



# Demonstrating the cost of invasive species to Great Britain

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**A Scottish Government-commissioned CABI report that ascertained the economic impact of invasive species to be £1.7 billion per year is a fundamental piece of evidence used by key decision and policy makers. This brief is based on an analysis of the impacts of the original study: F. Williams, Fl. Eschen, A. Harris, D. Djeddour, C. Pratt, R. S. Shaw, S. Varia, J. Lamontagne-Godwin, S.E. Thomas, S. T. Murphy (2010). The Economic Cost of Invasive Non-Native Species to the British Economy. CABI, Wallingford.**

## Summary

Invasive Non-Native Species (INNS) can have a detrimental effect on biodiversity, crop production and livelihoods across the world, and Great Britain is not exempt from this problem. Some of the most troublesome invasive species are now a common sight in Great Britain, for example, Japanese knotweed and the grey squirrel, but at what cost?

Until recently, the cost of INNS to the British economy was uncertain with previous estimates believed to be too low. However, in 2010, Defra, the Scottish Government and Welsh Assembly commissioned CABI to obtain an estimate of “The economic cost of invasive non-native species on Great Britain”<sup>1</sup>. This report considered the cost of INNS across 12 different sectors in the UK with a number of case studies looking at the cost of eradicating specific species. A better understanding of the negative impacts of INNS will help make people more aware of these species, prevent new introductions, and give impetus to deal with the problems caused by established invasive species.

Through a combination of literature reviews, questionnaires, expert interviews and peer reviews, CABI ascertained that, at the time of writing, the economic impact of invasive species was around £1.7 billion per year (nearer £1.8 billion now). The report and the figures relating to the economic impact have been widely cited in mainstream and specialist media, in authoritative academic articles, and in parliamentary and policy documents.

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<sup>1</sup> F. Williams, R. Eschen, A. Harris, D. Djeddour, C. Pratt, R.S. Shaw, S. Varia, J. Lamontagne-Godwin, S.E. Thomas, S.T. Murphy (2010). The Economic Cost of Invasive Non-Native Species to the British Economy. CABI, Wallingford, 198 pp.

Key opinion formers in important bodies such as Defra, the Environment Agency and the RSPB cite it as providing valuable evidence, which has influenced policy and practical management decisions related to tackling invasive species in the UK. An expert from the RSPB indicated that it, “gave us evidence that we had to do something”. The Scottish Environmental Protection Agency said it shows that, “prevention is better than cure”. Natural England suggested that, “the findings have influence across government and across society”. Niall Moore, head of the GB Non-native Species Secretariat describes the report as, “one of the most significant research projects that we commissioned in the past eight years”. The report is of relevance to other countries, especially in Europe.

## Project objectives

The main objective of the project was to report on the current economic cost of INNS on Great Britain. The aim was to include the cost of invasives in England, Scotland and Wales on a range of sectors: agriculture, horticulture, forestry, quarantine and surveillance, aquaculture, tourism and recreation, construction development and infrastructure, transport, utilities, research, biodiversity and conservation, and human health issues. Information on non-native species, including weeds, vertebrates, plant pathogens, and invertebrates, was to be gathered from scientific and grey literature, as well as the internet. Additionally, questionnaires and interviews were to be conducted with key organizations, including policy makers, land owners and managers in order to calculate further estimates.

## Findings

A total of 730 questionnaires were conducted, 250 telephone calls made, and more than 650 references of relevance gathered from scientific and grey literature. This included information on 500 non-native species. As a result of this extensive study, the cost was estimated to be around £1.7 billion per year, specifically £1.29 billion in England, £0.25 billion in Scotland and £0.13 billion in Wales.

Rabbits and Japanese knotweed were identified as being responsible for the majority of the costs incurred, followed by wild oat and the brown rat. In addition to this, the report highlighted how the costs of control increase dramatically as invasions progress. Using case studies, early identification and intervention aimed at eradicating invasions before they become widespread were highlighted as of particular economic benefit.



