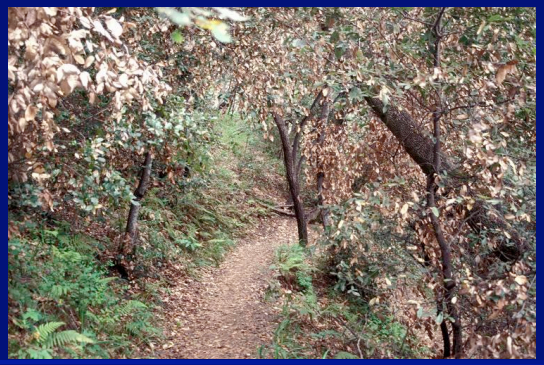

Public knowledge, perceptions and who pays: Lessons from Sudden Oak Death

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Tree diseases, gardens and landscape

- Tree diseases can have a visible effect upon the landscape
- Changes can be widespread and alter the landscape forever
  - Dutch Elm Disease: arrived in England in 1965 and led to the eventual death of over 25 million elm trees by the mid 1990s
  - Sudden Oak Death/ Phytophthora ramorum/ Ramorum disease: introduced in the UK in 2002, rapidly spreading and with the potential to affect a large number of tree species in woodland, heathland and historic gardens. The main infectious host in the UK is rhododendron.

Public preferences for landscape changes

- Very large literature on public preferences for landscape changes
  - Economics, human geography, rural sociology...
- Economic perspective: people value landscapes, i.e. landscapes affect well-being
  - Many studies on value of particular landscape assemblages; of attributes or features; of different groups of people, etc.
- Economic valuation studies attempt to measure changes in well-being caused by landscape changes in monetary terms, i.e. value landscape changes

Total economic value of landscapes

Category (1)	Category (2)	Example
Use value	Direct use benefits	Recreational, health, aesthetic amenity, spiritual, cultural heritage, education
	Distant use	Nature programmes, landscape paintings
Option value		Future use
Non-use value	Altruistic	"Preserve for others"
	Bequest	"Preserve for my descendents"
	Existence	"Preserve for its own sake"

Our study

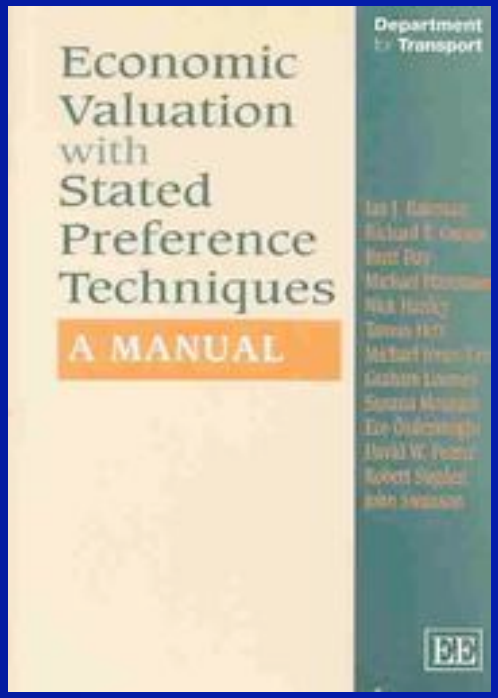
- 'Memory and Prediction in Tree Disease Control: A comparative analysis of Dutch Elm Disease and Ramorum Disease in the UK' (ESRC-RELU)
  - Historical disease events (Dutch Elm Disease) can be used as powerful research tools to explore policy learning, public awareness, preference formation and stakeholder engagement in relation to current emerging disease situations (Ramorum Disease)

Economic study objectives

- To investigate **public preferences for Ramorum disease control options**:
  - To analyse awareness, knowledge and attitudes
  - To uncover public willingness to pay for managing P. ramorum in both gardens and wider countryside
    - Measure of its economic value/benefit
- To assess the **effect of Dutch Elm Disease** on preferences for managing Ramorum disease:
  - To analyse the effect of prior knowledge, memory and/or experience of Dutch Elm Disease
  - To analyse the effect of provision of information about Dutch Elm Disease

