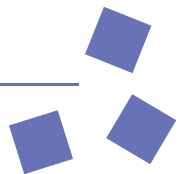


# Wildlife Management and Invasive Non-Native Species

Report of Research Findings among the General Public,  
Anglers and the Horticultural Retail Trade (Volume 1)



COI Job No: 288768



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The COI, on behalf of its clients, the Department for the Environment, Food and Rural Affairs and the GB Non-Native Species Secretariat

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# 1 Management Summary

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## 1.1 Introduction

1. This research is based on a comprehensive programme of qualitative and quantitative research among the general public, freshwater anglers and a sample of key retailers of terrestrial and aquatic plants in England.

## 1.2 Wildlife Management

1. Wildlife Management (WM) is not a term with which most members of the public are familiar. Nevertheless most are able to put forward a definition. It is about managing, conserving and protecting wildlife and, to a lesser extent, habitats and the environment. The public conceptualise WM very broadly and place more weight on managing human impacts on wildlife rather than the other way round.
2. There was broad support for managing wildlife for a range of reasons. The highest levels of support were voiced when management is to protect human health and safety. There was more qualified support, and some resistance, when it is to protect habitats, crops, infrastructure and, in particular, new developments. Support for WM was significantly higher among rural communities compared to people living in urban locations.
3. Three groups were identified on the basis of their support for, and attitudes towards, WM: Favourably Disposed (42%), Qualified Supporters (33%) and the Undecided (25%)
4. This is a broadly positive finding; Qualified Supporters, as the name suggests are not opposed to the idea of managing wildlife but tend to offer qualified rather than full support. Moreover, not only are the Undecided the smallest group, they were not so much opposed to WM as undecided and this suggest there is scope to persuade them of its merits.
5. Defra's marketing communications need to provide a rationale for both why WM is necessary and why the proposed methods are being used and are deemed appropriate.

## 1.3 Native, Non-Native and Invasive Non-Native Species

1. Three quarters of the public were familiar with the term 'native species' (NS) and two thirds had come across 'non-native species' (NNS) before. Moreover, most of them had a reasonable appreciation of what NNS means – species that are not naturally occurring in GB but which originate in other countries. The term 'alien species' was less familiar and deemed a less appropriate term.
2. The public are largely unable to differentiate between native and non-native species – they simply do not know which are which. Moreover, there was a tendency to assume that the difference is based on how long established a species is rather than how it became established in the first place – and this needs to be reinforced through any communication. It will be important when raising the profile of INNS to avoid demonising all NNS in the process as some do not cause problems and indeed sometimes play an important role.

3. Invasive non-native species (INNS) was not a familiar term - only 40% of the public in our survey had come across it before and one in every four could not offer a definition. INNS was most commonly described in terms of species that can spread and have negative impacts on native animals and plants.
4. Once the term had been explained, 60% could provide one or more examples of species they considered to be INNS, in particular, the Grey squirrel (64%), Japanese knotweed (38%), American mink (25%) and Signal crayfish (18%). However, leaving aside these headline species, awareness of most NNS was low so, not surprisingly, knowledge about which might be invasive was also low.
5. There was a high level of support for killing INNS that pose a threat to human health. There was more qualified support for killing INNS that threaten native species or cause economic damage – but this was often because respondents were unsure about this (they were more likely to ‘agree somewhat’ or ‘neither agree nor disagree’) rather than the fact that they disagreed. Levels of support for controlling INNS will depend on the actual circumstances – the nature of the problem and the perceived acceptability of the proposed solution.
6. Most members of the public perceived INNS to be a less serious (or no more serious) threat to biodiversity in GB compared to other threats, such as loss of habitat or climate change.
7. There is clearly a need to drive the issue up the public’s agenda via mainstream media coverage on two fronts:
  - the general issue: what INNS are, how they get here, that they are the second most serious threat to biodiversity
  - and about the specific species: which species are INNS and how they can be recognised.
8. Given the general lack of knowledge of, and ability to recognise/identify both native and non-native species, never mind knowing which non-native species are considered to be invasive, this is no small challenge.
9. The research indicated broad levels of support for controlling INNS but as things stand, the public has no idea what role, if any, it should play and how it can fulfil any such role. This is something Defra and NNS need to communicate.

#### 1.4 The Case for Managing Wildlife and Controlling INNS

1. While there was broad support for wildlife to be managed and for INNS to be controlled, the public have concerns that influence the extent to which they are prepared to support specific examples.
2. Where concerns were raised about the stated reasons for managing/controlling wildlife, these tended to be because more information was needed to demonstrate the seriousness of the problem.
3. Most concerns related to the choice of method and this is where most resistance is likely to be met. Ideally, many people would prefer humane methods to be used as well

as methods that are species specific. Nevertheless, there was a recognition that it is not straightforward and that various factors have to be weighed up and trade-offs may need to be made.

4. The research has highlighted a number of principles that the public feel should be used when considering the most appropriate choice of method of control. Communicating that these principles are indeed followed should result in higher levels of public acceptance:
  - the cost of the solution needs to be proportionate to the size and nature of the problem
  - where appropriate, preventative measures should be adopted
  - wherever possible, non-lethal control methods should be used in preference to culling
  - when culling is the appropriate method, humane methods should be used that result in an instant, painless death and which minimise the chances of non-target species being culled.
5. Public confidence in individual methods can be further enhanced as follows:
  - through knowing that there are rules and regulations governing who can use any given method, the circumstances under which they can be used, and the manner in which the method should be used
  - by knowing that there are codes of practice designed to encourage the appropriate use of various methods
  - through endorsements by recognised authorities
  - by explaining why a particular method is being used and why alternative methods are considered inappropriate.

## 1.5 Pet Owners, Gardeners and Pond Owners

1. Half of the general public sample owned one or more pets/companion animals. Over a quarter of these pet owners keep a companion animal that has the potential to be invasive. This equates to 15% of households in England.
2. Some 15% of the general public sample had a pond that contains animals/plants; many of these will have the potential to be invasive if released to the wild.
3. 90% of the general public sample had a garden. Gardeners and non-gardeners in the sample did not differ in terms of their support for, or attitudes towards, WM, however they were more likely to have heard of INNS and to be in favour of controls. For those respondents in our sample who were responsible for deciding which plants to buy, Garden Centres are by far the main source of plants (but not necessarily by volume or value), followed by the main DIY chains.
4. Plant labels, friends/relatives and staff in horticultural retail outlets were the main sources of information and advice about plants.



5. Gaining industry support for a plant labelling system and other PoS information, together with training staff on the problems associated with INNS and how they should be used/managed/disposed of is likely to be one of the most effective ways of reminding the public of the issue. The feedback from retailers was encouraging in this regard (see 1.7 below).

## 1.6 Anglers

1. Awareness of INNS was higher among anglers nevertheless, as with the public, there are considerable challenges in terms of educating anglers: some widely recognised species are not considered to be INNS, some species known to be INNS are not widely recognised and some species are both poorly recognised and not known to be INNS.
2. Anglers agreed that INNS pose a threat to native fish and plants and that they carry and spread disease and, as such, pose a threat to the future of angling.
3. Many anglers claim they are already adopting appropriate behaviour, including air drying nets, landing mats and slings after every trip, using a net dip where these are provided and not moving fish between waters. They were also willing to consider changing their behaviour if it can be shown to help combat the threat posed by INNS, including not releasing INNS that they catch (provided they recognise it as such) and cleaning their gear after every trip although there was considerable resistance from those who use 'stink bags' to stop doing so.
4. Given that a number of INNS are aquatic, a campaign aimed at the general public will also influence anglers. The main challenge is reaching and persuading the occasional pleasure angler of the threat of INNS and the need to adopt appropriate measures.
5. In addition to the more general messages about INNS that would be addressed as part of a campaign targeting the general public, there are some specific messages that need bringing to the attention of anglers, including:
  - the importance of not introducing to, or moving fish between, waters
  - the importance of biosecurity
  - not to release INNS back into the water – in many respects this could be the hardest attitude to change as, for most coarse anglers, it is the defining feature of their sport.
6. Any communication needs to address not just what anglers should or should not do but also why; the key motivators are 'to prevent spread of disease', 'to protect native plants and animals' and 'to preserve the sport they love'.

## 1.7 The Horticultural Retailer Perspective

1. Awareness of the Horticultural Code of Practice – launched to provide advice and guidance about INNS of plants - was less than 50% of the sample and was particularly low among retailers selling just aquatic plants. This is clearly a cause for concern given the number of potentially invasive aquatic plants. There is a need to continue to promote the Code especially among those selling aquatics.

2. There was almost universal awareness of the INNS concept among the horticultural retail trade, however, as with all other audiences their definitions contained very few references to entry pathways and this is something any future communications could seek to address. Such communication should remind the trade that many plants have become invasive in the wild because gardeners are unaware of the dangers and they (retailers) have a responsibility to educate their customers either to buy alternative species or to manage and dispose of such plants properly.
3. Currently there is a mismatch between the species that Defra and NNSS consider to be invasive or potentially invasive and the view of the trade. In many cases, a majority of the trade did not consider the plants in question to be potentially invasive.
4. Only half the sample had a policy specifically relating to the sale of INNS and, with a few exceptions, this was an informal, unwritten policy. This normally took the form of 'we don't sell INNS' – but the retailers' definition of an INNS is not the same as Defra's or NNSS's.
5. Two thirds of retailers claimed they were providing information and advice about INNS to their customers. Almost without exception, retailers were willing to consider displaying PoS materials and labelling especially if Defra was to provide the materials.
6. Defra and NNSS could consider whether they should encourage the industry to develop a standard form of labelling (e.g. a symbol to indicate INNS).
7. The majority of retailers in our sample had sold one or more species from a list of 16 invasive or potentially invasive species. In many cases, the species in question were plants that the retailers themselves classified as invasive. There is therefore scope to persuade retailers not to sell such plants.
8. There is also an issue relating to plants that are considered to be potentially invasive. The trade representatives questioned why retailers should be told not to sell plants, such as Water hyacinth, that are only potentially invasive where there is no evidence to show they are actually invasive. Clearly, retailers need to be convinced that the INNS strategy of tackling the problem by preventing potentially invasive species from establishing a foothold is the best approach.
9. A two-pronged campaign could be developed:
  - one targeting the public to raise awareness of the problem and suggest what the public can do to tackle it – including not buying certain species. Such a campaign will also impact on the trade and create an impetus to be seen as being responsible retailers
  - one targeting the trade to encourage them to 'do their bit' and be seen as 'responsible retailers'.

## 2 Introduction

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### 2.1 Background

1. Invasive non-native species, defined as ‘*species whose introduction and/or spread threaten biological diversity or have other unforeseen impacts*’<sup>1</sup>, are identified as one of the main causes of biodiversity loss, not just in this country but worldwide<sup>2</sup>. The Convention on Biological Diversity (CBD) sets out a framework for tackling this issue; contracting parties (which include the UK Government) have agreed to achieve significant reductions in the current rate of biodiversity loss by 2010 including those arising from the impact of invasive non-native species<sup>3</sup>.
2. The control of invasive non-native species is one aspect of the wider need to manage wildlife in the UK whether this is for conservation purposes, disease control, protection of livestock, crops, infrastructure or human health. This often entails culling/clearing although a variety of other methods have been used depending on the circumstances.
3. In England, responsibility for strategic policy for wildlife management and non-native species lies with Defra. Following a review in 2003 (see Footnote 2), and the establishment of the Non-Native Species Secretariat, a strategy for tackling invasive non-native species was published in 2008 (see Footnote 1).
4. Defra believes that public engagement with the issues is key to the successful implementation of the strategy:

*“Improved awareness and understanding of the issues surrounding invasive non-native species is key to wider support for the relevant policies and programmes, and for engaging the public in decision-making. The public could play several roles, including modifying behaviours to help reduce the likelihood of introducing invasive non-native*

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<sup>1</sup> The Invasive Non-Native Species Framework Strategy for Great Britain, 2008 produced by Defra, and the Welsh Assembly and Scottish Governments.

<sup>2</sup> Review of non-native species policy, Defra, 2003

<sup>3</sup> Cited by the GB Non-Native Species Secretariat, [http://www.nonnativespecies.org/05\\_Policy\\_and\\_strategy.cfm](http://www.nonnativespecies.org/05_Policy_and_strategy.cfm)

*species or the risk of facilitating their spread, and assisting with their detection and monitoring.”*

5. To this end, the framework strategy notes that the collection of baseline information is a key first step against which to measure future changes in attitude and perception. Creative Research was commissioned to carry out a programme of market research to provide this baseline data.

## 2.2 Aims and Objectives

1. The overall aim of the research is to assist Defra to assess levels of awareness of, and attitudes and behaviour towards, wildlife management in general and invasive non-native species in particular. It should achieve the following outcome: to provide an objective assessment of the general public's awareness of, and attitudes towards wildlife management and non-native species that can be used to inform Defra policy and to inform and underpin its media and communications strategy.
2. The research objectives, as set out in the brief, were to establish:
  1. The level of understanding of the terms a) 'wildlife management', and b) 'invasive non-native species'
    - a. on an unprompted basis
    - b. the extent to which explanations of the terms are required and how best to describe the terms in order to enhance understanding at a broad level
  2. Awareness of levels of the Government undertaking any activity in these areas, and what kinds of activity they think take place
  3. Why they think the wildlife management and invasive non-native species activities take place (unprompted)
  4. Who they think is responsible for wildlife management and invasive non-native species activities, and who carries out management work
  5. What they believe are the consequences of no action being taken in terms of management/control of wildlife/invasive non-native species
  6. What kind of methods they think are used to manage/control wildlife and invasive non-native species
  7. Views and awareness of the species involved
  8. How acceptable they find the methods of management/control and why they feel this way about the various methods

9. How attitudes and thought processes shift once respondents have a more informed understanding of what, why and how wildlife/ invasive non-native species are managed/controlled
  10. What “trade offs”, if any, are the general public willing to accept once more informed on the issues e.g. is culling more acceptable when they understand the impact of not culling?
  11. The level of awareness of specific invasive non-native species and issues associated with them, and how attitudes towards control vary across the species in terms of acceptability and willingness to consider modifying behaviours to help reduce the risks that species pose.
3. In addition to the wider general public, the brief identified a number of additional audiences including anglers, gardeners, owners of exotic pets, and the garden and pet trades<sup>4</sup>. These audiences (amongst others) are associated with pathways of introduction and spread of non-native species. The brief sets out three further research objectives among these audiences:
12. How do these audiences view invasive non-native species e.g. are they an interesting addition to their local park, pond etc?
  13. The extent to which these audiences move species about/release them and if so, why?
  14. To determine if there is anything the Government can do to reduce the unwanted behaviour (e.g. provide specialist facilities for safe removal/disposal of unwanted pets for instance or specialist composting for invasive plants etc.).
4. The findings of the research are reported in Volume 1 of this report. The Appendices are provided in Volume 2.

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<sup>4</sup> During the course of the research, it was decided to drop the Pet Trade as a research audience. This was done in order that a more robust sample of the garden trade could be interviewed.

# 3 The General Public

## 3.1 Introduction

1. The research among the general public was conducted in two stages: an initial qualitative stage followed by quantitative research.

## 3.2 The Qualitative Stage: Objectives, Method and Sample

1. The objectives of this stage of the research with the general public were:
  - to explore
    - understanding of the concepts of ‘wildlife management’ and ‘INNS’
    - awareness of, reactions to, and levels of support for, the reasons for managing wildlife and the methods of control
    - awareness of, reactions to, and levels of support for, the impacts of INNS and the steps required to tackle these
  - to use the qualitative findings to steer the quantitative research.

**Table 1: General Public Sample Structure (Qualitative)**

|           |                          | Gender           |                  |
|-----------|--------------------------|------------------|------------------|
|           |                          | Male             | female           |
| Lifestage | Dependent young people   | ABC1<br>Rural    | C2DE<br>Urban    |
|           | Independent young adults | C2DE<br>Urban    | ABC1<br>Suburban |
|           | Families                 | C2DE<br>Suburban | ABC1<br>Rural    |
|           | Empty Nesters            | ABC1<br>Rural    | C2DE<br>Urban    |
|           | Retired                  | ABC1<br>Suburban | C2DE<br>Rural    |

2. We conducted ten extended workshops, each lasting 3 hours, with members of the public structured by gender, lifestyle, SEG and location, during September 2008. Details of the recruitment questionnaire, the discussion guide and the stimulus materials are provided in the appendix. The sample is illustrated in Table 1.

### 3.3 The Quantitative Stage: Objectives, Method and Sample

1. The objectives of the quantitative research were as follows:

- to assess levels of awareness of terms Wildlife Management, Native, Non-native and Alien Species, Invasive Non-Native and Invasive Alien Species
- to assess levels of understanding of the meaning of terms Wildlife Management, Non-Native and Invasive Non-Native Species
- to report on levels of awareness of INNS
- to gauge levels of support for, and attitudes towards WM and support for controlling INNS
- to measure the perceived threat of INNS relative to other threats to biodiversity
- among Pet owners
  - to determine what proportion of households own a pet/companion animal and the types of companion animals owned, including companion animals that have the potential to be invasive
  - to investigate whether Pet owners and non-Pet owners have different opinions in relation to WM and INNS
- among Gardeners and Pond owners
  - to identify sources of plants and information/advice about plants and methods used to dispose of unwanted plants
  - to investigate whether garden and pond owners have different opinions in relation to WM and INNS.

2. A survey based on in-home, face-to-face interviews with 600 members of the general public in England was completed during November and December 2008. A quota sample was drawn based on quotas for demographics (gender, age, SEG), Government Office Region and urban and rural locations (based on Defra definitions – see appendix for details). Certain parts of the sample were over-sampled to ensure we had sufficient base sizes and the sample was weighted during the analysis to ensure it was representative of the English general public on these five variables. All bases quoted in this report are the weighted bases. Further details of the sample and the sampling procedures are provided in the appendix.
3. A number of sub-groups were identified and explored in the analysis of the data. These are outlined below:
  - **demographics:** gender, age and SEG (see Table 2) and ‘families’ defined as respondents who had dependent children aged 16 and under; they account for 30% of the sample. We found a relatively small number of significant differences by demographic groups
  - **region:** the numbers of respondents living in each GOR is also summarised in Table 2. The bases for the individual GORs were too small to allow meaningful comparisons; instead we grouped them into North (NE, NW and Y&H), Midlands (E Mids, W Mids, E of E) and South (SE, SW, London). The resulting split was 29% North, 30% Midlands and 41% South. We detect a significant regional difference on just one measure which indicates that the general public’s awareness, attitudes and perceptions are broadly the same across the whole of England
  - **urban vs. rural location:** the split between those respondents living in urban and rural locations based on the Defra definitions is also provided in Table 2. We recorded a number of statistically significant differences between people living in urban and rural locations; broadly speaking, those people from rural locations were more favourably predisposed towards wildlife management and the control of INNS.
  - In addition to classifying each location as either urban or rural following the Defra definitions, respondents were also asked to self-classify their location as urban,



rural or semi-urban/rural. Their classification and how it relates to Defra's, is shown in Table 3. Six out of every ten respondents (63%) classified their location according to the Defra definition. Only 6% of respondents disagreed with the Defra definition – either describing their location as rural when the Defra definition was urban or *vice versa*. 29% of respondents described their location as semi-urban/rural.

**Table 2: General Public Sample Demographics**

(Base: General Public total weighted sample, n=600)

| Base                    |            | 600 |
|-------------------------|------------|-----|
| <b>Gender</b>           |            |     |
| male                    | 288<br>48% |     |
| female                  | 312<br>52% |     |
| <b>Respondent's Age</b> |            |     |
| 16-24                   | 82<br>14%  |     |
| 25-34                   | 111<br>18% |     |
| 35-44                   | 110<br>18% |     |
| 45-54                   | 88<br>15%  |     |
| 55-64                   | 90<br>15%  |     |
| 65 and above            | 119<br>20% |     |
| <b>SEG</b>              |            |     |
| ABC1                    | 303<br>50% |     |
| C2DE                    | 297<br>50% |     |

| Base            |            | 600 |
|-----------------|------------|-----|
| <b>GOR</b>      |            |     |
| East of England | 66<br>11%  |     |
| East Mids       | 51<br>9%   |     |
| London          | 88<br>15%  |     |
| North East      | 31<br>5%   |     |
| North West      | 82<br>14%  |     |
| South East      | 98<br>16%  |     |
| South West      | 61<br>10%  |     |
| West Mids       | 64<br>11%  |     |
| York & Humber   | 60<br>10%  |     |
| <b>Location</b> |            |     |
| urban           | 481<br>80% |     |
| rural           | 119<br>20% |     |

**Table 3: Respondent Self Classification of Location by Defra Definitions**

(Base: General Public total weighted sample, n=600)

|   | Base               | Location           |                   |
|---|--------------------|--------------------|-------------------|
|   |                    | urban              | rural             |
| <b>Base</b>   | <b>600</b>         | <b>481</b>         | <b>119</b>        |
| <b>Would you say that the location where you live is...</b> |                    |                    |                   |
| <b>Urban</b>  | <b>321<br/>53%</b> | <b>316<br/>66%</b> | <b>5<br/>4%</b>   |
| <b>Semi urban/semi-rural</b>                                | <b>176<br/>29%</b> | <b>123<br/>26%</b> | <b>53<br/>44%</b> |
| <b>Rural</b>  | <b>93<br/>16%</b>  | <b>32<br/>7%</b>   | <b>61<br/>51%</b> |
| <b>Don't Know</b>   | <b>10<br/>2%</b>   | <b>10<br/>2%</b>   | <b>-<br/>-</b>    |

4. Additional breakdown groups used in the analysis included:

- **Pet/companion animal owners** (n=314) vs. **non-owners** (n=286)
- **'Gardeners'** – those with a garden who are responsible for deciding what plants they buy and grow (n=416) vs. **non-gardeners** – either do not have a garden or are not responsible for what is grown in it (n=184)
- **Pond owners** – those with a pond containing animals and/or plants (n=91) vs. **non-owners** – either do not have a pond or it does not contain animals or plants (e.g. a water feature) (n=509)
- Those demonstrating **above average support for wildlife management** (n=320) vs. those demonstrating **below average support** (n=280)
- Those with **above average positive attitudes towards wildlife management** (n=379) vs. those with **below average attitudes** (n=221)
- Those who were **familiar with the concept of INNS** (n=240) vs. those who were not (n=360)
- Those demonstrating **above average support for controlling INNS** (n=316) vs. those with **below average support** (n=286)

- Those with an **above average perception of the threat of INNS** (n=267) vs. those with a **below average perception** (n=333).
5. Sub-group comparisons were carried out using the Chi-square test; any sub-group differences included in this report were significant at the 95% confidence level.

## 4 Wildlife Management: The Public Perspective

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### 4.1 Awareness and Understanding of the Concept

1. Just over a third (37%) of the public in our survey said they had come across the term 'wildlife management' before. Familiarity with the term was significantly higher among men compared to women (44% vs. 32%), older respondents (43% among those aged 45 and above vs. 35% among those aged between 25 and 44 and just 23% among those aged between 16 and 24) and those from SEGs ABC1 (45% vs. 30% for C2DE)<sup>5</sup>. There was no difference between those living in urban and rural locations.
2. Respondents in the focus groups were asked for their associations to the term. A number of themes emerged from this. The most frequently mentioned themes (those that were mentioned in most sessions) were:
  - examples of **wildlife** and terms that are synonymous or similar in meaning such as 'nature', 'species', 'livestock', 'indigenous species', 'badgers', 'bees'
  - references to **conservation, preservation and protection** including 'managing', 'looking after', 'caring for', 'maintaining', 'controlling'; in particular, there were references to protecting **endangered species**, for example, through breeding programmes or schemes to re-introduce species such as the red kite
  - references to **animal welfare** such as 'looking after the health of animals', 'helping injured animals back to health', 'not harming or ill-treating animals', 'making wildlife happy'
  - as well as referring to individual species, there was a recognition that wildlife management might also relate to **habitats** such as woodlands, wetlands, marshes, meadows and hedgerows
  - there was some recognition of **organisations and individuals** that might be involved with wildlife management. Some of the organisations mentioned included the Woodland Trust, the Forestry Commission, the Environment

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<sup>5</sup> SEG correlates with educational attainment which may account for this difference; difference in media exposure may also play a part.

Agency, central and local government, and the RSPCA and other animal rescue organisations. Types of individuals included game keepers, farmers, rangers and zoo keepers

- there was also a recognition that the term might refer to methods of control that involve **killing/culling** for example to control population sizes (e.g. rabbits), for pest control (e.g. rats) or for disease management (e.g. badgers and TB). Hunting was also mentioned (e.g. fox hunting, hare coursing).

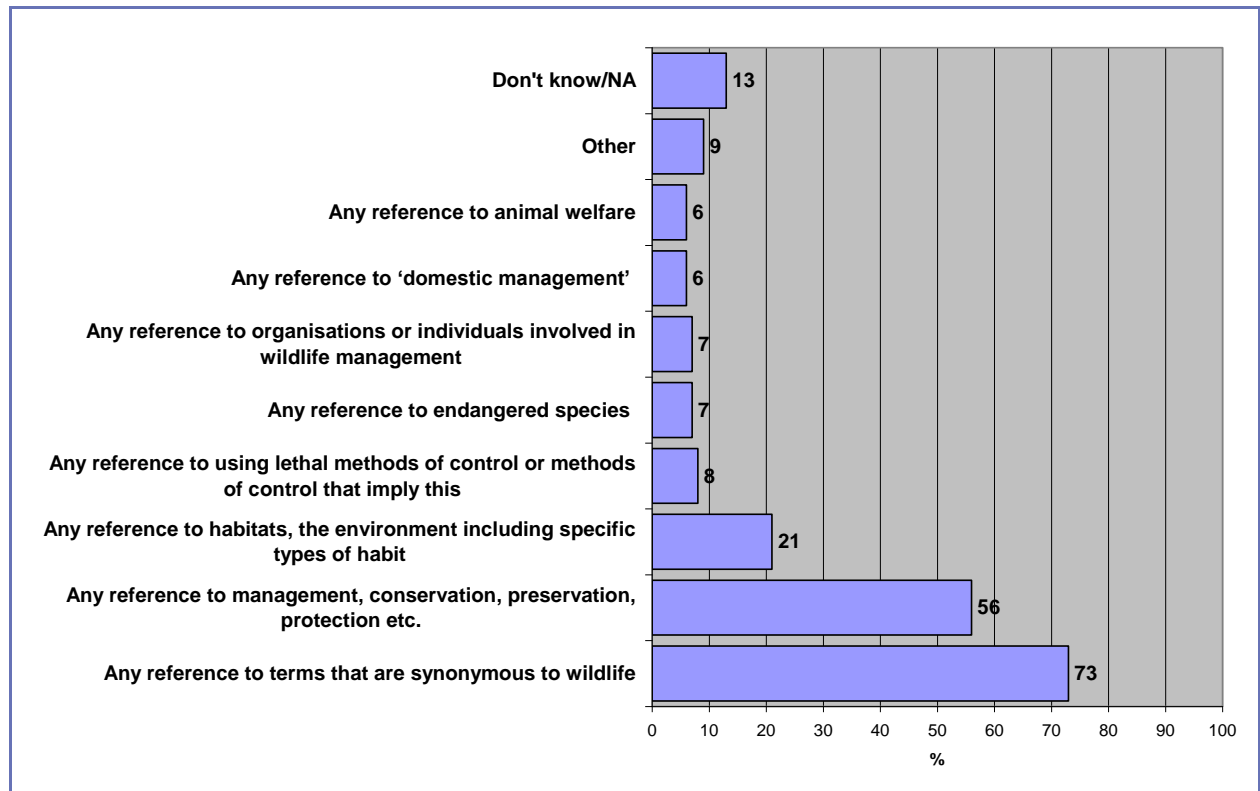
3. A number of other themes were mentioned less often:

- wildlife management might be carried out for reasons relating to **leisure and recreation**; examples here included bird watching and fishing, as well as to enable humans to enjoy the countryside (for example, by being able to go on walks)
- there was some recognition that wildlife management might imply that researchers are **carrying out research and/or monitoring wildlife**; this might relate to the identification of species, recording the numbers of different species and, more generally, keeping track of wildlife and what is happening
- for some respondents the term conjured up **designated places where wildlife is kept** and looked after. These could include national parks, protected areas and conservation areas. Some imagined the term referred to taking steps to keep animals in their natural environment while others saw it as being more about keeping exotic animals in a controlled environment, such as a zoo
- **non-lethal methods of control** were occasionally referred to such as the introduction of crossings over or under busy roads, using road signs to alert drivers to dangers and to reduce road traffic accidents, shelters for hedgehogs and old logs to provide shelter for newts and insects
- forms of **domestic management** were also occasionally mentioned, such as using bird tables to attract and feed birds and creating wildlife friendly areas in the garden

- the idea that there might be **rules and regulations** about who can do what was mentioned in a couple of the groups; for example, one respondent in a rural location was aware that there were restrictions on hedge cutting at certain times of the year to protect nesting birds
  - wildlife management may include an **educational role** to inform people about wildlife and the impact people have on wildlife; some felt this might include attempts to change our lifestyles to reduce our impact on wildlife
  - references to **invasive non-native species** were made in just three sessions largely in relation to red and grey squirrels and the need to protect indigenous species.
4. It can be seen that the term can give rise to a broad range of associations which mainly focus on 'positive' aspects, such as conservation and welfare, with less emphasis on methods of control. The richness of associations outlined above reflects the fact that, in a group context, respondents have the opportunity to discuss their ideas and to be prompted by what other people are saying. As part of the survey, all respondents were asked to describe what they understood by the term wildlife management (including those who were not familiar with the term). This provides an indication of the more top-of-mind associations that the public has when thinking about the term without the benefit of an in-depth discussion. Their answers were categorised into the various themes that emerged from the qualitative sessions. This revealed that most definitions were based on just two of the above themes: references to wildlife, or terms that are broadly synonymous, and references to the idea of management, conservation and protection. The most frequently mentioned themes are summarised in Figure 1. Verbatim examples of the main themes are provided below Figure 1.

# Figure 1: 'What do you think is meant by the term 'wildlife management'? Main Themes Mentioned by Respondents

(Base: General Public total sample, n=600)



## any reference to terms that are synonymous to wildlife

Maintaining **biodiversity**  
 Managing **plants and animals** in the wild

Look after the **wildlife** and everything it needs  
 Looking after the **countryside** and **plants** and **birds** and **trees** and **butterflies**

## any reference to management, conservation, preservation, protection, etc

**Caring** for where creatures are going and where they live  
**Protecting** wildlife species

**Managing** the wildlife in nature so that there aren't too many of anything  
 It's **looking after** wildlife, appreciating it

any reference to habitats, the environment including specific types of habitat

I should think generally looking after **hedgerows** and **forest** management

Looking after the **environment**

Checking that the **woodlands** are not overgrown and the footpaths are clear

The way they manage **marshes** and **wetlands** and the wildlife that revolves around the wetlands

any reference to using lethal methods of control or methods of control that imply this

People managing wildlife – like **culling badgers**

**Fox hunting**

The **culling** of dangerous plants and destructive animals

Managing wildlife by **killing off excess species**

any reference to endangered species

Looking after **rare** plants and wild animals

To maintain the wellbeing of the natural habitat of our wildlife and conserve **endangered species**

To manage and make sure wildlife is kept safe – to keep **endangered species**

Protecting animals, making sure species **don't become extinct**

any reference to organisations or individuals involved in wildlife management

**People who manage the wildlife** and treat them if they're sick

I think its something to do with **beck wardens** – they're trying to clean up the becks, overgrowth

It sounds like the **RSPC** (sic) sort of thing

I know **Devon Wildlife Trust**, that's all



any reference to domestic management

Letting your **garden be a wildlife haven** so wildlife will flourish

What we all try to do – **logs in the garden for bugs, leaving plants to get seeds**

Trying to encourage wildlife into an urban area – **bringing wildlife into the garden**

**What food you put out for the birds**, to attract the right sort of birds

any reference to animal welfare

**Feeding** wildlife

Management of wildlife, keeping people in order who have wildlife, **ensuring that they are not mistreated**

Looking after the animals, foxes and things like that **making sure they are not killed; making sure there are no traps or anything to get caught in**

Make sure you **don't put the wildlife at risk**

## 4.2 Wildlife Management: A Definition

1. A possible definition of Wildlife Management was discussed in the qualitative research:

*Wildlife Management involves the management of the impacts of wildlife on human interests and vice versa.*

2. It was acknowledged that it is difficult to define a broad concept in a single sentence but most felt this summed it up reasonably well. The term 'wildlife' was seen as covering animals and plants although some respondents tended to focus mainly on animals until they were prompted. It was considered to exclude pets and livestock but it was not always clear if it excludes wild animals kept in zoos.
3. There was some debate about the definition focusing on managing 'impacts' rather than managing the wildlife itself, and some interpreted this as implying wildlife management is mainly about managing the negative impacts. Similarly, although the meaning of 'vice versa' was understood, it can be interpreted as giving more weight to managing the impact of wildlife on humans and playing down the impact of humans on wildlife.
4. Following on from the qualitative research, we recommended adapting the definition so that it reads as follows and this definition was used in the subsequent quantitative research:

*Wildlife Management: managing the impacts of humans on wild plants and animals as well as the impacts of wildlife on human interests.*

### 4.3 Why, How and Who?

1. During the focus groups we explored with the public their perceptions of the reasons why wildlife management might be necessary, the methods they thought would be used and who would be involved in it. These issues were explored on an unprompted basis first and then respondents were given a short presentation covering these topics and their reactions were explored.

#### 4.3.1 Why is it necessary to manage wildlife?

1. Respondents often struggled to provide concrete examples of wildlife management based on their own experience; instead, they tended to offer generalised reasons (such as pest control or protection of crops) and methods (such as fox hunting or population culls). This was most marked among some of the younger participants whose examples included zoos, dog homes, nature reserves and feeding birds; this may reflect their more limited exposure to (and, possibly interest in) wildlife. Conversely, older respondents living in more rural areas were more likely to be able to describe real examples based on personal experience such as a farmer who burns the bracken in her wood each year to encourage a greater diversity of wild plants and flowers or respondents who had experienced problems in the gardens caused by deer, rabbits or badgers.
2. Despite this, respondents could describe a range of reasons why they thought wildlife management might be necessary and some of the methods that might be used. The reasons for managing wildlife presented to respondents are summarised in Figure 2. All of these were mentioned spontaneously by some participants in some workshops, however, conservation and protection of public health and safety were mentioned most frequently. The public response also tended to be couched in terms of needs (e.g. the need to control pests or the need to keep populations under control) rather than the impacts of pests or over-population. In line with their associations to the concept, the public also offered a wider range of reasons for managing wildlife compared to those set out in Figure 2, for example:
  - to protect endangered species

- to control the impact of humans on wildlife
- to protect food chains
- for leisure/recreation/human enjoyment
- to ensure wildlife welfare
- to protect habitats
- for the sake of future generations.

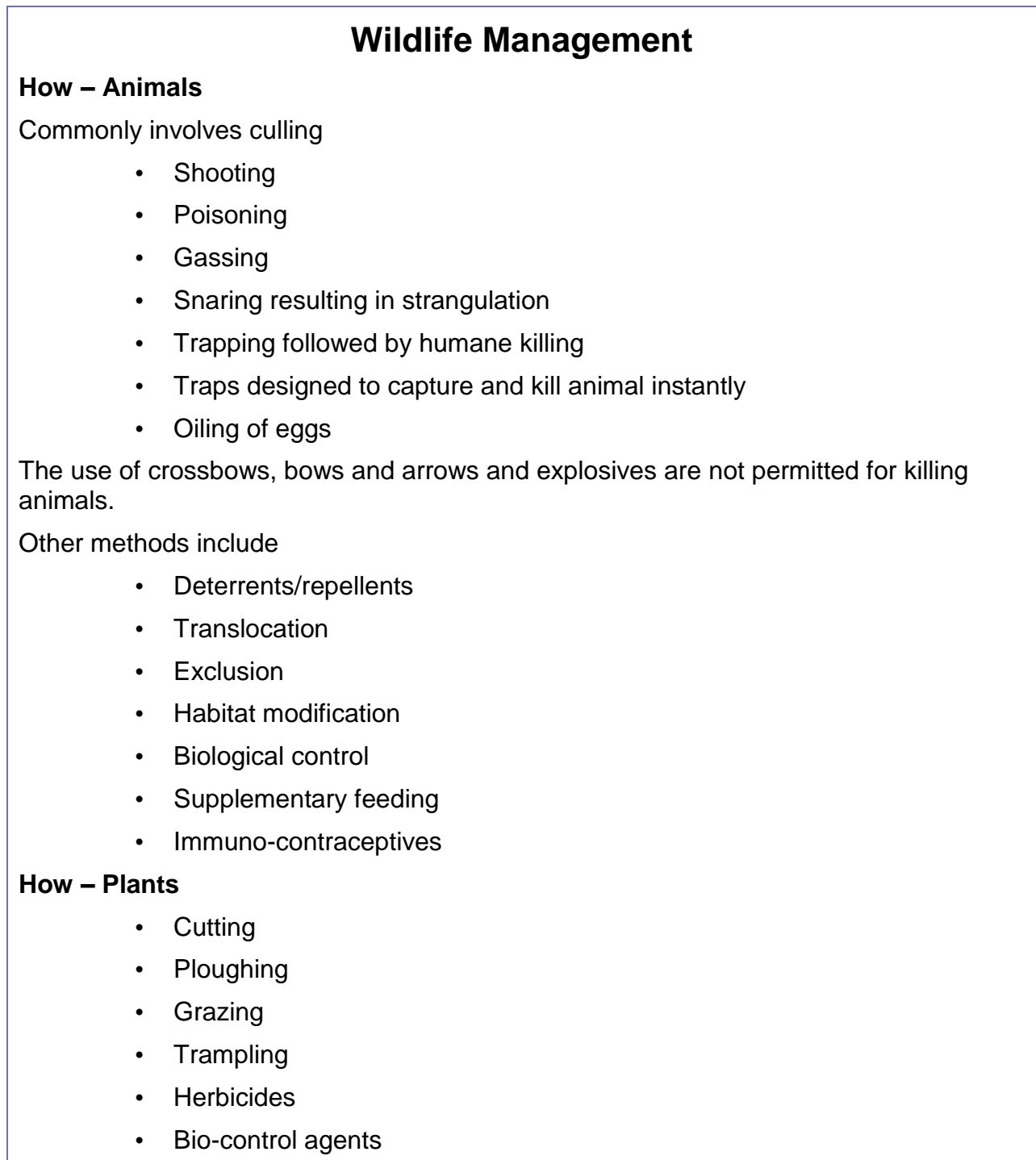
**Figure 2: Reasons for Managing Wildlife**



#### 4.3.2 What methods are used to manage wildlife?

1. The main methods used to manage wildlife presented to respondents are set out in Figure 3. Most of the methods used to manage animals were mentioned by at least one respondent in one or more of the workshops, with a few exceptions. These were snaring, which many participants considered to be both cruel and illegal, oiling eggs (most had not heard of this before), deterrents and repellents, and supplementary feeding.

