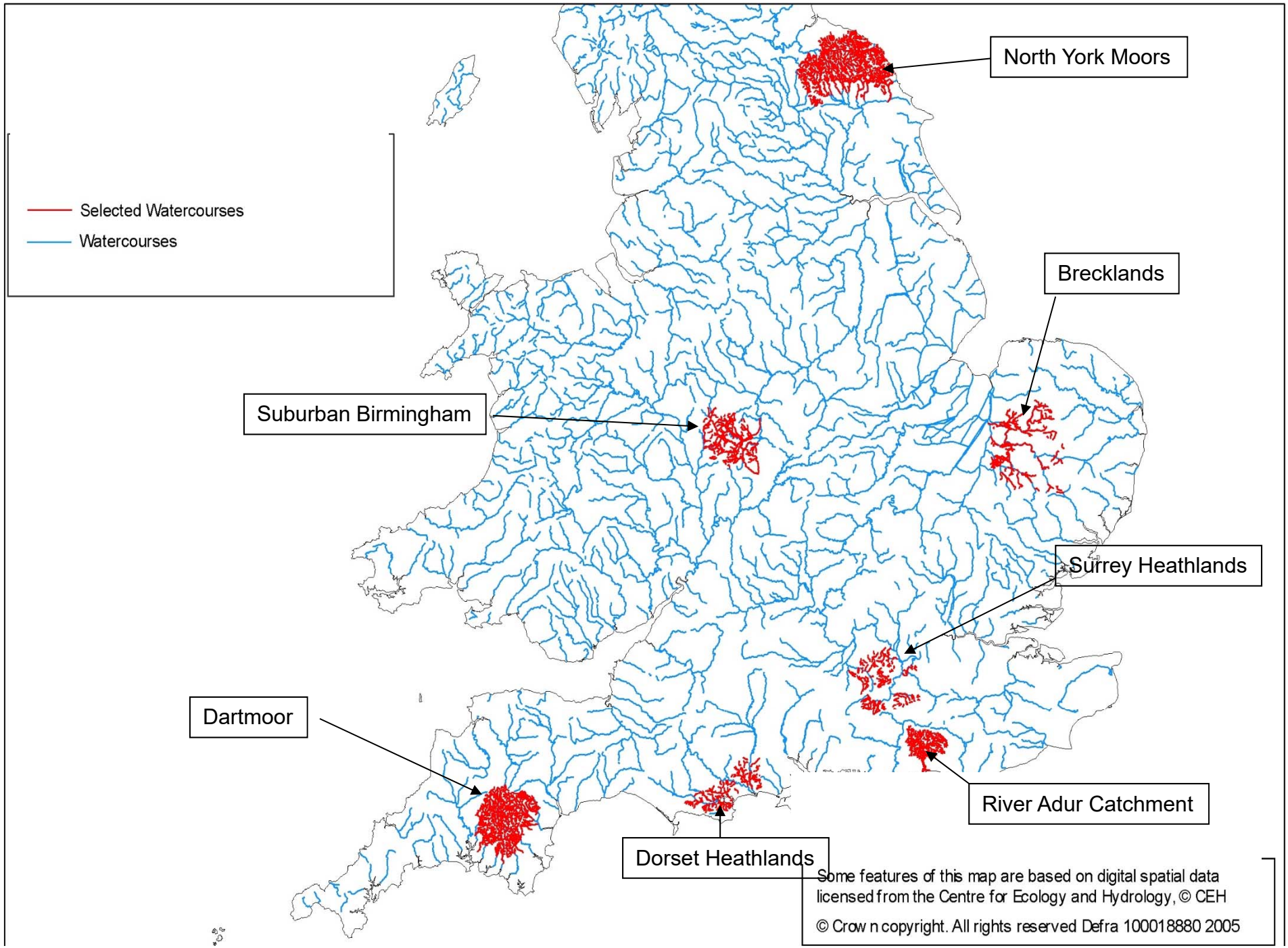
- Flow Rate :