## Impact

The full report is freely available for download from several key stakeholder websites, including those of CABI, Defra, and the Non-Native Species Secretariat (NNSS)<sup>2</sup>. Despite not being published in an established scientific journal, it appears that the results of the study and, in particular, the figure of £1.7 billion as an estimate for the economic cost of INNS has reached a very wide audience, including academics, members of parliament and the general public.

There is evidence that this report is having an impact within the scientific community. It is cited well in the literature, and a high proportion of citations are in high impact journals. According to Google Scholar, the article has been cited 39 times, of which 28% of all citations are in journals with a high impact factor. Of 27 citations specifically in journals, 40.7% [SCI] or 51.8% [Scopus SNIP 2012] are in

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<sup>2</sup> <http://www.cabi.org/VetMedResource/FullTextPDF/2012/20123122024.pdf>  
<https://secure.fera.defra.gov.uk/nonnativespecies/downloadDocument.cfm?id=487>

journals within the highest quartile of impacts<sup>3</sup>. The report was covered in the CABI invasives blog<sup>4</sup> and, in 2011, an article with the main findings of this report and a link for the full report was published in the “Aliens Newsletter”<sup>5</sup>, which is sent to an extensive mailing list of biological control practitioners from around the world. In 2013, a similar report looking at the economic cost of INNS for Ireland and Northern Ireland used the CABI methodology<sup>6</sup>; authors state that calculations used to determine the costs for the different sectors were based on those used in the CABI study. Within their study they provided an up-to-date figure of £1.8 billion as the cost of INNS to Great Britain, adjusting for inflation. This figure has also been cited regularly.

Although academic citation and targeted news services have taken the story to specialists, key findings have had much greater reach through the mainstream media. The figure of £1.7 billion (and the revised £1.8 billion) has been widely cited, reaching the UK public through a range of channels. The findings from the report have been well-reported in national newspapers (The Telegraph<sup>7</sup>, The Guardian<sup>8</sup>, The Independent<sup>9</sup> and The Daily Mail<sup>10</sup>), featured in popular television programmes (The One Show<sup>11</sup>, Countryfile) and covered on radio (BBC Radio 4)<sup>12</sup>. The figure of £1.7 billion is cited in well over 100 different articles dating from 2010 and is still regularly being used today. This figure is cited in news channels outside of the UK, for example, in news articles published in France, Malta, Mexico, Russia and the USA<sup>13</sup>.



Unfortunately, CABI or the report specifically is not always cited as the original source of this figure, nevertheless it provides an indication that these research findings are reaching a wide audience. Local news and news services from Non-Governmental Organizations, local authorities and wildlife trusts also frequently cite this figure. For example, Surrey Wildlife Trust cited the impacts of invasives and encouraged community action against INNS, organizing specific days for removal of these species<sup>14</sup>.

The report is widely used in policy contexts. When the report was first published, Jane Davidson, Minister for Environment, Sustainability and Housing in the Welsh Assembly Government,

<sup>3</sup> Figures as of end March 2014

<sup>4</sup> <http://cabiinvasives.wordpress.com/2010/12/15/the-economic-impact-of-invasive-species-on-great-britain-revealed/>

<sup>5</sup> Eschen and Williams (2013). Aliens Newsletter.

<sup>6</sup> Kelly, J. Tosh, D. Dale, K. Jackson, A. (2013). *The economic cost of invasive and non-native species in Ireland and Northern Ireland*. A report prepared for the Northern Ireland Environment Agency and National Parks and Wildlife Service as part of Invasive Species Ireland. [http://invasivespeciesireland.com/wp-content/uploads/2010/07/Economic\\_Impact\\_Assessment\\_FINAL\\_280313.pdf](http://invasivespeciesireland.com/wp-content/uploads/2010/07/Economic_Impact_Assessment_FINAL_280313.pdf)

<sup>7</sup> <https://www.telegraph.co.uk/science/science-news/10344281/Defending-UK-from-foreign-species-costs-26-per-person.html>

<sup>8</sup> <https://www.theguardian.com/environment/2010/dec/15/rabbits-invasive-species-cost>

<sup>9</sup> <https://www.independent.co.uk/environment/nature/nonnative-species-cost-economy-17bn-2160830.html>

<sup>10</sup> <https://www.dailymail.co.uk/sciencetech/article-2439754/1-7bn-spent-stop-foreign-invaders-killing-native-British-wildlife.html>

<sup>11</sup> The One Show (BBC1) report on Tuesday 3 May 2011. Study mentioned in an item about grey squirrels.