Methodology: contingent valuation method

- Survey-based technique
- Elicits demographic, knowledge, attitudinal, behavioural and valuation (willingness to pay) questions
- Constructs a scenario describing the policy change to be evaluated
  - *E.g.* Ramorum disease control policy
- Directly asks individuals to value the policy change, i.e. asks for willingness to pay
- Can measure future changes and non-use values
- Very widely used in policy: UK government best-practice guidance



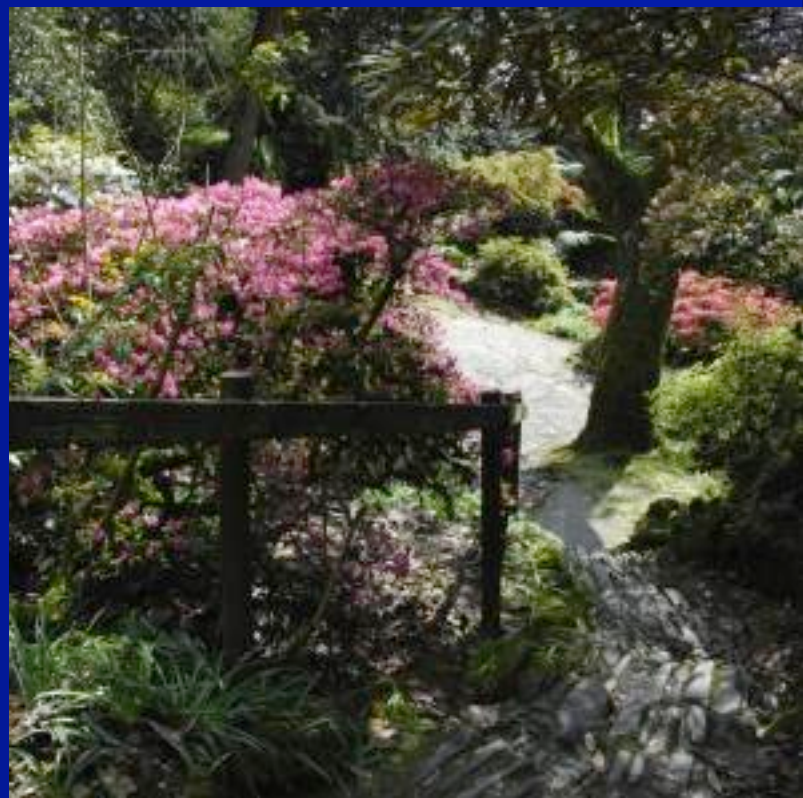
Outline of the CV questionnaire

- **Visitation**
  - Profile of garden visit
  - Satisfaction / opinion
- **Attitudes**
  - General environmental attitudes
  - Specific attitudes (trees, diseases)
- **Knowledge**
  - General awareness of tree diseases/ pests
  - Specific knowledge of Dutch Elm Disease and Ramorum disease
- **Half the sample:** Information on a past disease epidemic: Dutch Elm Disease

- **Scenario description**
  - Ramorum disease information
  - Current situation
  - Proposed high intervention policy
  - **Spread maps**
- **Value elicitation**
  - Payment vehicle (garden entry fee)
  - Elicitation mechanism
- **Follow-up questions**
  - Motivation behind WTP answer
  - Credibility / meaningfulness
- **Demographics**
  - Sex, age, income, family size, education

Case studies

- **<u>Case study 1</u>: Survey of individuals with a high interest in trees and gardens** *(completed)*
  - Likely to be the most affected
  - National Trust garden visitors in Cornwall
  - N=479
  - Paper-based, self-completion questionnaires
- **<u>Case study 2</u>: Survey of general population** *(on-going)*
  - N=1000
  - On-line questionnaire



National Trust gardens in Cornwall

- Cornwall: 'garden capital of the world', with over 60 gardens
  - Ramorum disease is widespread
  - Large collections of rhododendrons, camellias, magnolias
- Cornwall attracts over 4 million staying visitors per year.
  - 2007/08 tourist survey indicates that some 25% plan to visit a NT or EH property

- National Trust (1895): the largest conservation charity in Europe
  - 3.6 million members and 14.8 million visitors of pay for entry properties
  - 254,000 hectares of countryside, and more than 350 historic houses and gardens, ancient monuments, nature reserves and parks
  - Collaborating with Government in tackling Ramorum disease