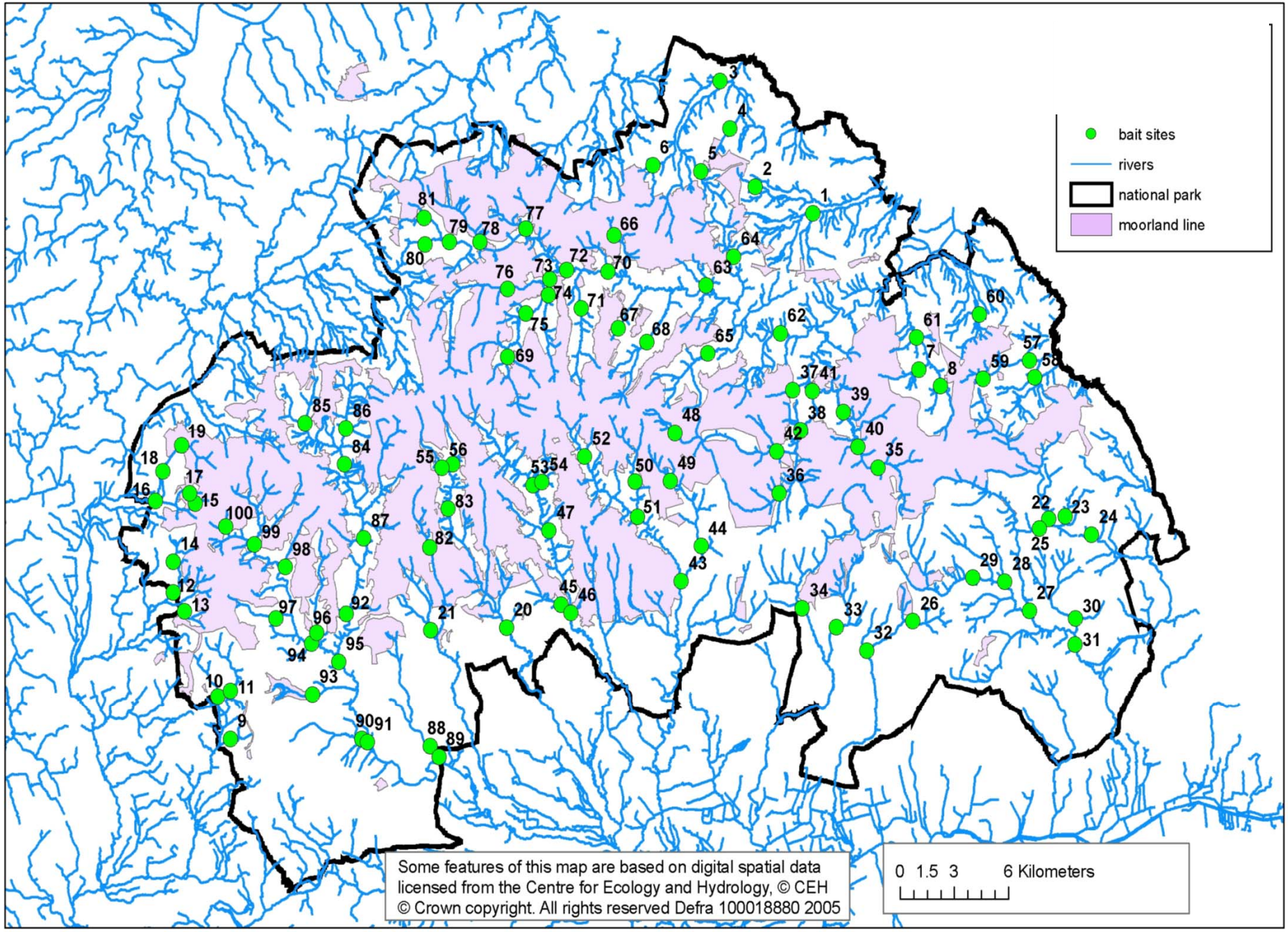
  Fast (30.6 % positive)