<sup>12</sup> [http://www.bbc.co.uk/iplayer/episode/b00zm0mk/Costing\\_the\\_Earth\\_Alien\\_Invaders/](http://www.bbc.co.uk/iplayer/episode/b00zm0mk/Costing_the_Earth_Alien_Invaders/)

<sup>13</sup> For example, <https://especies-envahissantes-outramer.fr/pdf/lettre%20information/fevrier%202011.pdf>

<sup>14</sup> A flyer produced by Surrey Wildlife Trust encouraging local community action against invasive species – Friends of the Earth, 2013 at <http://www.gwfoe.org.uk/community-action-against-non-native-invasive-species-nnis-in-surrey/>



acknowledged that “This report will help us to prioritize and target where actions can have the most impact, and will assist us in prioritizing our resources for action in the future.”<sup>15</sup> Since then, the figures for economic impact have been quoted in a number of government policies and working papers. In January 2013, a report was put together citing the cost of INNS to the economy and providing a list of invasive water species to be banned from sale in the UK in order to protect wildlife<sup>16</sup>. These species included water fern, parrots feather, floating pennywort, Australian swamp stone crop and water primrose; species which are all listed within the economics paper. The economic impact of INNS was quoted at the House of Commons Environmental Audit Commission, as recently as 12 March 2014, by Parliamentary Under-Secretary of State for Natural Environment and Science, Lord de Mauley<sup>17</sup>. It was presented at the Environment Audit Committee Invasive Species Enquiry in January 2014, and included in “Biodiversity 2020: A strategy for England’s wildlife and ecosystem services report” available from the UK Government website<sup>18</sup>. The Committee also called upon CAB International to provide an expert witness to the inquiry.

## What others say about the report

### Niall Moore, GB Non-Native Species Secretariat

*“The report is an excellent piece of work. It’s one of the most significant research projects commissioned on IAS in GB in the past eight years, in fact possibly the most important. The report has already been enormously influential; it’s difficult for me to overestimate its importance. I use it in pretty much all my presentations around the world, including recently in Israel and Ireland, and at the European Parliament. It is used in UK government circles all the time, within Defra and the devolved administrations. We’ve used it in negotiations with the EU in developing their invasive alien species regulation, and the EU has used the report in developing its impact assessment for their Regulation. It provides one of the only reliable sets of economic impact figures from an EU member state. The way figures are presented for different categories of invasives, for example just the aquatics, has been very useful for us, as has the focus on figures of individual species. It helps us look at the costs and benefits of intervention in a more meaningful way, and helps justify the spend on specific interventions, such as biological control. Its influence is such that it is helping change policy. INNS were previously seen as almost a purely environmental issue, but this study pulled all the evidence of economic impact together, and that’s helped change the minds of senior officials.”*

### Trevor Renals, Environment Agency

*“I make reference to ‘The Economic Cost of Invasive Non-Native Species on Great Britain’ more than any other report. The economic impact of invasive species is such a fundamental aspect of my role that I cannot recall the last time I completed a presentation without reference to the report. It is vital to have that information in a format that can easily be accessed by authors that possess the respect and competence to render the product robust and relevant. When I am asked why we are managing water primrose I can provide a range of justifications in terms of reducing flood risk, and protecting biodiversity and amenity, but what really tends to focus the minds of most people is when I tell them we will save £242 million by doing so.”*

### Simon Mackown, Defra

*“Biodiversity is a difficult thing to get across and this gave some scale to the problem. [The report] Enabled more easy engagement with stakeholders and acted as a lever for funding both internal and external partners to help address the issue. Figures bring it alive and make it more relevant.”*

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<sup>15</sup> <http://www.nonnativespecies.org/news/index.cfm?id=34>