Sampling strategy

NT Garden	Total respondents	With Dutch Elm Disease information	No Dutch Elm Disease information
Lanhydrock	92	47	45
Saltram	98	49	49
Glendurgan	100	50	50
Arlington Court	97	47	50
Trengwainton	92	47	45
Total	479	240	239

Sample characteristics

Women	59%
Average age	57 years
Employed (FT, PT, self-employed)	51%
Retired	45%
Average annual household income	£39,000
% earning over 50,000	24%
Higher education	42%
Times, Guardian, Independent, FT	26%
Daily Mail, Daily Telegraph	41%
Members of National Trust	80%

High interest in gardens

- 90% of people have visited more than one fee-paying garden in the last 12 months
  - 45% visited over 5 gardens
- 60% were repeat visitors of the garden where they were interviewed
- 64% would describe themselves as 'gardeners'!

- Reasons for visit:
  - 70% are garden-related
    - general interest in gardens; seeing rhododendrons, azaleas, magnolias; nice walk; peace and quiet
  - 51% said free access (90% did not pay!)
- Priority environmental problems:
  - Loss of countryside: 41%
  - Litter / waste: 40%
  - Climate change: 35%
  - Tree diseases: 10%

Awareness of tree diseases

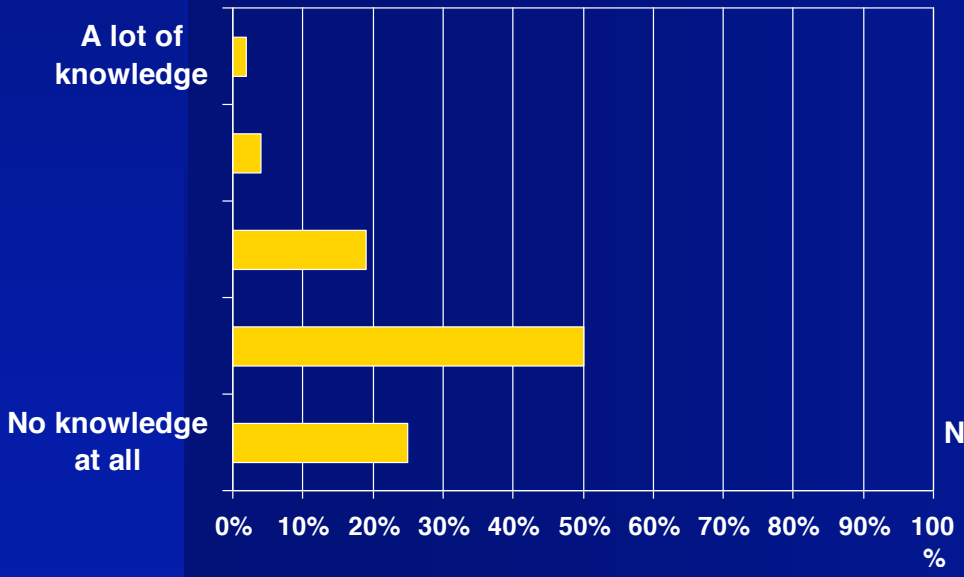
- Garden visitors appear to have a high awareness of tree diseases
- From a list of 9 diseases and pests
  - 98% were aware of at least 1 disease
  - 50% heard of 3 or more
  - 30% had heard of 4 or more