  Slow (34.3 % positive)

  Still (16.5 % positive)

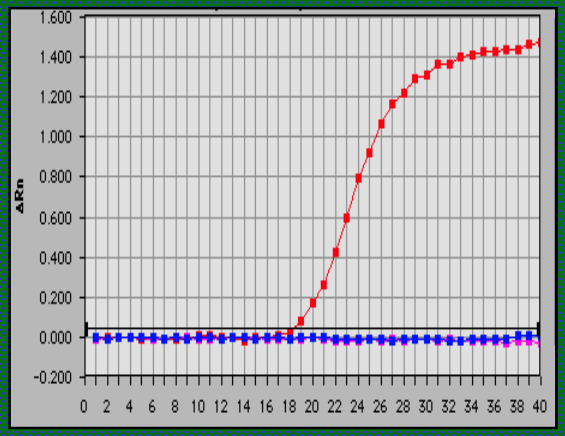
- No difference between open and shaded sites, shallow or deep water.




bait sites
rivers
national park
moorland line
Some features of this map are based on digital spatial data licensed from the Centre for Ecology and Hydrology, © CEH
© Crown copyright. All rights reserved Defra 100018880 2005
0 1.5 3 6 Kilometers

National Survey Results:

- 716 Baits sent
- 707 Returned and tested

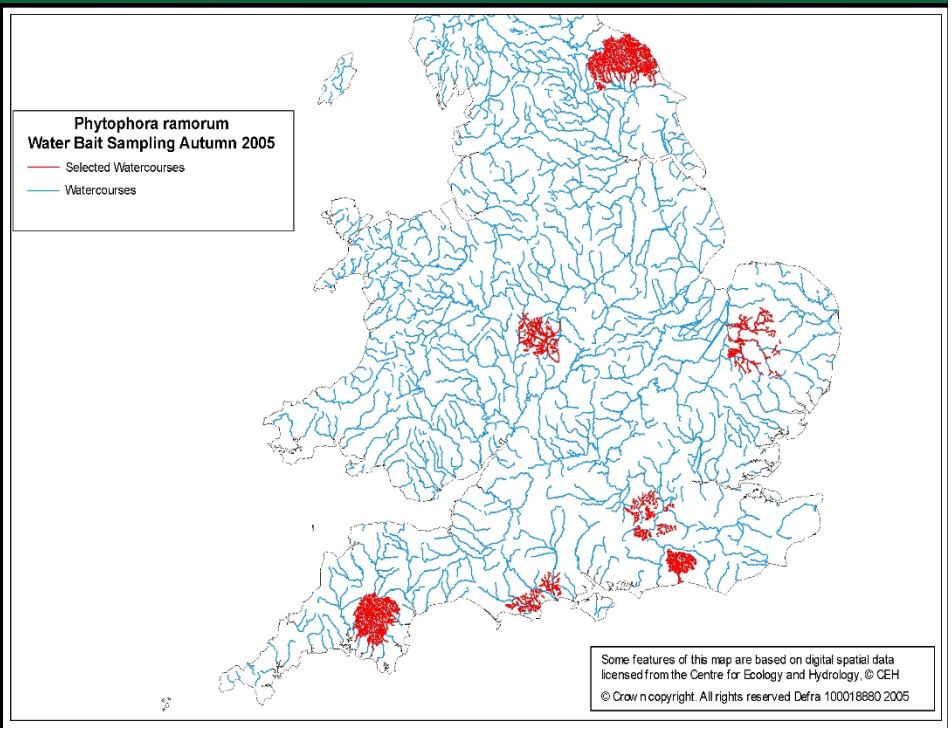


- 32 positive findings

Conclusions:

P. ramorum not present in the majority of waterways tested in the UK

Found in areas where eradication of plants currently in progress

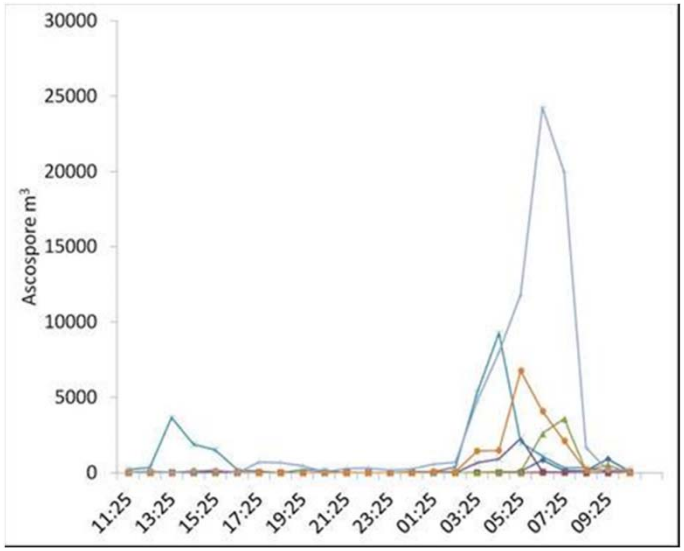


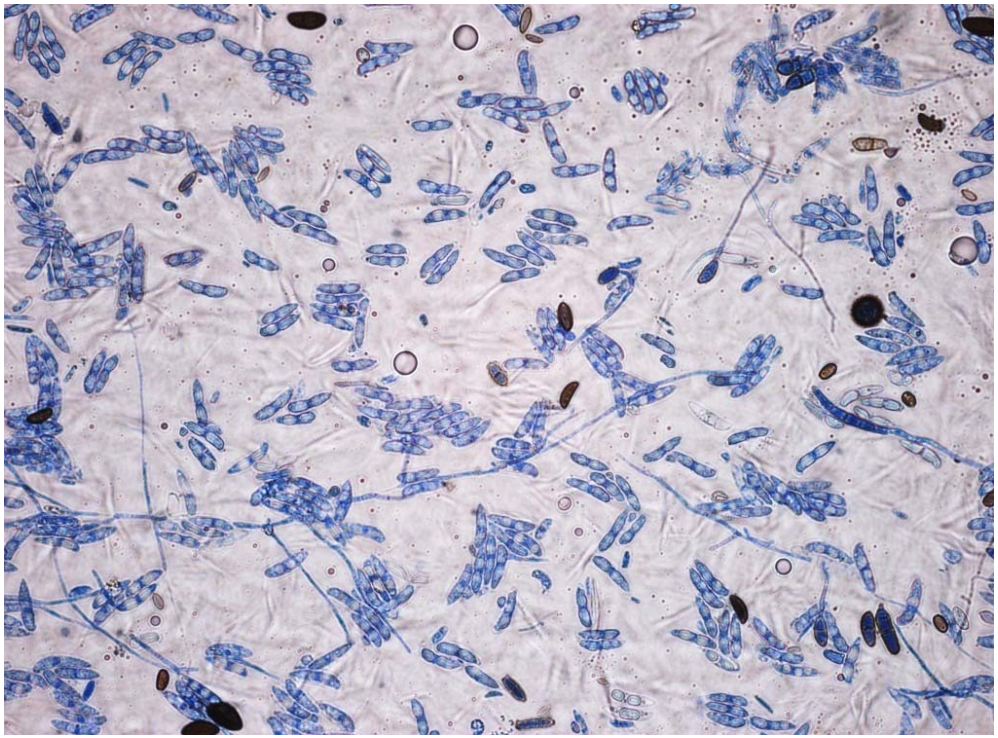
Trapping Ash dieback spores

Spore trapping – *H. fraxinea*

- Spore trapping 2013-2015 at infection sites across the UK
- Air spora impacts onto melinex tape
- Daily segments analysed using real time PCR to determine number of spores released per day