**Figure 3: Methods of Wildlife Management**



2. Once again, in their unprompted discussions, participants made very few references to methods of controlling plants; they also described a number of additional methods of management including:

- animal welfare (e.g. feeding, helping injured animals)

- selective breeding as a method of conservation
  - sustainable practices (e.g. replanting trees that had been cut down, green belts, restrictions on developments, set aside, stewardship schemes)
  - maintaining and protecting habitats
  - managing human impacts (e.g. restrictions on what can be done, fishing quotas to conserve stocks, educating the public about their impact on wildlife and how to minimise it)
  - conferring protected status (either to individual species or habitats).
3. Some participants also included commercial and leisure activities/practices such as forestry, fisheries/fishing, and hunting as forms of management.
  4. A comparison of the public's perceptions of why and how wildlife is managed with the information subsequently presented to them, suggests that the public conceptualise wildlife management more broadly and, in particular, they place greater weight on managing the impacts of humans on wildlife. It was also noticeable that they focused almost exclusively on animals; plants were rarely mentioned without prompting.

#### 4.3.3 Who is responsible for managing wildlife?

1. Interestingly, when asked who they thought was responsible for wildlife management most participants in the workshops felt that 'we' (the public) are all responsible even though it was not clear to them what form their responsibility might take. When prompted in terms of the types of organisations and people who might have specific responsibilities, most of the key players were mentioned. The three most frequently mentioned bodies were central and local government and various lobby and/or special interest groups.
2. Central government was seen as being responsible for determining policy and defining the rules and regulations. Interestingly, Defra was only mentioned by name in two of the workshops.

3. Local government was perceived as implementing the rules and regulations. This was because it was seen to employ people such as wardens and rangers and was considered to be responsible for planning rules and pest control at the local level.
4. A number of lobby/Interest groups were mentioned including the National Trust and English Heritage (owners of large tracts of land), animal welfare organisations such as RSPCA, RSPB and WWF, local wildlife trusts, environmental lobby groups, such as Greenpeace, and representative bodies such as the NFU.
5. Government agencies and other bodies, landowners and property developers were mentioned less frequently. A number of government agencies and other bodies were mentioned by name although respondents did not always have a clear understanding of what their role might be, if any. Examples included the Environment Agency, the Soil Association, the Forestry Commission and Environmental Health.
6. There was some awareness that landowners have responsibility for managing wildlife on their land although respondents were less clear as to the extent their behaviour might be regulated. Property developers were perceived as having little or no interest in wildlife management and were seen as only taking steps where they are legally obliged to do so.
7. Interestingly, private pest controllers were never mentioned, probably because there was an expectation that this came under the umbrella of local authorities. Scientists and researchers were also never mentioned spontaneously. On prompting about their possible role, participants had mixed views. They were variously associated with animal experimentation, disease monitoring and developing methods of control.

#### 4.4 Support for, and Attitudes towards, Managing Wildlife

1. In the workshops, we tracked the extent to which participants were willing to support efforts to manage and control wildlife. This revealed that at the start of the workshops 87% of our sample (n=76) thought wildlife management is an important issue. At the end of the sessions, 89% supported efforts to manage and control wildlife, although over half the sample expressed some reservations (these are explored in detail in Section 6). During the workshops, we were able to explore in some depth the extent to which the public might support a range of specific examples of wildlife management.

From this, we were able to distil some general principles of management and control that the public felt should be followed. We report on this in a later section (see Section 7).

2. In the quantitative research, we examined the extent to which the public might support the broad principle of wildlife management in more detail, along with their attitude towards wildlife management. This was done by asking them the extent to which they agreed or disagreed with a number of reasons for, and opinions about, managing wildlife.

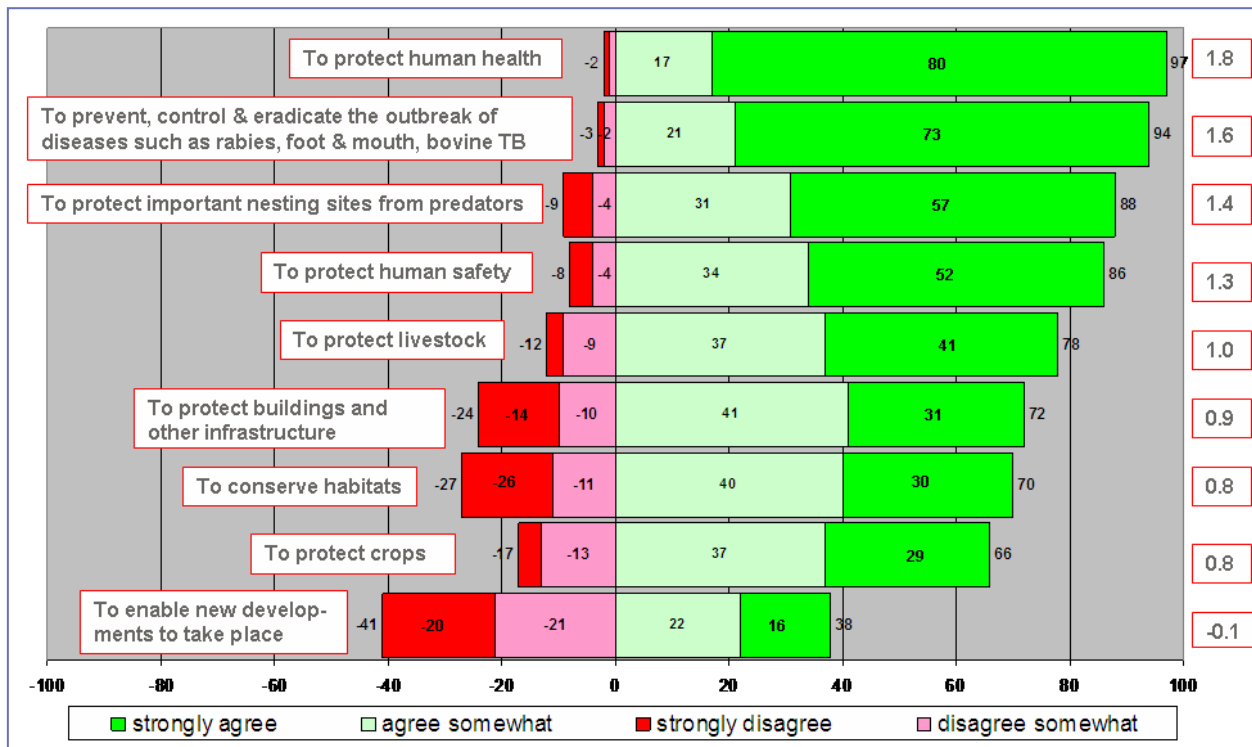
#### 4.4.1 Support for managing wildlife

1. The nine reasons given for managing wildlife in the quantitative survey were as follows:
  - to prevent, control and eradicate the outbreak of diseases such as rabies and foot and mouth
  - to protect livestock e.g. from foxes
  - to protect crops e.g. from birds
  - to protect buildings and other infrastructure e.g. closing rabbit burrows that are undermining foundations
  - to conserve habitats e.g. controlling deer that are causing damage to woodland
  - to protect important nesting sites from predators
  - to protect human health e.g. controlling rats and mice
  - to protect human safety e.g. to reduce the chances of road traffic accidents
  - to enable new developments (roads, factories, housing, etc.) to take place.
2. For each statement, respondents could choose one of the following options:
  - strongly agree (+2)
  - agree somewhat (+1)
  - neither agree nor disagree/DK (0)
  - disagree somewhat (-1)
  - strongly disagree (-2).

3. Each option was assigned a score (shown in brackets) and an average score was computed (shown to the right of the bars in the graph). The results are summarised in Figure 4. The proportion of respondents neither agreeing nor disagreeing is not shown in the graph but can be inferred from the other values. For example, 97% agreed either strongly (80%) or somewhat (17%) with the need to manage wildlife to protect human health, 2% disagreed either strongly or somewhat. This leaves 1% who neither agreed nor disagreed. The average score for this reason was 1.8 out of 2.

**Figure 4: Extent of Agreement/Disagreement with Different Reasons for Managing Wildlife**

(Base: General Public total sample, n=600)



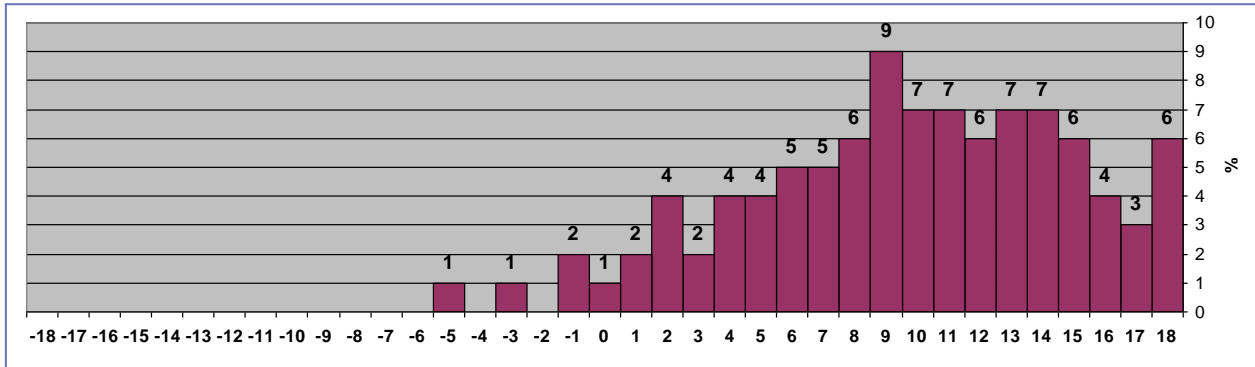
4. The graph reveals broad support for managing wildlife. The majority of the public strongly agreed with managing wildlife on the grounds of human health and safety, in response to the threat of various diseases and to protect important nesting sites. A majority either strongly agreed or agreed somewhat with the need to manage wildlife to protect livestock, crops, habitats and infrastructure. Indeed, the only reason for wildlife management that was not agreed with, at least to some extent, by a majority of respondents, was when it was done in order to enable new developments to take place. Even here however the proportion of the public agreeing to some extent with this reason (38%) was nearly as large as the proportion disagreeing (41%) with a further one in five (21%) undecided.



5. In order to explore further the range of views, we calculated for each respondent a single overall support score by summing their scores across the nine reasons. These scores could therefore range from +18 (strong agreement with all reasons for managing wildlife) to -18 (strong disagreement with all reasons). The resulting distribution of scores is given in Figure 5.

**Figure 5: Distribution of Overall Support for Managing Wildlife**

(Base: General Public total sample, n=600)



6. 95% of our sample had a positive score and the mean was 9.5, confirming that there was broad support for managing wildlife.

7. We divided our sample into two roughly equal groups:

- those with an above average score who we have labelled as *Favourably Disposed* (53% of the sample)
- and those with a below average score who we refer to as *Less Favourably Disposed* (47% of the sample).

8. There was very little to choose between these two groups in terms of their level of support for managing wildlife on the grounds of human health and safety or for disease control. However, while a majority of the Favourably Disposed agreed at least somewhat with all nine reasons for managing wildlife, those who were Less Favourably Disposed were less supportive. The position is summarised in Table 4 which shows the percentage of each group who agreed strongly/somewhat with each reason. The right hand column shows the difference between the two groups.

**Table 4: Levels of Agreement with Reasons for Wildlife Management for those who are *Favourably* and *Less Favourably Disposed***

(Base: Favourably Disposed, n=320; Less Favourably Disposed, n=280)

| % who agree somewhat/strongly                              | Favourably Disposed | Less Favourably Disposed | Difference |
|--|---------------------|--------------------------|------------|
| To enable new developments to take place                   | 60%                 | 12%                      | +48%       |
| To protect crops   | 88%                 | 41%                      | +47%       |
| To conserve habitats                                       | 91%                 | 45%                      | +46%       |
| To protect buildings and other infrastructure              | 92%                 | 49%                      | +43%       |
| To protect livestock                                       | 94%                 | 58%                      | +36%       |
| To protect important nesting sites from predators          | 96%                 | 76%                      | +20%       |
| To protect human safety                                    | 90%                 | 78%                      | +12%       |
| To prevent, control and eradicate the outbreak of diseases | 99%                 | 89%                      | +10%       |
| To protect human health                                    | 100%                | 93%                      | +7%        |

9. There were a number of statistically significant differences between the two groups. Members of the public who were Favourably Disposed towards wildlife management were more likely to live in rural locations; in contrast, the Less Favourably Disposed were more likely to live in urban locations (see Table 5). Owners of ponds containing animals and/or plants were more likely to be found among the Less Favourably Disposed (see Table 6).

**Table 5: Location by Overall Support for Managing Wildlife**

(Base: General Public total sample, n=600)

|                          | Base       | Location   |            |
|--------------------------|------------|------------|------------|
|                          |            | urban      | rural      |
| <b>Base</b>              | <b>600</b> | <b>481</b> | <b>119</b> |
| <b>Support for WM</b>    |            |            |            |
| Favourably Disposed      | 320<br>53% | 243<br>50% | 77<br>65%  |
| Less Favourably Disposed | 280<br>47% | 239<br>50% | 42<br>35%  |

**Table 6: Pond Ownership by Overall Support for Managing Wildlife**

(Base: General Public total sample, n=600)

|                          | Base       | Has pond with plants/animals |            |
|--------------------------|------------|------------------------------|------------|
|                          |            | Yes                          | No         |
| <b>Base</b>              | <b>600</b> | <b>91</b>                    | <b>509</b> |
| <b>Support for WM</b>    |            |                              |            |
| Favourably Disposed      | 320<br>53% | 35<br>39%                    | 284<br>56% |
| Less Favourably Disposed | 280<br>47% | 56<br>61%                    | 225<br>44% |

#### 4.4.2 Attitudes towards wildlife management

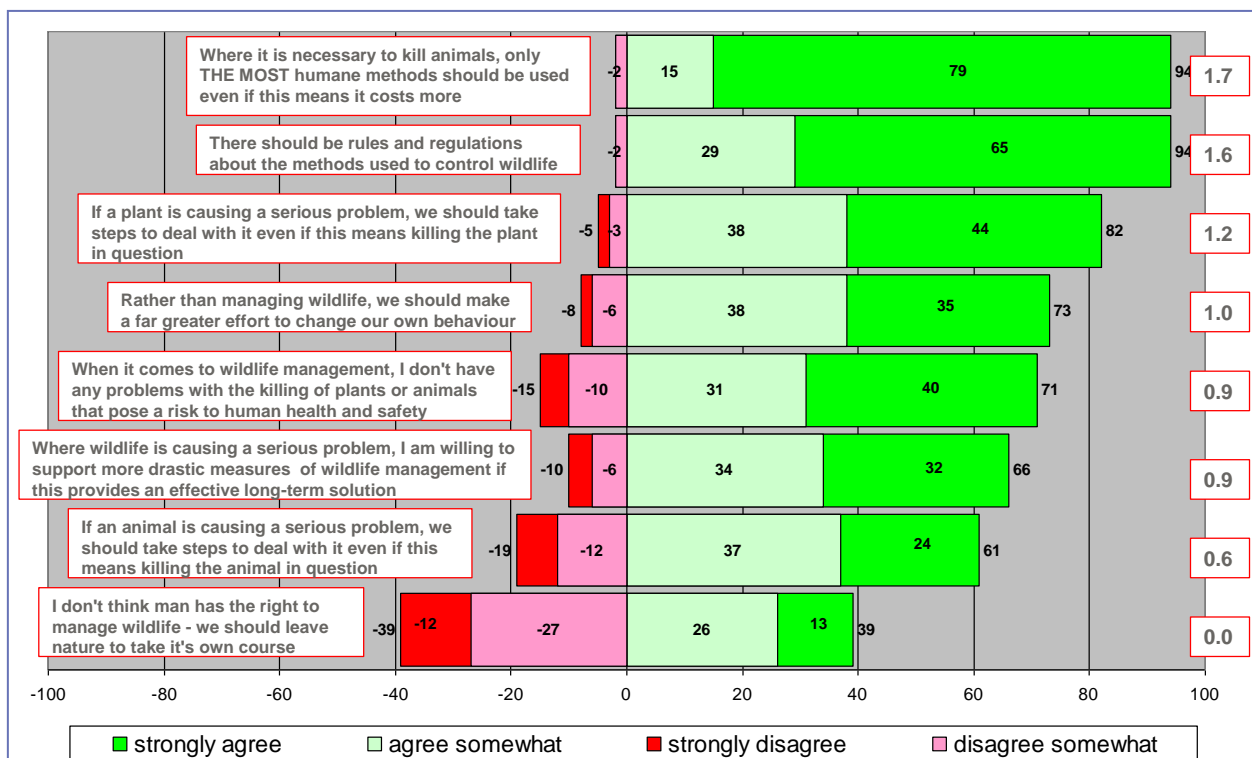
1. Respondents in the quantitative survey were invited to agree or disagree with eight attitude statements about wildlife management using the same five-point scale as before. The eight statements were:
  - there should be rules and regulations about the methods used to control wildlife
  - where it is necessary to kill animals, only THE MOST humane methods should be used even if this means it costs more
  - where wildlife is causing a serious problem, I am willing to support more drastic measures of wildlife management if this provides an effective long-term solution

- rather than managing wildlife, we should make a far greater effort to change our own behaviour
- if a plant is causing a serious problem, we should take steps to deal with it even if this means killing the plant in question
- when it comes to wildlife management, I don't have any problems with the killing of plants or animals that pose a risk to human health and safety
- I don't think man has the right to manage wildlife - we should leave nature to take it's own course
- if an animal is causing a serious problem, we should take steps to deal with it even if this means killing the animal in question.

2. The results are set out in Figure 6.

**Figure 6: Extent of Agreement/Disagreement with Attitudes about Wildlife Management**

(Base: General Public total sample, n=600)



3. Three quarters of the public strongly agreed that only the most humane methods should be used where it is necessary to kill animals while two thirds strongly agreed that there should be rules and regulations in place about the methods used to control wildlife. Only

2% of the public disagreed with these views. With one exception, all other attitude statements were agreed with at least somewhat by a majority of the public. The exception was the statement about whether nature should be left to take its own course where the numbers agreeing and disagreeing with this statement were almost identical.

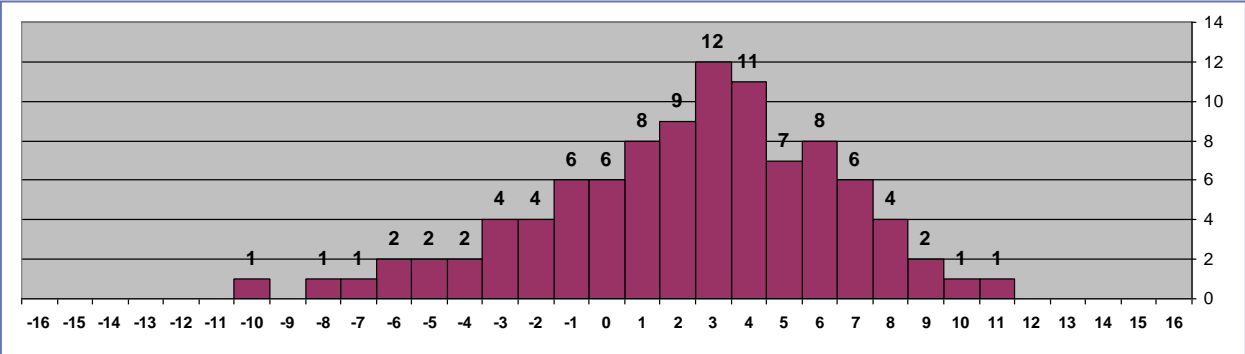
4. Once again, we computed a single overall attitude score for each respondent. Three of the statements could be said to be worded such that someone agreeing with them would be expressing a less favourable attitude or an attitude which implies that management should only be undertaken under certain conditions. The three statements in question are:

- there should be rules and regulations about the methods used to control wildlife
- where it is necessary to kill animals, only THE MOST humane methods should be used even if this means it costs more
- I don't think man has the right to manage wildlife - we should leave nature to take its own course.

5. For this reason, scores on these statements were reversed so that a positive score represents a favourable attitude towards wildlife management. These scores could range from +16 to -16. Seven out of every ten respondents (71%) had a positive score and the mean was 2.4. The distribution of the scores is shown in Figure 7.

**Figure 7: Distribution of Overall Attitude to Wildlife Management Scores**

(Base: General Public total sample, n=600)



6. As before, we divided the sample into two groups in order to explore where there were differences in attitudes:
- those who were *Favourably Disposed* towards wildlife management (63%; mean score = 4.9)
  - those who were *Less Favourably Disposed* (37%; means score = -2.0).
7. Table 7 indicates that all respondents agreed that humane methods should always be used and that there should be regulations governing which methods can be used to control wildlife.

**Table 7: Levels of Agreement with Attitudes towards Wildlife Management for those who are *Favourably* and *Less Favourably Disposed***

(Base: Favourably Disposed, n=379; Less Favourably Disposed, n=221)

| % who agree somewhat/strongly agree  | <i>Favourably Disposed</i> | <i>Less Favourably Disposed</i> | Difference |
|--|----------------------------|---------------------------------|------------|
| If an animal is causing a serious problem, we should take steps to deal with it even if this means killing the animal in question                                  | 84%                        | 22%                             | +62%       |
| When it comes to wildlife management, I don't have any problems with the killing of plants or animals that pose a risk to human health and safety                  | 91%                        | 36%                             | +55%       |
| Where wildlife is causing a serious problem, I am willing to support more drastic measures of wildlife management if this provides an effective long-term solution | 83%                        | 37%                             | +46%       |
| If a plant is causing a serious problem, we should take steps to deal with it even if this means killing the plant in question                                     | 93%                        | 62%                             | +31%       |
| There should be rules and regulations about the methods used to control wildlife   | 97%                        | 88%                             | +9%        |
| Where it is necessary to kill animals, only THE MOST humane methods should be used even if this means it costs more  | 95%                        | 96%                             | -1%        |
| I don't think man has the right to manage wildlife - we should leave nature to take it's own course  | 26%                        | 73%                             | -47%       |

8. Those who were Favourably Disposed were, almost without exception willing to support action where wildlife is causing a serious problem; in contrast, those who were Less Favourably Disposed were less likely to support such action especially when it involves killing animals. Moreover, these individuals were much more likely to feel that man does not have the right to manage wildlife and would prefer to see nature being left to take its own course.
9. Once again, respondents who were Favourably Disposed towards wildlife management in terms of their attitudes were more likely to be found in rural locations while those who were Less Favourably Disposed were more likely to live in urban locations (see Table 8). Attitudes always varied by gender and age with men and older people being more likely to be Favourably Disposed (see Table 9).

**Table 8: Location by Overall Attitude towards Managing Wildlife**

(Base: General Public total weighted sample, n=600)

|                          | Base       | Location   |           |
|--------------------------|------------|------------|-----------|
|                          |            | urban      | rural     |
| Base                     | 600        | 481        | 119       |
| <b>Attitude to WM</b>    |            |            |           |
| Favourably Disposed      | 379<br>63% | 291<br>60% | 88<br>74% |
| Less Favourably Disposed | 221<br>37% | 190<br>40% | 31<br>26% |

**Table 9: Gender and Age by Overall Attitude towards Managing Wildlife**

(Base: General Public total weighted sample, n=600)

|                          | Base       | Gender     |            | Age       |            |            |           |
|--------------------------|------------|------------|------------|-----------|------------|------------|-----------|
|                          |            | male       | female     | 16-24     | 25-44      | 45-64      | 65+       |
| Base                     | 600        | 288        | 312        | 82        | 220        | 179        | 119       |
| <b>Attitude to WM</b>    |            |            |            |           |            |            |           |
| Favourably Disposed      | 379<br>63% | 195<br>68% | 185<br>59% | 43<br>53% | 129<br>59% | 121<br>68% | 85<br>71% |
| Less Favourably Disposed | 221<br>37% | 93<br>32%  | 128<br>41% | 39<br>47% | 91<br>41%  | 57<br>32%  | 34<br>29% |

### 4.4.3 A possible segmentation

1. Combining each respondent's support for and attitude towards wildlife management provides us with a possible segmentation of the public in terms of their views regarding wildlife management. Table 10 shows the relationship between the two measures.

**Table 10: Relationship Between Support for and Attitudes towards Wildlife Management**

(Base: General Public total weighted sample, n=600; NB percentages sum to 101 due to rounding)

|  |                          | Overall Support for Managing Wildlife |                             |
|--|--------------------------|---------------------------------------|-----------------------------|
|  |                          | Favourably Disposed                   | Less Favourably disposed    |
| Overall Attitude towards Managing Wildlife | Favourably Disposed      | Favourably Disposed<br>42%            | Qualified Supporters<br>22% |
|  | Less Favourably disposed | Qualified Supporters<br>12%           | Undecided<br>25%            |

2. Four out of every ten respondents (42%) were favourably disposed to wildlife management both in the sense of agreeing with reasons why it might be necessary and in their attitude towards it. We have labelled this group Favourably Disposed. A quarter of our sample (25%) was less favourably disposed both in terms of supporting and in their attitude towards wildlife management. However, looking at their scores it is clear that these people are not necessarily opposed to wildlife management as they often adopted a neutral position (i.e. neither agreeing nor disagreeing with reasons for managing wildlife or with attitude statements). For this reason, we have called them Undecided. This leaves a further third of our sample (33%) who fell somewhere between the Favourably Disposed and the Undecided. These respondents tended to offer qualified support to wildlife management either in terms of why it might be necessary (22%) or in terms of their attitudes (12%) – more often than not, they would agree somewhat with the statements. For this reason, we have called them Qualified Supporters.
3. The fact that we did not find a group that were in total opposition to wildlife management is very promising. There should be scope for winning over both the Qualified Supporters

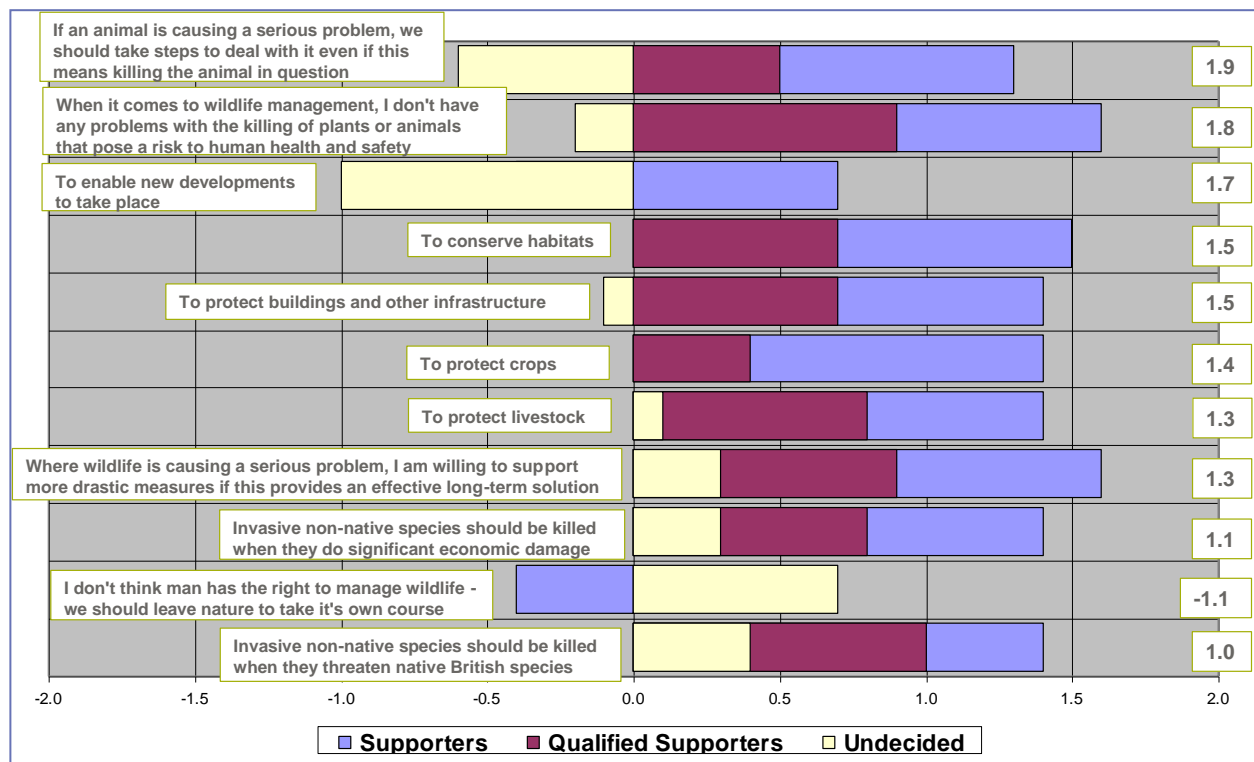


and the Undecided by explaining to them why wildlife management may be necessary provided the methods being proposed are perceived to be justified.

- We have compared the average scores of each of these three groups across all nine reasons for managing wildlife and all eight attitude statements in order to see where the greatest differences lie. The top eleven discriminators (i.e. the largest differences between the mean rating scores of the Favourably Disposed and the Undecided) are illustrated in Figure 8. The values to the right hand side of the bars are the difference in the mean ratings between The Favourably Disposed and the Undecided.

**Figure 8: Key Discriminators between The Favourably Disposed and the Undecided**

(Base: Favourably Disposed, n=250; Partial Supporters, n=200; Undecided, n=151)



- This confirms that although the Undecided are against the idea of killing animals, even when they pose a threat to human health and safety, and they are opposed to wildlife management in order to enable new developments to take place, on all of the other discriminating variables, they tend to be undecided about or marginally in favour of the issue rather than against it, thus confirming our conclusion that they are not so much opposed to wildlife management as they are unsure about it.
- There were some statistically significant differences between the three segments with respect to location and age. The Favourably Disposed were more likely to be found

living in rural locations (see Table 11) and were more likely to be older people (see Table 12).

**Table 11: Location by Wildlife Segments**

(Base: General Public total sample, n=600)

|                               | Base              | Location          |                  |
|-------------------------------|-------------------|-------------------|------------------|
|                               |                   | urban             | rural            |
| <b>Base</b>                   | <b>600</b>        | <b>481</b>        | <b>119</b>       |
| <b>Overall response to WM</b> |                   |                   |                  |
| <b>Favourably Disposed</b>    | <b>250</b><br>42% | <b>185</b><br>38% | <b>65</b><br>55% |
| <b>Qualified Supporters</b>   | <b>200</b><br>33% | <b>164</b><br>34% | <b>35</b><br>30% |
| <b>Undecided</b>              | <b>151</b><br>25% | <b>132</b><br>27% | <b>19</b><br>16% |

**Table 12: Age by Wildlife Segments**

(Base: General Public total sample, n=600)

|                               | Base              | Age              |                  |                  |                  |
|-------------------------------|-------------------|------------------|------------------|------------------|------------------|
|                               |                   | 16-24            | 25-44            | 45-64            | 65+              |
| <b>Base</b>                   | <b>600</b>        | <b>82</b>        | <b>220</b>       | <b>179</b>       | <b>119</b>       |
| <b>Overall response to WM</b> |                   |                  |                  |                  |                  |
| <b>Favourably Disposed</b>    | <b>250</b><br>42% | <b>24</b><br>30% | <b>84</b><br>38% | <b>82</b><br>46% | <b>60</b><br>50% |
| <b>Qualified Supporters</b>   | <b>200</b><br>33% | <b>30</b><br>37% | <b>78</b><br>36% | <b>54</b><br>30% | <b>37</b><br>31% |
| <b>Undecided</b>              | <b>151</b><br>25% | <b>27</b><br>33% | <b>58</b><br>26% | <b>43</b><br>24% | <b>23</b><br>19% |

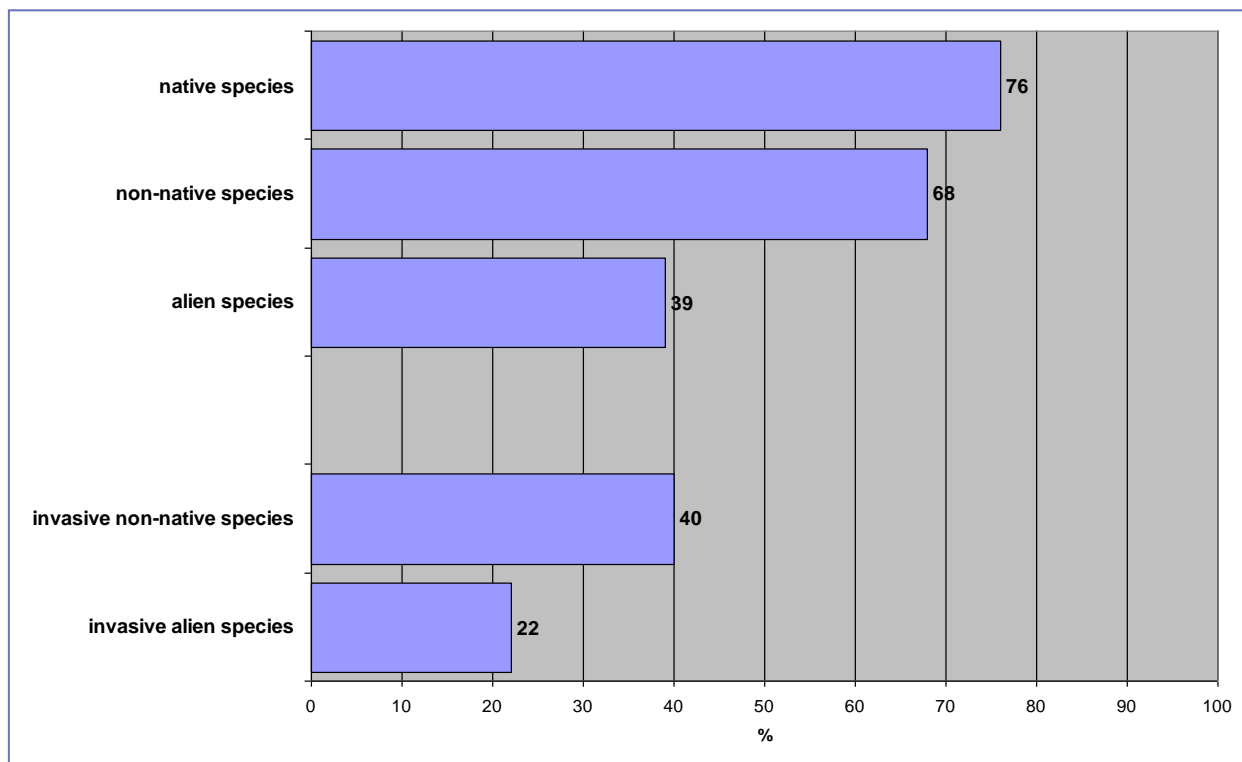
## 5 INNS: The Public Perspective

### 5.1 Non-native Species: Awareness and Understanding of the Concept

1. In the survey of the general public we explored whether people had come across the terms native, non-native and alien species, invasive non-native species and invasive alien species. The levels of awareness are summarised in Figure 9.

**Figure 9: Awareness of Terms**

(Base: General Public total sample, n=600)



2. Between two thirds and three quarters of the sample claimed to be familiar with the terms native (76%) and non-native species (68%); the alternative description, alien species was familiar to less than 40% of the public. During the workshops, we explored whether 'alien species' was a more meaningful term than 'native species'. There was a clear consensus in favour of non-native. Alien species was considered inappropriate as it conjured up associations of 'from out of space'<sup>6</sup>.
3. We also explored what the term non-native species meant to people during the workshops. The findings are compatible with the levels of awareness recorded in the

<sup>6</sup> When members of the public were asked to define a NNS in the quantitative research, the term 'alien' was almost never used.