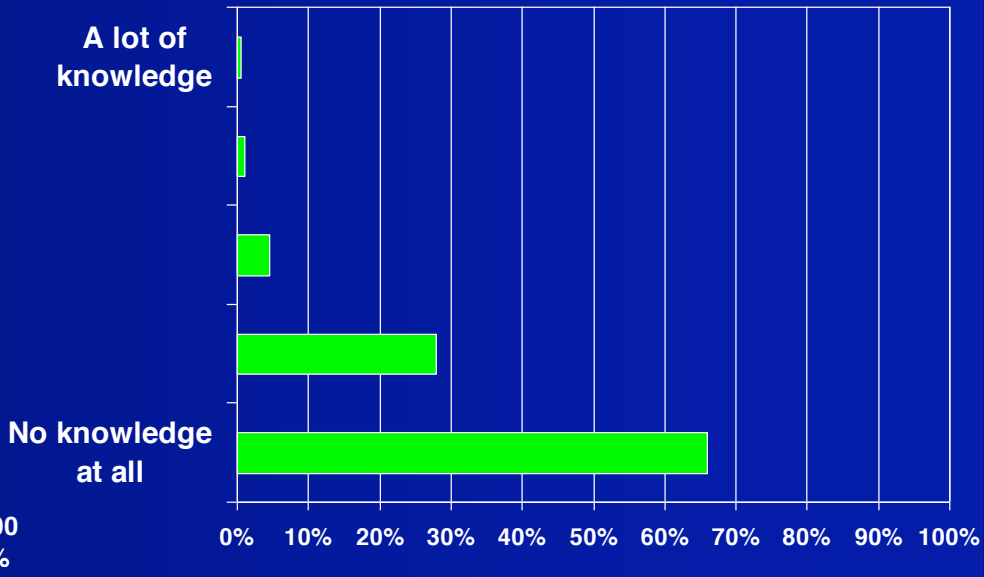
Awareness of tree pests and diseases

- Horse Chestnut Bleeding Canker: 41%
- Dutch Elm Disease: 97%
- Asian Longhorn Beetle: 19%
- Red Band Needle Blight: 2%
- Oak Dieback/ Oak Decline: 32%
- Oak Processionary Moth: 13%
- Phytophthora ramorum: 10%
- Sudden Oak Death: 48%
- Horse Chestnut Leaf Miner: 25%

Awareness and knowledge of DED and Ramorum disease

- 97% had heard of Dutch Elm Disease
  - 39% remember/ experienced/noticed it
- 50% had heard of Sudden Oak Death and/or Phytophthora ramorum
  - 7% noticed it





Attitudes towards tree diseases

- 'Landscape change due to some trees dying and others becoming established is a **natural part of life** and evolution'
  - Agree or strongly agree: 70%
- 'The impact of tree pests and diseases on the environment is something that I am **worried about**'
  - Agree or strongly agree: 64%
- 'We should prioritise tacking the big environmental problems such as climate change rather than worry about tree diseases'
  - Agree or strongly agree: 26%

Ramorum disease valuation scenario

CURRENT POLICY:

Nursery trade

- Regular inspections at all nurseries. Destruction of all infected plants found.

Countryside

- Sporadic surveys of woods and heathland. Some clearance of rhododendron where funds permit.

Historic gardens

- Regular inspection of gardens in infected areas. Some clearance of infected plants. Re-planting with similar species to maintain gardens appearance.

HIGH INTERVENTION POLICY:

Nursery trade (*no change*)

- Regular inspections at all nurseries. Destruction of all infected plants found.