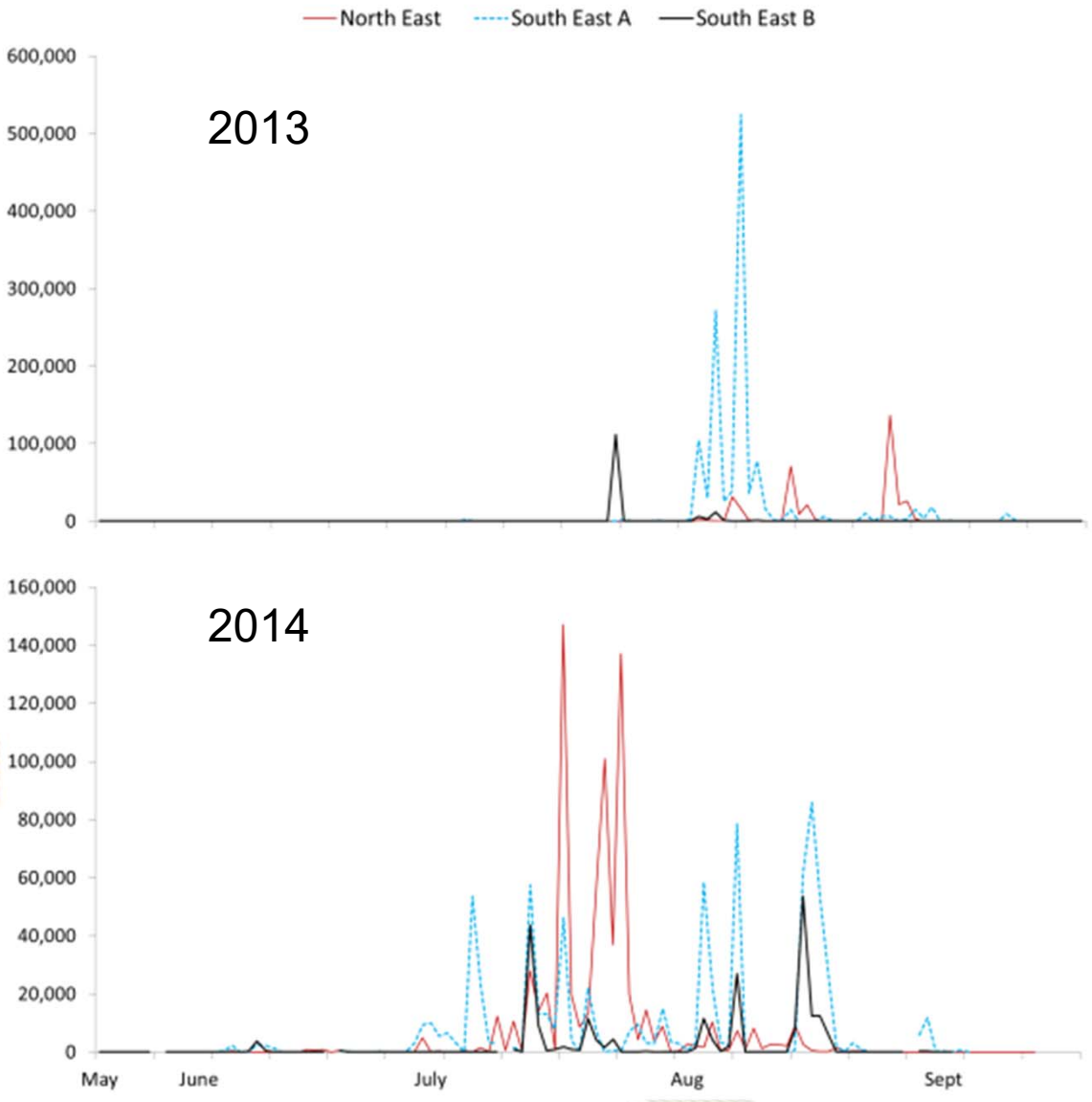
Spore trapping – *H. fraxinea*





- Routine diurnal pattern to spore release
- Spores stained with cotton blue for visual examination