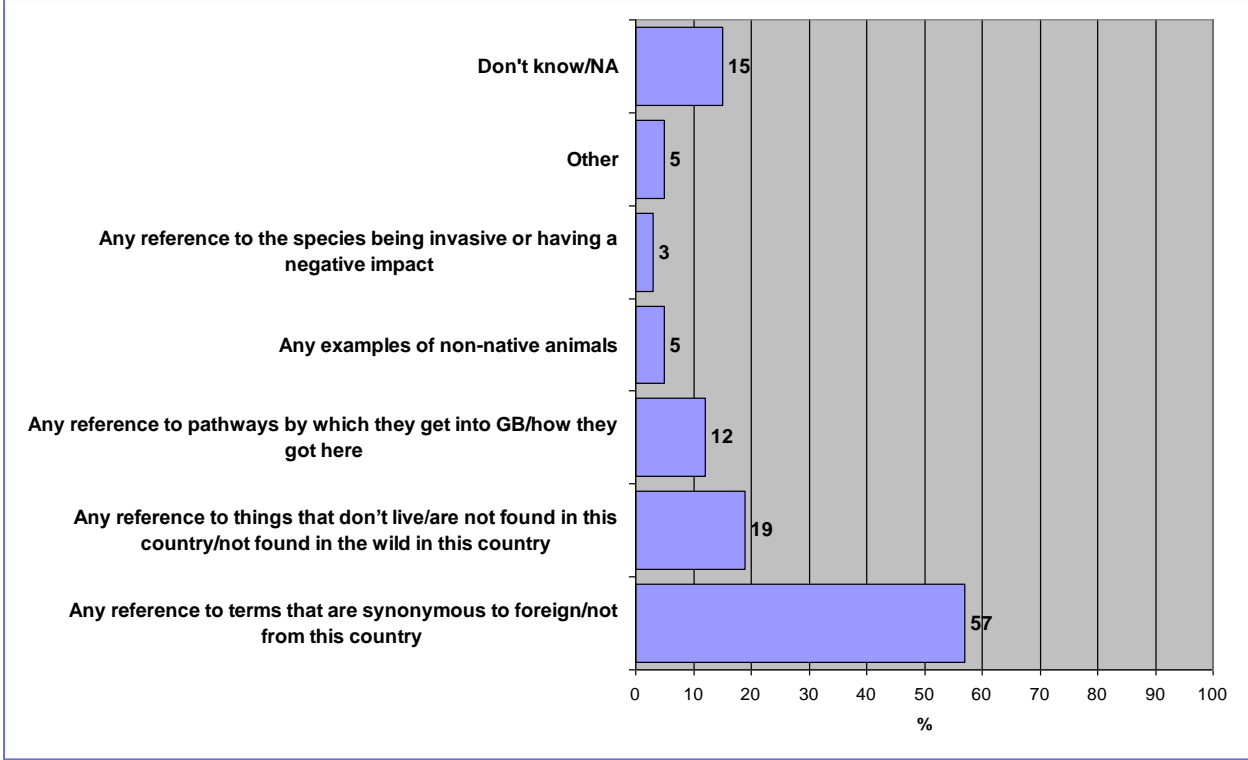
quantitative research – most workshop participants had a reasonable grasp of what the term refers to. Analysis of their answers revealed four main themes:

- NNS were often described as being **‘foreigners’**, **‘not indigenous’** or **‘non-British’** but instead originated **from abroad/another country** or did not evolve naturally in this country
  - a range of **examples** were given which included more exotic animals usually found in zoos and safari parks (e.g. lions, tigers, crocodiles), domestic pets including more unusual pets and a number of **invasive species** including the grey squirrel, mink, American crayfish, Chinese crabs, parrots, Canada goose and Zander
  - indeed, some respondents did not differentiate between NNS and INNS, sometimes describing NNS as having **invasive qualities** such as ‘having an impact on the local ecosystem’. ‘damaging the environment’, ‘becoming a pest’ and ‘usually damaging native species’
  - there was also some recognition of different **pathways** by which NNS arrived in this country including species that have escaped or been released into the wild, things being imported particularly on/in food, deliberate introduction by man (often for a particular reason but then having unforeseen consequences), the effects of climate change, being smuggled in or being transported in ships’ ballast and the desire for exotic pets.
4. Once again, it was noticeable that nearly all references made by respondents were to animals rather than plants. There were also a number of misconceptions including:
- animals that were not born in this country
  - animals that don’t live in this country
  - animals that do not live in the wild in this country (zoo animals)
  - animals that spend some of their life in this country (including migrating birds)
  - animals that are rare, exotic, dangerous, endangered, of unknown origin.
5. Members of the public interviewed as part of the quantitative survey were asked what they understood the term to mean. Their replies have been grouped according to the

themes identified from the qualitative research and the most frequently mentioned themes are illustrated in Figure 10.

**Figure 10: ‘What do you think is meant by the term ‘non-native species’? Main Themes Mentioned by Respondents**

(Base: General Public total sample, n=600)



6. The results are consistent with the definitions participants arrived at in the workshops with 63% of the public in the survey including references to terms synonymous with ‘foreign’ and/or ‘not from this country’. This increased to 80% of the public who said they were familiar with the term. Only 12% made any reference to how such species may have arrived in this country.

7. Examples of some of the definitions of NNS provided are given below.

any reference to terms that are synonymous to foreign/not from this country

Species which have come **from another country or continent**

Something that is **foreign to our country**

A plant that has been **brought here from abroad** – not a native species

**Not native** to that particular country and spreads

Any reference to things that don't live/are not found in this country/not found in the wild in this country

Animals or plants that are **not usually found in this country**

Species that **wouldn't live here** unless we import it here

Animal in an area that is **not a native of that area**

Something that **doesn't belong**

any reference to pathways by which they got into GB/how they got here

Species **introduced to this country by man**

From somewhere else like the **Romans brought in slugs and snails** because they liked eating them

It's found its way into our country from abroad **by its own means**

Anything that is not native to Britain, it has **come in through imports, etc.**

Any examples of non-native animals

Not native to this country, such as the **American crayfish**

Like the **grey squirrel**, brought in from another country. It would change the structure of our wildlife

I don't know – probably **lions and tigers**

Species that have come from other countries or animals introduced from other countries e.g. **rabbits, rats, crayfish**

Any reference to the species being invasive or having a negative impact

Something that poses a **threat to humans**, not native to our origin

**Foreign invasive predators**

**Harmful**

They come over here and **damage our own wildlife**. They mate here and **take over our species**

## 5.2 Non-native Species: A Definition

1. The workshop participants were shown the following definitions of a native and a non-native species and invited to comment on them:

**Native species:** Any species that has colonised Great Britain since the last Ice Age without the direct assistance of man. Species that may colonise GB in the future by natural means may also be deemed native.

**Non-native species:** Any species that has colonised Great Britain since the end of the last Ice Age with the direct assistance of man.

2. The key points to emerge from the discussion were as follows. The reference to the last Ice Age often seemed to throw people – most participants had no idea when this was other than it was a long time ago and not everyone appreciated the significance of this in terms of the definition. There was also a tendency to assume that species that have been here for hundreds of years should be considered native. The definition did not appear to address the issue of migratory species and some participants were unsure what is meant by ‘colonised’; for others, including some BME participants, it carried overtones of ‘imperialism’. Finally, references to ‘direct assistance of man’ can be read as ‘intentional’ thereby ruling out any unintentional pathways.
3. When reporting back on these findings, we put forward alternative definitions that took these comments into account:

**Native species:** Any animals or plants that have established themselves in Great Britain **without the assistance of man** – either intentional or accidental. This includes migrating animals that spend part of their lifecycle outside GB.

**Non-native species:** Any animals or plants that have established themselves in Great Britain **with the assistance of man**. This includes any that were first introduced hundreds, if not thousands, of years ago.

4. The definition of NNS was used in the quantitative survey among the public.

## 5.3 Invasive Non-native Species: Awareness and Understanding of the Concept

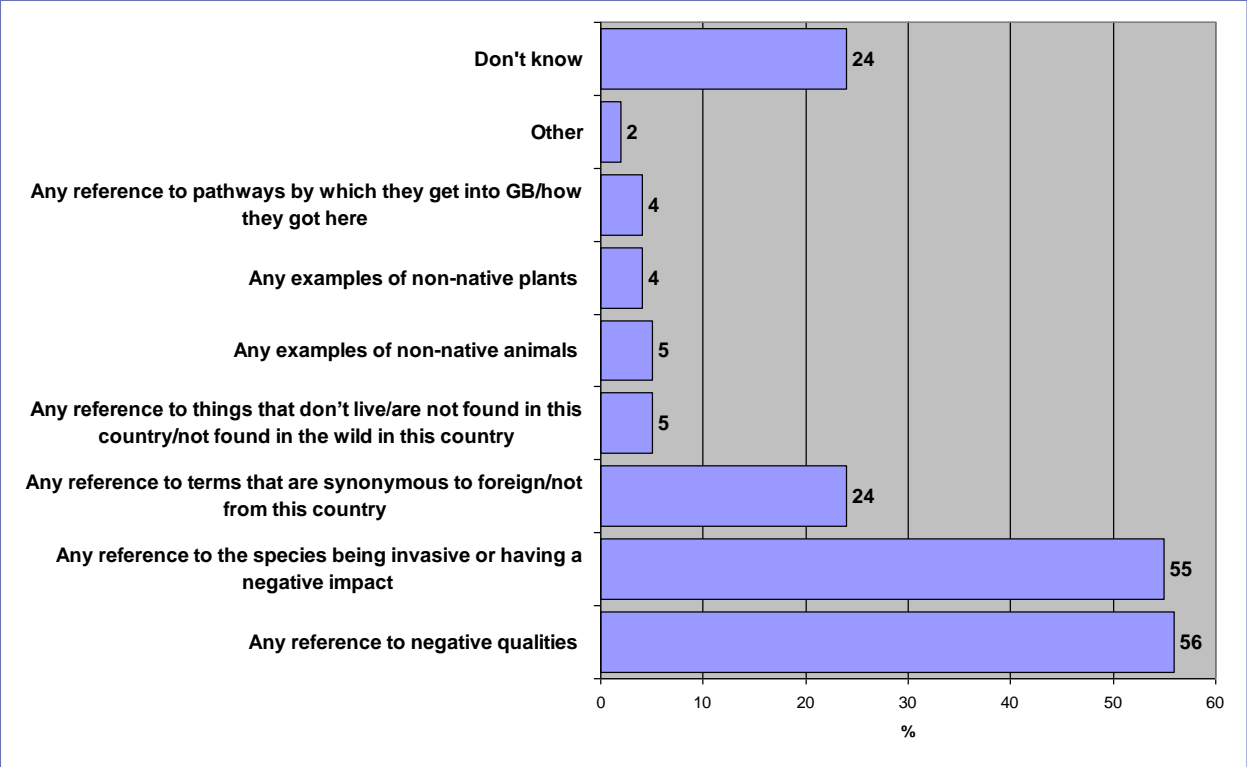
1. A majority of the public (60%) had not come across the term invasive non-native species and only one in five said they were familiar with the term invasive alien species (see Figure 9).

2. We explored whether awareness of the INNS concept varied across our sample. Although respondents classed as living in rural locations based on the Defra definition were more familiar with the term compared to those living in urban areas, the difference was not statistically significant (49% and 40% respectively). However, when we looked at respondents who classified themselves as living in rural locations the difference was statistically significant: 52% of them were familiar with the term compared to 36% of those who classified themselves as living in urban areas, while those who classified themselves as living in semi urban/rural area fell in between (48%).
3. Awareness of the concept was also higher among the following sub-groups:
  - older respondents (48% awareness among those aged 45+ compared to 35% for those aged 16-44)
  - respondents from SEGs ABC1 (47% vs. 36% C2DE)
  - those without children aged 16 and under living at home (45% vs. 36%)
  - those with responsibility for a garden (45% vs. 34%)
  - those with a pond (59% vs. 38%).
4. During the workshops we explored participants understanding of INNS in more depth; this was done immediately after the discussion of the meaning of native and non-native species and the findings should be viewed in this context (in other words, participants tended to focus on the meaning of invasive in the context of non-native species, which they had already discussed and defined). In this context, invasive conveys mainly negative connotations such as ‘unwanted, ‘taking over’, ‘aggressive, ‘menacing’ and ‘destructive’. INNS were therefore seen by most participants as species that are damaging native species and the native ecosystem, for example, ‘breeding prolifically’, ‘taking over from native species’, ‘spreading disease’ and ‘leading to hybridisation’. It was noticeable that many of the younger respondents struggled with this term.
5. During the quantitative survey of the general public, respondents were asked what they understood the term INNS to mean (this was also asked immediately after they were asked about the meaning of NNS). Their replies were grouped into various categories and the most frequently mentioned categories are shown in Figure 11 and some examples are provided over the page.



**Figure 11: ‘What do you think is meant by the term ‘invasive non-native species’? Main Themes Mentioned by Respondents**

(Base: General Public total sample, n=600)



8. A quarter of our sample (24%) was unable to suggest what the term means. Two themes were referred to most often – the negative qualities of these species and their negative impact. As with the definitions of NNS, very few references (4%) were made to how such species arrived in this country.

#### any reference to negative qualities

One that's **causing a problem** in our area

If someone brings a plant in to the country which takes over and **can't be controlled**

Plants that **take over**

**Out of control, overpowering, keeps coming back, can't get rid of it**

#### Any reference to the species being invasive or having a negative impact

Has come from abroad but **kills our own species**

It's a species that **invades** on another species' area

Ones that **overrun everything**, not native to Great Britain

Things that **spread** and cause **damage**

### 5.4 INNS: A Definition

1. During the workshops, participants were given the following definition of INNS and asked to discuss it:

*Any non-native species that has the ability to spread and cause negative environmental, economic or societal impacts.*

2. Although this largely confirmed what respondents had assumed, it uses lots of 'difficult' concepts and came across as very 'technical'. Most participants found it difficult to comment on the relative importance of the three impacts (environmental, economic and societal); this was because they found it difficult to unpack them into more meaningful terms. When pushed to do so, the most common response was they are all interlinked and therefore of equal importance.
3. We also explored the idea of introducing the concept of biodiversity into the definition but this was also felt to be a technical term which only serves to compound the problem of comprehension.
4. Participants felt the definition should convey the idea that INNS affects us all personally as this is then harder for people to ignore.
5. We suggested re-wording the definition as:

*Any non-native animal or plant that has the ability to spread causing damage to the environment, the economy, our health and the way we live.*

## 5.5 Native or Non-Native, Managed or Unmanaged?

1. In the workshops we explored the extent to which participants could differentiate between native and non-native species as well as which species they felt were actively managed in Great Britain.
2. 58 species were used for this exercise. The list was divided into two and participants worked with one or other list. Each species was presented on a separate card. In some workshops, the species were illustrated using photographs as well as their common name while in other sessions participants were given just the names. We found that this made very little difference to how the task was carried out and the only advantage offered by the photographs was in identifying what type of animal or plant a species was if people did not recognise the name (for example, not everyone knew what an Avocet was). As a group participants were asked to try and sort the cards into three piles: those they believed to be native species, those they considered to be non-native and any they were unsure about. They were then asked to take each of these piles and further divide them into those they believed were 'actively managed', those that were not and those they were unsure about. We offered no definition of 'actively managed' other than referring participants back to the earlier discussion about what is meant by wildlife management.
3. The result of the card sort for native and non-native species is shown in Table 13. Each species has been assigned to the category it was more frequently placed in across the ten workshops. The species in the cells shaded green (the top left and bottom right cells) were correctly sorted while those in the red shaded cells (the top right and bottom left cells) were incorrectly sorted. 23 out of the 28 native species were correctly identified as such and only two native species were mistaken for non-natives – the Hummingbird hawk moth (an unknown moth that sounds exotic) and the polecat. Participants were less adept at identifying non-native species correctly with nearly a third of them being classed as native species. Indeed, the results may have been even worse if it wasn't for the fact that many of the NNS have names which point to their origin (e.g. American mink, Japanese knotweed) or sounded/looked 'exotic' (e.g. Muntjac deer, Citrus longhorn beetle). Moreover, it was clear from their discussions while carrying out the task that participants often resorted to guesswork even though the moderators stressed they could use the 'don't know' category.

4. 16 out of the 36 managed species but only four of the 22 unmanaged species were correctly identified (see Table 14). For example, participants considered any species known to have protected status (such as the pipistrelle bat) or had reserves or nesting sites or other designated areas where they were protected (such as the red squirrel) were, by definition, being managed.
5. Overall, participants correctly identified two thirds of the native and non-native species but just one third of the managed species. When these two categories were combined (i.e. managed natives, unmanaged natives, managed non-natives and unmanaged non-natives), participants correctly classified just over a quarter of the species.

**Table 13: Native vs. Non-native Species – Result of Card Sort Exercise**  
(Base: general public workshop participants; n=87)

|                       |            | Correct Sorting  |   |  |  |
|-----------------------|------------|--|---|--|--|
|                       |            | Native   |   | Non-native   |  |
| Participants' Sorting | Native     | Adder<br>Bluebell<br>Bracken<br>Common Frog<br>Common wasp<br>Fox<br>Garden slug<br>Grey seal<br>Hedgehog<br>Hen harrier<br>Magpie<br>Mole | Pike<br>Pipistrelle bat<br>Ragwort<br>Red deer<br>Robin<br>Red squirrel<br>Roe deer<br>Stoat<br>Water vole<br>Wood mouse<br>Wood pigeon | Common carp<br>Fallow deer<br>Floating pennywort<br>House mouse<br>Ivy-leaved toadflax   | Little owl<br>Mute swan<br>Rabbit<br>Water primrose  |
|                       | Undecided  | Avocet<br>Cormorant  | Furniture beetle  | Brown rat<br>Rhododendron  | Oak processionary moth   |
|                       | Non-native | Hummingbird hawkmoth   | Polecat   | American mink<br>Black swan<br>Canada goose<br>Chinese mitten crab<br>Citrus longhorn beetle<br>Colorado beetle<br>Coypu<br>Giant hogweed<br>Grey squirrel | Himalayan balsam<br>Japanese knotweed<br>Muntjac deer<br>Red-necked wallaby<br>Ring-necked parakeet<br>Ruddy duck<br>Signal crayfish<br>Wireweed<br>Zander |

**Table 14: Managed vs. Unmanaged – Result of Card Sort Exercise**

(Base: general public workshop participants; n=87)

|                       |           | Correct Sorting  |   |   |   |
|-----------------------|-----------|--|---|---|---|
|                       |           | Managed  |   | Unmanaged   |   |
| Participants' Sorting | Managed   | Bracken<br>Fox<br>Furniture beetle<br>Garden slug<br>Grey seal<br>Red deer<br>Roe deer | American mink<br>Brown rat<br>Colorado beetle<br>Fallow deer<br>Japanese knotweed<br>Muntjac deer<br>Mute swan<br>Rabbit<br>Signal crayfish | Bluebell<br>Hedgehog<br>Hen harrier<br>Pipistrelle bat<br>Robin<br>Red squirrel | Black swan<br>Common carp<br>Little owl<br>Red-necked wallaby |
|                       | Undecided | Cormorant<br>Pike<br>Wood mouse  | Floating pennywort<br>Giant hogweed<br>Himalayan Balsam<br>Oak processionary moth<br>Rhododendron<br>Zander                                 | Avocet<br>Hummingbird hawkmoth<br>Polecat                                       | Ivy-leaved toadflax<br>Ring-necked parakeet<br>Wireweed       |
|                       | Unmanaged | Common wasp<br>Magpie<br>Mole<br>Ragwort<br>Stoat<br>Wood pigeon                       | Canada goose<br>Citrus longhorn beetle<br>Coypu<br>Grey squirrel<br>House mouse<br>Ruddy duck<br>Water primrose                             | Adder<br>Common frog<br>Water vole  | Chinese mitten crab   |

5.6 Awareness and Recall of Specific Examples of INNS

5.6.1 Recent publicity

1. Immediately preceding the survey of the general public, the BBC carried a number of news items on the topic of INNS. Moreover, the qualitative research indicated that participants who knew about INNS had often read and/or heard about the topic in the media. Respondents to the survey were asked if they had seen or read any recent publicity about INNS. One in five (21%) had and a quarter of these (5% of the total sample) specifically mentioned BBC Breakfast TV, BBC radio or the BBC website. Six out of 10 (13% of the total sample) mentioned other TV sources. Not surprisingly, those who had previously indicated they were familiar with the concept were more likely to

have come across recent publicity (42% vs. 7% of those who were not familiar with the concept).

2. Certain other sub-groups were more likely to recall recent publicity:

- those living in rural locations (30% vs. 18% of those from urban locations)
- those responsible for a garden (24% vs. 14% of those either without a garden or not being responsible for it) or a pond (32% vs. 19% of those without a pond)

3. Conversely, younger respondents aged 16-24 were least likely to have come across such publicity (11% vs. 22% of those aged 25 and above).

### 5.6.2 Unprompted recall

1. Four out of every ten members of the public taking part in the survey (42%) were unable to give any examples of INNS when asked. Of those who could, there were four species that were mentioned most frequently:

- Grey squirrel, mentioned by 37% of the public
- Japanese knotweed, mentioned by 19%
- Signal/American crayfish (10%)
- American mink (10%).

2. A total of 65 other species/types of animal or plant were also mentioned, in each case by 15 or fewer respondents (less than 3%), including:

- some native species (e.g. fox)
- some generic animals/plants (e.g. weeds, fish)
- some diseases (e.g. bird flu, Dutch elm disease).

3. A complete list of these, along with the number of people mentioning each one, is provided in Table 15.

**Table 15: ‘Can you suggest any ‘invasive non-native species’ that you are aware of in Great Britain?’ – Unprompted Recall**

(Base: General Public total sample, n=600)

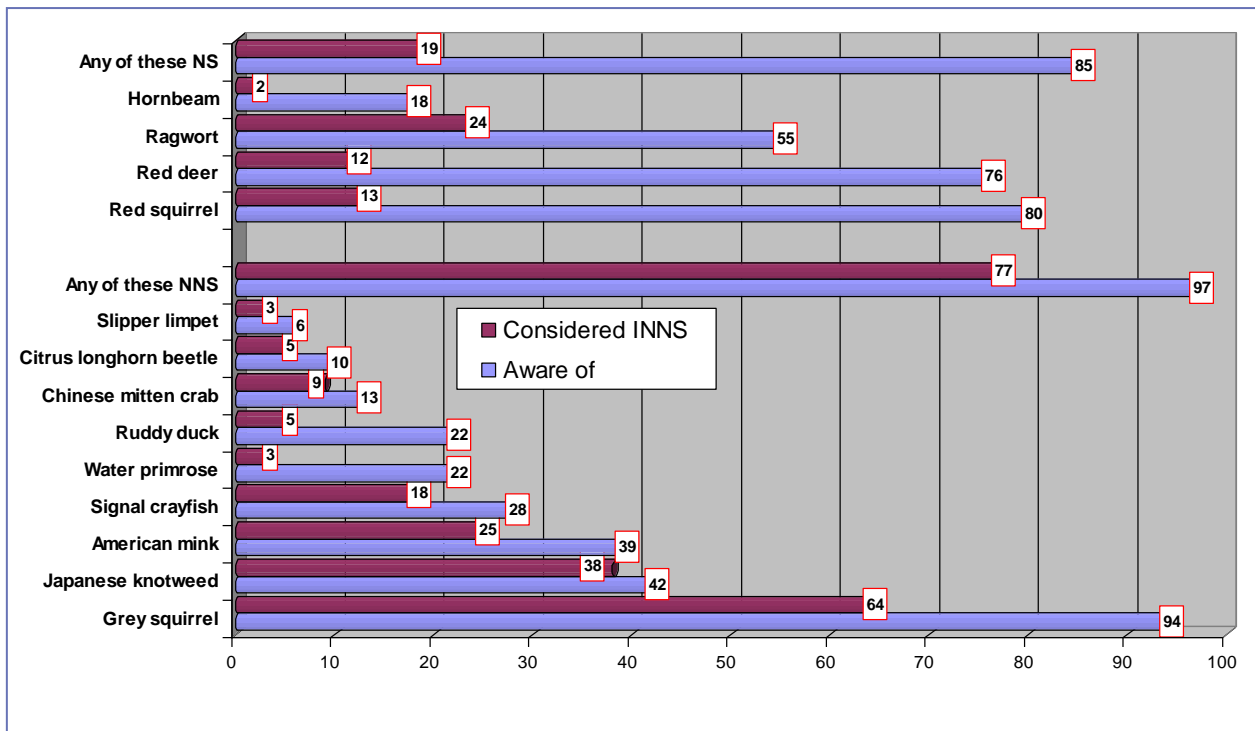
|   |     |                                 |   |                  |     |
|---|-----|---------------------------------|---|------------------|-----|
| Grey squirrel   | 221 | Ragwort                         | 3 | Fish (unspec)    | 1   |
| Japanese knotweed   | 117 | Wasp/hornet                     | 3 | Frog             | 1   |
| Signal/American crayfish                                  | 59  | Colorado beetle                 | 2 | Ginko baloma     | 1   |
| American mink   | 58  | Mosquito                        | 2 | Gorse            | 1   |
| Ruddy duck  | 15  | Parakeet/parrots                | 2 | Himalayan balsam | 1   |
| Chinese mitten crab                                       | 12  | Rape seed                       | 2 | Japanese maple   | 1   |
| Ladybird/harlequin ladybird                               | 8   | Slipper limpet                  | 2 | Kite             | 1   |
| Rabbit  | 8   | Zander                          | 2 | Koi              | 1   |
| Rat   | 8   | aquatic plants (unspec)         | 1 | Mole             | 1   |
| Rhododendron  | 8   | Balsam poplar                   | 1 | Pigeon           | 1   |
| Citrus longhorn beetle                                    | 7   | Bats                            | 1 | Potatoes         | 1   |
| Water primrose  | 6   | Birds with bird flu             | 1 | Rabid dogs       | 1   |
| Weeds (unspec)  | 6   | Black mamba                     | 1 | Red deer         | 1   |
| Dutch elm   | 5   | Black squirrel                  | 1 | Scorpions        | 1   |
| Fox   | 5   | Blue algae                      | 1 | Spanish sparrow  | 1   |
| Muntjac deer  | 5   | Bugs                            | 1 | Thai knotweed    | 1   |
| Bee   | 4   | Catfish                         | 1 | Wallaby          | 1   |
| Bluebell/Spanish bluebell                                 | 4   | China pond weed                 | 1 | Water cress      | 1   |
| Red squirrel  | 4   | Chinese beetle                  | 1 | Wild boar        | 1   |
| Spiders   | 4   | Conifers                        | 1 | Withy wind       | 1   |
| Black widow spider /tarantula                             | 3   | Crayfish                        | 1 | Wolf             | 1   |
| Canada duck/Canadian goose                                | 3   | Death watch beetle              | 1 | Woodworm         | 1   |
| Giant hogweed/Japanese hogweed/ hogweed                   | 3   | Disease of horse chestnut trees | 1 | Wort weed        | 1   |
| respondent unable to name any invasive non-native species |     |                                 |   |                  | 250 |

### 5.6.3 Prompted recall

1. Respondents were given a list of nine INNS that are found in Great Britain along with four native species. They were asked which of these they were aware of (irrespective of whether they were INNS) and then which they knew to be INNS that are present in Great Britain. This revealed that levels of awareness of most species that were non-native were low – below fifty percent in all but one case - although this was not confined to the NNS on the list – awareness of Hornbeam, a native species, was less than one in five (18%).
2. At the same time, most respondents (97%) were aware of at least one of the NNS on the list and this was higher than the proportion aware of at least one of the native species (85%). However, this is partly due to a single species, the Grey squirrel which achieved 94% recognition. If this is removed from the calculation, recognition of at least one of the other INNS was 79% (see Figure 12).

**Figure 12: ‘Leaving aside whether or not they may be invasive non-native species, which, if any, of these animals and plants are you aware of?’**

(Base: General Public total sample, n=600)

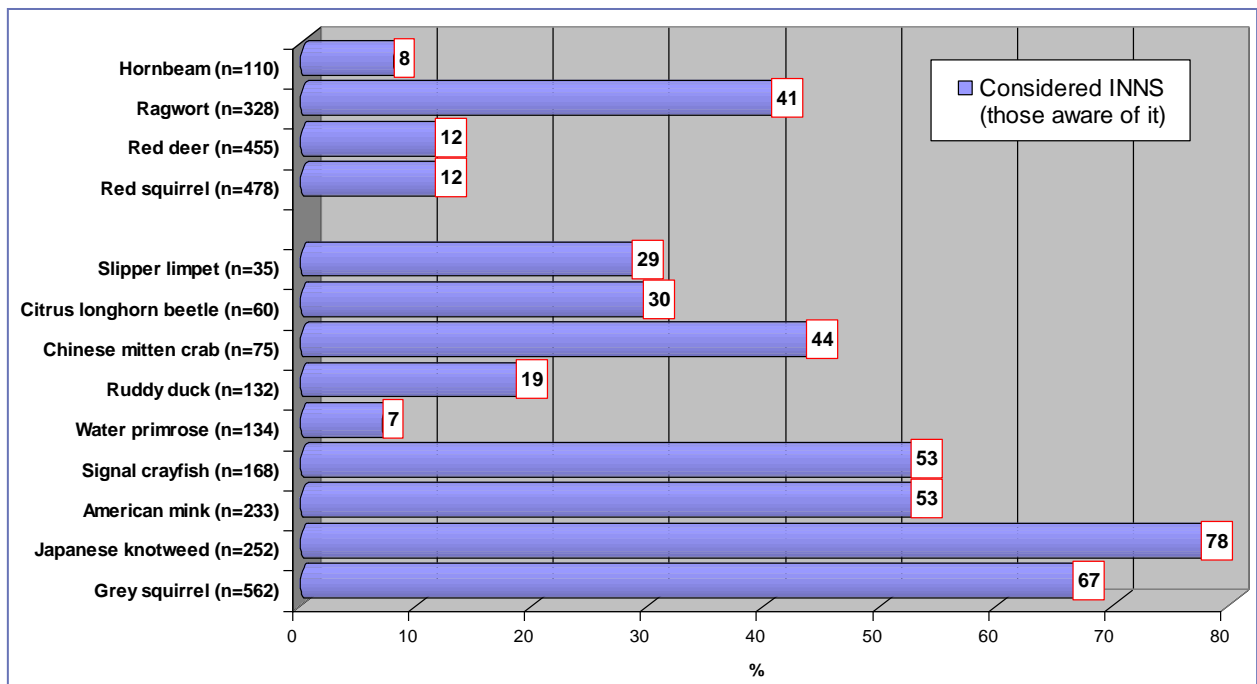


3. With the exception of the Grey squirrel – which nearly everyone (94%) was aware of and almost two thirds knew it was an INNS (64%) – most respondents were unable to identify the INNS.
4. Of the native species, Ragwort was often incorrectly identified as an INNS; we know from the qualitative research that this species is known by some to have negative qualities which may explain why a quarter of respondents (24%) in the survey considered it an INNS (see Figure 12).
5. Even when one considers just those respondents who said they were aware of the species in the first place, five of the INNS were identified as such by less than half the sample (see Figure 13). Amongst those who knew of the two species, Japanese knotweed had higher recognition as an INNS compared to the Grey squirrel (78% vs. 67%) and just over half of those aware of the Signal crayfish and American mink identified them as INNS. All other examples were considered to be invasive by less than half of those who knew the species.



### Figure 13: Species Considered to be Invasive

(Base: all aware of each species, n=variable)



6. These findings highlight the nature of the challenge facing Defra and NNSS. The ideal state of affairs would be that the public would not only demonstrate high levels of awareness of a species but also a high level of awareness that it is invasive. However, as the grid below demonstrates, only one of the species we investigated falls into this category. Some of the species that are known by some members of the public to be invasive are not widely recognised in the first place and many others are only known to a minority of the public and most of these are unaware they are invasive.

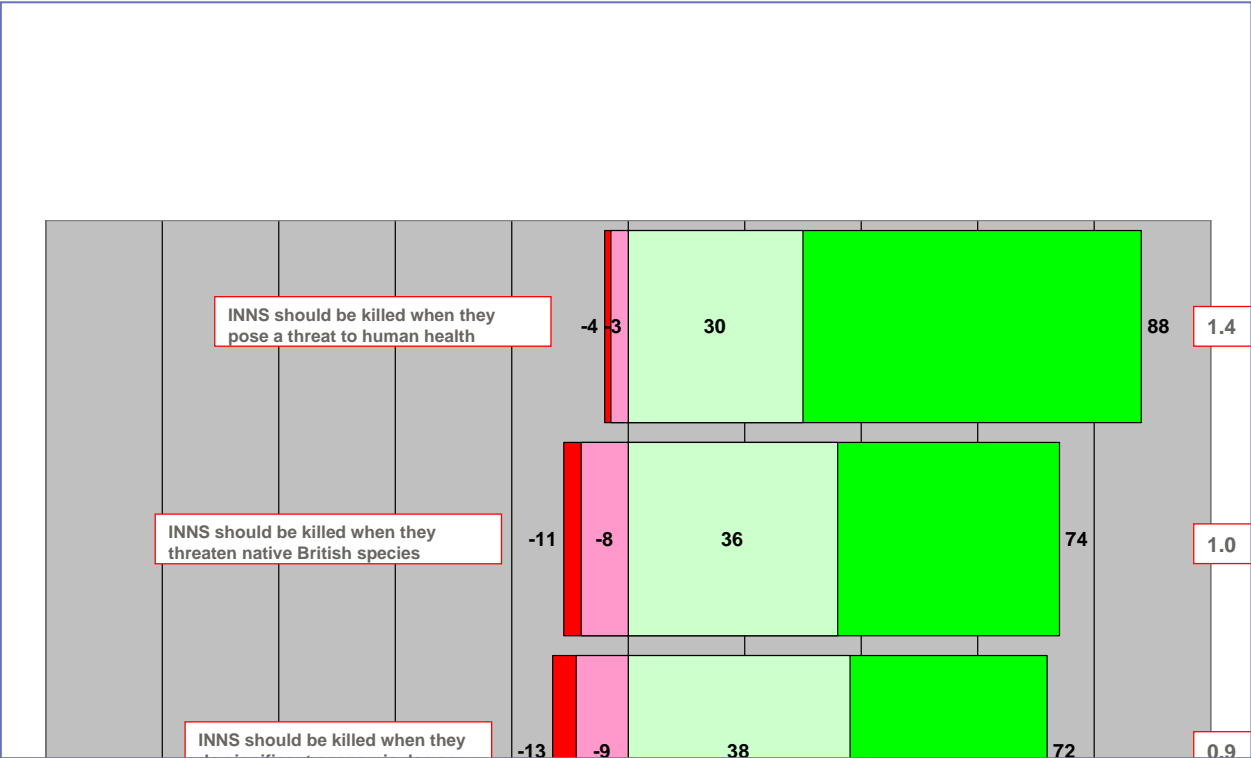
|          |      | Considered to be INNS                                 |   |
|----------|------|---|---|
|          |      | High  | Low   |
| Aware of | High | Grey squirrel   |   |
|          | Low  | American mink<br>Japanese Knotweed<br>Signal crayfish | Chinese mitten crab<br>Citrus longhorn beetle<br>Ruddy duck<br>Slipper limpet<br>Water primrose |

## 5.7 Support for Controlling INNS

1. During the workshops, participants were presented with some information about INNS (a copy of the presentation can be found in the appendix). A number of things took participants by surprise, in particular:
  - the cost of INNS to the economy (estimated to be £2 - £6 billion per annum)
  - the number of NNS present in Great Britain (over 2,700) including some assumed to be native
  - and the extent of the problems caused by INNS.
2. This led participants to conclude that there is a need for much greater public awareness of the issue. They also felt that there should be stricter controls at ports of entry – most assume there are currently no controls in place and this was contrasted with participants' experiences of visiting countries such as Australia and New Zealand.
3. As part of the survey among the general public we explored levels of support for managing INNS. This was done without respondents being aware of the extent of the problem (i.e. they did not have the benefit of the information we presented at the workshops).
4. In the survey we asked respondents the extent to which they agreed or disagreed with three statements about controlling INNS:
  - Invasive non-native species should be killed when they do significant economic damage
  - Invasive non-native species should be killed when they threaten native British species
  - Invasive non-native species should be killed when they pose a threat to human health.
5. The same 5-point agree/disagree scale and scoring system was used (see 4.4.1). There was broad support for all three reasons put forward for killing INNS. This was especially true where INNS pose a threat to human health (58% strongly agreed and 30% agreed somewhat). A majority also gave at least qualified support to killing INNS if they threaten British species or where they do significant economic damage (see Figure 14).

**Figure 14: 'I am going to read out some statements about INNS and I should like you to tell me whether or not you agree with what I say'.**

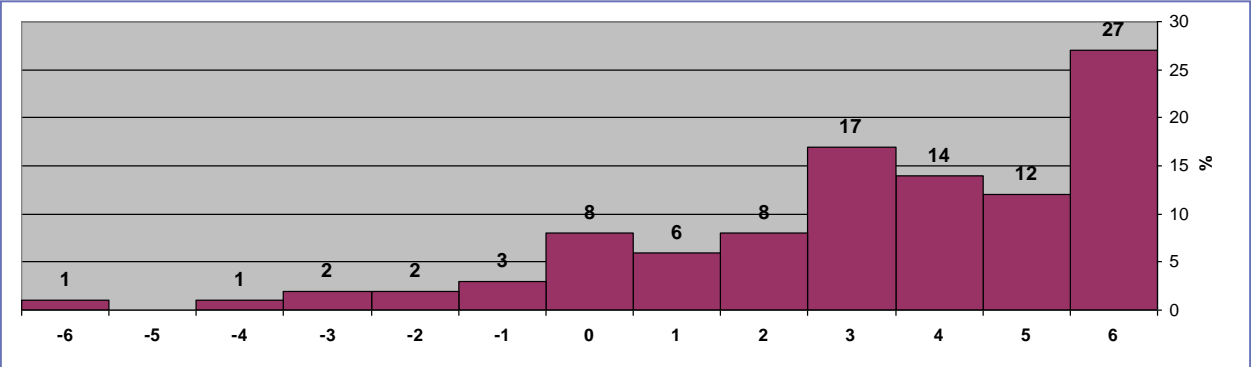
(Base: General Public total sample, n=600)



6. We computed a single Overall Support for Controlling INNS score for each respondent by summing their scores across the three statements. The distribution of these is shown in Figure 15. 84% of respondents had a positive score and the mean was 3.3 out of six.

**Figure 15: Distribution of Overall Support for Controlling INNS Scores**

(Base: General Public total sample, n=600)



7. We divided our sample into two roughly equal groups:
- those with above average scores who we called *INNS Supporters* (53%)
  - those with below average scores who we called *INNS Partial Supporters* on the grounds that they were not disagreeing with the need to control INNS so much as offering qualified support.
8. Perhaps not surprisingly, there was little difference between the two groups when it came to human health but the Partial Supporters were less willing to give unconditional support for killing INNS when they threaten native species or cause economic damage – they did not necessarily disagree but either ‘agreed somewhat’ or were undecided (see Table 16).