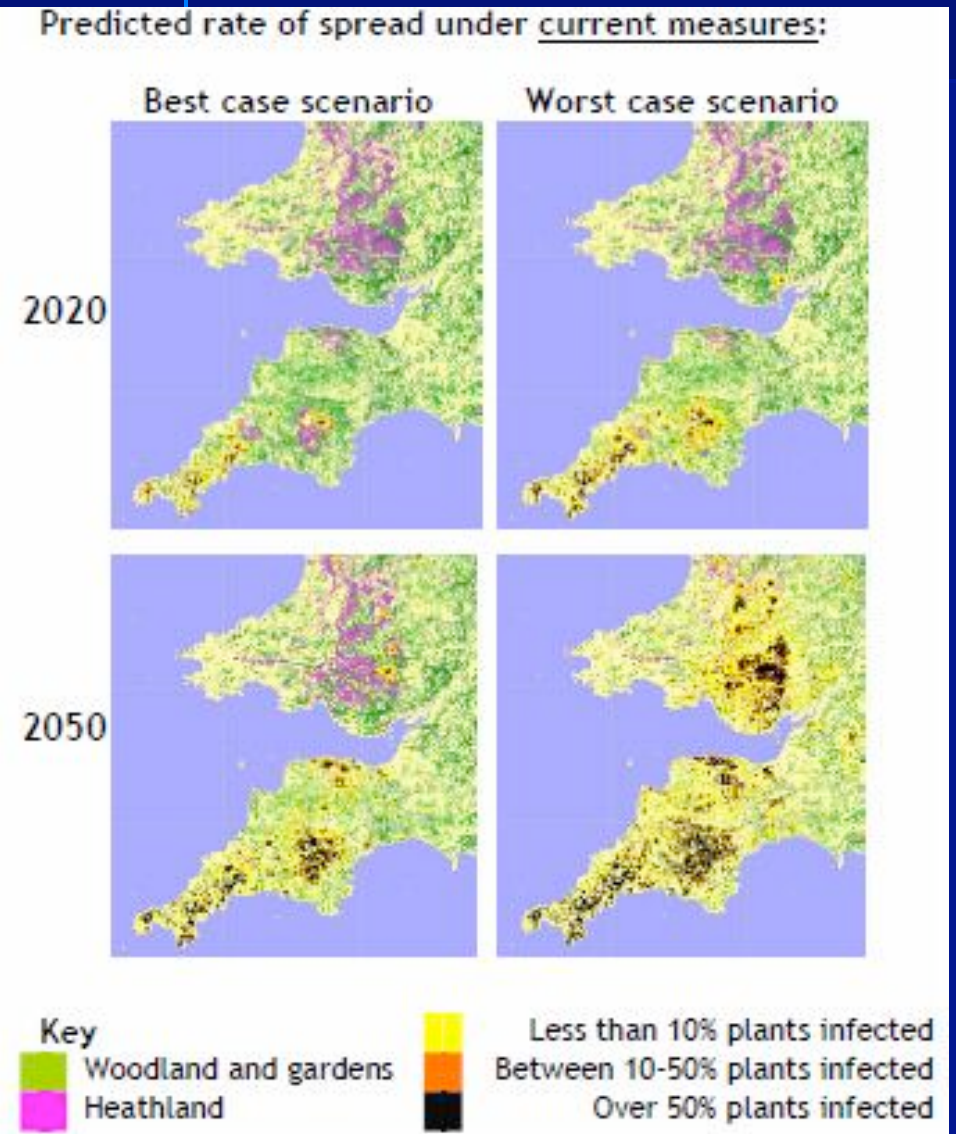
Countryside

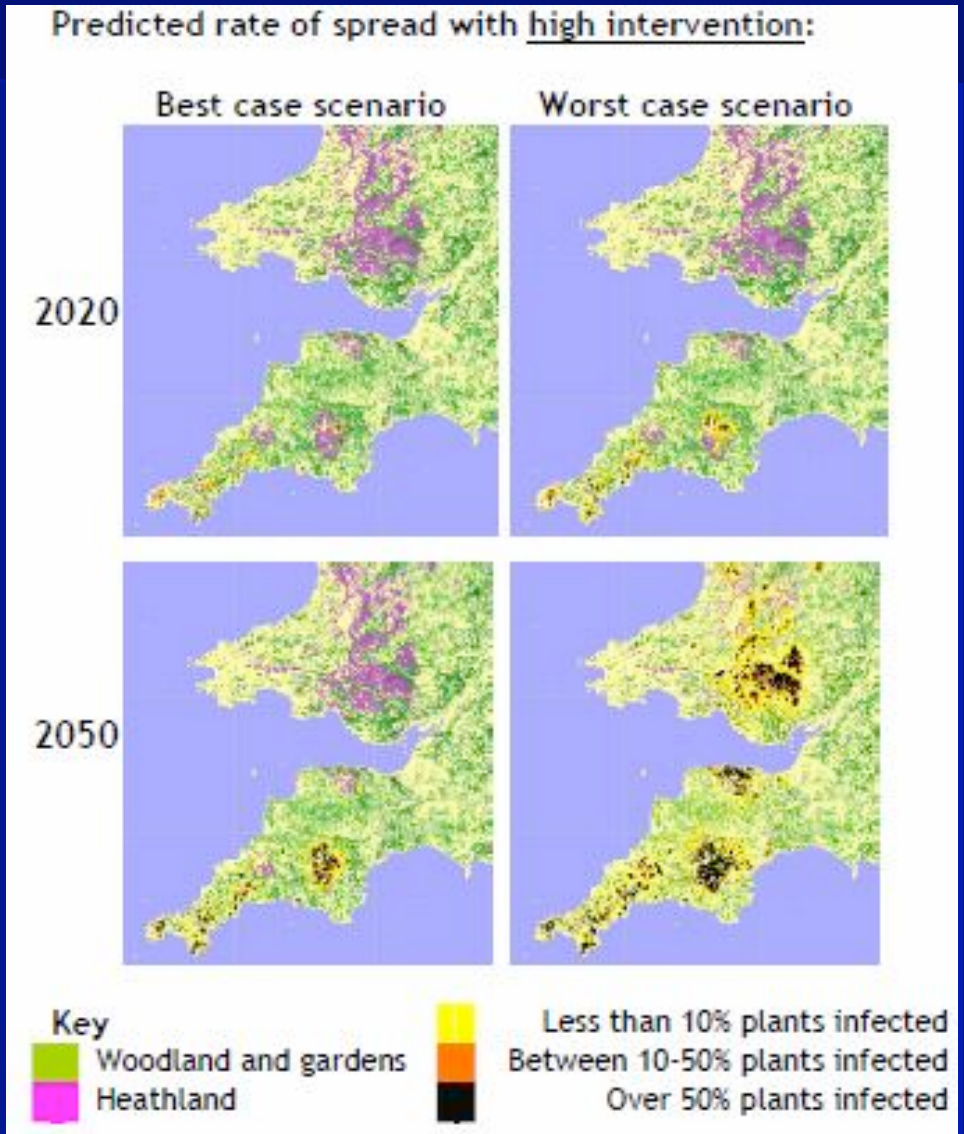
- Frequent surveys of woods and heathland. Clearance of all rhododendron in infected sites.