H. fraxinea – Spore dispersal



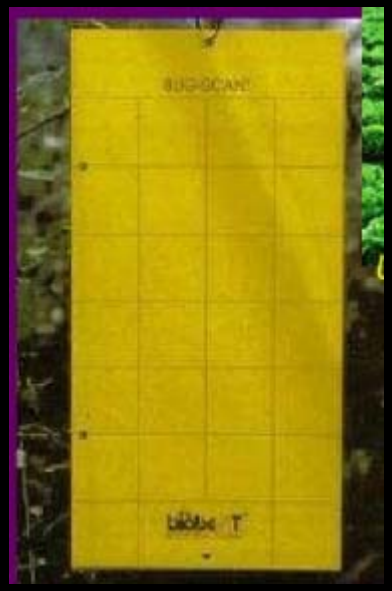
- Dry conditions in June and July 2013 resulted in large conserved spore release events later in the summer
- Higher average daily temperatures and more frequent rainfall encountered in 2014 resulted in a prolonged spore release starting in June

Trapping insect pests.

Types of traps :

1. Passive : No lure involved
   e.g. Pitfall, water traps, beat-sheets (Thrips)

2. Active : Use a lure of some kind e.g.
   - Food
   - Colour
   - Shape
   - Light (*Spodoptera*)
   - Pheromones



Pheromone Traps

- Pheromones are chemicals released into environment in small amounts by special abdominal glands in insects.
- Pheromones are species specific, may stimulate one gender or all genders.

Adantages:

- Affordable
- Detect low levels of target insect pest
- One trap effective over large areas.
- Can be used throughout season

- Latest research (FPPH) looking at pheromone blends
- Trials for use with as citizen science.

In-Field use by PHSI

Sticky traps :

Commonly used for

Whitflies (yellow)

Thrips (blue / yellow (when high numbers)

Light traps :

Spodoptera spp. (cotton leaf worm moth)

In-Field use by PHSI

Sticky traps example : *Bemisia tabaci*

3 main uses :

1. Plant packing areas etc., to monitor for *B. tabaci* moving in trade.
2. Growers who regularly **import from high risk countries**, to detect low levels of *B. tabaci*
3. Monitor or control populations at outbreak sites

Placement

- Two-dimensional traps ar or rolled into cylinder (most effective)
- Close to and level with, or just below, the top of the crop
- If possible place some traps horizontally below crop (BT weak flier)
- Cucumbers 50 cm above ground optimal
- 1 per 2.25m2 to 1 per 500m2
- Not near drafts, facing sun
- Near heating pipes – hot spots for detection
- Labelled clearly with date and replaced monthly

Pheromone Traps In-Field use example 1: Red Palm Weevil (*Rhynchophorus ferrugineus*)

- Important pest of palm species.
- Introduction to the Mediterranean from Asia it has decimated mature palms in a number of southern member states, particularly the Canary Island Palm (*Phoenix canariensis*) and Date Palm (*P. dactylifera*).
- Infestations weaken the plants resulting in crown collapse and ultimately the death of the plant
- Found in one area of the UK 2016

Pheromone Traps In-Field use example 1: Red Palm Weevil (*Rhynchophorus ferrugineus*)

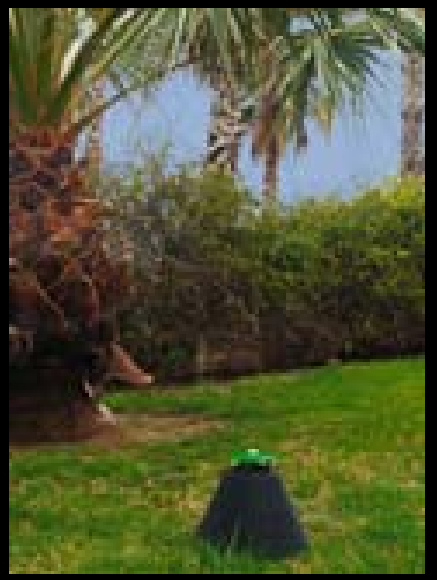
National protected zone survey conducted June-Sept 2017

As part of visual monitoring and sampling,

Traps placed :

- Original outbreak site in Essex
- Garden centre that provided original plants
- Other strategic sites in 10 Km of outbreak (e.g national parks, stately homes)
- 1 further trap placed at strategic site per PHSI region across the Country.