**Table 16: Levels of Agreement with Reasons for Controlling INNS for those who are *Supporters* and *Partial Supporters***

(Base: Supporters, n=316; Partial Supporters, n=284)

| % who agree somewhat/strongly agree                             | Supporters | Partial Supporters | Difference |
|---|------------|--------------------|------------|
| INNS should be killed when they pose a threat to human health   | 100%       | 74%                | +26%       |
| INNS should be killed when they threaten native British species | 100%       | 46%                | +54%       |
| INNS should be killed when they do significant economic damage  | 99%        | 41%                | +58%       |

9. There were some statistically significant differences between Supporters and Partial Supporters. In terms of demographics, Supporters were:
- more likely to live in **rural locations**; 70% of those living in rural locations were *Supporters* compared to just 48% of those living in urban locations
  - more likely to live in the **Midlands**; 61% of those from the Midlands were *Supporters* compared to 51% of those from the North and 48% of those from the South<sup>7</sup>

<sup>7</sup> This is the only significant difference we found between respondents living in the North, Midlands or the South. It is not clear why people living in the Midlands should be more willing to support controlling INNS.

- more likely to be **male**; 57% of men were *Supporters* compared to 48% of women
- more likely to be **older**; 67% of those aged 65 and above were *Supporters* compared to 56% of those aged 45-64 and 45% of those aged under 45
- less likely to have **children** aged 16 and under living at home; only 47% were *Supporters* compared to 55% of those with children (this will correlate with the age of respondents)
- have responsibility for a **garden**; 55% were *Supporters* compared to 47% of those not responsible for a garden.

10. Unsurprisingly, Supporters were more likely to be familiar with the concept of INNS (69% of those familiar with the concept were Supporters compared to 48% of those not familiar with the concept). Also unsurprisingly, there was a correlation between views on wildlife management and control of INNS, although as the table below reveals, they are not one and the same thing – not all those supporting the control of INNS were supporters of wildlife management.

**Table 17: Relationship Between Views on Control of INNS and Wildlife Management**

(Base: Supporters, n=316; Partial Supporters, n=284)

|                     |                     | Control of INNS |                      |
|---------------------|---------------------|-----------------|----------------------|
|                     |                     | Supporters %    | Partial Supporters % |
| Wildlife Management | Favourably Disposed | 59              | 22                   |
|                     | Partial Supporters  | 29              | 38                   |
|                     | Undecided           | 12              | 40                   |

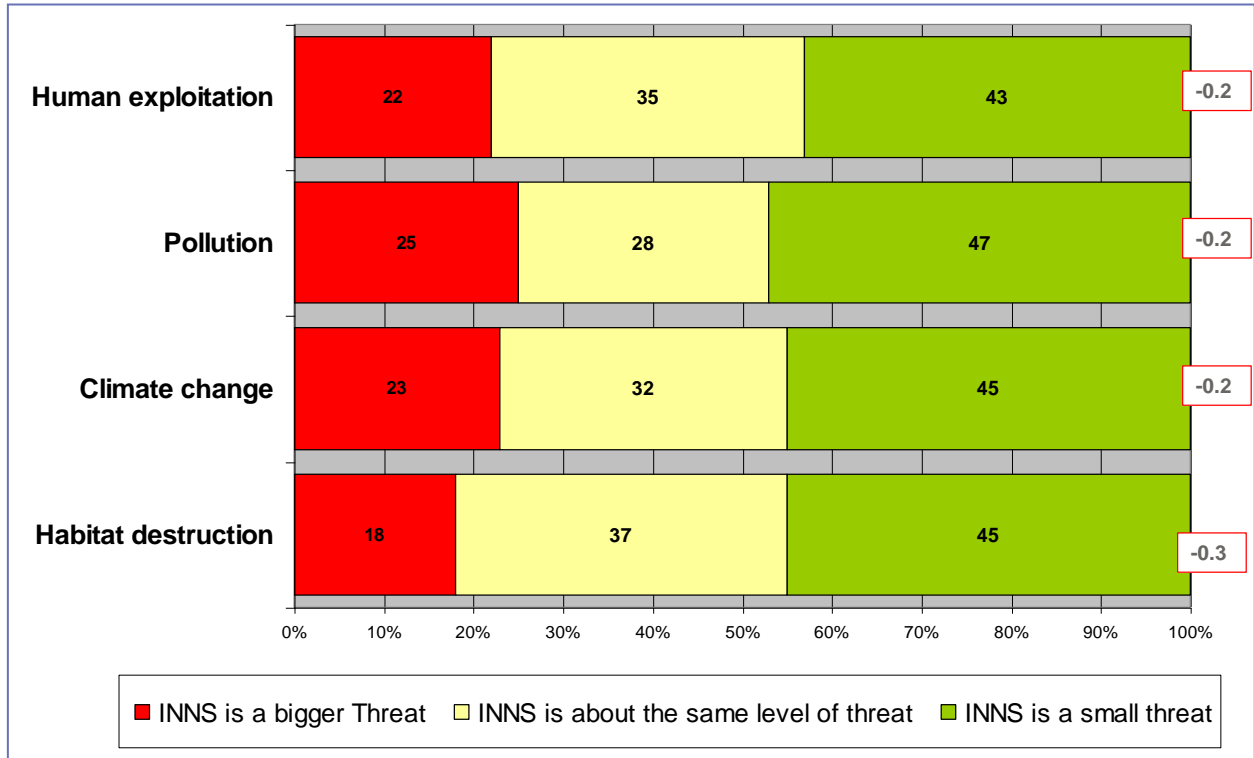
## 5.8 Perceived Impact of INNS

11. As part of the survey of the general public, respondents were asked to compare the threat posed by INNS with a number of other threats to biodiversity namely, human exploitation, pollution, climate change and habitat destruction. In each case they were

asked to state whether or not they felt INNS represents a bigger (+1) or a smaller threat (-1) or whether the level of threat was about the same in each case (0). We assigned scores to their answers as shown. As Figure 16 illustrates, most respondents perceived the threat of INNS to be either smaller, or no greater than the other threats.

**Figure 16: Perceived Threat from INNS Relative to Other Threats to Biodiversity**

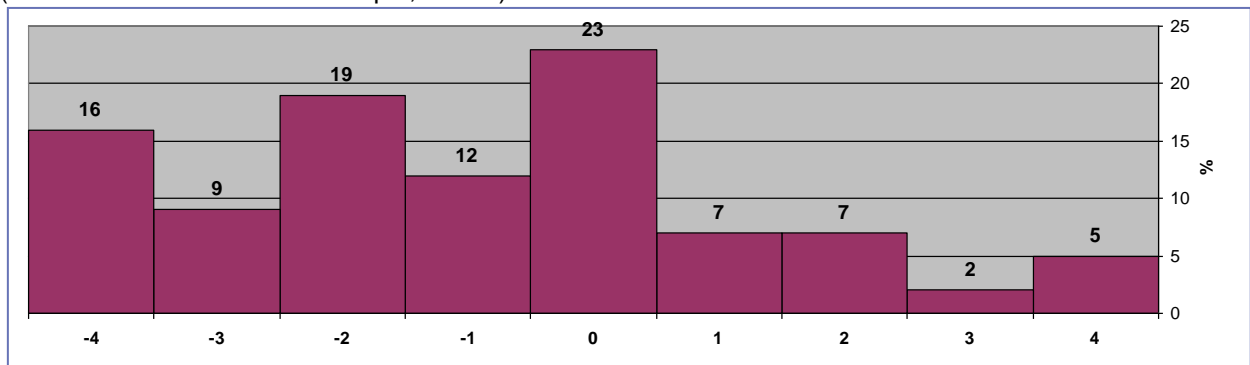
(Base: General Public total sample, n=600)



12. Once again, we computed a single Overall Impact score by summing each respondent's individual scores across the four threats. The distribution of these scores is shown in Figure 17.

**Figure 17: Distribution of Overall Impact Scores**

(Base: General Public total sample, n=600)



13. One in five respondents had a positive score although the mean was -0.9. The total sample was divided into two roughly equal groups:

- those with an above average *Overall Impact* score who we have labelled as *High Impact* (although this is a relative term)
- and those with a below average score labelled *Low Impact*.

14. The difference between the two groups was of the same order of magnitude for each of the threats to biodiversity. The greatest difference was with respect to pollution where 51% of the High Impact group considered INNS to represent the greater threat compared to just 4% of the Low Impact group (see Table 18).

**Table 18: Percentage Considering INNS to be a Bigger Threat for those in the High and Low Impact Groups**

(Base: High Impact, n=267; Low Impact, n=333)

| % who consider INNS to be the bigger threat | > average impact score % | <average impact score % | Difference % |
|---|--------------------------|-------------------------|--------------|
| Habitat Destruction                         | 33                       | 6                       | +27          |
| Human exploitation                          | 39                       | 9                       | +30          |
| Climate Change                              | 44                       | 6                       | +38          |
| Pollution                                   | 51                       | 4                       | +47          |

15. Respondents in the High Impact group were more likely to be Favourably Disposed towards wildlife management. However, there were no significant differences between the two groups in terms of their awareness of the concept of, or their level of support for controlling, INNS.

## 6 Wildlife Management & INNS: Putting Theory into Practice

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### 6.1 Introduction

1. The findings from the quantitative research among the general public reveals a broad level of support for managing wildlife and for controlling INNS albeit that many respondents offered either qualitative support (that is, they agreed somewhat but not fully) or were undecided. In the workshops we were able to explore this in much greater depth by giving participants a range of case studies to consider. The results of this exercise were consistent with the quantitative data but go further in allowing us to begin to identify the range of concerns the public are likely to have about managing wildlife and controlling INNS. As such, this allows us to identify a number of principles which are likely to come into play whenever the public are consulted about specific examples of wildlife management and INNS.
2. Participants in the workshops were divided into twos and threes and given two or three different case studies to consider. A total of 20 case studies was used. Some of these involved native species and some involved INNS. Each case study was based on one or more species and provided the following information:
  - some background information about those species
  - a list of impacts these species can have; these represented reasons why the species may need to be managed
  - and a list of possible control mechanisms.
3. In some workshops, the case studies included a photograph of the species while in others only the name was provided. Two examples are given in Table 19, the full list of case studies can be seen in the appendix.
4. Working in their twos and threes, participants had to decide which of the impacts they felt represented a good reason for controlling or managing the species, which they felt were not a good reason and any others that they were unsure about. Similarly, for each control method shown they were asked to indicate whether or not they felt it was a reasonable method of control in the circumstances.



**Table 19: Examples of Case Studies**

**RUDDY DUCK**

**Species information:** This bird is native to North America where it is relatively common (over 500,000 birds). It was released/escaped from wildlife collections in Britain in the 1940s and became established over most of Britain by 1995. There is currently a Government-led campaign to eradicate Ruddy ducks in the UK.

**Impacts:**

- Some of the feral British ruddy ducks fly to Spain and interbreed with the very rare white-headed duck. Interbreeding with ruddy ducks is the biggest threat to the survival of this duck as a distinct species. [The Spanish Government has spent millions of Euros trying to bring the White-headed duck back from the brink of extinction. They have been very successful with the population in Spain (the only country where it breeds in Europe) increasing from 22 in the 1970's to over 2,000 today]. The ruddy duck has no obvious impact in Britain.

**Control methods:**

- Shooting with rifles and shotguns (sometimes from boats).

**BRACKEN**

**Species information:** A native species that was originally a woodland plant, however, changes in land management practices have favoured the spread of bracken. Is an important habitat for some fritillary butterfly species and birds such as the whinchat and nightjar.

**Impacts:**

- Bracken is highly competitive and can replace other habitats including grassland and heathland.
- Bracken can reduce the available area for grazing and can cause poisoning in grazing animals.
- Bracken is a favoured habitat of the sheep tick, which can carry lymes disease.
- It can have major negative impact on archaeological remains.

**Control:**

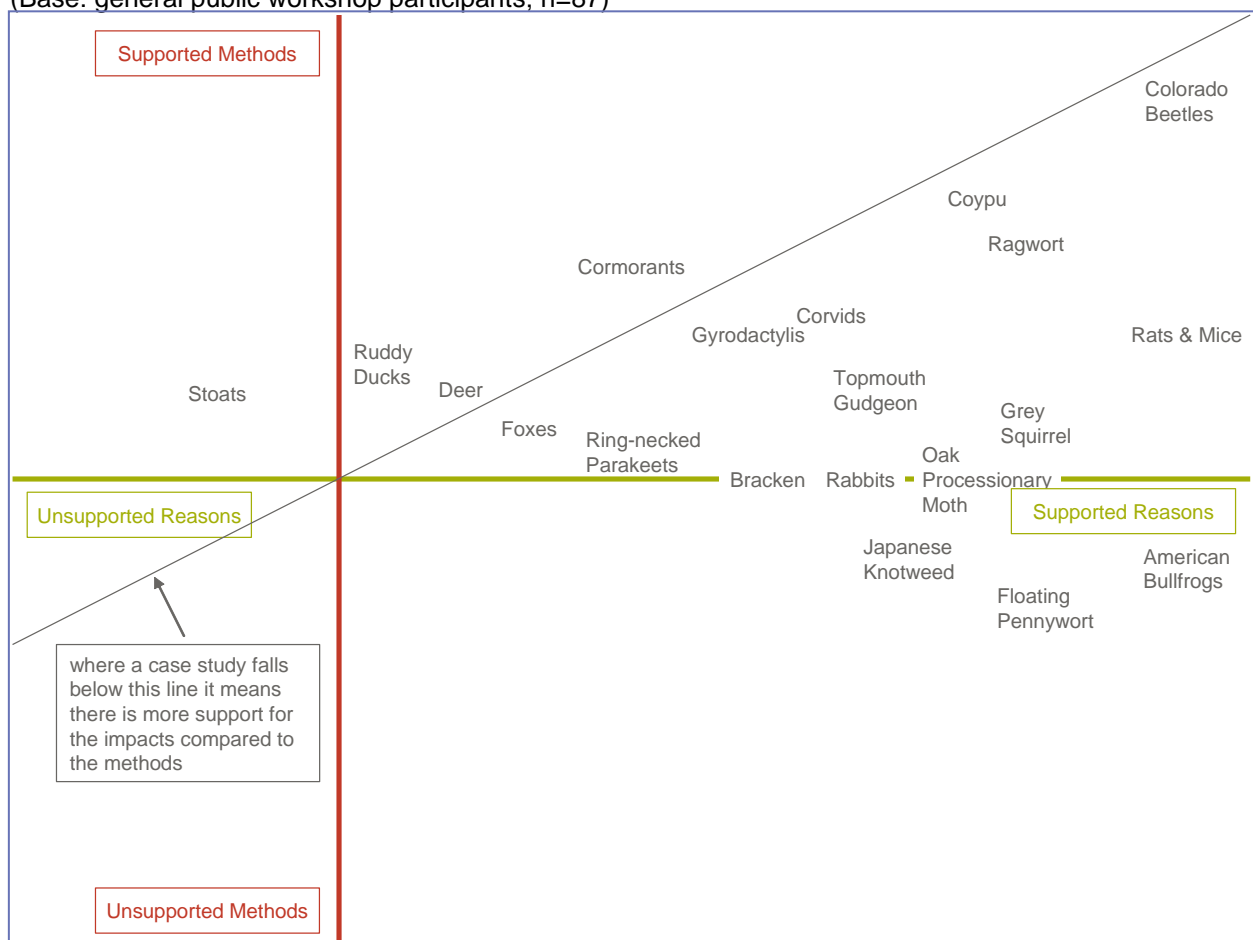
- Before control takes place consideration needs to be given to the impact of the control method e.g. impact on other plants; soil erosion due to the loss of bracken; whether control brings adequate benefits; the long term costs.
- Cutting. Needs to occur twice in the season over a period of 3 – 5 years. Will not lead to eradication and should not be used where ground-nesting birds are present.
- Crushing. Can be used where ground surface makes the use of machinery difficult. Should not be used where there are ground-nesting birds, or on sites of archaeological importance. Carries risk of soil erosion.
- Livestock treading. Winter feeding of livestock to encourage crushing of young plants and the disturbance of the ground which increases frost damage to plant structures. In the spring livestock needs to be removed to prevent risk of poisoning. This method is unreliable and should not be used where trampling risks damaging other plants or archaeological site.
- Burning. Only effective if follow up treatment used.
- Ploughing and cultivation. Deep ploughing of the ground in summer which is left undisturbed over winter followed by sowing of more desirable plant species in the spring. Not suitable where other important ground flora present or on archaeological site.
- Use of Herbicides. Should not be used where other important flora present.

## 6.2 Mapping Out the Case Studies

1. Different case studies had different numbers of impacts and control methods described. A qualitative scoring system was worked out such that each case study was given a single score to reflect the extent to which participants agreed with the reasons for managing the species concerned and a second score to show the extent to which they agreed with the proposed methods of control. Using these scores, we were able to map out the level of support along two axis, one showing support for the reasons (shown in green) and the other showing support for the methods (shown in red) (see Figure 18).

### Figure 18: Support for Reasons for Managing and Methods of Control

(Base: general public workshop participants; n=87)



2. The first point to note about the map is that the majority of case studies cluster in the top right hand quadrant which confirms that there was broad support for both the reasons for managing and the methods being proposed. However, the fact that the case studies are spread out within this quadrant indicates that in most cases there was not full and unqualified support (we will explore the reasons for this in a moment).

3. Three case studies fell into the bottom right quadrant which indicates that although there was support for the need to manage these species, there was little support for the methods being proposed:

### **Japanese knotweed**

4. The suggested methods of control and reactions to these were as follows:
  - Spraying regularly for 3 years with strong herbicides (this also kills other plants nearby) - *this was considered to have detrimental impacts on other species*
  - Removing soil down to 3m (10ft) depth and transporting it to one of only 6 designated disposal sites (this means lorries moving many tons of soil around the country) – *this was perceived to be extremely costly and impractical*
  - (Potentially) biological control involving the release of a Japanese louse that as been tested and shown to (almost certainly) attack Japanese Knotweed only – *participants were concerned with the idea of introducing yet another NNS which might, in turn, become invasive*

### **Floating Pennywort**

5. Reactions to this case study were very similar
  - Spraying the plant with pesticide (a herbicide) which also kills other plants –*not sufficiently species specific*
  - Mechanical removal – lifting out by hand or using a digger (probably the most common method used in Britain but there is the problem that if a tiny piece of the plant breaks off it can re-grow rapidly) – *considered costly and impractical and probably ineffective*
  - Potentially releasing a pest from its native range in South America (not yet developed) – *another NNS that could become invasive*

### **American Bullfrogs**

- shooting adult frogs (in the pond) – *participants who did not have a photograph assumed these would be the size of a common frog and felt the idea of trying to shoot them was ludicrous*
- draining down the pond and removing all adults and tadpoles (to be humanely killed)

- poisoning them in the pond (adults and tadpoles) – fish could be removed before this poisoning is done otherwise they would also be killed. Poisoning the ponds will kill most insects etc. in any case. The pond will take several years to fully recover – *this and the previous method were considered to have too much of a negative impact on the wider ecosystem.*
6. One case study, Stoats, fell in the top left hand quadrant which indicates that while respondents were not necessarily objecting to the proposed methods of control, they were not convinced there was a valid case to demonstrate control was necessary. The reason given was because of predation of poultry, songbirds and game birds but many participants saw this as nothing more than nature at work and they questioned the seriousness of the problem.
  7. No case studies fell into the bottom left quadrant (no support for the reasons or the methods).

### 6.3 Concerns about Controlling Wildlife and INNS

8. Overall, the fact that most case studies fell below a diagonal line running from bottom left to top right indicates that there was greater support for the reasons for controlling species than for the proposed methods. We explore these concerns in more detail in the next two sections.

#### 6.3.1 Concerns about the reasons given for controlling wildlife

9. We identified four concerns that participants had about some of the suggested reasons for controlling wildlife:
  - participants sometimes questioned the **seriousness of the impact**; they were not always convinced, for example, that foxes are causing a significant nuisance in urban areas (the very use of the word ‘nuisance’ may underlie this perception); other examples included the level of predation by stoats, overgrazing by deer and damage to archaeological sites due to rabbits borrowing
  - in some cases, participants felt that the behaviour in question is **‘nature at work’** and questioned whether there was any real need to intervene; examples included corvids preying on eggs and chicks, and cormorants preying on fish

- in the case of hybridisation (red and sika deer, ruddy duck and white headed duck) some participants perceived this to be '**evolution at work**' and again questioned if it was appropriate or necessary to intervene
- and in the case of the ring-necked parakeets the case study stated that this species '*probably competes with native bird species*'; participants felt action should only be taken where there is **conclusive evidence** that a species is causing a problem.

10. Two issues in particular arose in relation to possible impacts. The first of these is the need to demonstrate that there is a real and significant impact – suggesting a species is being a 'nuisance' or is 'possibly' having a negative impact is unlikely to win the public's support.

11. Secondly, it will be important to make it clear if the problem is widespread and the aim of any control measures is to eradicate the species in question, as opposed to a localised problem with any action taken to control the species also being localised. For example, the public would probably not support the blanket control of species that have the potential to over-graze or prey on other species, however, if it could be demonstrated that there is a significant problem at a local level, they may well be willing to support localised methods of control.

### 6.3.2 Concerns about the methods of controlling wildlife

1. We identified many more concerns about the choice of methods of control and these are summarised below.

- **Prevention vs. cure:** participants felt it was better to prevent the problem occurring in the first place rather than having to deal with the consequences. Examples included measures to prevent infected salmon entering GB waters (gyrodactylis); the use of fox-proof bins, and not leaving food about that attracts pests (rats). This attitude is consistent with the strategy of preventing INNS establishing a foothold in this country
- **lethal vs. non-lethal methods:** ideally, non-lethal methods would be adopted in preference to lethal methods however, there was recognition that this may not always be appropriate. For example, it may simply shift the problem elsewhere (fences, live traps etc.)

- **humane methods:** where animals are to be culled/killed there was an almost universal consensus that the methods used should result in instantaneous, painless death; there was also a recognition that most methods cannot guarantee this (for example, snares, traps, poisons/pesticides, shooting). Snares, in particular, were singled out as having the potential for causing animal suffering and many participants assumed they were illegal
- **cost effectiveness:** there was also a recognition that the cost of the solution needs to be proportional to the size and cost of problem. Furthermore, participants could see that this can result in a dilemma if the more humane methods are also the more expensive methods. There was a concern that many landowners will primarily be cost driven and this could result in animal suffering
- **effectiveness:** cost was not the only factor that participants used to judge the effectiveness of a solution, they sometimes questioned whether a method of control would work. Examples included fencing for deer (deer may get injured) and rabbits (burrow under) and crushing/burning of bracken (on the grounds this was a short-term solution as the bracken would presumably grow back). Some participants took the view that it is better to use a method that results in long-term rather than short-term outcomes. Some of the more 'drastic' measures, such as poisoning an entire river or pond would only be acceptable if it can be guaranteed to provide a permanent 'cure'. The example of gyrodactylis in salmon provides an interesting case study. The potential consequences of the infection taking hold are enormous and, in this situation, what appears to be a drastic solution (poisoning an entire river) would be acceptable provided there was no alternative and the solution was guaranteed to be effective
- **species specific:** most of the methods of culling are not species specific (examples include gassing, poison, pesticides, herbicides, snares, traps, flame throwers) and participants were looking for reassurances that only the 'problem species' will be killed (or, at the very least, the number of other animals and plants affected will be kept to an absolute minimum)
- **impact on the wider environment/ecosystem:** in a very similar vein, some of the proposed methods had the potential to damage the wider environment (e.g.

pesticides and herbicides polluting waterways) and wider ecosystems (e.g. draining ponds, damaging food chains)

- **potential to cause further problems:** using native predators to tackle a problem was acceptable but the introduction of NNS as predators was seen to represent a high risk approach as these species could, themselves, subsequently become invasive
- **size and scale of the problem:** methods that only target single organisms (e.g. snares, traps, shooting) are unlikely to provide a cost/time effective approach where there is a need to control large numbers of target organisms
- **high maintenance:** some methods of control were felt to require high levels of maintenance; setters of snares and live traps, for example, may not inspect them frequently enough resulting in unnecessary suffering
- **skills/competence:** some methods of control were perceived to require a certain level of competence; for example, shooting has the potential for animals to be wounded but not killed and some felt it should only be carried out by marksmen; shooting was more acceptable in rural locations
- **tried and tested:** one suggested method of control involved the development of immuno-contraceptives; participants felt this was a largely untested approach and they had concerns about the methods of application (how can it be applied to enough animals to make it effective) and the possible wider impacts (for example, if it is added to feed how can one prevent it being consumed by other species). Some felt this type of approach was 'messing with nature'.

2. Having considered a range of case studies in more detail, the workshop participants realised that the decision about which methods should be used in any given situation is not at all straightforward and that trade-offs are going to be inevitable. It was also apparent that some of their concerns came about through misunderstandings and misperceptions. For example, in the case of the Oak processionary moth, participants were unaware of the scale of the infestations such that the proposed use of flame throwers to incinerate the caterpillars sounded dramatic and over-the-top and might cause more damage to the trees compared to the caterpillars. Similarly, as we

commented on earlier, the idea of trying to shoot something that participants assumed was no bigger than a common frog (when, in fact American bullfrogs are much larger), seemed rather ludicrous.

3. It also became clear that methods of control might be perceived to be more acceptable if members of the public know that there are rules and regulations and codes of practice governing who can use each method and how it can be used. In a similar vein, the endorsement of a method by a recognised authority can help to overcome people’s concerns. Endorsements by the government or government departments, such as Defra, will have some impact; endorsements by respected, independent bodies would carry even greater weight.

6.4 Other Factors Influencing Public Opinion

6.4.1 Native vs. non-native

1. The case studies included examples of both native and non-native species to allow us to see if participants would respond differently to them. What was clear from the workshops was that while eradicating INNS was considered important – that is, participants would accept this as the reason for controlling such species provided the case can be made – the origin of the individual species in the case studies was not considered especially relevant. Participants said they based their decisions on the nature of the problem being caused – if native species can be shown to be causing significant problems, they were just as likely to support some form of control.

6.4.2 The type of organism

1. We also explored with participants whether the type of organism (e.g. animal or plant, mammal or insect, etc.) influenced how they responded to the case studies. Some participants took the view that all organisms should be treated the same however, for most people there was a clear hierarchy (although exactly which animals and plants fell into each category varied between individuals). This is summarised below.

|  |   |  |
|--|---|--|
| <p><b>No Concerns</b><br/>Plants (no feelings)<br/>Organisms associated with disease, dirt etc (e.g. rats)<br/>Organisms that harm humans (e.g. wasps)</p> | <p><b>Fewer Concerns</b><br/>'Lower'/'less intelligent' animals (insects, bugs, worms etc)<br/>Birds (for some)</p> | <p><b>Most Concerns</b><br/>'Higher'/'more intelligent' animals<br/>Cute and cuddly animals<br/>Birds (for some)<br/>Those associated with specific benefits (e.g. bees)</p> |
|--|---|--|



2. There was some supporting evidence of this hierarchy in work in the case studies. For example, there was more support for controlling Colorado beetles, rats and mice and most plants and less support for controlling stoats, deer and foxes (see Figure 18).

#### 6.4.3 Personal involvement

1. Although this did not emerge from the discussions of the case studies, it was clear from various comments throughout the workshops that levels of support for controlling wildlife management varied according to participants' personal level of involvement. For example, some were willing to see certain species being culled because they had caused damage to their gardens (e.g. Muntjac deer) while others would want to take steps to control protected species if they were personally affected (for example, if they had bats roosting in their roof space).

## 7 Pets, Ponds and Gardens

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### 7.1 Introduction

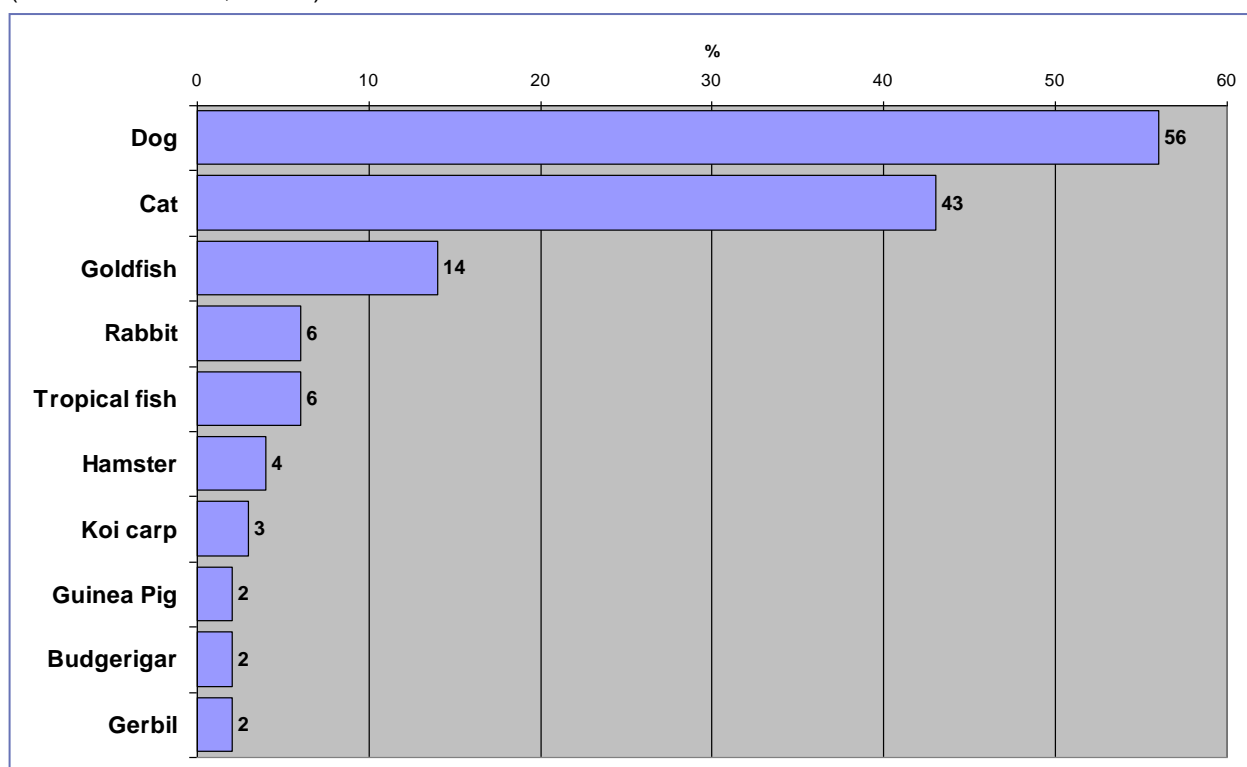
1. Respondents taking part in the survey of the general public were asked if they kept any pets or companion animals and, if so, the type(s) of companion animals they owned. We also asked about whether respondents had a garden and, if so if they were responsible for deciding which plants they grow and whether their garden had a pond that contained animals and/or plants. Those who did were asked about where they source plants and information about plants and how they dispose of unwanted plants. Their replies are summarised in this section of our report.

### 7.2 Pet Owners

1. Just over half of the households in our sample (52%) owned one or more pets or kept companion animals. The most common types of pet were dogs (56% of pet/companion animal owners had one or more dogs) and cats (43% of pet/companion animal owners had one or more cats). Nine out of every ten pet/companion animal owners had one or more small mammals (dogs, cats, rabbits, guinea pigs, hamsters, etc.). One in five (21%) kept fish, mainly goldfish (14%) and/or tropical fish (6%) while birds were kept by 5% of pet/companion animal owners, amphibians and reptiles by just 3% and insects by 1%. The most common types of pets/companion animals owned by our sample are summarised in Figure 19 and a full list is provided in Table 20.
2. 'Families' – that is, respondents who had dependent children aged under 17 – were significantly more likely to own a pet (64% vs. 47% for non-families), as were 'gardeners' (59% of people with a garden who were responsible for deciding what plants to grow vs. 38% of non-gardeners) and pond owners (70% vs. 49% of non-owners). Pet ownership dropped off sharply among the over 65 age group: 56% of those aged under 65 were pet owners compared to just 36% of those aged 65 and above.
3. There were no significant differences in pet ownership between the three wildlife management segments (Favourably Disposed, Qualified Supporters and the Undecided), nor was there a relationship between pet ownership and the degree of support for controlling INNS or the perceived level of threat from INNS.

**Figure 19: Most Common Types of Pets/Companion animals**

(base: Pet owners, n=314)



**Table 20: Number of Respondents Owning Each Type of Pet/Companion animal**

(Base: Pet Owners, n=314)

|                         |     |                       |   |                |   |
|-------------------------|-----|-----------------------|---|----------------|---|
| Dog                     | 176 | Parrot                | 4 | Pond fish      | 1 |
| Cat                     | 135 | Canary                | 3 | Cockatiel      | 1 |
| Goldfish                | 43  | Newt                  | 3 | Fruit beetle   | 1 |
| Rabbit                  | 20  | Ferret                | 3 | Frog/Toad      | 1 |
| Tropical fish           | 19  | Chinchilla            | 3 | Stick insect   | 1 |
| Hamster                 | 12  | Snake                 | 3 | Lovebird       | 1 |
| Koi carp                | 8   | Lizard                | 2 | Loach          | 1 |
| Guinea Pig              | 7   | Saltwater/marine fish | 2 | Shark          | 1 |
| Budgerigar              | 6   | Rat                   | 2 | Other carp     | 1 |
| Any type of farm animal | 5   | Shubunkin             | 2 | Bearded Dragon | 1 |
| Gerbil                  | 5   | Golden orfe           | 1 | Hedgehog       | 1 |
| Horse/pony              | 5   | Rudd                  | 1 | Finch          | 1 |
|                         |     |                       |   | Dove           | 1 |

### 7.3 Garden and Pond Owners

- 90% of respondents in the survey had a garden and, of these, three quarters (77%) were solely or jointly responsible for deciding what sorts of plants are grown (we refer to this sub-group as ‘gardeners’; they make up 69% of the total sample).

- 22% of respondents with a garden also had a pond or a water feature (20% of the total sample) and, of these, 78% had a pond containing animals and/or plants (we refer to this sub-group as ‘pond owners’; they comprise 17% of people with a garden and 15% of the total sample). The penetration of gardens, gardeners, ponds and pond owners is summarised in Table 21.

**Table 21: Penetration of Gardens, ‘Gardeners’, Ponds/Water Features and ‘Pond Owners’**

(Base: General Public total weighted sample, n=600)

|  | Total Sample | With a Garden | With a pond/water feature |
|--|--------------|---------------|---------------------------|
| n=   | 600          | 539           | 118                       |
|  | %            | %             | %                         |
| has a garden                                 | 90           | 100           |                           |
| responsible for plants (‘gardeners’)         | 69           | 77            |                           |
| has a pond/water feature                     | 20           | 22            | 100                       |
| pond contains animals/plants (‘pond owners’) | 15           | 17            | 78                        |

### 7.3.1 Gardener profile

- We recorded a number of statistically significant differences between the ‘gardeners’ and ‘non-gardeners’ in our sample. There were demographics differences based on location, gender and age:
  - although there was no difference between those living in urban and rural locations using the Defra definition, those who classed themselves as living in rural (79%) and semi-urban/rural (76%) locations were more likely to be gardeners compared to those living in urban locations (62%)
  - women were more likely to be gardeners (75%) compare to men (63%); furthermore, the incidence varied by age, reaching a peak among the 45-64 year old age cohort (see Table 22).

**Table 22: Has Responsibility for a Garden by Gender and Age**

(Base: General Public total sample, n=600)

|                                      | Base       | Gender     |            | Age       |            |            |           |
|--------------------------------------|------------|------------|------------|-----------|------------|------------|-----------|
|                                      |            | male       | female     | 16-24     | 25-44      | 45-64      | 65+       |
| Base                                 | 600        | 288        | 312        | 82        | 220        | 179        | 119       |
| <b>Has responsibility for garden</b> |            |            |            |           |            |            |           |
| Yes                                  | 416<br>69% | 181<br>63% | 235<br>75% | 28<br>35% | 146<br>67% | 153<br>86% | 88<br>74% |
| No                                   | 184<br>31% | 107<br>37% | 77<br>25%  | 54<br>65% | 74<br>33%  | 25<br>14%  | 31<br>26% |

2. ‘Gardeners’ were more likely than ‘non-gardeners’ to own pets (59% vs. 39% of non-gardeners). There were no differences between ‘gardeners’ and ‘non-gardeners’ in terms of their support for or attitudes towards wildlife management but there were some differences in relation to INNS:

- ‘gardeners’ were more likely to be familiar with the concept of INNS - 77% of those familiar with the concept were gardeners compared to 64% of those who were unfamiliar with the concept
- ‘gardeners’ also demonstrate an above average support for controlling INNS; 55% of ‘gardeners’ had above average scores compared to 47% of ‘non-gardeners’
- There was no difference between ‘gardeners’ and ‘non-gardeners’ in terms of the perceived threat of INNS.

### 7.3.2 Pond owner profile

1. Pond ownership (that is, ponds containing animals and/or plants) also varied by age, peaking among the 45-64 age group, but not gender (see Table 23).
2. ‘Families’ were less likely to own a pond (11% vs. 19% of ‘non-families’).
3. Once again there was no difference between those living in urban and rural locations using the Defra definition, however those who classed themselves as living in rural locations were more likely to own ponds (28%) compared to those living in urban or semi-urban/rural locations (15%).

**Table 23: Pond Ownership by Gender and Age**

(Base: General Public total sample, n=600)

|                                     | Base       | Gender     |            | Age       |            |            |            |
|-------------------------------------|------------|------------|------------|-----------|------------|------------|------------|
|                                     |            | male       | female     | 16-24     | 25-44      | 45-64      | 65+        |
| Base                                | 600        | 288        | 312        | 82        | 220        | 179        | 119        |
| <b>Has pond with plants/animals</b> |            |            |            |           |            |            |            |
| No                                  | 509<br>85% | 242<br>84% | 267<br>86% | 72<br>87% | 202<br>92% | 131<br>74% | 104<br>87% |
| Yes                                 | 91<br>15%  | 46<br>16%  | 45<br>14%  | 10<br>13% | 18<br>8%   | 47<br>26%  | 15<br>13%  |

4. Pond owners were more likely to be Qualified Supporters rather than Favourably Disposed towards wildlife management (see Table 24). They were more likely to be familiar with the concept of INNS (59% vs. 38% of non-owners), however there were no differences between pond owners and non-owners in terms of their level of support for controlling, or the perceived threat of INNS.