Historic gardens

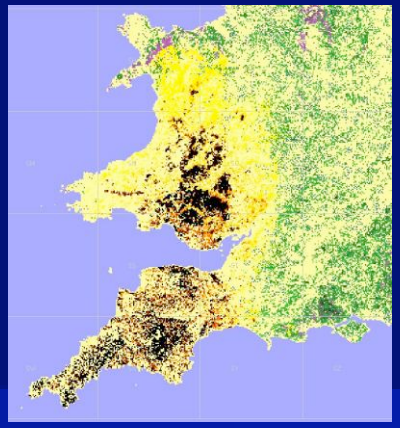
- Regular inspection of gardens in infected areas. Clearance of all infected plants. Preventive removal of plants that could become infected. Visitors restricted to footpaths and shoe disinfection required. New garden designs and plant combinations would be required.

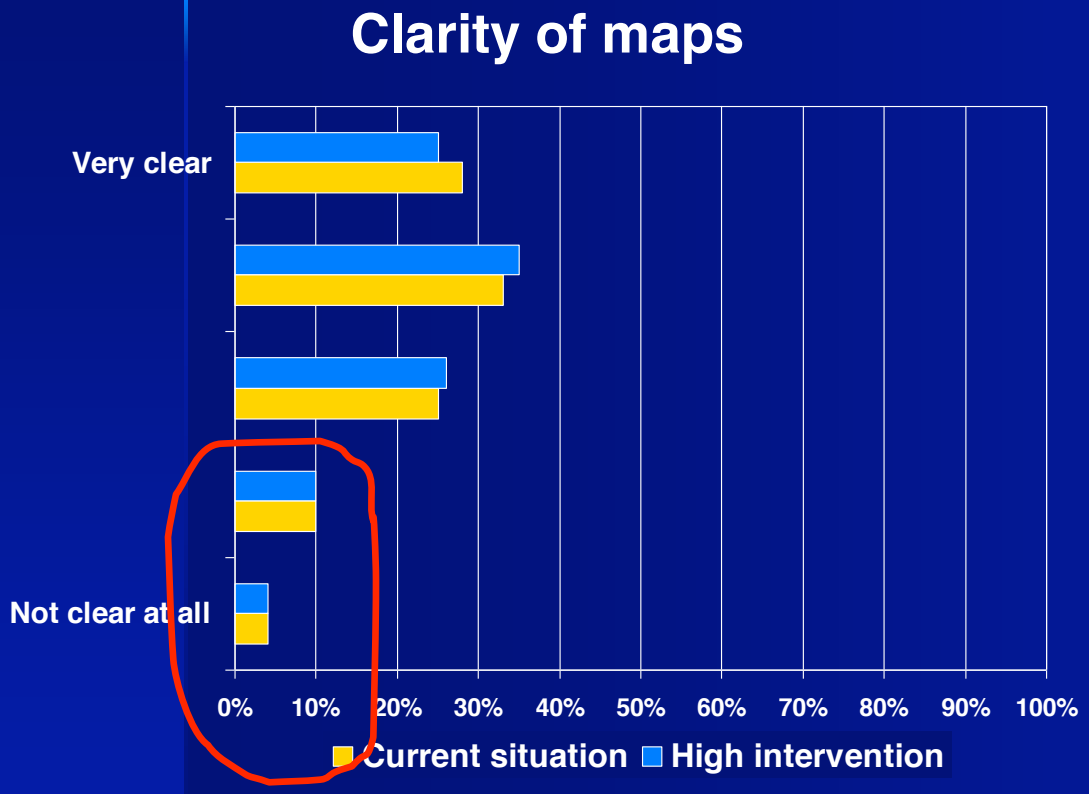
Disease spread maps





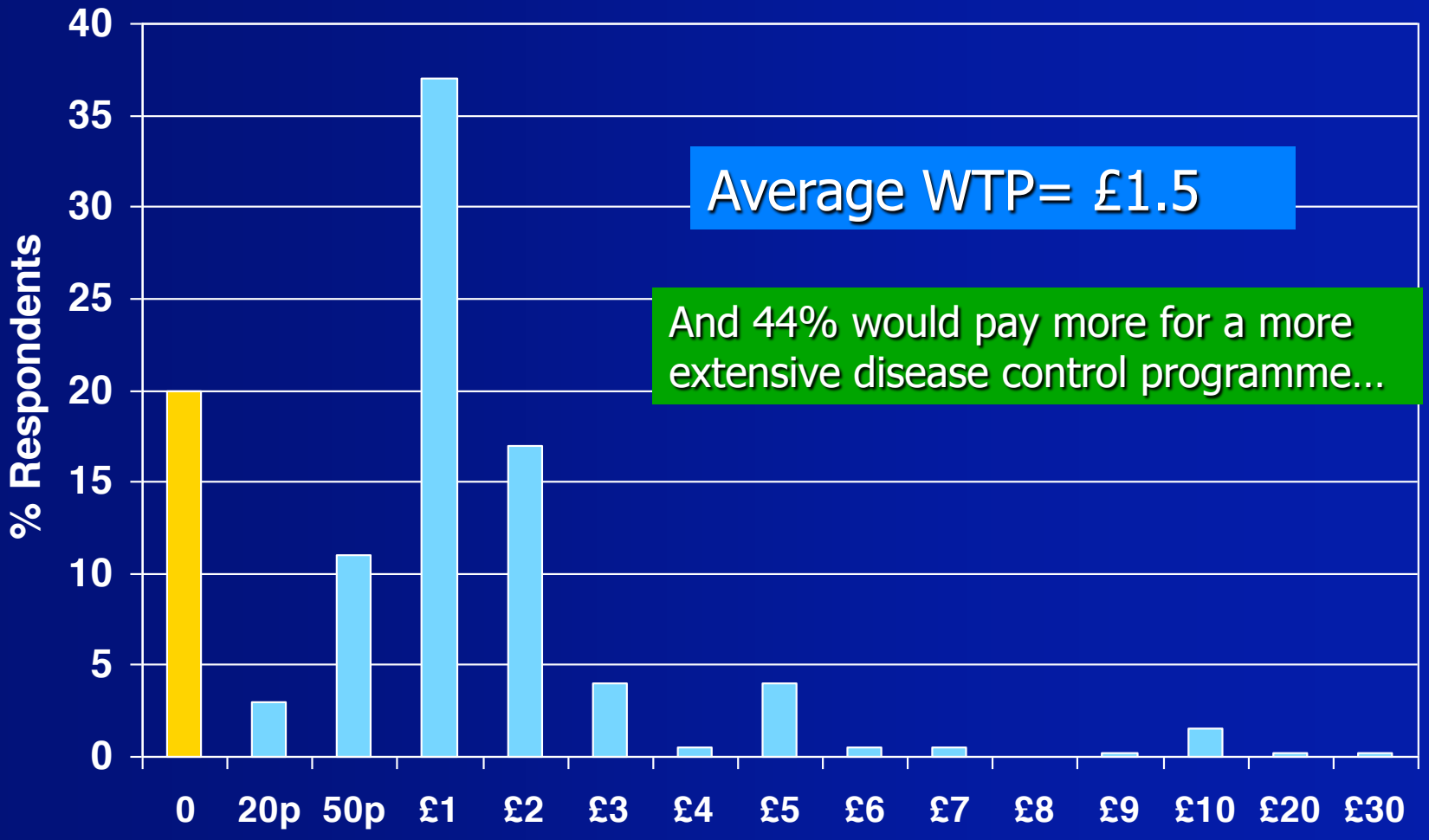
Clarity of maps and questionnaire





Questionnaire	%
Interesting	63%
Educational	38%
Too long	21%
Difficult	7%
Unrealistic	1%

Willingness to pay distribution



What influences the probability of paying for Ramorum control?

Age	-	*
Income	+	---
Dutch Elm Disease information	+	---
Prior/past knowledge of Dutch Elm Disease (memory, past experience, noticing)	+	**
Prior knowledge of Ramorum disease (noticing)	-	***
'Gardener'	-	**
Number of garden visits last 12 months	-	**
'Tree diseases should be an environmental priority'	+	*
'Landscape change due to trees dying and others becoming established is a natural part of evolution'	-	*
'Would be happy to keep to footpaths in historic gardens to reduce spread of Ramorum disease'	+	***

Logit model, Pseudo R2=16%

Findings (1)

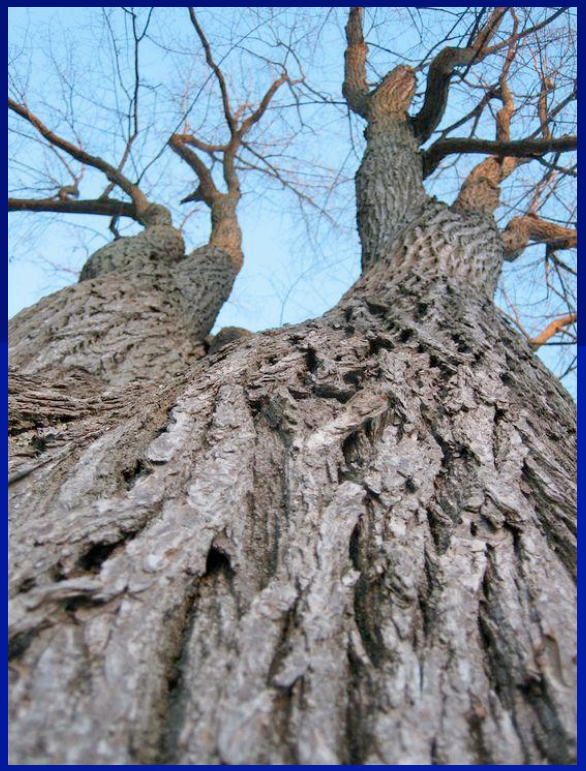
- Garden visitors have high awareness of tree diseases
  - Particularly of Dutch Elm Disease that many remember and personally experienced
- But majority had little or no detailed knowledge of the diseases
  - Very little knowledge of Ramorum disease
- Most people accept that the landscape changes naturally, with some trees dying and others becoming established
  - Many are nevertheless worried about tree diseases

Findings (2)

- Most people (80%) are willing to pay for a high intervention Ramorum disease control programme via a compulsory garden entry fee
  - Despite 90% not having paid to enter gardens…
  - Average WTP is £1.5 per visit, per person
    - And there are multiple repeat yearly visits…
    - And 15 million visitors to NT properties…

Findings (3)

- The provision of info on Dutch Elm Disease appears to have had no effect on values
  - High pre-existing awareness…
- But memory and personal experience of Dutch Elm Disease has a positive influence on the value of Ramorum disease control



Next steps

- Investigate if these findings extend to the general public…
- Extend the scope of the study:
  - Preferences for a control programme for a wider range of tree diseases
  - Analyse how preferences for landscape change/ adapt over time

Thank you!