Pheromone Traps In-Field use example 1: Red Palm Weevil (*Rhynchophorus ferrugineus*)



- Black colour attractive to adult RPW
- Ribbed sides helps traction
- Ground trap (does not need to be buried)
- Pheromone lure inserted into a small green baskets
- Adult climbs in and drowns in water.

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No RPW Found

Mouse, 3 carrion b
eetles (*Nicrophorus interruptus*)
and a suspected Ruby Tiger Moth (*Phragmatobia fullginosa*)
range of spiders, centipedes and 1 vine weevil.

Pheromone Traps In-Field use example 2: *Diabrotica virgifera* (Western corn rootworm)

- 2003 First finding UK
- National survey – concentrating around airports
- Pheromone on clear sticky trap used.

Pheromone Traps In-Field use example 3: Asian long horn beetle (*Anoplophora glabripennis*)

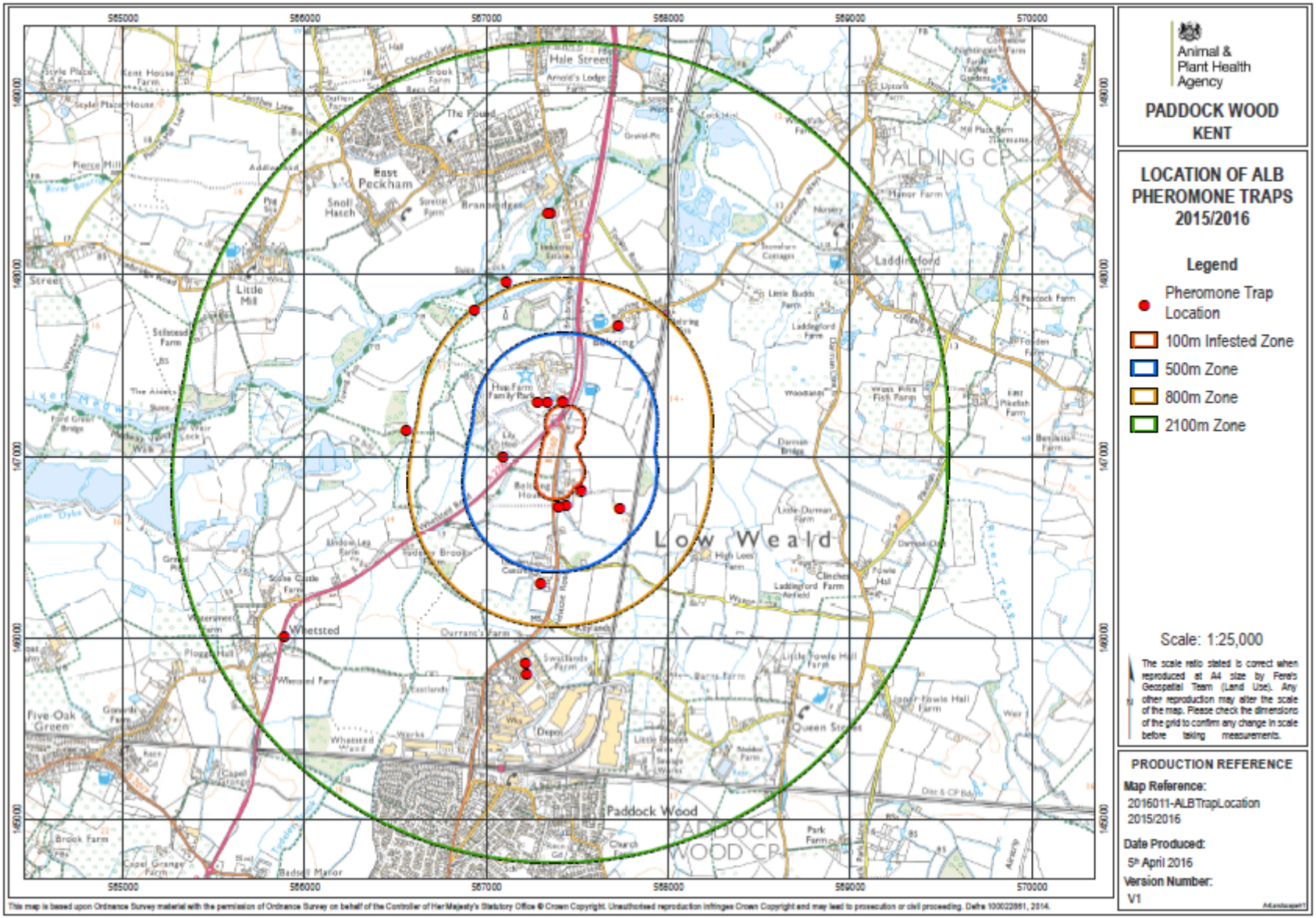
- 2012 UK Outbreak in Kent
- Wood packaging introduction suspected.
- Total 2000+ trees felled in 100 m zone.
- Eradicated