**Table 24: Pond Ownership by Support for Wildlife Management**

(Base: General Public total weighted sample, n=600)

|                               | Base       | Has pond with plants/animals |            |
|-------------------------------|------------|------------------------------|------------|
|                               |            | Yes                          | No         |
| Base                          | 600        | 91                           | 509        |
| <b>Overall response to WM</b> |            |                              |            |
| Supporters                    | 250<br>42% | 25<br>27%                    | 225<br>44% |
| Qualified Supporters          | 200<br>33% | 41<br>45%                    | 159<br>31% |
| Undecided                     | 151<br>25% | 25<br>28%                    | 125<br>25% |

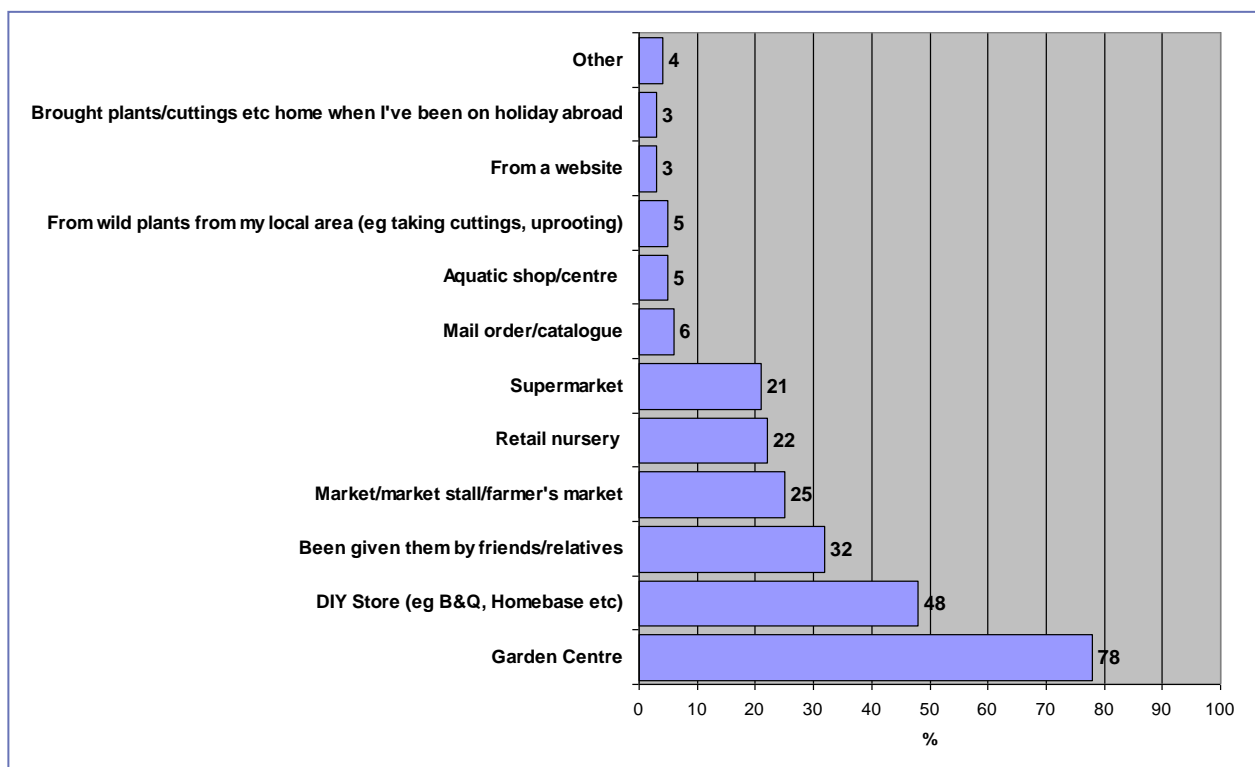
7.3.3 Sourcing plants and information about plants and disposing of unwanted plants

1. The gardeners in our sample were asked where they and other members of their family get plants for their garden and pond (if owned). They were also asked about sources of information and advice they used to help them decide which plants to buy.

2. Eight out of ten respondents (78%) bought plants from garden centres<sup>8</sup> while half of them (48%) used DIY stores. The next most frequently mentioned source was friends and relatives (32%), followed by markets (25%), retail nurseries (22%) and supermarkets (21%) (see Figure 20).
3. Pond owners (n=73) were more likely to use aquatic shops/centres (23% vs. 1% of non-pond owners, n=343); they were also more likely than non-pond owners to use retail nurseries (44% vs. 17%) although it is not clear if this relates specifically to purchases of aquatic plants.

**Figure 20: Where do you/you and other members of your family get plants for your garden/garden and pond?**

(Base: Gardeners, n= 416)

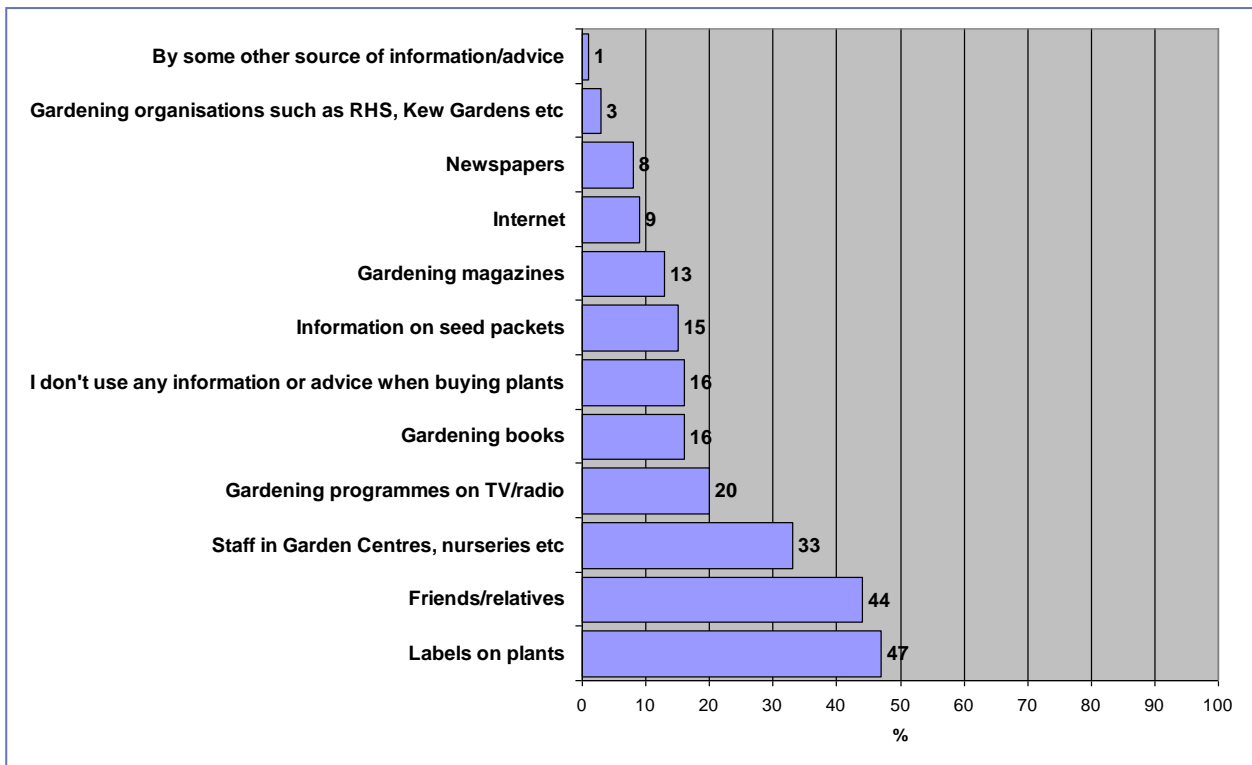


- The three most important sources of plant information and advice, in terms of the proportion of our sample using them, were plant labels (47%), friends and relatives (44%) and staff in garden centres and nurseries (33%) (see Figure 21).

<sup>8</sup> The data only indicate how many respondents use each source; it does not equate with frequency of use or with the number or value of plants purchased from each source.

**Figure 21: Which, if any, of the following information and advice do you use to help you decide what plants to buy for your garden/garden and pond?**

(Base: Gardeners, n= 416)



4. Those aware of the INNS concept (n=184) were more likely to use the following sources:

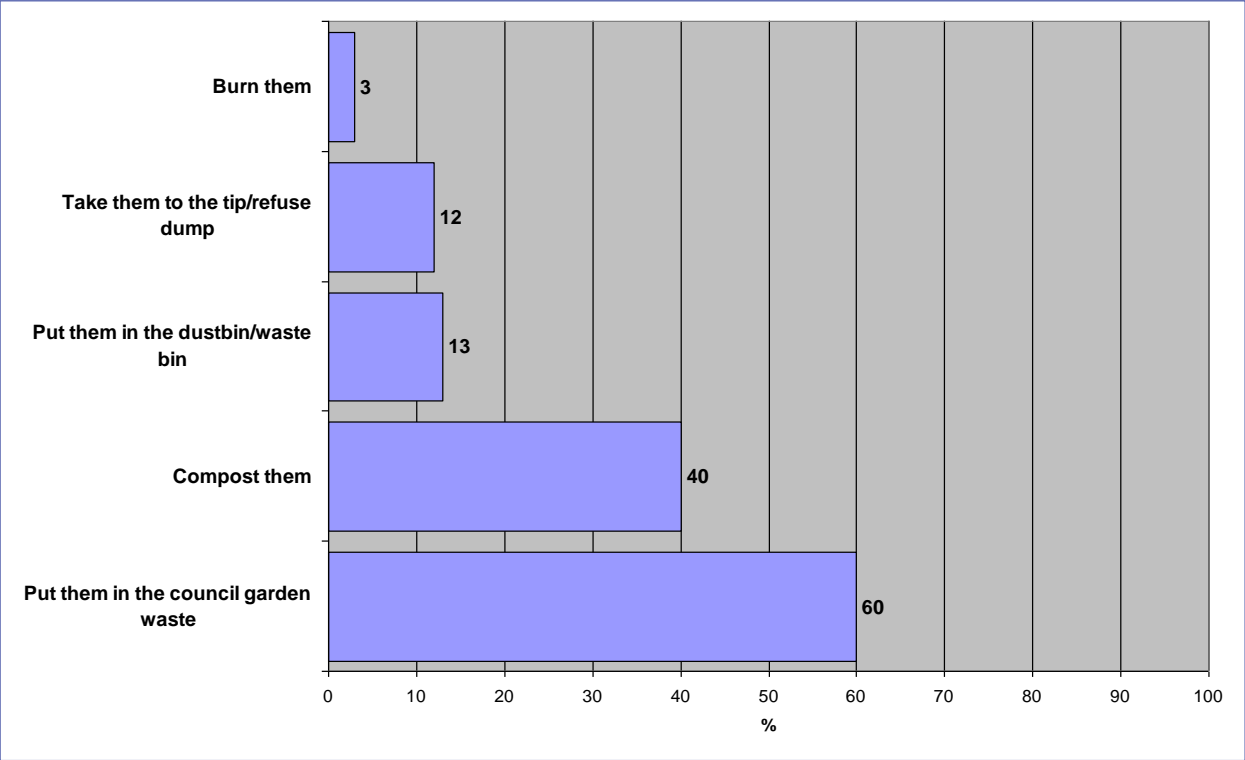
- friends/relatives (49% vs. 40% of those unfamiliar with the INNS concept; n=232)
- TV/radio (29% vs. 13%)
- gardening books (26% vs. 8%)
- websites (13% vs. 6%)
- gardening organisations (6% vs. 1%).

5. The main methods used to dispose of unwanted plants were via the council garden waste collection (60%) or by composting (40%) (see Figure 22). Only four respondents in our sample admitted to disposing of plants into the wild, two admitted to planting them in the wild and one admitted to putting aquatic plants into a waterway.



**Figure 22: Which of these describe how you dispose of plants from your garden/ garden and pond you no longer want?**

(Base: Gardeners, n= 416)



## 8 Wildlife Management & INNS: Influencing Public Behaviour

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### 8.1 Introduction

1. During the workshops with the general public we explored participants' views on the role and responsibilities that the general public has with regard to wildlife management and INNS. Participants felt that retailers also have responsibilities and we explored what form this might take. We also explored how to communicate effectively with the public. We summarise their views below. The views of horticultural retailers are presented in Section 11.

### 8.2 The Public Role/Responsibility

1. It was widely accepted by the workshop participants that the public has a responsibility and a role to play in relation to wildlife management and INNS. Indeed, this was often raised spontaneously when we discussed who might be involved in managing wildlife. At the same time, when asked to suggest what form this might take, participants struggled to articulate what their role might be other than taking steps to protect the environment (e.g. do not feed wildlife, don't drop litter). This was partly because they tended to focus on methods of control and did not know what they could or should be expected to do. There was almost no spontaneous discussion, for example, of monitoring or reporting the presence of INNS to the authorities.
2. So, while there was a willingness to play their part, there was a recognition that the public needs to be educated before they can meet their responsibilities. In particular, participants felt that they need to know:
  - what to look out for and how to recognise individual species
  - what steps, if any, to take to control and dispose of such species
  - who to contact/inform and how to do this.
3. Moreover, if the public took their responsibilities seriously and reported the presence of INNS, for example, they would expect to see something being done as a result of this otherwise they would assume that no one was taking any notice of their actions and they would be less likely to report something in the future.

### 8.3 The Retailer Role/Responsibility

1. Participants considered that retailers have a duty to avoid selling certain species and to provide customer information and guidance. Some participants called for stricter controls on what can be imported into the country and felt that the more invasive species should be banned or that retailers and/or owners should be licensed before they can sell/buy certain species.
2. Some called for more information to be provided at point-of-sale such as plant labels informing the consumer of the potential invasive nature of certain species together with advice about care and disposal.

### 8.4 Communicating with the General Public

1. Most of the methods of communication we explored with the workshop participants, such as posters, leaflets and a website, met with a lukewarm response mainly because the issue is currently so low on the public radar that they would not take any notice of these methods of communication.
2. We also explored reactions to the idea of having posters displayed at places such as air and sea ports and at places where the public go to experience nature and wildlife.
3. Participants assumed that posters were currently displayed at ports of entry but felt that this was too passive an approach and that proactive screening was needed, often citing the Australian/New Zealand approach as a possible model.
4. Displaying information at places where people go to experience and enjoy wildlife was felt to be effective because there would be a receptive audience and people are often seeking out information about some of the things they are hoping to see.
5. Another idea we explored was providing facilities where the public could safely dispose of INNS; this also met a lukewarm response. Given the difficulty in getting people to recycle and sort their waste even after years of effort, participants felt that providing facilities for the safe disposal of INNS would probably have little impact.
6. The forms of communication explored in the workshops rest on the assumption that the public are already aware of the issue and that all they need is to be reminded about why it is important and what steps they should be taking. The reality of the situation is that for most members of the public the issue of INNS and the problems they cause is not one they are aware of. The quantitative research supports this view given that 60% of

respondents in our survey had not come across the concept before. The implication is that the issue needs to be brought to the public's attention. Once it is 'on their radar' and perceived to be a serious problem affecting us all, the public will have a reason to notice and respond to other forms of communication.

#### 8.4.1 Key messages

1. From the workshop discussions, we were able to identify a number of key messages that can be used to bring the issue to the public's attention. These include:
  - the cost of INNS to the tax payer
  - the impact they have on the environment especially the damage they cause to native species
  - the consequences of not taking action
  - the consequences of releasing non-native species into the wild – even when done for 'the best of reasons'
  - the legal position – no one was aware that it was illegal to release NNS into the wild and for many this information alone had the power to shape their future behaviour.
2. In terms of the tone of voice of any communication, it will be important not to preach. Participants did not want to be told that they should or should not do certain things. Instead they wanted to understand the reasons for wildlife being controlled and needed to feel that the methods being proposed are appropriate and proportional to the threat.
3. As we have seen, there is a receptiveness on the part of the public to play a part in managing wildlife and controlling INNS but in order to build upon this Defra needs to decide what role the public is expected to play and how they can fulfil this – and then communicate this.

#### 8.4.2 Methods of communication

4. Given the need to raise awareness of the issue of INNS, participants felt that this meant the use of mainstream media including TV and radio news programmes, the 'red tops' as well as the broadsheets as well as popular TV and current affairs programmes (e.g. The One Show, nature programmes, gardening programmes, storylines in soaps).

5. They also felt there was a role for specialist interest media such as fishing, gardening, and wildlife magazines. Recognised and respected personalities, who might act as spokespeople, included Alan Titchmarsh, David Attenborough and Bill Oddie.
6. It was also clear from the workshops that people were more likely to engage with the issue if it could be demonstrated that it affects 'me' and this suggests there is a role for local press and local authority newspapers, possibly using case studies involving local people.

## 9 INNS: The Angler Perspective

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### 9.1 Research Objectives, Method and Sample

1. The objectives of the qualitative phase of the research were broadly similar to the objectives of the general public research except our focus with anglers was on the issue of INNS; wildlife management was not covered. We explored their awareness and attitudes towards INNS, their levels of knowledge about which species are considered INNS and aspects of their current behaviour including relocating and re-releasing fish, and bio-security and ways of communicating with the angler community.
2. A single two hour discussion group was carried out with freshwater anglers. The sample included a mix of coarse and game anglers and club members and non-members. The group was recruited in the North East and carried out in September 2008. In addition, a depth interview was carried out with a representative of the Fisheries and Angling Conservation Trust (FACT), one of the lead bodies for fisheries and angling in England<sup>9</sup>.
3. The recruitment questionnaire and topic guides are provided in the appendix,
4. The objectives of the quantitative research among anglers were:
  - to establish levels of **awareness** and understanding of the **meaning of INNS**
  - to report on levels of **awareness of INNS**
  - To gauge the perceived seriousness of the **threat of INNS** to angling
  - to establish **current behaviour** and **willingness to modify such behaviour** to help control INNS in relation to
    - releasing catches
    - introducing fish to, and moving fish between, waterways
    - biosecurity (air drying nets, cleaning equipment, use of net dips and stink bags<sup>10</sup>).

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<sup>9</sup> Since the interview was carried out, FACT has merged with a number of other bodies to form the Angling Trust – an organisation that aims to represent all game, coarse and sea anglers in England.

<sup>10</sup> Many commercial fisheries provide net dips containing a sterilising solution. Anglers are expected to put their nets into these before they start fishing. A stink bag is an air tight bag used to store nets between trips; nets may be put away wet and this creates ideal conditions for incubating diseases.

5. 150 telephone interviews were conducted during November 2008. The sample was drawn at random from a list of adults in England who had indicated that angling was a leisure activity. A copy of the questionnaire can be found in the appendix.

## 9.2 Sample Details

1. The sample was almost entirely made up of men (97%) aged 45 and above (81%). Nearly two thirds of the sample (62%) was from SEGs C2DE (see Table 25).

**Table 25: Sample Demographics**

(base: Anglers total sample, n=150)

| Base                              |     | 150 |
|-----------------------------------|-----|-----|
| <b>Record Respondent's Gender</b> |     |     |
| male                              | 146 | 97% |
| female                            | 4   | 3%  |
| <b>Record Respondent's Age</b>    |     |     |
| 16-24                             | 1   | 1%  |
| 25-34                             | 5   | 3%  |
| 35-44                             | 23  | 15% |
| 45-54                             | 47  | 31% |
| 55-64                             | 59  | 39% |
| 65 and above                      | 15  | 10% |
| <b>SEG</b>                        |     |     |
| AB                                | 23  | 15% |
| C1                                | 32  | 21% |
| C2                                | 55  | 37% |
| DE                                | 38  | 25% |
| REFUSED                           | 2   | 1%  |

**Table 26: Types of Anglers**

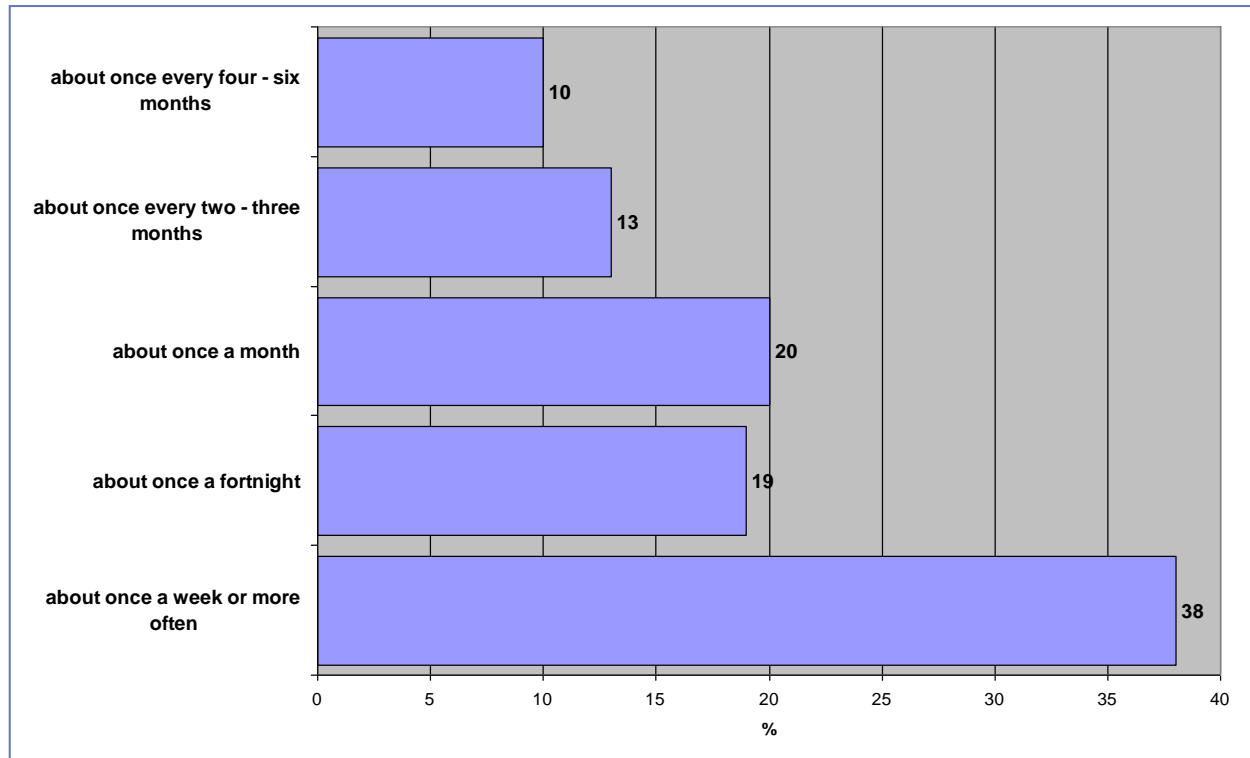
(base: Anglers total sample, n=150)

| Base   |     | 150 |
|--|-----|-----|
| <b>Would you describe yourself as a game or a coarse angler?</b> |     |     |
| Game   | 25  | 17% |
| Coarse   | 105 | 70% |
| Both   | 20  | 13% |
| <b>Angler</b>  |     |     |
| match/specialist   | 34  | 23% |
| pleasure   | 116 | 77% |
| <b>Club Member</b>   |     |     |
| Yes  | 74  | 49% |
| No   | 76  | 51% |

- Some four out of every ten (38%) anglers in our sample were fishing at least once a week and three quarters of the sample were going fishing at least once a month (see Figure 23).

**Figure 23: ‘How often do you normally go freshwater fishing in England?’**

(base: Anglers total sample, n=150)



- 70 percent of anglers in our sample were coarse fishermen, 17% were game fishermen and 13% did both. Nearly a quarter of the sample (23%) were either match fishermen (who regularly take part in competitions and made up 15% of our sample) or specialists (who target particular species and made up 9% of our sample). For the purposes of our research, anyone who did not describe themselves as a match or a specialist angler was defined as a ‘pleasure angler’ and this was far the largest group, comprising three quarters of our sample (77%). In terms of membership of angling clubs, our sample was evenly divided between members (49%) and non-members (51%). These details are set out in Table 26.
- NB We have no way of determining how representative our sample is in terms of freshwater fishermen in England as we have not been able to find any profile data against which to compare it. There is some indication, based on information provided by FACT, that our sample may include a larger proportion of frequent anglers and fewer occasional anglers. The findings need to be interpreted in this context. Although the



overall sample of anglers is large enough to allow us to have confidence in the results, some of the sub-group comparisons are based on relatively small bases and so care is needed when interpreting these.

### 9.3 Invasive Non-native Species: Awareness & Understanding of the Concept

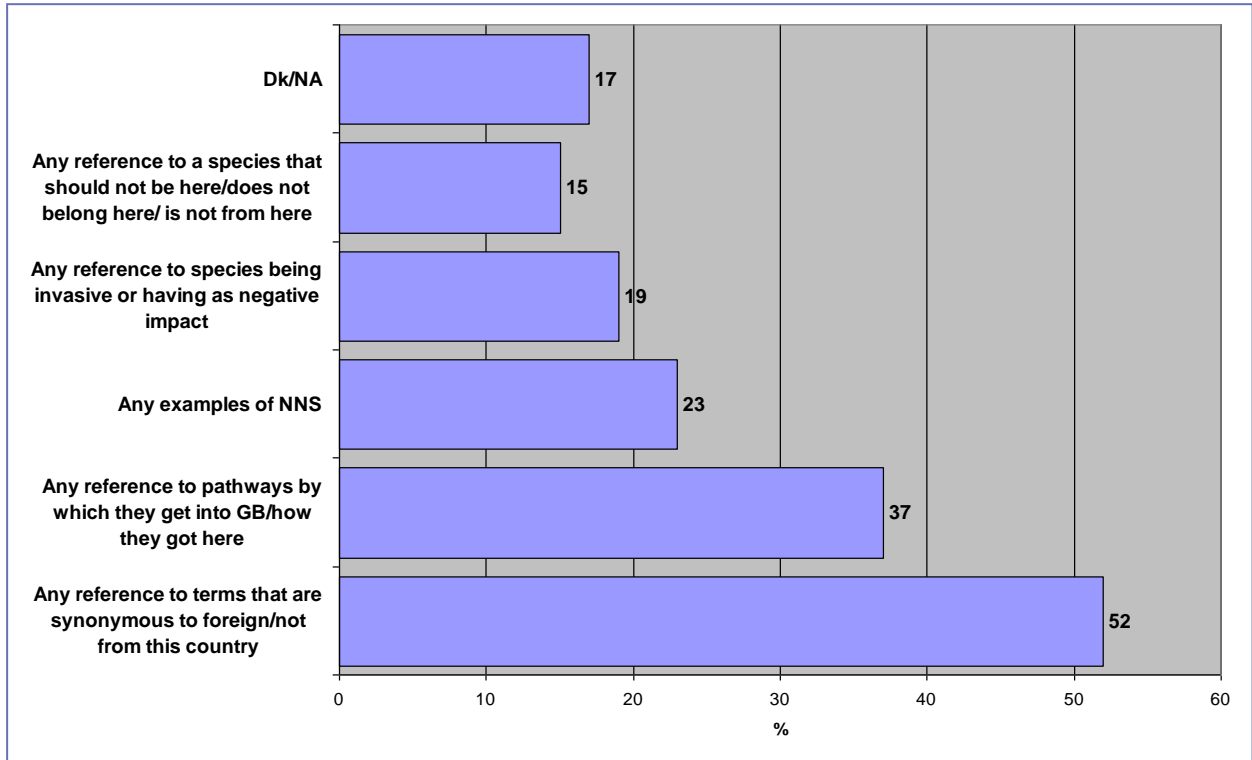
1. Levels of awareness of the INNS concept were much higher among our sample of anglers compared to the general public. Eight out of every ten (78%) anglers were familiar with the term compared to just 40% of the general public. Game anglers (91%; n=45) were more familiar than coarse fishermen (76%; n=125).
2. Respondents in the telephone survey were asked what they thought the term means and their answers were grouped using the themes that emerged from the workshops with the general public and the angler discussion group. The most frequently mentioned themes address the non-native element of the term and less than one in every five made reference to the invasive qualities. This contrasts with the general public who focused on the negative and invasive qualities of INNS but this probably reflects differences in the way the questions were asked<sup>11</sup>. Unlike the general public, who rarely made reference to how such species were introduced, some four out of every ten anglers (37%) made some reference to entry pathways (see Figure 24).

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<sup>11</sup> For reasons of time, anglers were only asked to define INNS whereas in the general public survey respondents were asked to define NNS first and then INNS. This probably accounts for differences in the definitions put forward by the two groups.

**Figure 24: What do you think is meant by the term ‘invasive non-native species?’**

(base: Anglers total sample, n=150)



3. Examples of some of the definitions provided are given below.

**any reference to terms that are synonymous to foreign/not from this country**

**Foreign** fish that have been put in the rivers

Fish from the **continent, abroad**

Something that has been introduced from **another country**

Fish that are **not indigenous** to our waters

**Any reference to pathways by which they go into GB**

Fish or plants **that have been introduced** but are not native to this country

Fish that may have **escaped from farms** or **brought into the country** like zander

Catfish, zander, species that have been **brought in by other anglers.**

**Illegally imported** species

**any reference to species being invasive or having a negative impact**

It's a species that **takes over and causes aggravation**

Non-native species that **cause damage to the bank side**

Things like signal crayfish and mussels and crabs and parasites that **destroy natural fish stocks**

Things like zander, **they wipe out the whole population** of fish, they're predators

**Any reference to a species that should not be here/does not belong here**

Species that **aren't supposed to be there**

Japanese knotweed, something that comes from another country and **shouldn't be there**

Fish that **do not belong** in our waters

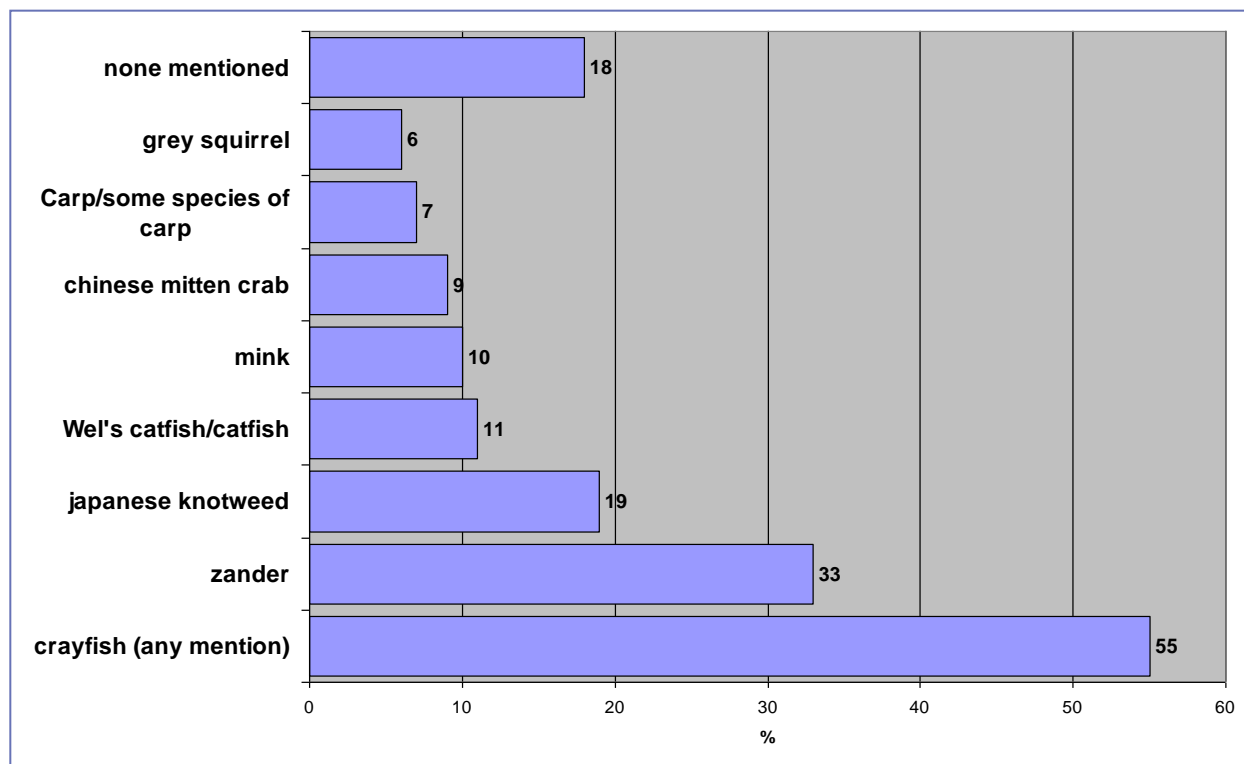
## 9.4 Awareness and Recall of Specific Examples of INNS

### 9.4.1 Unprompted recall

1. Anglers taking part in the telephone survey were asked if they could give any examples of INNS that can be found in Great Britain. Eight out of ten (82%) were able to offer an example (76% of the general public were able to give an example). The most commonly mentioned species were the crayfish (55% in total mentioned the crayfish; this can be broken down further into 32% mentioning the American crayfish, 16% Signal, 6% Red clawed and 3% not specifying), Zander (33%), and Japanese knotweed (19%) (see Figure 25). In total some 45 different examples were provided and a complete list can be found at Table 27.

**Figure 25: Can you name any invasive non-native species that can be found in Great Britain?**

(Base: Anglers total sample, n=150)



**Table 27: Unprompted examples of INNS – Number of mentioned**

(Base: Angler total sample, n=150)

|                     |    |                                     |   |                      |    |
|---------------------|----|-------------------------------------|---|----------------------|----|
| Zander              | 49 | Pumpkinseed                         | 3 | Japanese crab        | 1  |
| American crayfish   | 48 | Red squirrel/squirrel (unspecified) | 3 | Koi carp             | 1  |
| Japanese knotweed   | 29 | Canadian pondweed                   | 2 | Orfe/ide)            | 1  |
| Signal crayfish     | 24 | Goldfish                            | 2 | Piranha              | 1  |
| Mink                | 15 | Minnow/motherless minnow            | 2 | Rabbit               | 1  |
| Chinese mitten crab | 14 | Parakeet                            | 2 | Ragwort              | 1  |
| Wel's catfish       | 12 | Rainbow trout                       | 2 | Rhododendron         | 1  |
| Carp/some carp      | 10 | Topmouth gudgeon                    | 2 | Rosebay willow       | 1  |
| Grey squirrel       | 9  | Water hyacinth                      | 2 | Snakehead fish       | 1  |
| Red clawed crayfish | 6  | Beaver                              | 1 | Spanish red kite     | 1  |
| Crayfish (unspec.)  | 5  | Bitterling                          | 1 | Turtle               | 1  |
| Catfish             | 4  | Chinese weed                        | 1 | Wallaby              | 1  |
| Cormorant           | 4  | Dogweed                             | 1 | Water weed (unspec.) | 1  |
| Coypu               | 4  | Duck type riverbank bird            | 1 | Wide mouthed bass    | 1  |
| Terrapin            | 4  | European wasp                       | 1 | Zebra mussel         | 1  |
| Himalayan balsam    | 3  | Hermit crab                         | 1 | None mentioned       | 27 |

#### 9.4.2

### 9.4.3 Prompted recall

1. The anglers taking part in the telephone survey were read out a list of 19 plants and animals. With two exceptions, these were all examples of INNS. They were asked which they would recognise if they caught or saw them when out fishing. Their answers are summarised in Table 28. This reveals that while there was high recognition of most of the animal species, anglers were not very good at recognising the plants.

**Table 28: Which of the following animals and plants would you recognise if you caught it or saw it when out fishing?**

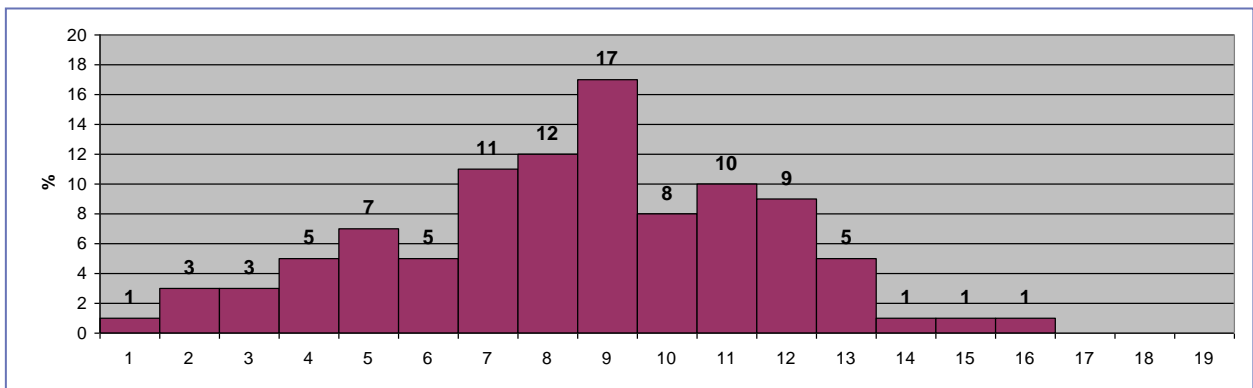
(Base: Angler total sample, n=150)

|                | >50% Recognition         |                  | <50% Recognition    |     |
|----------------|--------------------------|------------------|---------------------|-----|
| <b>Animals</b> | Roach                    | 99%              | Chinese mitten crab | 25% |
|                | Common carp              | 98%              | Bitterling          | 24% |
|                | Rainbow trout            | 97%              | Sunbleak            | 17% |
|                | Goldfish                 | 95%              |                     |     |
|                | Zander                   | 85%              |                     |     |
|                | Signal/american crayfish | 81%              |                     |     |
|                | Wel's catfish            | 75%              |                     |     |
|                | Topmouth gudgeon         | 63%              |                     |     |
|                | Orfe                     | 60%              |                     |     |
| <b>Plants</b>  | Ragwort                  | 57%              | Japanese knotweed   | 45% |
|                |                          |                  | Water primrose      | 35% |
|                |                          |                  | Pumpkinseed         | 34% |
|                |                          |                  | Water fern          | 31% |
|                |                          |                  | Floating pennywort  | 29% |
|                |                          | Himalayan balsam | 14%                 |     |

2. A 'species recognition score, was calculated for each angler which could range from 0 to +19. The distribution of these scores is provided in Figure 26. The mean score was 10.7. We divided the sample into two roughly equal groups:
  - those with an above average species recognition score (49% of the sample with a mean score of 13.3)
  - those with a below average score (51% with a mean of 8.2).
3. This revealed that Match and Specialist Anglers tended to recognise a greater number of species (65% of Match and Specialist anglers [n=34] had above average scores compared to 44% of Pleasure anglers [n=116]).