<sup>16</sup> DEFRA (2013). Sale of invasive water plants banned to protect wildlife. Available at: <https://www.gov.uk/government/news/sale-of-invasive-water-plants-banned-to-protect-wildlife> [online]

<sup>17</sup> <http://www.parliamentlive.tv/Main/Player.aspx?meetingId=15072&wfs=true>

<sup>18</sup> [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/69446/pb13583-biodiversity-strategy-2020-111111.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69446/pb13583-biodiversity-strategy-2020-111111.pdf)

**Caries Carbonaras, RSPB**

*“Yes [the report] definitely has had an influence in developing a line of work in IAS and gave evidence that we had to do something.”*

**Paul Walton, RSPB**

*“The case studies have been very useful in showing the value of intervention versus inaction. We have subsequently become deeply involved in preparation of the EU Regulation on IAS and have managed to influence that.”*

**Jo Long, Scottish Environmental Protection Agency**

*“The report really helped with scene setting, highlighting why invasives are important and getting the impacts into context. It has been used in all sorts of presentations, especially when awareness of non-native species was low, as we could use the figures to emphasize the scale of the problem. It has been most useful for interactions with the general public and user groups to explain why prevention is most important. The case studies in the report have been great for getting the message across that prevention is better than cure, showing what the financial difficulties could be if we don’t improve”*

**Stan Whittaker, Scottish Natural Heritage**

*“We have used the headline figure extensively in communications and press releases, in our 2020 Challenge for Biodiversity Strategy and in public presentations. We often use figures for specific species in support of a communications message [related to] those species, for example, signal crayfish or similar. Also, for example, for Black tailed prairie dog where the burrowing damage can be extrapolated from the rabbit case study. It was probably used in some decisions such as not to license the trapping of crayfish for consumption by fisheries or to support the national strategies on Japanese knotweed, Himalayan balsam and Rhododendron. On the flip side, the figures on knotweed probably justified less intervention than conservation agencies have been trying to do, due to the lack of strong evidence that there is significant impact on natural habitats when compared, for example, with competing needs to control signal crayfish or Rhododendron.”*

**Catherine Murdoch, Scottish Executive**

*“The headline figures have been used a lot in press releases and briefings but the stories and case studies help the deeply sceptical and those new to the subject to grasp the scale of the issue. The report has been used to support ongoing policy, for which it has been extremely useful. It was the first time we actually had figures, the scale of which was a surprise. We already knew that control costs are high versus early intervention but the case studies gave real proof. This work really helps when trying to tell the story and justify investing resources in circumstances where the problem doesn’t currently appear very significant. Case studies are the most valuable but Ministers were already persuaded.”*

**Michael Meharg, Department of Environment Northern Ireland**

*“Through the Invasive Species Ireland project NIEA has had information focused on our part of the world and so [we] have used these data when developing policy and briefing Ministers here in Northern Ireland [noting that this was developed through a report, which used the CABI methodology]. However, it is always useful to have a number of sources of evidence to identify the costs to the economy of Invasive Alien Species and, as such, the report will be a useful reference.”*

**Megan Ellershaw, Invasives, Natural England**

*“This work represents the first attempt to put a value on IAS and not just control; i.e. the wider costs. Natural England has used it internally for species—specific accounts and for making the case for particular interventions at a species level. Its influence is in the policy rather than delivery arena it provided a justification for action. It should be easier for us now to do assessments on agri-environment schemes and deliver invasive species action plans that the GB NNSS secretariat are doing, for example, with signal crayfish. The findings have influence across government and across society.”*

## The wider context

With the continued increase of the three Ts – Trade, Travel and Tourism – INNS are increasingly moving around the world. Many countries are ill-equipped to prevent their continued arrival or mitigate their extensive impact. CABI is committed to continuing to address the issue of INNS globally with a renewed focus on livelihoods in the developing world. With over 800 years of collective experience in-house, CABI is well-positioned to deliver this, and is the only organization capable of combining specialist knowledge management, research and activities on the ground in all regions of the world.

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