- Post -eradication surveillance strategy included pheromone traps.
- 6 year programme

- Deployed July – Sept (Oct) , checked every 2 weeks.

- Generic pheromone blend (range of beetles)
- More than 1 lure blend added to each trap

- Position : In or close to broad-leaved woodland
    - Pref : near Acers, Salix and Poplars.
    - Attach to tree – not obscured by branches
    - At least head height higher if possible


Animal & Plant Health Agency
PADDOCK WOOD
KENT
LOCATION OF ALB PHEROMONE TRAPS 2015/2016
Legend
Pheromone Trap Location
100m Infested Zone
500m Zone
800m Zone
2100m Zone
Scale: 1:25,000
The scale ratio stated is correct when reproduced at A4 size by Fera's Geospatial Team (Land Use). Any other reproduction may alter the scale of the map. Please check the dimensions of the grid to confirm any change in scale before taking measurements.
PRODUCTION REFERENCE
Map Reference:
20160111-ALBTrapLocation 2015/2016
Date Produced:
5th April 2016
Version Number:
V1
Low Weald
Paddock Wood
Whetsted
Five Oak Green
East Peckham
Hale Street
Laddingford
YALDING CP
PADDOCK WOOD CP
565000
566000
567000
568000
569000
570000
149000
148000
147000
146000
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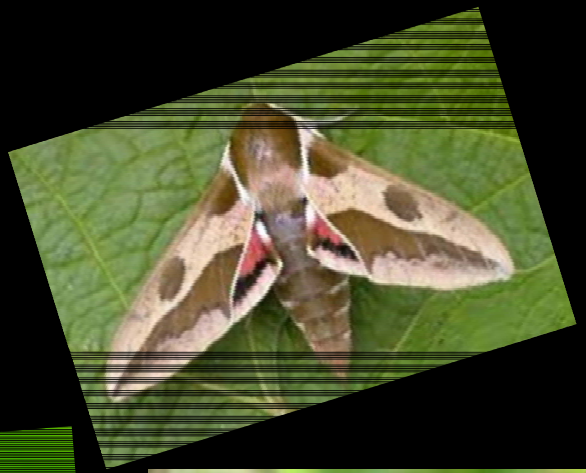
Other Findings:

Hawthorn shield bug
Forest shield bug
Range of moths
Range of common flies
Wasps
Spurge hawkmoth
Undescribed beetle
Ladybirds (spotted and harlequin)
Weevils
Earwigs
Alderfly
Clothes moth
Various larvae
Crane fly
Spiders
Mayfly
Ground beetle
1 Bat



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