### Figure 26: Distribution of Species Recognition Scores

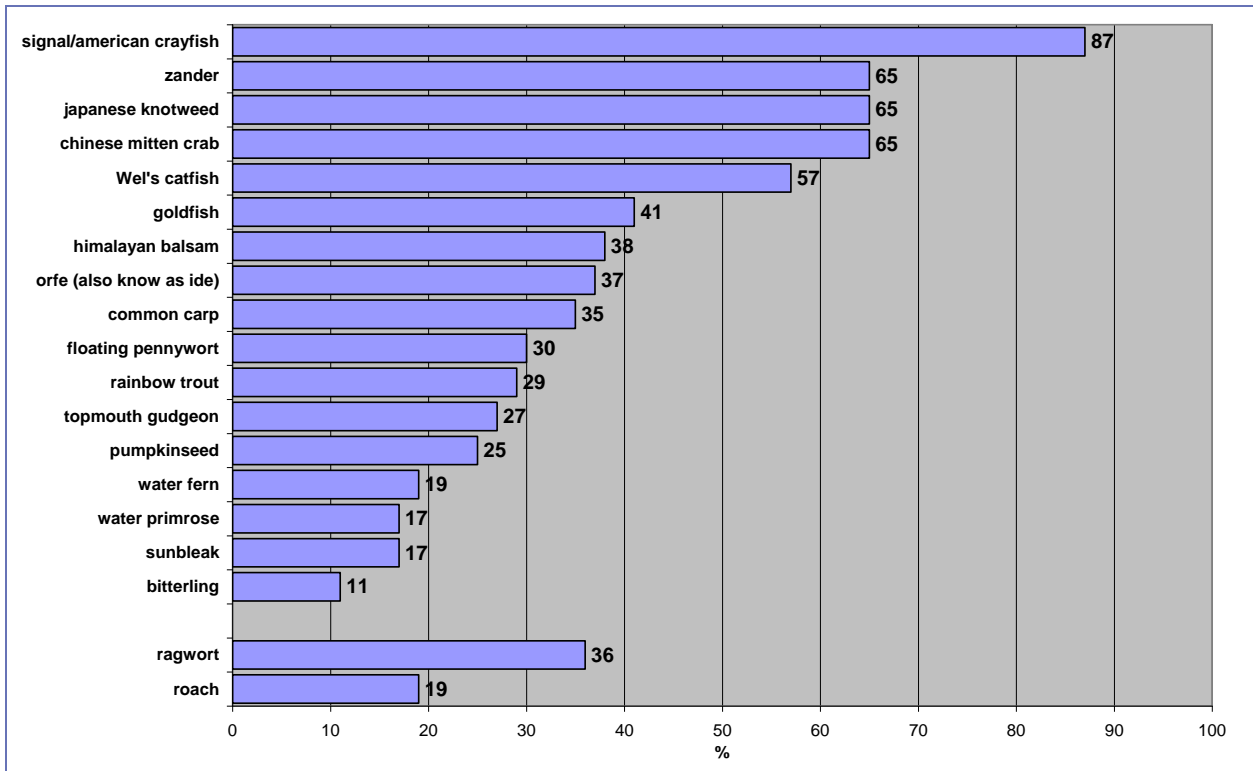
(base: Anglers total sample, n=150)



4. Using the same list of 19 species, Anglers were asked which they considered to be INNS present in Britain. Their answers are set out in Figure 27. The Signal or American crayfish was known to nearly nine out of every ten anglers (87%) while almost two thirds of the sample identified the Chinese mitten crab, Japanese knotweed and Zander (65% in each case). Wel’s catfish was also correctly identified as an INNS by just over half the sample. All other species were considered to be INNS by less than half the sample. Ragwort and Roach (both native species) were incorrectly identified by 36% and 19% of the sample respectively.

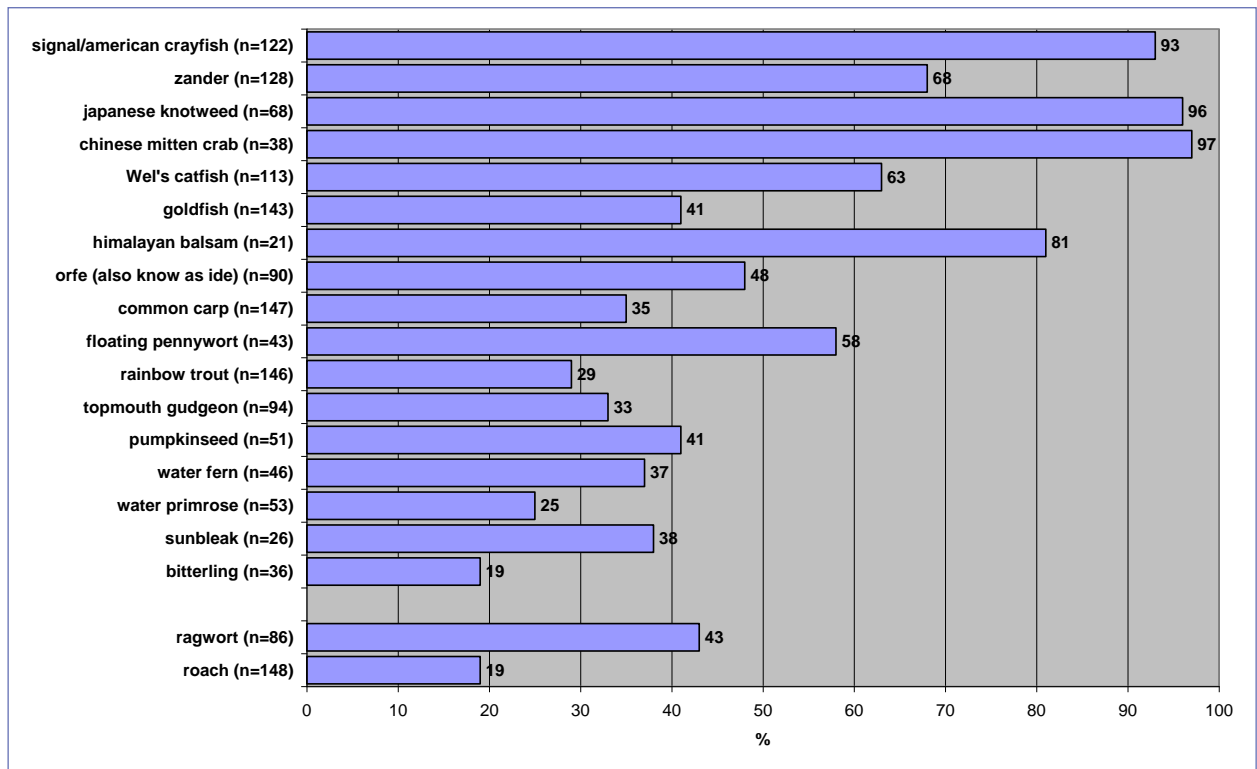
**Figure 27: Can you tell me which of the following animals and plants, if any, are considered to be invasive non-native species that can be found in Britain?**

(base: Anglers total sample, n=150)



**Figure 28: Proportion Identifying each Species as INNS**

(Base: those who would recognise each species, n= variable)



5. If we reanalyse the data on the basis of those respondents who would recognise each of the species, the number identifying each species as INNS increases; in the case of the Chinese mitten crab, Japanese knotweed and Zander almost everyone who would recognise the species also know they are invasive non-natives (see Figure 28). The problem, however, is that the number of anglers who know something is an INNS and could recognise it is often very small. This is illustrated in the matrix below. Only three of the 19 species would be recognised and are known to be INNS by 50% or more of our sample. Five of the better recognised species were not widely known or considered to be INNS (in the angler discussion group some participants knew that the common carp was an introduced species but they were not willing to accept that it is invasive). Two species that are known to be INNS (Chinese mitten crab and Japanese knotweed) would only be recognised by less than half our sample, and six other species were neither widely recognised nor known to be INNS.

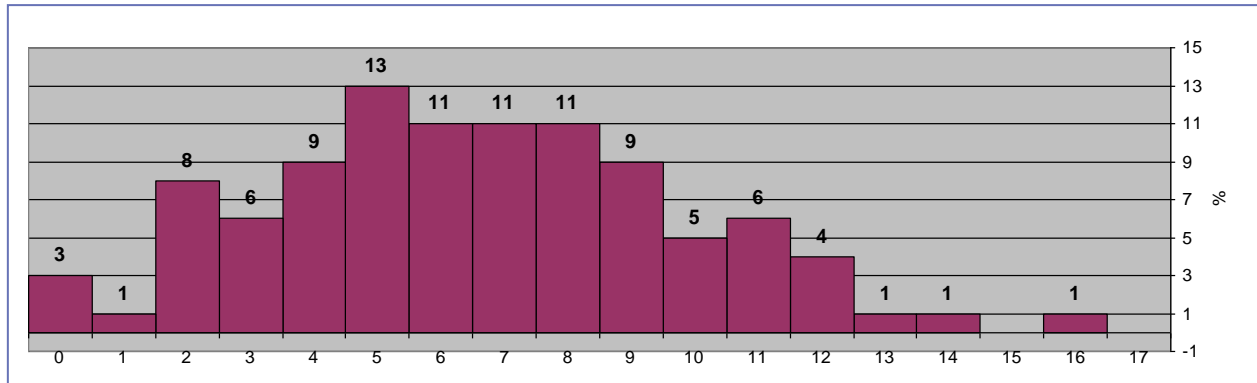
|            |      | Considered to be INNS                      |   |
|------------|------|--|---|
|            |      | High                                       | Low   |
| Recognised | High | Signal crayfish<br>Wel's catfish<br>Zander | Common carp<br>Goldfish<br>Rainbow trout<br>Orfe<br>Topmouth gudgeon                        |
|            | Low  | Chinese mitten crab<br>Japanese knotweed   | Bitterling<br>Floating pennywort<br>Pumpkinseed<br>Sunbleak<br>Water fern<br>Water primrose |



6. An INNS Recognition score was computed for each angler based on the number of INNS in the list they correctly identified – this could range from 0 to +17. The distribution of these scores is set out in Figure 29. The mean score was 6.7.

**Figure 29: Distribution of INNS Recognition Scores**

(base: Anglers total sample, n=150)



7. As before, we divided our sample into those with an above average recognition score (50%) – their mean was 9.4 – and those with a below average recognition score (50%) – their mean was 3.9. We then looked to see if certain sub-groups had a higher recognition of INNS than others. There were no significant sub-group differences.

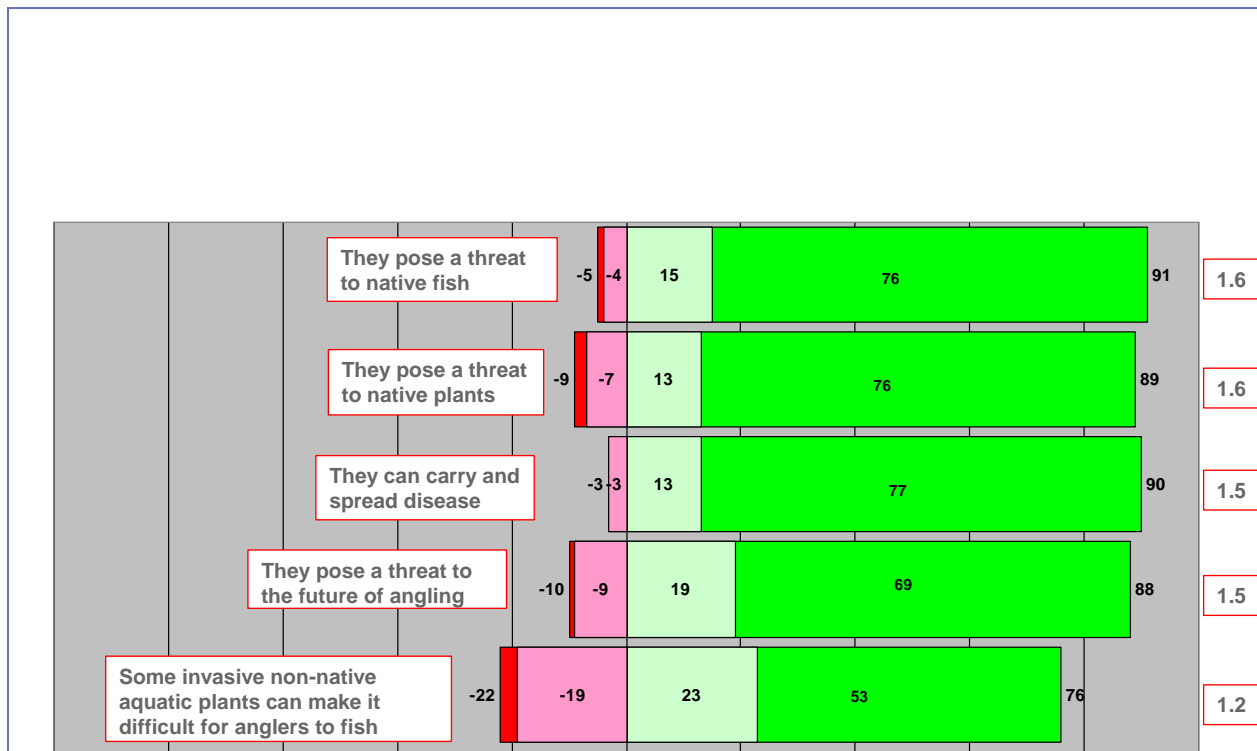
### 9.5 Perceived Threat of INNS

- During the course of the angler discussion group, we explored participants' attitudes towards non-native species of fish. A number of arguments were put forward in favour of non-native fish. For example, Rainbow trout (a non-native) is much easier to catch than the native Brown trout, and especially for the less skilled/patient angler, this offers some advantages. Some of the anglers felt that allowing NNS to be kept in artificial lakes and ponds poses no significant threat, although as some respondents recognised, there is always the possibility of them escaping during floods. One more knowledgeable angler felt it was important to distinguish between NNS and INNS especially since several well established species that are popular among fishermen – such as carp – are NNS but 'do not cause problems'.
- The arguments put forward against the introduction of NNS included:
  - there is no need for such species as there are sufficient numbers and variety of NS already present
  - it is not natural: some participants adopted a 'purist' view and wanted to fish 'as nature intended' without any artificial or unnatural 'aids'

- there is the potential to damage the sport through the introduction of disease, the impact of such species on native species, and problems accessing the bank side due to the proliferation of certain INNS of plants.
3. Based partly on these opinions, our sample of anglers taking part in the telephone survey were asked how serious a threat they thought INNS were in terms of:
- posing a threat to native fish
  - posing a threat to native plants
  - by carrying and spreading disease
  - some INN plants making bank side access difficult
  - some INN aquatic plants making it difficult to fish
  - posing a threat to the future of angling.
4. For each threat, they were asked to rate it as shown below (numbers in brackets correspond to the scores assigned to each rating).
- very serious (+2)
  - fairly serious (+1)
  - DK (0)
  - not very serious (-1)
  - Not at all serious (-2).
5. A summary of their views is provided in Figure 30.
6. Overall, a majority of anglers rated INNS as a 'very serious threat' on five of the threats; and 70% rated INNS as at least a 'fairly serious threat' for the remaining threat (difficulty of accessing the bank side).

**Figure 30: I am going to read out some of the effects invasive non-native species can have. I should like you to tell me how serious you feel each threat is.**

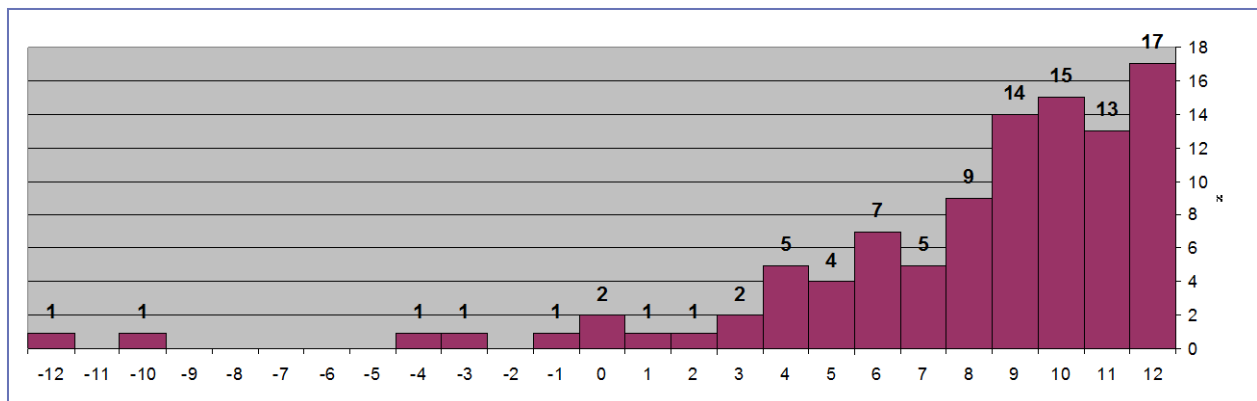
(base: Anglers total sample, n=150)



7. An Overall Threat score was computed for each angler based on their ratings of the six threats – this could range from +12 to -12. The distribution of these scores is given in Figure 31 . The mean score was 8.0.

**Figure 31: Distribution of Overall Threat Scores**

(base: Anglers total sample, n=150)



8. Again, we divided our sample into those with an above average threat score (59%) – their mean was 10.6 – and those with a below average threat score (50%) – their mean was 4.4. Match and Specialist anglers (74% vs. 54% of Pleasure anglers; n=34/116)

and members of angling clubs (69 vs. 49% of non-members; n=74/76) were more likely to be in the above average threat category compared to other anglers.

9. A comparison of the proportion of each group rating each threat as ‘very serious’ reveals that a majority in both groups perceive INNS to be a very serious threat in terms of spreading disease and to both native plants and animals and, as such, threaten the future of angling. Where the two groups differ is just how serious a threat plant species pose in terms of accessing the bank side and being able to fish (for example, clogging up a waterway such that it can be difficult to present the bait). The first four threats are messages that are therefore likely to have the greatest impact across the greatest number of anglers (see Table 29).

**Table 29: Percentage Considering INNS to be a Very Serious Threat for those in the Above and Below Average Threat Groups**

(Base: Above Average, n=88; Below Average, n=62)

|  | Above average threat % | Below average threat % | Difference % |
|--|------------------------|------------------------|--------------|
| Some invasive non-native aquatic plants can make it difficult for anglers to fish                | 80                     | 15                     | +65          |
| Some invasive non-native aquatic plants can make it difficult for anglers to get to the bankside | 58                     | 6                      | +52          |
| They pose a threat to the future of angling  | 84                     | 47                     | +37          |
| They pose a threat to native plants  | 90                     | 56                     | +34          |
| They pose a threat to native fish  | 89                     | 58                     | +31          |
| They can carry and spread disease  | 88                     | 61                     | +27          |

**9.6 Influencing Angler Behaviour**

1. At the start of the telephone survey, before introducing the topic of INNS, we asked anglers a number of questions about their behaviour. Towards the end of the interview, after discussing INNS and their potential impact, the interviewer read out a number of

ways in which anglers could help to combat the threat of INNS by adopting certain behaviours. Respondents were asked to say whether they would be willing to adopt these behaviours. A comparison of their current behaviour with their willingness to adopt the suggested behaviours provides an indication of their willingness to modify their behaviour where this might be necessary.

#### 9.6.1 Moving fish between waters

1. A significant problem within the angling community is the fact that some anglers have moved fish from one water to another in order to be able to fish in those waters for species that would not naturally be found there.
2. Some of the discussion group respondents had seen goldfish and terrapins in local waters and had assumed this is down to members of the public rather than anglers. When asked, they claim not to do it themselves but some of them were aware of other anglers moving fish from one water to another. They felt that this was much more common several years ago but happens less now and this was a view reinforced by the FACT representative (but who believes it still goes on).
3. The discussion group respondents recognised that this was inappropriate behaviour and, to an extent, tried to deflect the blame by pointing out that fish get released/moved by other means (for example, escaping from artificial ponds during floods). They also felt that the Environment Agency has some responsibility for this by suggesting that if the Agency ensured waterways were adequately stocked with native fish, anglers would have less need to introduce or move fish.
4. Anglers taking part in the survey were asked if they had ever moved fish between waters. Only 6% were willing to admit this (n=9) but they all claimed they did so with Environment Agency or Section 30 Consent<sup>12</sup>.
5. Not surprisingly then, when asked if they would agree never to move fish or plants from one water to another, 98% said they would definitely agree not to in the future.

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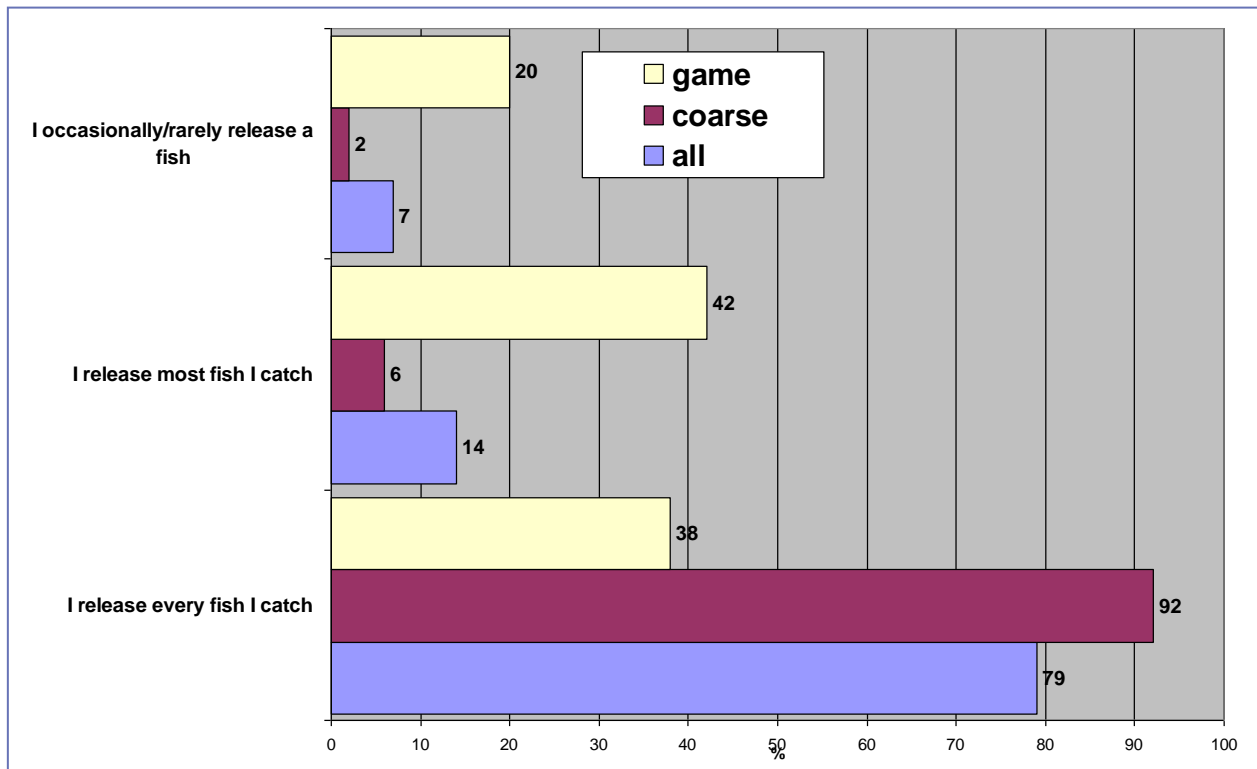
<sup>12</sup> Before introducing any fish (or fish spawn) into inland waters (including all private fisheries and still waters), the written consent of The Environment Agency must be obtained. This is known as Section 30 Consent.

## 9.6.2 Releasing fish

1. The extent to which an angler will keep or release a fish depends on the type of fishing. A defining feature of coarse angling is that the fish is always released – for some of the anglers in the group discussion this was a matter of honour and pride and they were reluctant to change their behaviour even if they knew the fish in question was an INNS. This was confirmed in the telephone survey where 92% of coarse anglers said that they released every fish they caught. Traditionally game fish were kept; according to the FACT representative, there is an increasing trend to release partly due to concerns about stocks. This was confirmed by the results of the telephone survey – 80% of game anglers (NB low base) said they release most if not all the fish they catch (see Figure 32).

**Figure 32: Propensity to Release Fish that have been Caught**

(base: Anglers total sample, n=150; Game Fishermen, n=45; Coarse Fishermen, n=125)

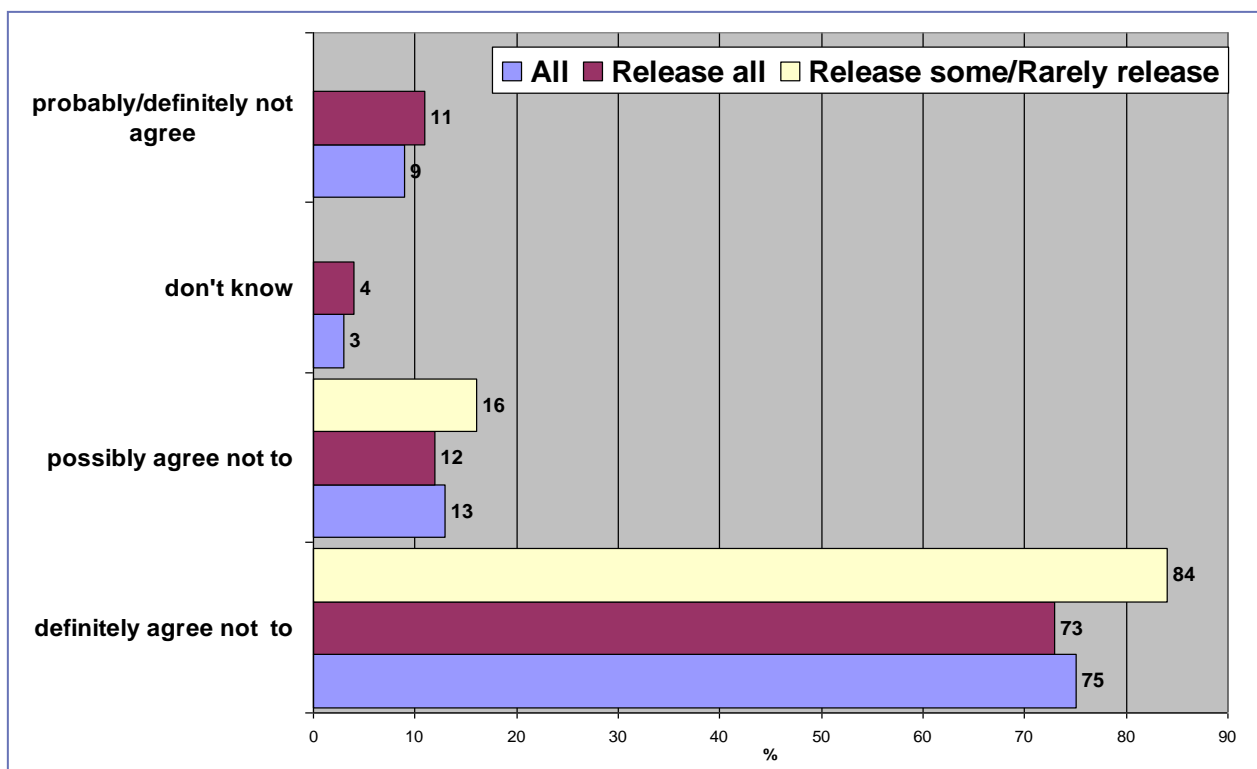


2. Angler behaviour is also dependent on the size of the catch and the season.
3. None of those taking part in the discussion group were aware of the legal position – that it is an offence to release an INNS – and some felt this might influence their behaviour. The provision of methods of disposal of INNS was only seen as having an impact on their behaviour if it did not involve any inconvenience; in other words, it would have to be available on the bank side.

- Three quarters of all anglers taking part in the telephone survey said they would be willing to never release an INNS back into the water. More importantly, 84% of those who currently do not always release their catches agreed to do so (see Figure 33. NB low base). While this suggests that anglers can be persuaded to change their behaviour where necessary, this is dependent on them recognizing the fish as an INNS in the first place and, as we have seen already, depending on the species in question, many anglers may not be able to do so.

**Figure 33: Willingness to never release an invasive non-native species back into the water if you caught one**

(base: Anglers total sample, n=150; Release all, n=119; Release some/Rarely release, n=31)



### 9.6.3 Bio-security

- Appropriate bio-security measures are considered a key method of helping to prevent the spread of INNS as well as diseases. According to the FACT representative:
  - all anglers should ideally air dry their nets, slings and landing mats<sup>13</sup> after every trip

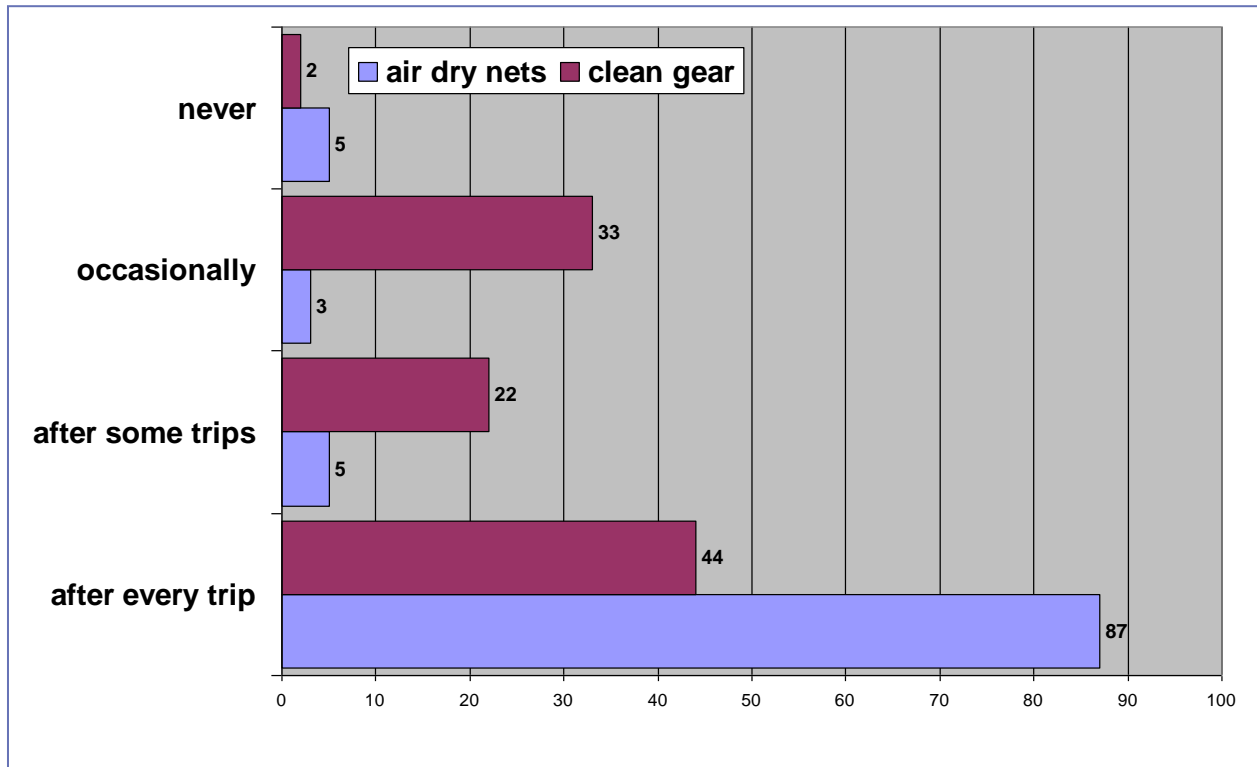
<sup>13</sup> Anglers may use a landing mat on which to unhook a fish and a sling in which to weight their catch.

- clubs and commercial fisheries increasingly provide net dips in which anglers can sterilise their nets before starting fishing but, according to the FACT representative, dwell time is an issue; it typically takes 15-20 minutes and not all anglers are prepared to spend this long before they start fishing
  - 'big fish' anglers may keep separate gear for each water they fish but regular match anglers may keep their nets in a 'stink bag' between matches – the worse thing they can do as it provides perfect conditions for incubating diseases.
2. The anglers taking part in the discussion group demonstrated a full range of behaviours: some cleaned their gear after every single trip – either just air drying items of equipment or, in one case, washing everything in soapy water, some did so after some but not all trips while others had never cleaned their gear. One of these latter respondents justified his behaviour on the grounds that he only ever fishes in the same water. Most of the anglers claimed they knew why it was important – to combat spread of disease – but they still offered excuses as to why they don't (always) take the time (for example, having spent several hours away from the family, they felt they could not justify taking more time to keep their gear clean). However, even if they knew why they should do it, some were not aware of what is required and in some cases assumed it would be a more arduous task than it need be – for example, they assumed they would need to sterilise everything rather than air drying certain items.
  3. Anglers taking part in the survey were asked how often they air dry their nets, hooks and slings and how often they cleaned their gear. 87% said they always air dried their nets however less than half always cleaned their gear (see Figure 34). Match and Specialist anglers were significantly more likely to state they clean their gear after every trip (68% vs. 37% of other anglers).
  4. Given that only 18 anglers in our sample reported that they currently do not always air dry their nets, the opportunity to modify angler behaviour is limited and, as Figure 35 indicates, there was some resistance from those not already doing this.
  5. In contrast, over half the sample was not currently cleaning the rest of their gear after every trip and nearly all of these reported that they would either definitely do so in the future (42%) or they would possibly agree to do so (45%), which suggests there is scope to change behaviour (see Figure 36).



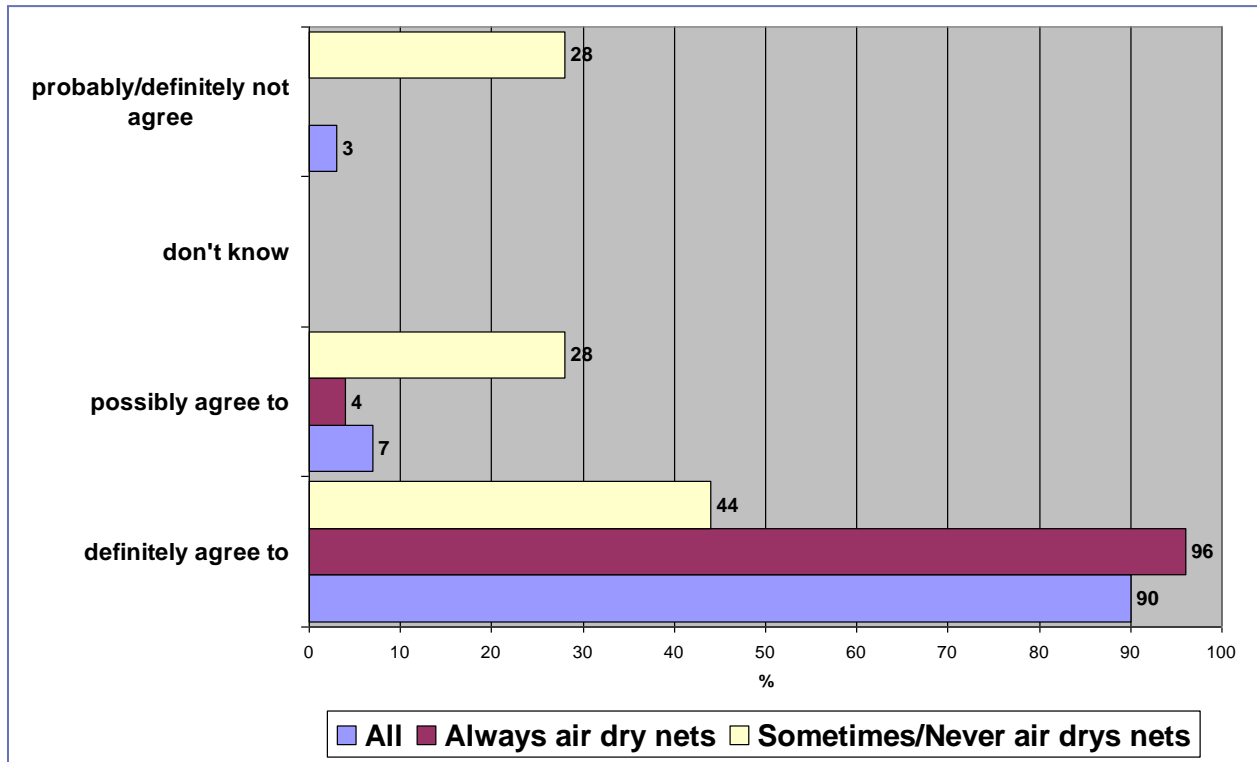
**Figure 34: How often do you air dry your nets, sling and landing mat? Apart from air drying, how often do you clean your fishing gear?**

(base: Anglers total sample, n=144)



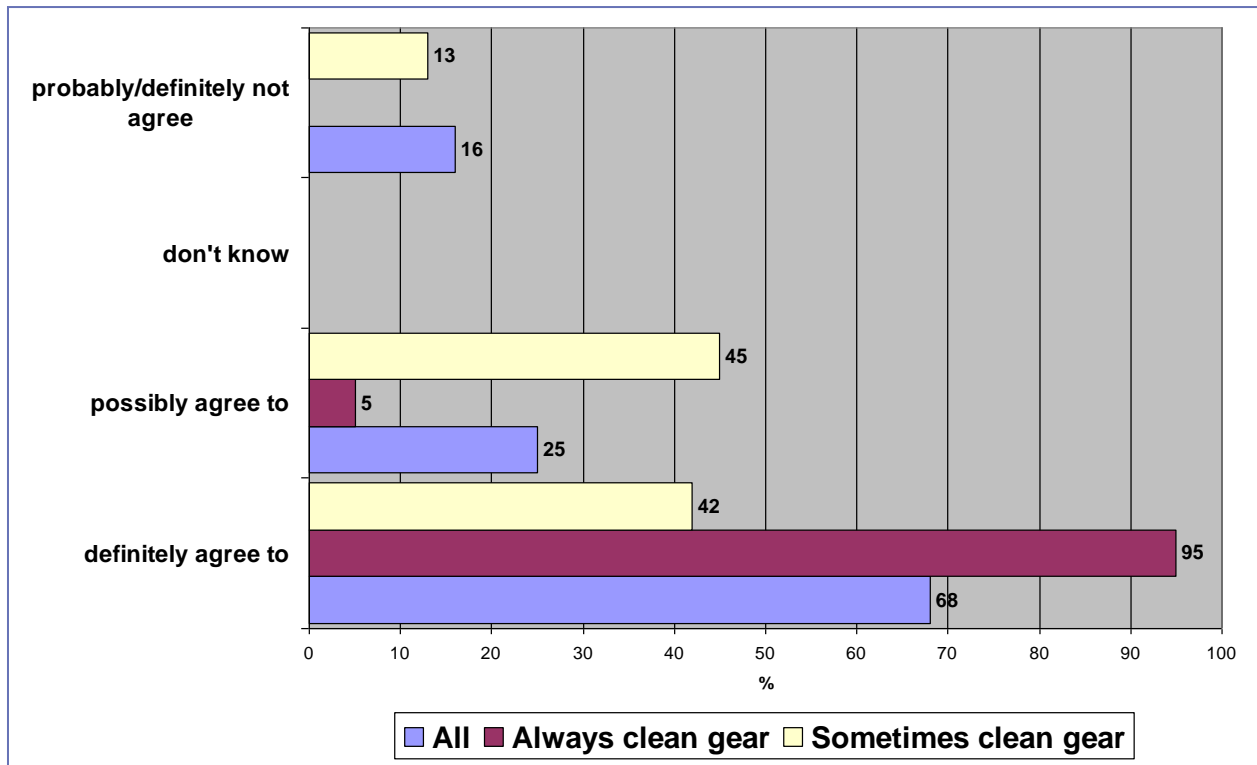
**Figure 35: Willingness to Air Dry Nets, Hooks and Slings After Every Trip**

(base: Anglers total sample, n=150; Always air dry nets, n=131; Sometimes/never air dry nets, n=18)



### Figure 36: Willingness to Clean Gear After Every Trip

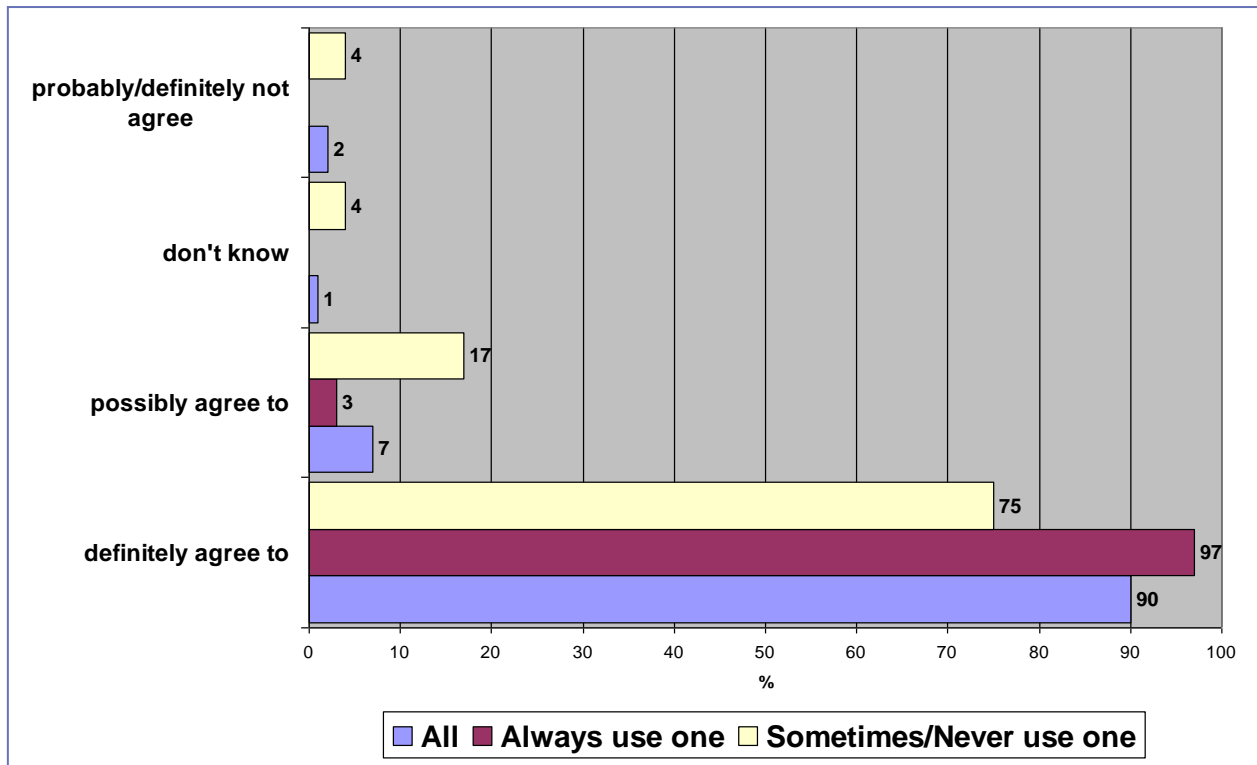
(base: Anglers total sample, n=150; Always clean gear, n=63; Sometimes/never clean gear, n=81)



- Two thirds of the anglers in our survey said that they always use a net dip if one is provided although a quarter said they never use one. Once again, Match and Specialist anglers (90% vs. 60% other anglers; n=31/113) and club members (79% vs. 55% non-members; n=70/74) were more likely to do so.
- However, these same sub-groups were also more likely to use a 'stink bag': 44% of Match and Specialist anglers and 30% of club members used a stink bag compared to 21% of the total sample.
- There would appear to be scope to persuade anglers to always use a net dip whenever one is provided as Figure 37 suggests – three quarters of those anglers who were not currently doing this indicated that they would be willing to do so in the future. In contrast, although the number of anglers in our sample using a stink bag was small, the majority of these were not willing to change their behaviour (see Figure 38).

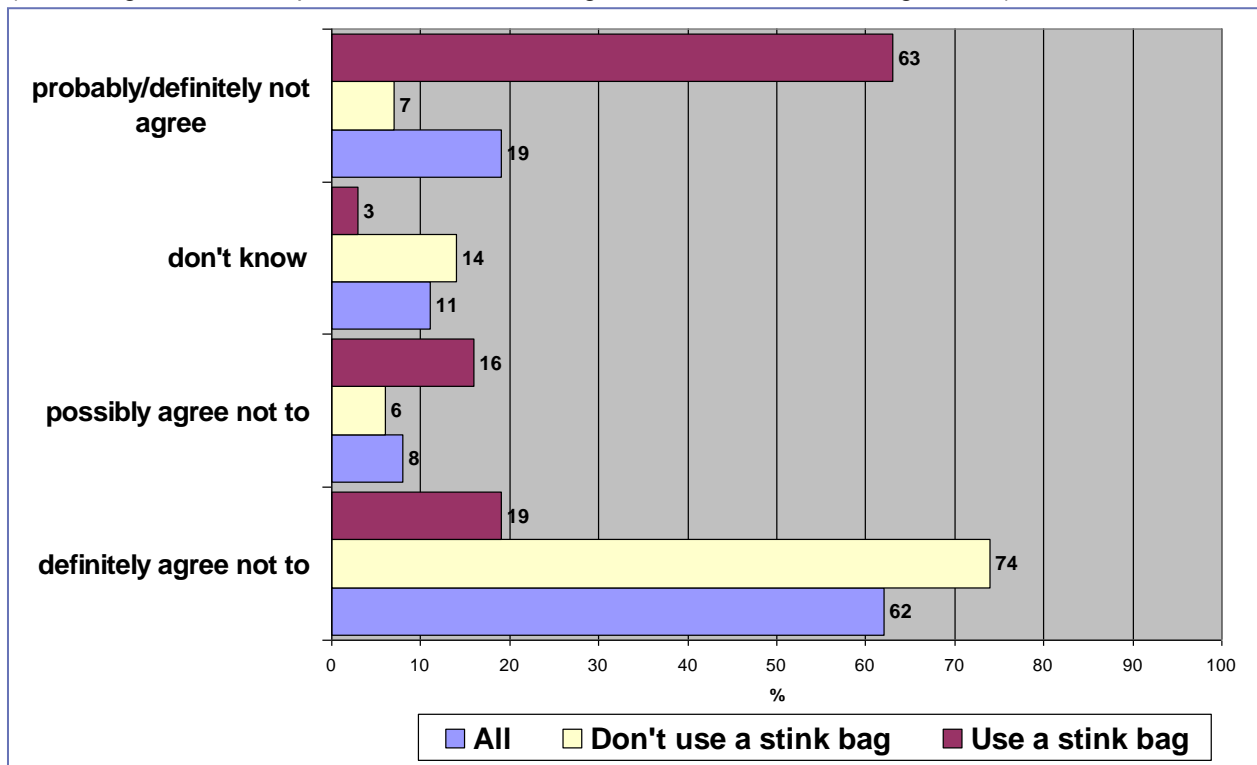
**Figure 37: Willingness to Use a Net Dip Whenever Provided**

(base: Anglers total sample, n=150; Always use net dip, n=96; Sometimes/never use net dip, n=48)



**Figure 38: Willingness Never to Use a Stink Bag**

(base: Anglers total sample, n=150; Use stink bag, n=32; Don't use stink bag, n=118)



## 9.7 Communicating with Anglers

1. We explored this in the depth interview with the representative from FACT, and in the angler discussion group. The findings are therefore qualitative in nature.

### 9.7.1 Nature of the challenge

1. As a group, anglers present a very diverse audience. They can be divided into three broad types: match, specialist and pleasure anglers. Match anglers (who take part in match competitions) and specialist anglers (who concentrate on just one or two species of fish) are likely to be the most well informed and the easiest to reach via clubs and specialist publications; although they are the most frequent anglers they are also the two smallest groups. In contrast, pleasure anglers (i.e. all those in the sample who were neither match nor specialist anglers) represent a much larger group; many of them will not be that well informed and they will be the hardest group to reach as they are less likely to belong to clubs or to read specialist publications.
2. Not only is the audience fragmented but so is the angling media. The FACT representative estimated that there are some 50-60 different publications but they all have small circulation levels; moreover, he estimated that possibly only 10% of anglers read any of the specialist publications and this suggests that the only way of being sure of reaching the majority of anglers is through mainstream media especially the tabloids.

### 9.7.2 Role of clubs

3. The FACT representative estimated that no more than 30% of anglers will be club members. Nevertheless, angling clubs will play an important role in influencing anglers' opinions and behaviour. They often have rule books and there is the opportunity to encourage clubs to include in their rulebooks information on INNS and what to do if an angler catches one; anglers who break the rules run the risk of being expelled from their club. In addition to their rule books, clubs could encourage their members to adopt improved biosecurity by educating their members about the minimum acceptable behaviour.

### 9.7.3 Self-policing

1. The FACT representative felt this should be one of the aims of any communication so that it becomes socially unacceptable among anglers to behave in certain ways. In the angler discussion group some of the more informed anglers clearly perceived

themselves as ‘environmental guardians’ and one approach would be to appeal to these anglers to promote appropriate behaviour among their peers.

#### 9.7.4 Other opportunities

1. Anglers need to apply for an annual rod licence and this was perceived by the discussion group respondents and the FACT representative to be an ideal method of communicating with all anglers. Information about INNS and recommended practices could be promoted via an existing channel that will reach all anglers except those who ‘cheat’ the system and are unlikely to be overly concerned about INNS in the first place.
2. Other communication opportunities include displaying information at point of sale at fisheries and retail outlets and to use respected personalities as spoke people. Some suggestions included Keith Arthur (press, radio and TV journalist/presenter), other journalists/presenters such as Des Taylor, Martin Bowler, Matt Hughes, Paul Young, and successful anglers such as Will Raison (present world champ) and Alan Scothorne (ex world champ).

#### 9.7.5 Key messages

3. The key messages that should be communicated to anglers include:
  - **What** they should/should not do:
    - don’t move/introduce fish between waters
    - do clean nets, slings and mats and the rest of their gear
    - use net dips but avoid using stink bags
    - don’t release INNS back into the water
  - **Why** they should do it/not do it:
    - to prevent spread of disease
    - to protect native plants and animals
    - to preserve the sport they love

- What the legal position is – but care is needed as anglers tend to consider themselves ‘free spirited’ and ‘happy to do their own thing’ and therefore the idea of acting outside the law could have some appeal
- Appeal to their love of nature – cast them as heroes, not villains.

# 10 INNS: The Horticultural Retailer Perspective

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## 10.1 Research Objectives, Method and Sample

### 10.1.1 Research Objectives and Method

1. The objectives of the horticultural trade research were:
  - To determine awareness of the **Horticultural Code of Practice** and whether it is being followed
  - To assess levels of **awareness and understanding of** Invasive Non-Native Species
  - To report on levels of **awareness of which species are INNS**
  - To find out if retailers have a **policy regarding INNS**
  - To investigate whether **information and advice about INNS** is being provided to customers and retailers willingness to do so in the future
  - To establish whether certain **INNS are being sold** and, if so, reasons for this and what Defra could do to discourage such sales.
  
2. To begin with, three depth interviews were carried out with representatives of trade bodies in order to begin to develop an understanding of the structure of the market place and to explore some of the issues. The three trade bodies in question covered the horticultural and pet trades:
  - the **Horticultural Trade Association** (HTA) representing some 2000 nursery growers, and retail outlets
  - the **Ornamental Aquatic Trade Association** (OATA), a not for profit organisation that represents 750 businesses in the UK including importers, wholesalers and retailers of plants, invertebrates and fish
  - and the **Pet Care Trust** (PCT), a national pet care education charity that promotes responsible pet ownership. It has around 1,550 members of which the majority are small and medium enterprises including pet shops, groomers, kennels, catteries, manufacturers, wholesalers and colleges.

3. In deciding on how to take the trade research forward, we needed to decide on the most cost effective approach to adopt. The budget available for this part of the research would allow us to conduct a short telephone survey with between 100 and 150 respondents. An initial count suggested there might be 2000-2500 retail garden and aquatic outlets and 1500 pet outlets. The issues facing the horticultural and pet retail trade are different, not least in terms of the range of potentially invasive species we would need to ask about. If we wanted to cover both sectors we would need to divide our sample into two and the resulting smaller bases would mean we would have less robust data about both sectors. Following discussions with Defra and NNSS, it was decided that the trade research should concentrate on the retail horticultural sector, including those selling aquatic plants.
4. The main body of the research was conducted by telephone with a sample of 126 retailers. Each interview lasted approximately 10 minutes and was carried out with the individual responsible for deciding which plants are stocked and sold to the public.
5. A copy of the questionnaire is available in the appendix.

#### 10.1.2 Sample

6. The horticultural retail market is quite diverse. Information provided by the HTA suggested that the largest share of the horticultural retail trade is shared between garden centres/retail nurseries and the DIY retail outlets.<sup>14</sup> Supermarkets represent another potentially significant retailer given their distribution and customer base. A number of retailers will sell both terrestrial and aquatic plants while others will sell just one type. Given the size of our sample, we decided to focus on the most important sectors either in terms of the number of organisations that exist (garden centres and retail nurseries) or because of the potential sales volumes they achieve (supermarkets and DIY stores).
7. Initial counts based on SIC codes suggested that the relative numbers of retail organisations was as shown in Table 30.

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<sup>14</sup> This includes all sales, not just plants.



**Table 30: Relative Size of Horticultural Retail Trade in Terms of Garden Centres and Nurseries, Aquatic Centres, Supermarkets and DIY Sheds<sup>15</sup>**

|                                  | Multiples (HO only) | Independents |
|----------------------------------|---------------------|--------------|
| Supermarkets                     | 2%                  |              |
| DIY                              | 1-2%                |              |
| Garden centres and nurseries     | 1-2%                | 90-94%       |
| Water garden activities/services | 0%                  | 2-4%         |

8. The sample structure that we set out to achieve based on 120 interviews is shown in Table 31. This involved over-sampling from the multiple retailers to ensure their views were adequately captured.

**Table 31: Target Sample Structure for the Trade Interviews**

|                                  | Multiples (HO only) | Independents |
|----------------------------------|---------------------|--------------|
| Supermarkets                     | 10                  |              |
| DIY                              | 10                  |              |
| Garden centres and nurseries     | 10                  | 80           |
| Water garden activities/services | 0                   | 10           |

9. Lists of suitable retailers were purchased. These were topped up by adding any large, well known retailers not present in the lists (for example, the major DIY stores and supermarkets). Pilot interviews were carried out in which we aimed to conduct at least one interview with a retailer from each of the six cells. The pilot identified a number of issues including the following:

- the water garden activities/services sector includes a proportion of retailers who do not sell plants (for example, they may focus on selling pond kits and related equipment)

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<sup>15</sup> Based on head counts provided by Sample Answers, a company specialising in providing sampling lists for market research purposes.

- the majority of retailers classed as DIY suppliers do not sell plants; the main exceptions are the large stores such as B&Q and Homebase
- many of large multiples (principally the supermarkets and the DIY stores) were reluctant to take part in a research survey without getting agreement of senior management
- in contrast, most of the garden centres and retail nurseries were willing to take part in the survey.

10. For this reason, the approach was modified. We decided to reduce the number of supermarkets and DIY retailers in our sample from 20 to 10 and to increase the number of interviews with garden centres and nurseries. In addition, the survey was conducted in two stages. In the first stage, we contacted a sample of garden centres and retail nurseries and aquatic centres drawn at random from our lists with the aim of completing 110 interviews. At the same time a letter was sent from Defra to 43 retailers (32 supermarkets and 11 DIY retailers) explaining the research and its importance. They were asked initially to return a one page questionnaire which established whether or not they sold plants to the public and, if they did, to indicate whether they would be willing to take part in a short telephone interview. Those who agreed to do so were asked to provide the necessary contact details. We received replies from just 14 of the retailers. Two of these refused to take part and another five said that they did not sell plants. Seven indicated that they did sell plants and they were willing to take part in an interview and we were able to complete four interviews from these. The balance of the interviews was made up from the lists of garden centres and retail nurseries. The final achieved sample structure is provided in Table 32.

**Table 32: Achieved Sample for the Trade Interviews**

|                                  | Multiples (HO only) | Independents |
|----------------------------------|---------------------|--------------|
| Supermarkets                     | 4                   |              |
| DIY stores                       | 1                   |              |
| Garden centres and nurseries     | 22                  | 87           |
| Water garden activities/services | 1                   | 11           |

11. Two thirds (68%) of the retailers taking part in the survey only sold terrestrial plants, 10% only sold aquatics while one in five (21%) sold both terrestrials and aquatics.

12. Interviews were carried out with the person responsible for deciding which plants were sold. 27 of the outlets sold both terrestrial and aquatic plants; where there was a single decision maker, this person was interviewed about both types of plants. Where there were different decision makers for terrestrial and aquatic plants, interviews were alternated between the person responsible for terrestrial plants and the decision maker for aquatics. 108 interviews covered the sale of terrestrials (86% of the sample) while aquatics were covered in 33 interviews (26% of the sample).

13. Respondents were asked how they would describe their organisation. Three quarters of the sample (77%) described themselves as independent garden centres or retail nurseries; 10% said they were multiple garden centres/nurseries and a similar proportion described themselves as aquatic shops/centres. Four interviews were with supermarkets and one with a DIY store. The breakdown of organisation type, the plants sold and which decision maker was interviewed is provided in Table 33.

**Table 33: Type of Organisation (self defined) by Type of Plants Sold and Buyer Interviewed**

(Base: Retailer total sample, n=126)

| Base                              |  | 126       |
|-----------------------------------|--|-----------|
| Type of organisation              |  |           |
| multiple garden centre/nursery    |  | 12<br>10% |
| independent garden centre/nursery |  | 97<br>77% |
| aquatic centre                    |  | 12<br>10% |
| multiple supermarket              |  | 4<br>3%   |
| DIY store                         |  | 1<br>1%   |

14. 85% of the retailers taking part in the survey had just one or two outlets (see Table 35). There was considerable variation in terms of the proportion of annual turnover derived from the sale of plants. One in five (19%) reported that plants accounted for 75% to 100% of their turnover while a similar proportion (20%) said plant sales accounted for no more than 25% of their annual turnover (see Table 36).

**Table 34: Type by Number of Outlets**

(Base: Retailer total sample, n=126)

| Base          | 126       |
|---------------|-----------|
|               |           |
| Mean          | 31.0      |
| No of outlets |           |
| 1             | 98<br>78% |
| 2             | 9<br>7%   |
| 3             | 4<br>3%   |
| 4             | 1<br>1%   |
| 5             | 1<br>1%   |
| 6-10          | 2<br>2%   |
| >10           | 11<br>9%  |

**Table 35: Type of Outlet by Proportion of Turnover from Sale of Plants**

(Base: Retailer total sample, n=126)

| Base  | 126       |
|---|-----------|
| Approximately what proportion of your annual turnover comes from sales of plants to the general public? |           |
| less than 10%   | 15<br>12% |
| 11-25%  | 10<br>8%  |
| 26-50%  | 37<br>29% |
| 51-75%  | 19<br>15% |
| 76-100%   | 24<br>19% |
| Don't know  | 18<br>14% |
| Refused   | 3<br>2%   |

## 10.2 The Horticultural Code of Practice

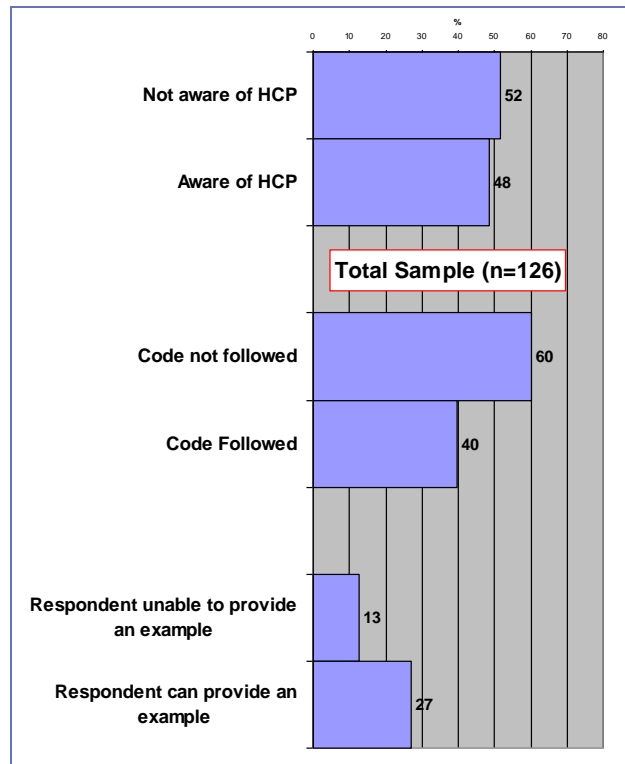
1. Launched by Defra in 2005, the Horticultural Code of Practice (HCP) provides '*advice and guidance on the safe use, control and disposal of invasive non-native plants for everyone engaged in horticulture and related activities that involve the use of plants*'.
2. Respondents were asked if they were aware of the Code and, if so, whether their organisation followed it. Fewer than half the sample (48%) was aware of the HCP; retailers selling just aquatic plants were least aware (only 2 out of 13 said they had heard of it – nb low base). Eight out of ten of those who were aware of the Code (82% of those aware or 40% of the total sample) stated they followed the Code. However, only two thirds of these (68% of those aware of the Code or 27% of the total sample) could provide an example of how it was followed in their organisation (see Figure 39).

3. The main ways in which the Code was said to be followed were as follows (see Figure 40):

- 8 respondents said they label plants and/or provide customer information
- 5 said they only buy from reputable suppliers/suppliers who adhere to the plant passport scheme
- 5 said they check plants for disease etc before selling them
- 5 said they would consult Defra if they needed to
- 5 said they would not sell INNS.

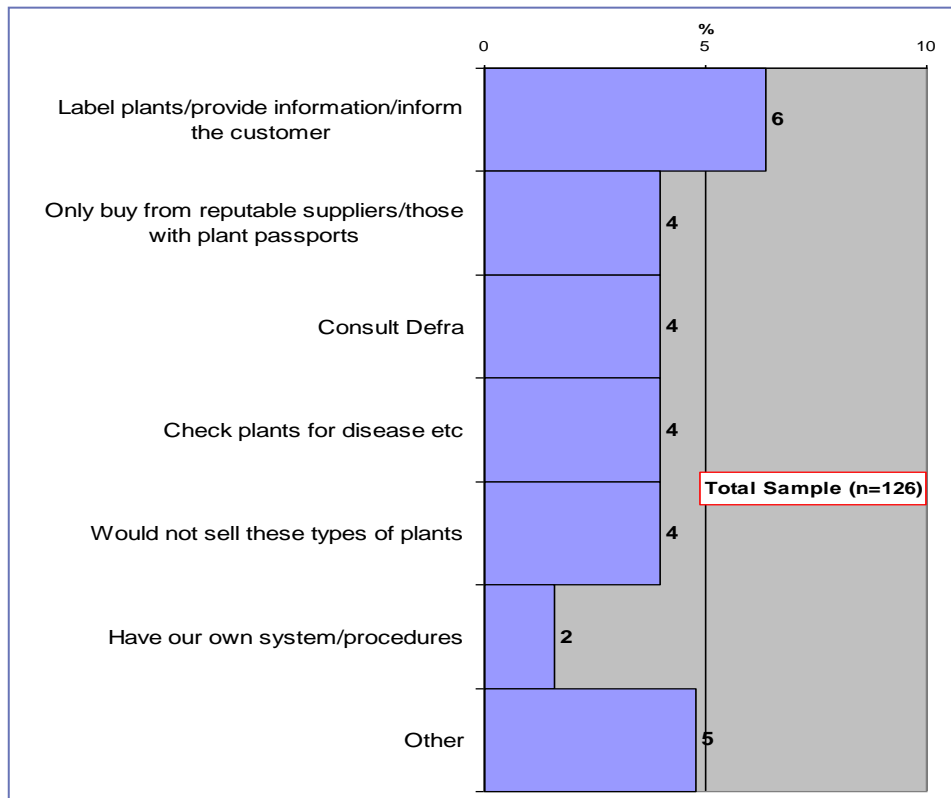
**Figure 39: Awareness of and Whether HCP is Followed**

(Base: Retailer total sample, n=126)



**Figure 40: Ways in Which HCP was said to be Followed**

(Base: Retailer total sample, n=126)



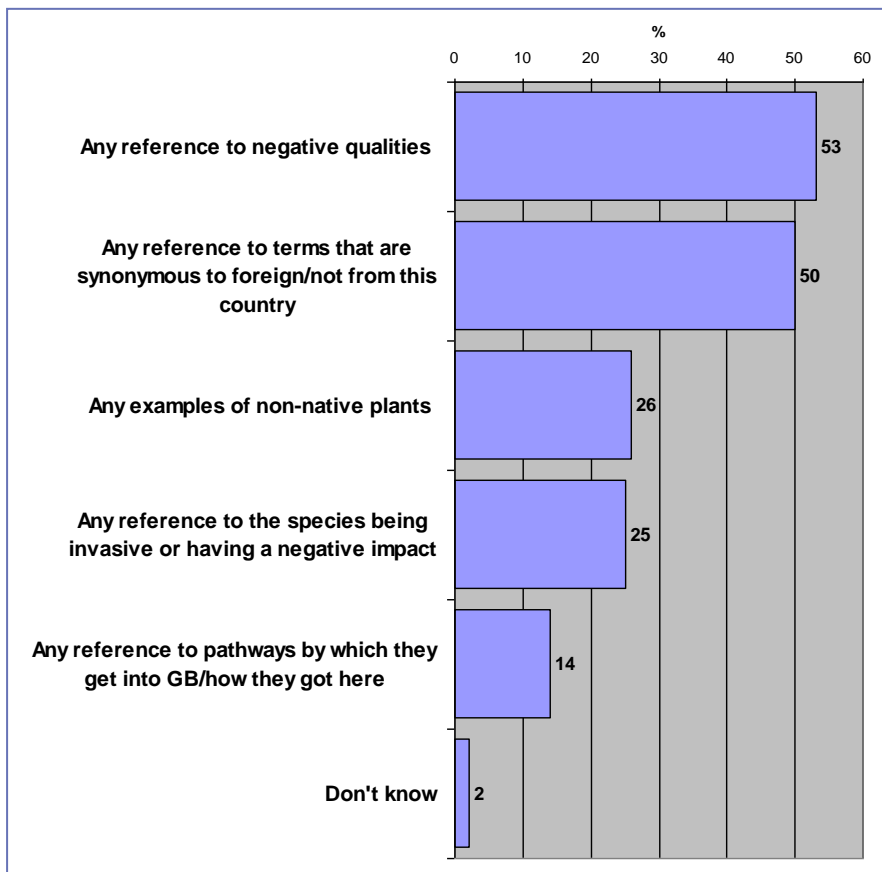
## 10.3 Invasive Non-Native Species

### 10.3.1 Awareness and understanding of the concept

1. Awareness of the concept of INNS was very high among the retailer sample – 94% of respondents said they were familiar with the term. When asked to describe what it means the two most common themes were ‘foreign plants’ that have ‘negative qualities’. As with all other audiences, respondents rarely made any reference to how such plants arrived in Britain in the first place. The main themes mentioned, and the proportion of respondents mentioning each one are set out in Figure 41. Examples of the main themes are provided over the page.

**Figure 41: What do you think is meant by the term ‘invasive non-native species?’**

(base: Retailer total sample, n=126)





### 10.3.2 Species considered to be potentially invasive

1. A list of nine terrestrial and seven aquatic species which Defra and NNS consider to be potentially INNS, was read out to respondents. For each plant they were asked whether or not they considered it to have the potential to be invasive in the wild. Each plant was described by both its common name and its scientific name. The full list is shown below.

### Terrestrials

Buddleia (*Buddleia davidii*)  
Cherry Laurel (*Prunus laurocerasus*)  
False Acacia (*Robinia pseudocacia*)  
Few-flowered Leek (*Allium paradoxum*)  
Giant Rhubarb (*Gunnera tinctoria*)  
Hottentot Fig (*Carpobrotus edulis*)  
Montbretia (*Crocosmia* species)  
Shallon (*Gaultheria shallon*)  
Skunk Cabbage (*Lysichiton americanus*)

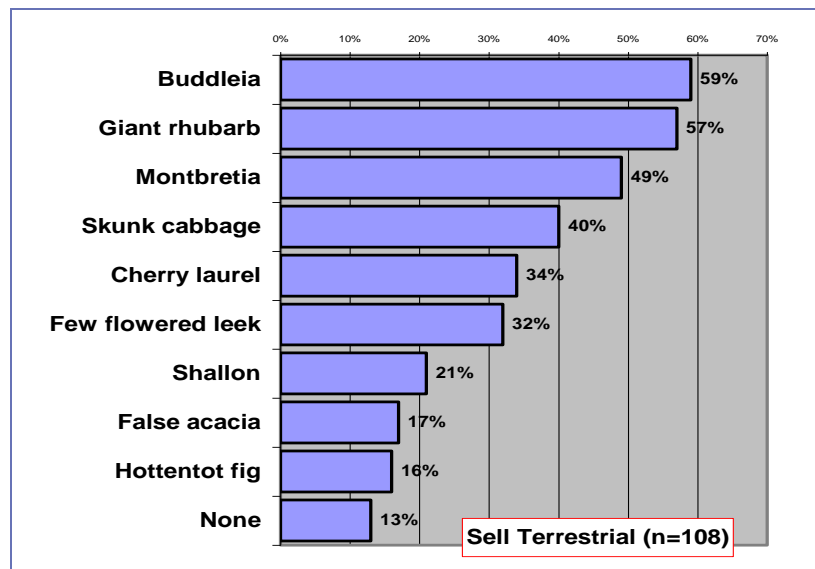
### Aquatics

Curly Waterweed (*Lagarosiphon major*)  
Fanwort (*Cabomba caroliniana*)  
Floating Pennywort (*Hydrocotyle ranunculoides*)  
New Zealand Pygmyweed (*Crassula helmsii* or *Tilaea recurva* or *Tilaea helmsii*)  
Parrot's Feather (*Myriophyllum aquaticum*)  
Water Hyacinth (*Eichhornia crassipes*)  
Water Primrose (*Ludwigia peploides* or *Ludwigia grandiflora*)

2. With the exception of Buddleia and Giant rhubarb (considered potentially invasive by 59% and 57% of respondents respectively), the majority of respondents did not consider any of the terrestrial plants to be potentially invasive. One in every seven respondents did not consider any of the nine species to be potentially invasive (see Figure 42).

**Figure 42: Terrestrial Plants Perceived to be Potentially Invasive in the Wild**

(base: Retailers selling terrestrials, n=108)

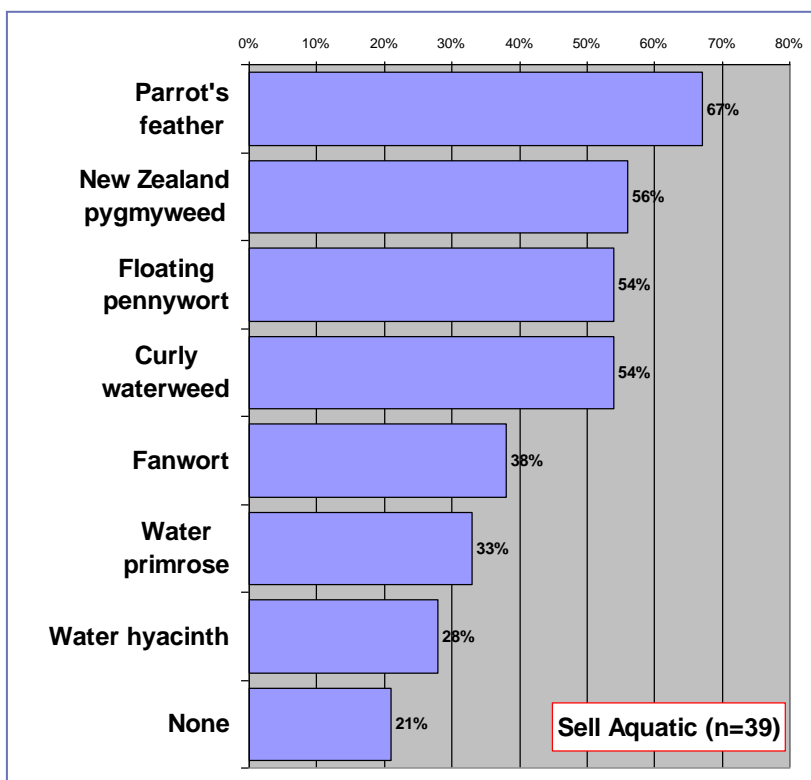


3. Although the base for aquatics is small, a not dissimilar picture emerges with only one species, Parrot's feather, being considered potentially invasive by two thirds of the sample. The other six aquatics were considered potentially invasive by around fifty percent or less of the sample (see Figure 43).



### Figure 43: Aquatic Plants Perceived to be Potentially Invasive in the Wild

(base: Retailers selling aquatics, n=39)



#### 10.3.3 INNS policy

1. Respondents were asked if their organisation had a policy regarding the sale of potentially INNS. Only half the organisations in the sample had such a policy (52%) and only one in ten of these (9%) had a formal written policy. Those organisations with a policy were not necessarily the same ones who were following the HCP: half of those with a policy about INNS (49%) were also following the HCP.
2. When asked, 85% of those with a policy could provide an outline of their policy (44% of the total sample):
  - 42 outlets said they do not stock/grow INNS (65% of those with a policy; 33% of total sample)
  - 8 outlets said they include information on the label or inform customers in some other way (12% of those with a policy; 6% of total sample)
  - 3 said their suppliers would not sell plants to them that were 'dangerous' (5% of those with a policy; 2% of total sample).

3. Thus, where it exists, more often than not the policy is not to sell plants that the retailer considers to be invasive.

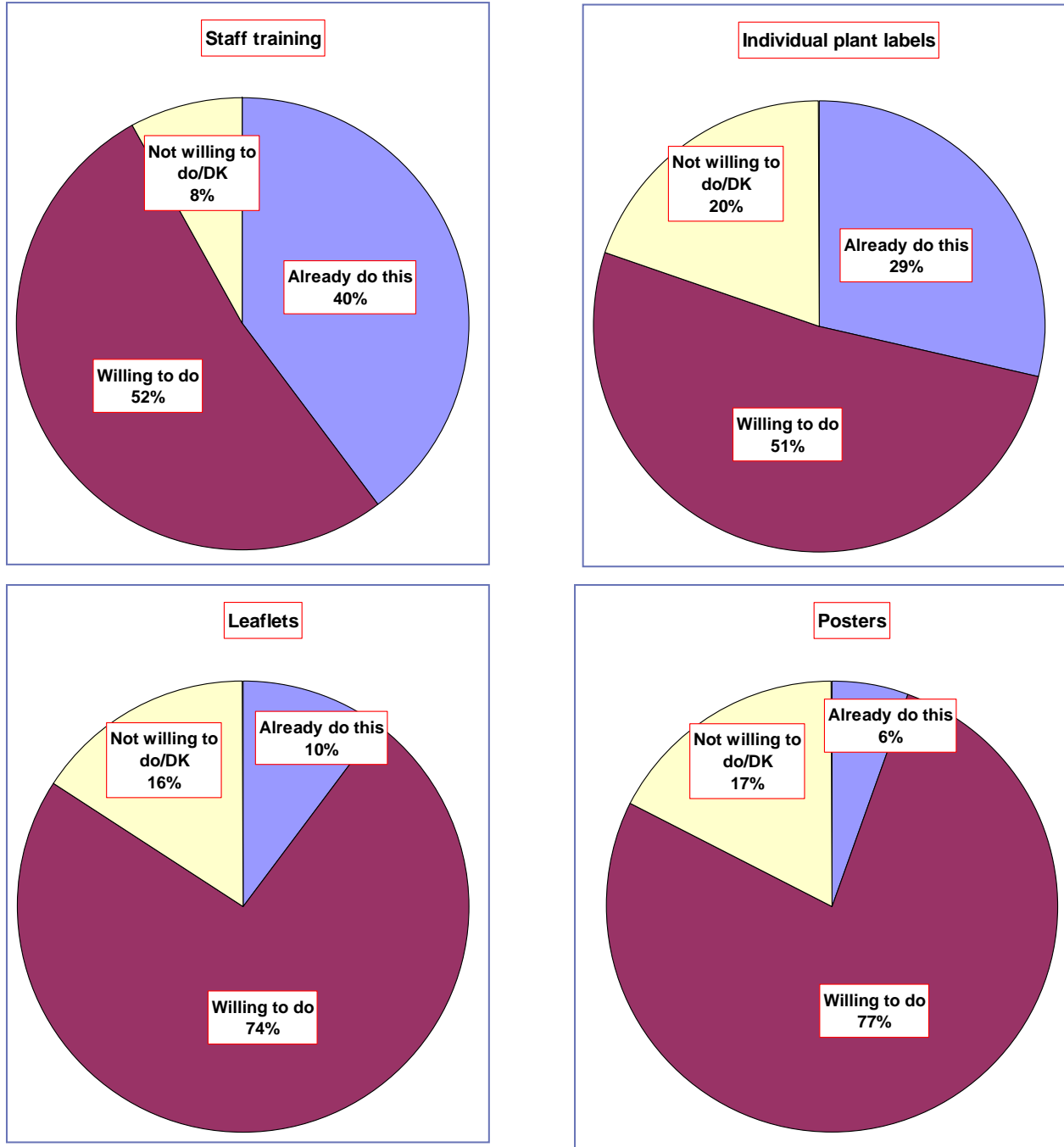
#### 10.3.4 Providing customers with information and advice about INNS

4. Respondents were asked which of the following methods of information and advice about potentially invasive plants they currently provided:
  - training staff to offer customers information and/or advice about how to use and dispose of plants that have the potential to be invasive in the wild
  - including information on individual plant labels to identify plants that have the potential to be invasive in the wild
  - providing leaflets that explain the threats from species that have the potential to be invasive in the wild and which provide information about how to use and dispose of them
  - displaying posters that explain the threats from species that have the potential to be invasive in the wild and which provide information about how to use and dispose of them.
5. Where a retailer was not currently providing information and advice in the way described, they were asked if they would be willing to do so in the future. Their replies are summarised in Figure 45.
  - 40% of the sample said that they were already training their staff to provide such information and most of the rest said they would be willing to do so (52%)
  - just over a quarter (29%) said they included information on individual plant labels and a further 51% were willing to do so in the future. One in five (20%) were not willing to do this
  - only one in every ten organisations (10%) was providing leaflets and a smaller proportion (6%) was displaying posters however some 70-80% were willing to consider doing both in the future.

6. Overall, some two thirds (65%) of retailers claimed to be already offering information or advice in some form and only six retailers were unwilling to adopt at least one of these measures.

**Figure 44: Providing Customer with Information and Advice**

(base: Retailer total sample, n=126)



7. Respondents were asked if they provided information and advice in any other form. Nearly half (46%) said yes but when asked what form this took they often referred back to one of the above measures (e.g. plant labels or leaflets). Most examples either

explicitly involved providing information verbally or no explicit method was mentioned (but probably was delivered verbally). Only two respondents provided information on their website.

8. Respondents were also asked how Defra can encourage the organisation to provide (more) information and advice to customers. Their replies indicate that they were looking to Defra to provide more information about INNS and, in particular, to provide leaflets and posters that they could use:

- 44% suggest Defra could supply leaflets, posters and other PoS material for them to display
- 23% wanted more information in general.

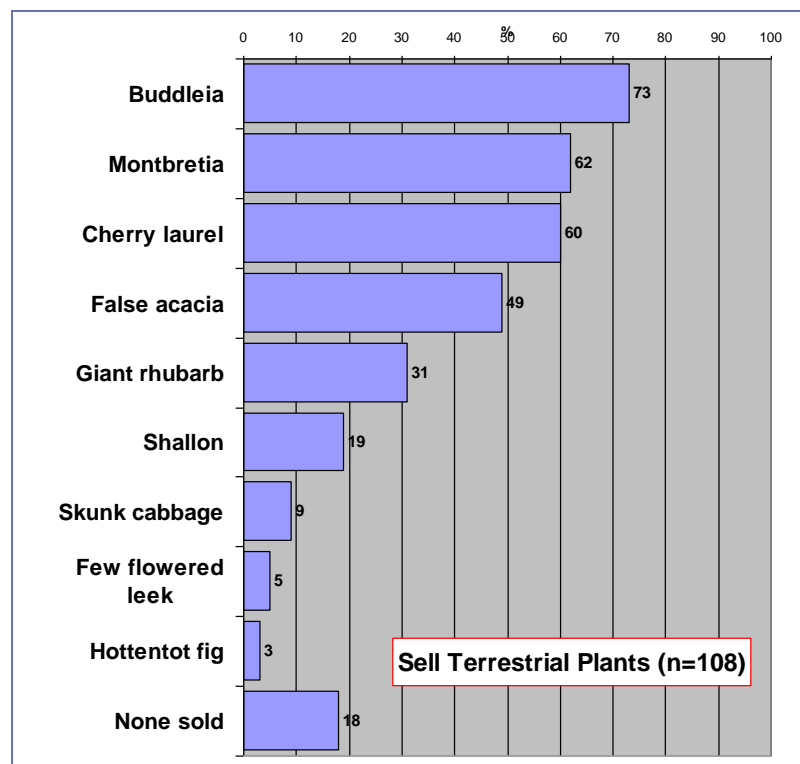
9. Other suggestions included a media campaign (7%), via the internet/web/email (5%), providing plant labels (2%) and making INNS illegal (2%).

### 10.4 Selling INNS

1. At the start of the interview, prior to introducing the topic of INNS, respondents were asked which of nine terrestrial and seven aquatic plants they had sold to the public in the last year. The species in question were all non-native plants that are considered to have the potential to be invasive in the wild.

2. Eight out of every ten retailers (82%) selling terrestrial plants had sold one or more potentially

**Figure 45: Terrestrial Plants Sold in the Last Year**  
(base: Retailers selling terrestrials, n=108)



invasive species from the list of nine plants. On average, retailers were selling three out of the nine species, in particular, Buddleia (73%), Montbretia (62%) and Cherry laurel (60%) (see Figure 45).

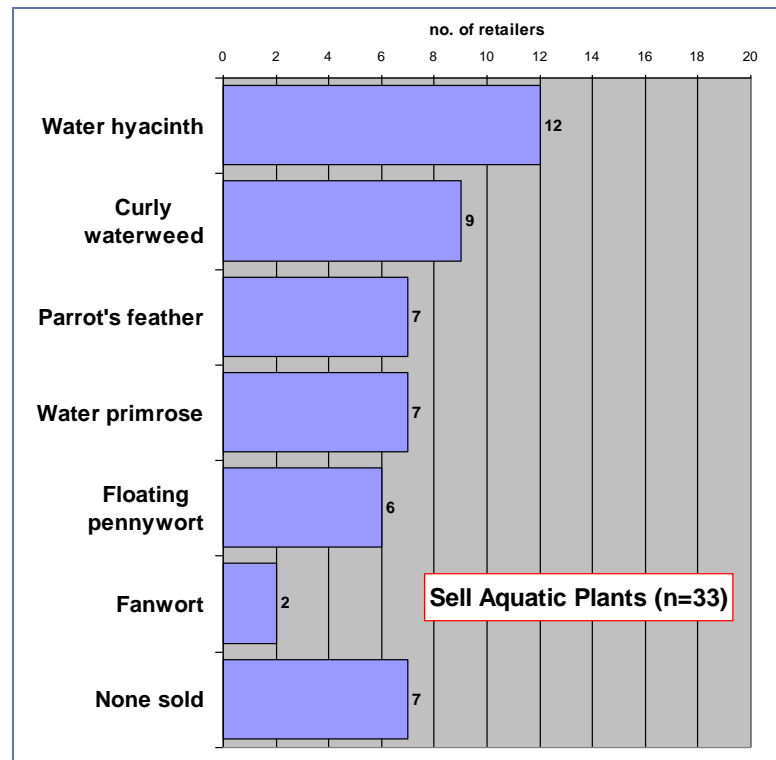
3. Although the base is small, a similar proportion of retailers selling aquatic plants (79%) had sold one or more potentially invasive species from the list of seven plants. On average, retailers were selling one of the seven species – no one particular species stood out as being more likely than the others to have been sold (see Figure 46).

4. Later during the interview, respondents were asked which of these 16 plants they considered to have the potential to be invasive in the wild (see 11.3.2.). This revealed that many respondents did not consider the plants in question to be invasive. This might suggest that the retailers who had sold these species did not consider them to have the potential to be invasive. However, this does not appear to be the case. Although the numbers of retailers selling each species was sometimes small, many of them did consider the plants to be potentially invasive, as Figure 47 illustrates.

5. For example, of the 76 retailers who had sold Buddleia in the last year, 50 consider it to be potentially invasive, while 41 of the 64 retailers selling Montbretia considered it to be potentially invasive. Seven of the nine retailers selling Curly waterweed, five of the six selling Floating pennywort and all seven retailers selling Parrot's feather considered these plants to be potentially invasive.

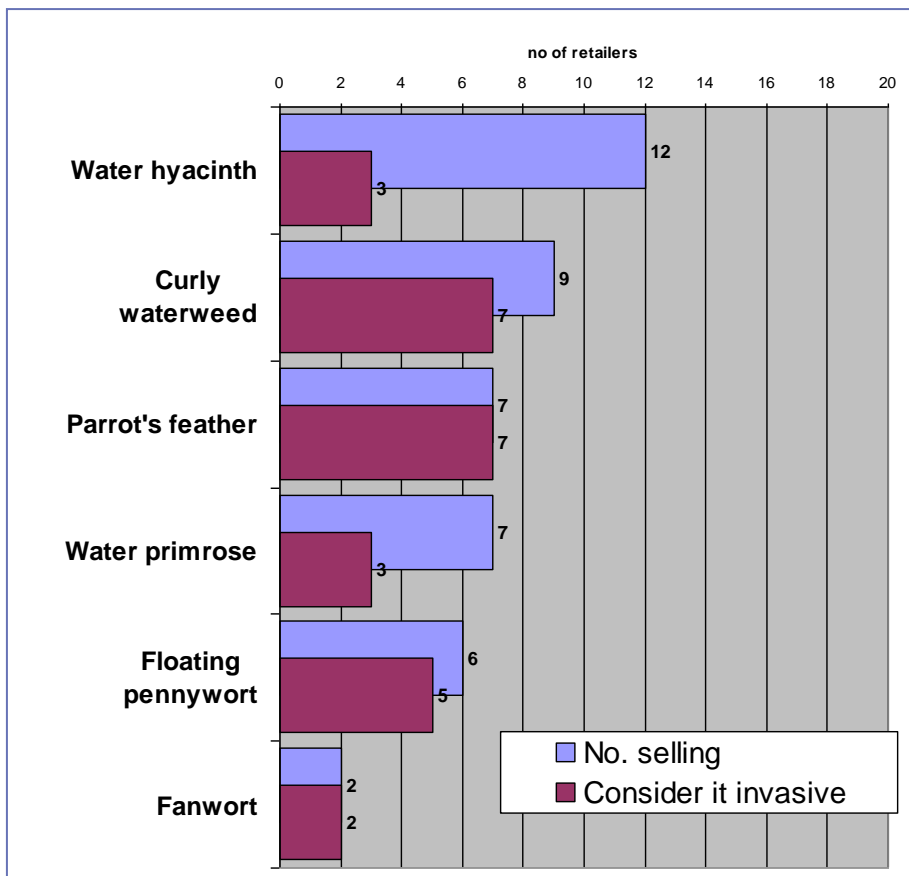
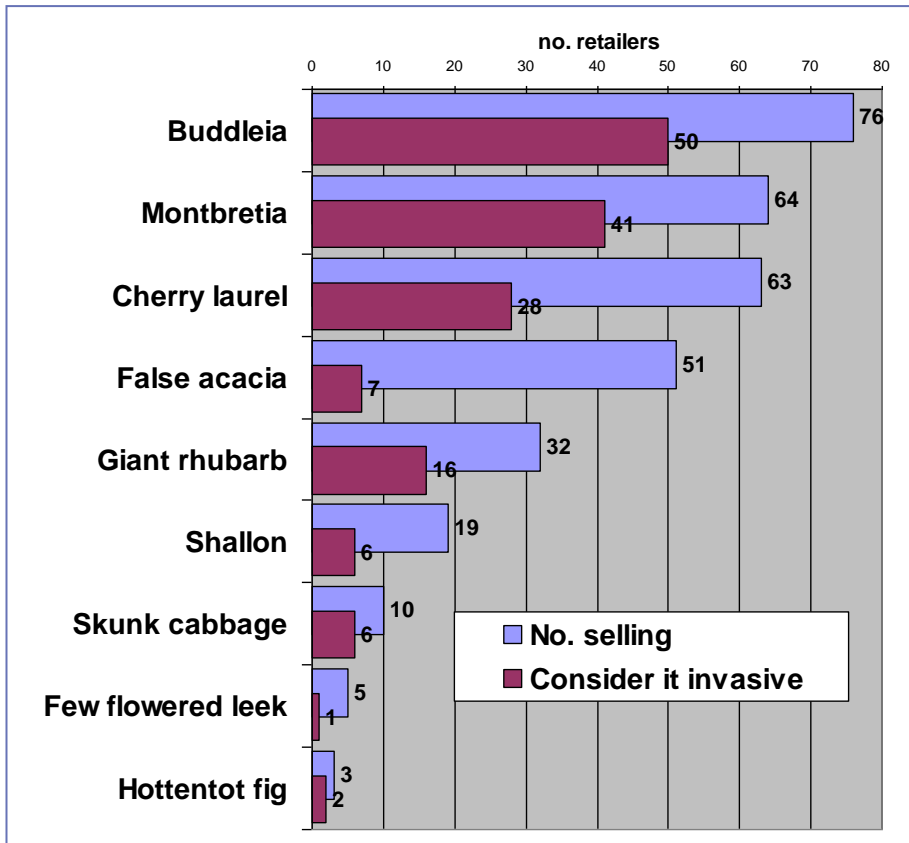
**Figure 46: Aquatic Plants Sold in the Last Year**

(base: Retailers selling terrestrials, n=33)



**Figure 47: Number of Retailers Selling Each Species and Considering Them Potentially Invasive**

(base: no of retailers selling each species)



6. Towards the end of the interview, respondents were told which species they had sold were considered by Defra and NNSS to be potentially invasive. They were asked why they sold these species. The main reasons given were:
- customer demand (48%)
  - various plant attributes including:
    - to attract wildlife e.g. butterflies, bees (21%)
    - ornamental plants, for colour, late flowering etc (14%)
    - good for hedging, shade, edging etc (13%)
  - the perception that the plants were unlikely to cause a problem
    - not considered invasive (15%)
    - they are bought to go in gardens where they can be monitored (11%).
7. They were also asked what, if anything, Defra could do to discourage them from selling such plants. The main suggestion was to provide retailers and consumers with information about such species:
- provide retailers/the public with more information (27%)
  - ban the sale of such plants (12%)
  - provide posters, leaflets (7%)
  - offer an alternative plant (7%).
8. There was also some evidence of resistance to the idea. Nearly a quarter of the sample either suggested that there was nothing that Defra could do or they 'didn't know' what could be done. A small number (5%) said that they did not consider these plants are invasive and 2% wanted Defra to 'prove that these plants are invasive'. The trade depths offered further insights into this issue. The view put forward was that while the trade would be willing not to sell plants where there is conclusive evidence that they are invasive, there was resistance to the idea of not selling plants that have an unproven potential to become invasive. The example of the water hyacinth was used as a case in point. According to the trade representatives, there is no evidence that this plant is invasive, it is popular with the public and the trade will be unwilling to stop selling it.

# 11 Conclusions & Recommendations

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## 11.1 Wildlife Management

1. There was broad agreement in terms of the main findings across both the qualitative and the quantitative research.

### 11.1.1 Awareness and understanding

1. Wildlife Management (WM) is not a term with which most members of the public are familiar (almost two thirds of the public had not come across it before) and the qualitative research revealed that it is not a topic they would think about without prompting; in other words, for most people it does not appear on their radar until something happens to bring it to their attention. Familiarity was greatest among men, older people and people from SEG ABC1s; there was no difference between those living in rural and urban locations.
2. Nevertheless, most of public are able to put forward a definition. WM is seen as being about managing, conserving and protecting wildlife and, to a lesser extent, habitats and the environment. Definitions rarely made reference to methods of management. Moreover there was a tendency for the public to conceptualise WM very broadly and to place more weight on managing human impacts on wildlife rather than the other way round.
3. Although 'wildlife' covers both animals and plants found in the wild, there was a tendency for the public to focus mainly on animals and there is a need to remind people that it also covers plants.
4. Based on the qualitative findings, we have put forward a possible definition:

*Wildlife Management: managing the impacts of humans on wild plants and animals as well as the impacts of wildlife on human interests.*

### 11.1.2 Support for, and attitudes towards, managing wildlife

1. In both stages of research we found broad support for managing wildlife for a range of reasons. The highest levels of support were voiced when management is to protect human health and safety. There was more qualified support and some resistance when it is to protect habitats, crops, infrastructure and, in particular, new developments.



2. Support for WM was significantly higher among rural communities compared to people living in urban locations.
3. Attitudes were somewhat more mixed. Everyone was in favour of having rules and regulations governing methods of control and for humane methods of control to be used wherever possible even if these are more expensive. Those who were more favourably disposed were, almost without exception willing to support action where wildlife is causing a serious problem; in contrast, those who were less favourably disposed were less likely to support such action especially when it involves killing animals. Moreover, these individuals were much more likely to feel that man does not have the right to manage wildlife and would prefer to see nature being left to take its own course.
4. As we have seen, respondents' interpretation of the term WM suggests they see it as primarily about protecting wildlife. The definition used in the research did not explicitly contradict this. The attitude statements made references to killing plants and animals in certain situations whereas the reasons for WM did not. This may be why there was more agreement with the reasons and not quite so much agreement with all of the attitude statements. Nevertheless, this does not detract from the main finding – that reactions to WM were mainly positive.
5. The findings from the quantitative research were used to suggest a possible segmentation of the public into three groups based on the combination of their support for why WM may be necessary and their attitudes towards it. The three groups are
  - ***Favourably Disposed*** – the largest group (42%); tend to be found more in rural communities and among older age groups
  - ***Qualified Supporters*** (33%)
  - ***Undecided*** (25%)
6. This is a broadly positive finding; Qualified Supporters, as the name suggests, are not opposed to the idea of managing wildlife but tend to offer qualified support. Moreover, not only are the Undecided the smallest group, they were not so much opposed to WM as undecided and this suggest there is scope to persuade them of its merits.
7. It is important to note, however, that while we can segment people on the basis of their views about WM, the extent to which individuals will support or oppose specific

examples will depend on how they perceive and evaluate the reasons why it is deemed appropriate and the proposed methods. For example, we anticipate that The Favourably Disposed will not give unconditional support but will take a view on a case by case basis. We summarise the reasons for this below (see 11.4)

8. Defra's marketing communications will need to provide a rationale for both why WM is necessary and why the proposed methods are being used and are deemed appropriate.

## 11.2 Native Species and Non-native Species

### 11.2.1 Awareness and understanding

1. Some three quarters of the public (76%) said they were familiar with the term 'native species' (NS) and two thirds (68%) said they had come across non-native species (NNS) before. Moreover, most of them had a reasonable appreciation of what NNS means – species that are not naturally occurring in GB but which originate in other countries. There was some uncertainty over where migratory species fit – are they native or non-native?
2. The term 'alien species' was less familiar to the public (39% said they had come across it before) and it conjured up associations of 'from out of space'; it was therefore deemed a less appropriate term compared to NNS.
3. It was clear from the workshops that the public are largely unable to differentiate between native and non-native species – they simply do not know which are which – the main exceptions being where the name gives it away or where there has been considerable publicity. Moreover, there was a tendency to assume that the difference is based on how long established a species is rather than how it became established in the first place – and this needs to be reinforced through the communications. It will also be important to reinforce the fact that most NNS do not cause problems (and, in some cases, are very important).
4. Based on the qualitative findings, we have put forward a possible definition:

***Native species:*** Any animals or plants that have established themselves in Great Britain without the assistance of man – either intentional or accidental. This includes migrating animals that spend part of their lifecycle outside GB

***Non-native species:*** Any animals or plants that have established themselves in Great Britain with the assistance of man. This includes any that were first introduced hundreds, if not thousands, of years ago.

## 11.3 Invasive Non-native Species

### 11.3.1 Awareness and understanding

1. Invasive Non-native Species (INNS) was not a familiar term - only 40% of the public in our survey had come across it before and one in every four could not offer a definition. Familiarity was greatest among older people, those from SEGs ABC1, those without children, 'gardeners' and pond owners. There was some evidence of a town/country effect - there was a difference based on respondents' self-classified locations but not when using the Defra classification (see 4.3.2).
2. INNS was most commonly described in terms of species that can spread and have negative impacts on native animals and plants. There were very few references in any of the definitions to how such species arrived in GB – and this may be something that marketing communications could address.
3. A possible definition based on the research is as follows:

*Any non-native animal or plant that has the ability to spread causing damage to the environment, the economy, our health and the way we live.*

### 11.3.2 Spontaneous and prompted recall

1. One in every five respondents in the survey had come across some recent publicity about INNS.
2. 60% could provide one or more examples of species they considered to be INNS, in particular, the Grey squirrel (64%), Japanese knotweed (38%), American mink (25%) and Signal crayfish (18%).
3. However, leaving aside these headline species, awareness of most NNS was low so, not surprisingly, knowledge about which might be also be invasive was low. In other words, most members of the public had not heard of the species in the first place, let alone whether or not it was invasive.

### 11.3.3 Controlling INNS

1. There was a high level of support for killing INNS that pose a threat to human health. There was more qualified support for killing INNS that threaten native species or cause economic damage – but this was often because respondents were unsure about this rather than that they disagreed. The workshops revealed that levels of support for controlling INNS will depend on the actual circumstances – the nature of the problem and the perceived acceptability of the proposed solution – nevertheless, the quantitative research suggests that many people will start out broadly supportive.
2. The Favourably Disposed are more likely to be: male, older (and less likely to have children living at home), living in rural locations, and be ‘gardeners’.
3. Although there was a considerable overlap between support for, and attitudes towards WM and support for controlling INNS, there was by no means a perfect correlation.

### 11.3.4 Perceived threat of INNS

1. Most members of the public in our survey perceived INNS to be a less serious (or no more serious) threat to biodiversity in GB compared to other threats, such as loss of habitat or climate change.

### 11.3.5 Marketing Communications

1. There is clearly a need to drive the issue up the public’s agenda via mainstream media coverage on two fronts:
  - the general issue: what INNS are, how they get here, that they are the second most serious threat to biodiversity
  - and about the specific species: which species are INNS and how can they be recognised.
2. Given the general lack of knowledge of, and ability to recognise/identify both native and non-native species, never mind knowing which non-native species are considered to be invasive, this is no small challenge.
3. Both stages of research have indicated broad levels of support for controlling INNS but as things stand, the public has no idea what role, if any, it should play and how it can fulfil any such role. For example, should the public’s role primarily be one of looking out

for and reporting sightings of INNS or are they to be encouraged to take steps to eradicate such species? This is something Defra and NNS need to communicate.

4. It was clear from the workshops in particular (with additional support from the quantitative survey where one in five members of the public had recently come across some publicity about INNS), that the species which tended to stick in people's minds were those that had featured in news items. Rather than trying to educate the public about lots of different species or focusing on the general problem, one aim of any communication campaign should be to achieve high levels of awareness of a small number of target species that are causing significant problems together with the steps the public can take to tackle the problem. This is likely to achieve higher engagement and public involvement compared to a campaign that focuses on just the broader principles (e.g. not to release animals/plants into the wild). The target species could then serve as vehicles for communicating the broader principles.
5. However, if it is to be successful, the campaign would need appropriate support structures in place – such as how to recognise individual species, methods of reporting sightings, guidelines for controlling particular species, and so on.

## 11.4 The Case for Managing Wildlife and Controlling INNS

### 11.4.1 Concerns and issues

6. There was broad support for wildlife to be managed – whether this involves NS, NNS or INNS. At the same time, when the workshop participants focused on specific case studies, they identified a number of issues and concerns that influenced the extent to which they were prepared to support each one.
7. Where concerns were raised about the **stated reasons** for managing/controlling wildlife, these tended to be because more information was needed to demonstrate the seriousness of the problem; for example, demonstrating the impact of rabbit burrows on specific archaeological sights or the impact of cormorants on a particular fishery. Given that many cases of wildlife management presumably reflect a localised need, this should be made clear. For example, it is not the case that rabbits need to be managed at every archaeological site.
8. In the case of INNS, if the aim is total eradication throughout GB, this needs to be made clear (and may require more compelling arguments). If the aim is localised control (where this is the only cost effective approach), this needs to be explained; if the public

assume the aim is eradication and the problem recurs, they may assume the control measures have failed.

9. Most concerns related to the **choice of method** and this is where most resistance is likely to be met. Ideally, many people would prefer humane methods to be used as well as methods that are species specific. At the same time, once the workshop participants were aware of the issues, there was a recognition that it is not straightforward and that various factors have to be weighed up and trade-offs may need to be made.

#### 11.4.2 Getting the public on side

1. The research has highlighted a number of principles that the public feel should be used when considering the most appropriate choice of method of control. Communicating that these principles are indeed followed should result in higher levels of public acceptance:
  - the cost of the solution needs to be proportionate to the size and nature of the problem
  - where appropriate, preventative measures should be adopted
  - wherever possible, non-lethal control methods should be used in preference to culling
  - when culling is the appropriate method, humane methods should be used that result in an instant, painless death and which minimise the chances of non-target species being culled.
2. Public confidence in individual methods can be further enhanced as follows:
  - through knowing that there are rules and regulations governing who can use any given method, the circumstances under which a method can be used, and the manner in which it should be used
  - similarly, where they exist, by knowing that there are codes of practice designed to encourage the appropriate use of various methods
  - through endorsements by recognised authorities
  - by explaining why a particular method is being used and why alternative methods are considered inappropriate.

3. Certain methods are still likely to raise public concern; in particular, the use of snares which many people consider cruel and had assumed were illegal.
4. It is likely that more persuasive arguments will be needed if public support is to be gained to control certain species that are held in high public regard.

## 11.5 Pet Owners, Gardeners and Pond Owners

### 11.5.1 Pet owners

1. Half of the general public sample owned one or more pet/companion animal.
2. Over a quarter of pet owners keep an companion animal that has the potential to be invasive. This equates to 15% of households in England. Owners of potentially invasive companion animals were more likely to be 'families' and 'pond owners' and to come from SEGs C2DE.
3. There was no evidence to suggest that pet ownership has a major bearing on people's support for managing wildlife or controlling INNS.

### 11.5.2 Pond owners

1. Some 15% of the general public sample owned a pond that contains animals/plants; ownership peaks among the 45-64 age cohort. Many of these ponds will contain animals and plants that have the potential to be invasive.
2. Pond owners were more likely to be Qualified Supporters rather than Favourably Disposed towards wildlife management. They were more likely to be familiar with the concept of INNS although they were no more likely to support the control of INNS or perceive them to be a greater threat compared to non-pond owners.

### 11.5.3 Gardens and gardeners

1. Nine in every ten households in the general public sample had a garden. Gardeners (defined as those who are responsible for choosing which plants are grown) and non-gardeners did not differ in terms of their support for, or attitudes towards, WM however they were more likely to have heard of INNS and to be in favour of controls. In the qualitative research a number of gardeners had 'suffered' because of INNS which may account for this difference.

2. Garden Centres are by far the main source of plants (but not necessarily by volume or value), followed by DIY Stores. Friends/relatives are the third most frequently mentioned source followed by markets, retail nurseries and supermarkets.
3. Plant labels, friends/relatives and staff in horticultural retail outlets are the main sources of information and advice about plants.
4. The majority of gardeners claim to dispose of unwanted plants in a responsible manner – either by putting them in the council garden waste or composting them.

#### 11.5.4 Communicating with these audiences

1. Any mainstream communications will reach gardeners and mainstream pet owners; pond owners and owners of more exotic companion animals may require a more targeted approach.
2. One approach to use with gardeners is to talk about how INNS can have a negative impact on their gardens – this is consistent with the qualitative research where we found that making the issue local and personal had the potential to gain support.
3. Gaining industry support for a plant labelling system and other PoS information, together with training staff on the problems associated with INNS and how they should be used/managed/disposed of is likely to be one of the most effective ways of reminding the public of the issue – however, this is only likely to be effective once the public's awareness of the threat from INNS has been raised.
4. Word of mouth will be another key way of influencing people.

## 11.6 Anglers

### 11.6.1 Awareness and understanding

1. We recorded much higher levels of awareness of INNS among anglers compared to the public at large although their definitions focused mainly on the non-native rather than the invasive nature of the species (this may reflect differences in the way the question was put to respondents in the telephone survey – see 10.3). Although anglers were reasonable good at recognising/identifying a number of fish species, they often did not recognise some species of fish (e.g. Bitterling, Sunbleak) and they were less able to recognise plants.
2. As with the public, there are considerable challenges in terms of educating anglers:



- some widely recognised species are not considered to be INNS
  - some species known to be INNS not widely recognised
  - some species are poorly recognised **and** not known to be INNS.
3. We recorded high levels of agreement that INNS pose a threat to native fish and plants and that they carry and spread disease and, as such, pose a threat to the future of angling. Match and specialist anglers, and members of angling clubs, were more likely to perceive INNS as a threat. These individuals are likely to be important spokespeople who can influence the wider angling community.

#### 11.6.2 Influencing angler behaviour

1. The findings from the quantitative research suggest that many anglers are already adopting appropriate behaviour, including:
  - air drying nets, landing mats and slings after every trip
  - use a net dip where these are provided
  - not moving fish between waters.
2. They were also willing to consider changing their behaviour if it can be shown to help combat the threat posed by INNS, including:
  - not releasing INNS that they catch (provided they recognise it as such)
  - cleaning their gear after every trip.
3. However, there was considerable resistance from those who use stink bags to stop doing so.

#### 11.6.3 Communicating with anglers

1. Given that a number of INNS are aquatic, a campaign aimed at the general public will also influence anglers – this is important given the fragmented nature of both the angling community and the specialist angling media.
2. The main challenge is likely to be reaching and persuading the occasional pleasure angler of the threat of INNS and the need to adopt appropriate measures – this group were almost certainly under-represented in our sample.

3. Marketing communications targeting regular anglers, including match and specialist fishermen and club members, should aim to encourage them to pass on the message to other anglers.
4. In addition to the more general messages about INNS that would be addressed as part of a campaign targeting the general public, there are some specific messages that need bringing to the attention of anglers, including:
  - the importance of not introducing to, or moving fish between, waters
  - the importance of biosecurity
  - don't release INNS back into the water – in many respects this could be the hardest attitude to change as, for most coarse anglers, it is the defining feature of their sport.
5. The communications need to address not just what anglers should or should not do but also why; the key motivators are:
  - to prevent spread of disease
  - to protect native plants and animals
  - to preserve the sport they love.
6. There may also be some mileage in communicating the legal position regarding re-releasing INNS but this will need some care as anglers tend to consider themselves 'free spirited' and 'happy to do their own thing' and therefore the idea of acting outside the law could have some appeal.
7. In terms of its tone, it will be important that any communication aimed at anglers appeals to their egos as responsible anglers rather than casting them in the role of villains.
8. Channels for communication include the specialist angling media, angling clubs, the EA rod licence, fisheries and waterways and point of sale material in retailer suppliers. There are a number of well known and respected personalities within angling who could possibly act as spoke people.

## 11.7 The Retailer Perspective

### 11.7.1 Awareness and application of Horticultural Code of Practice

1. Less than 50% of the sample was aware of the Horticultural Code of Practice (HCP). Awareness was particularly low among retailers selling just aquatic plants. Although the number of such organisations in our sample was small, this is clearly a cause for concern given the number of potentially invasive aquatic plants.
2. Of those who were familiar with the Code, eight out of every ten retailers said they followed it although only two thirds could provide an example of how it is put into practice by their organisation. The trade representatives interviewed during the research felt that Defra and central and local government should require all contractors to abide by the Code and this should be written into all contracts. This would send a signal of its importance and would increase its uptake 'at a stroke'.
3. Given the current awareness levels, there is a need to continue to promote the Code especially among those selling aquatics.

### 11.7.2 Awareness and understanding of INNS concept

1. There was almost universal awareness of the concept among the horticultural retail trade. INNS was understood to refer to '*foreign plants with negative qualities*'. As with other audiences, there were few references in respondents' definitions to entry pathways and this is something any future communications could seek to address. Such communication should remind the trade that many plants have become invasive in the wild because gardeners are unaware of the dangers and they (retailers) have a responsibility to educate their customers either to buy alternative species or to manage and dispose of such plants properly.

### 11.7.3 Awareness of INNS

1. Currently there is a mismatch between the species that Defra and NNSS consider to be invasive or potentially invasive and the view of the trade. In many cases, a majority of the trade did not consider the plants in question to be potentially invasive.

### 11.7.4 Retailer policies regarding INNS

1. Only half the sample had a policy specifically relating to the sale of INNS and, with a few exceptions, this was an informal, unwritten policy. This normally took the form of 'we

don't sell INNS' – but as we have seen, the horticultural retailers' definition of an INNS is not the same as Defra's or NNS's.

#### 11.7.5 Providing customers with information and advice about INNS

1. Two thirds of the sample claimed they were already taking steps to provide their customers with information and advice about INNS – for example, by training staff and by labelling plants. Almost without exception, retailers were willing to consider displaying PoS materials especially if Defra was to provide it – this represents an opportunity – such material will educate not just customers but the retailers as well.
2. Defra and NNS should consider whether they should encourage the industry to develop a standard form of labelling (e.g. a symbol to indicate INNS). Given that many retailers buy in stock (plants and seeds), and this presumably includes labels, such a policy would need to target the wholesale trade as well as retailers.

#### 11.7.6 Are INNS being sold and why?

1. Despite the fact that many respondents said that they had a policy of not selling INNS, the majority of horticultural retailers in our sample had sold one or more potentially invasive species from a list of 16. In many cases, they cannot claim ignorance or argue that they don't consider these species to be non-invasive as they had sold a species that they themselves classed as invasive<sup>16</sup>.
2. They claim this is due to customer demand – often linked to particular plant attributes - but this suggests that they are not going out of their way to educate their customers and suggest alternatives.
3. The trade representatives we interviewed questioned why retailers should be told not to sell plants, such as Water hyacinth, that are only potentially invasive where there is no evidence to show they are actually invasive. Clearly, retailers need to be convinced that the INNS strategy of tackling the problem by preventing potentially invasive species from establishing a foothold is the best approach.
4. The findings suggest there is still some way to go to persuade the horticultural retail trade to change their behaviour with regards to INNS.

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<sup>16</sup> In the interview, we asked respondents which of 16 plant species they had sold before we introduced the topic of INNS. Later in the interview, we asked them which, if any of the 16 species they themselves considered to be INNS.

### 11.7.7 Communicating with the retail trade

1. A two-pronged campaign is likely to be needed:
  - one targeting the public to raise awareness of the problem and to suggest what the public can do to tackle it – including not buying certain species. Such a campaign will also impact on the trade and create an impetus to be seen as being responsible retailers
  - one targeting the trade to encourage them to ‘do their bit’ and be seen as ‘responsible retailers’.

## 11.8 Looking Ahead

1. This research has provided a wealth of benchmark data for tracking the progress and effectiveness of any future marketing communications. Some of the headline measures that could be used in future tracking research are as follows

### 11.8.1 General public

- Awareness of term INNS
- Spontaneous and prompted recall of INNS
- Spontaneous and prompted recall of publicity (sources/channels; messages)
- Support for controlling INNS
- Perceived threat of INNS
- Gardeners: sources of info/advice about INNS (spontaneous/prompted).

### 11.8.2 Anglers

- Current behaviour
- Awareness of term INNS
- Spontaneous and prompted recall of INNS
- Spontaneous and prompted recall of publicity (sources/channels; messages)
- Perceived threat of INNS.

### 11.8.3 Retailers

- Awareness and application of HCP
- Number of retailers with a policy specifically about the sale of INNS
- Number of retailers selling potentially invasive plants
- Spontaneous and prompted recall of INNS
- Spontaneous and prompted recall of publicity (sources/channels; messages)
- Number of retailers providing their customers with information and advice about INNS.

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