

The Great Britain Invasive Non-native Species Strategy

August 2015



Department
for Environment
Food & Rural Affairs



The Scottish
Government



Llywodraeth Cymru
Welsh Government

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Cover photographs: Main image - Floating pennywort (*Hydrocotyle ranunculoides*). Insert images (top to bottom) - Asian hornet (*Vespa velutina*) [image courtesy of Jean Haxaire]; Killer shrimp (*Dikerogammarus villosus*); Monk parakeet (*Myiopsitta monachus*).

PB 14324

Foreword

In 2008, the first Great Britain Invasive Non-native Species Strategy was published. It built upon the comprehensive review of policy that reported in 2003. The Strategy set out key aims and actions to deliver a co-ordinated approach for addressing the threats posed by these species.

Since 2008, there has been significant progress underpinned by the Strategy including:

- The establishment of the Non-native Species Information Portal (NNSIP), providing a central repository for non-native species information and distribution data;
- Undertaking and publishing risk assessments for 60 species, with a further 71 under way;
- Responding effectively to threats, including efforts to eradicate the ruddy duck, which has seen the population decline from 6,000 in 2000 to around 30 today;
- Raising awareness through two campaigns focused on aquatic plants ('Be Plant Wise') and recreational water users ('Check Clean Dry');
- Undertaking an assessment of the economic impact of invasive non-native species, which indicated an annual cost to the British economy of £1.7 billion.

The UK Government was also instrumental in successfully arguing for collective action across Europe to address these issues, resulting in the European Union's Invasive Alien Species Regulation, which came into force on 1 January 2015. The Regulation will ensure that for the most invasive and threatening species an EU-wide approach prevents their entry into and spread across the Single Market.

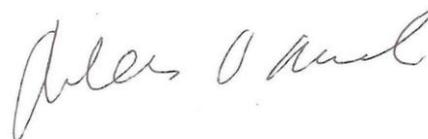
This updated Strategy builds on the successes of the last six years, recognises where more work is required, and sets a series of ambitious aims and objectives which will underpin action over the next five years. Its success will require not only continued strong leadership and direction from government but effective partnerships with environmental NGOs, trade representatives and the voluntary sector. We will be looking to build on and extend these partnerships further in the coming months and years.



Lord Gardiner of Kimble
Defra spokesman in the
House of Lords



Carl Sargeant AM
Minister for Natural Resources
Welsh Government



Aileen McLeod MSP
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Chapter 1 - Introduction and scope

1. In 2008, the Invasive Non-native Species Framework Strategy for Great Britain was published. It included a recommendation for evaluation every five years. The first review commenced in 2013 and included six workshops with stakeholders and public consultation on the review's interim findings. Two international experts were also commissioned to review the Strategy from an international perspective. This updated Strategy is the output of that review process.
2. This Strategy aims to address invasive non-native species (INNS) issues in Great Britain (GB), maintaining the approach of the 2008 Strategy and the 2003 policy review. The Strategy covers the terrestrial, freshwater and marine environments and also species native to one part of a country that become invasive in areas outside their natural range. The term 'non-native species' (NNS) is used throughout this document and is the equivalent of 'alien species' as used by the Convention on Biological Diversity (CBD). INNS (the equivalent of 'invasive alien species' or 'IAS') are broadly defined as species whose introduction and/or spread threaten biological diversity or have other unforeseen impacts.
3. The scope of the Strategy covers all non-native species of flora and fauna with the exception of genetically modified organisms (GMOs), bacteria and viruses. Its full effect, however, is aimed at those non-native species that are known to be or are potentially invasive. The Strategy does not aim to address issues related to human health or formerly native species, nor does it cover animal or plant diseases although it aims to ensure close working with these areas where appropriate.

Our vision

4. Our vision is that if this Strategy is fully implemented, biodiversity, quality of life and economic interests in GB will be better protected against the adverse impacts of INNS because there will be:
 - widespread awareness and understanding of the risks and adverse impacts associated with INNS, and greater vigilance against these;
 - integration of INNS within the broader biosecurity agenda;
 - a strong sense of shared responsibility across government, key stakeholder organisations, land managers and the general public for action and behaviour that will reduce the threats posed by INNS;
 - a guiding framework for national, regional and local mitigation, control or eradication initiatives helping to reduce the detrimental impact of INNS; and

- improved co-ordination and co-operation on INNS issues at a European and international level.

The need for a Strategy

5. The 2008 Strategy was drafted in the knowledge that, while the majority of non-native species pose little or no risk, INNS are a significant and growing problem; however, the threat to GB was largely unquantified. Now, in 2015, we have considerably more knowledge of the magnitude of the issue we face. There are nearly 2,000 non-native species established in GB, most of which are terrestrial (c.1,800) with smaller numbers in the marine and freshwater environments (c.80 in each). The number of new arrivals is also increasing with 10-12 new non-native species becoming established every year. This trend is mirrored across Europe and the rest of the world. If it is not addressed, it is expected to continue increasing for the foreseeable future.
6. About 10-15% of non-native species established in GB cause significant adverse impacts. Aquatic species tend to be more invasive than terrestrial ones and animals more invasive than plants. Impacts include:
 - Environmental: Disrupting habitats and ecosystems, preying on or out-competing native species, spreading disease, and interfering with the genetic integrity of native species. The ecological impact of some INNS, such as the American mink, signal crayfish and grey squirrel are well known, but many other impacts are less visible;
 - Economic: The cost of INNS in GB is at least £1.7 billion per year. Much of this cost is borne by the agriculture and horticulture sector, but many other sectors, including transport, construction, aquaculture, recreation and utilities, are also affected. Japanese knotweed alone is estimated to cost the British economy around £166 million per year;
 - Social: Some species cause problems to human health or are a nuisance to landowners. Invasive plants clog water bodies preventing access for navigation and angling. Some significant threats to human health are posed by species not yet in GB but that could establish in the future. For example, the Asian hornet which has killed at least seven people in France since its introduction, and ragweed which has substantially increased hay fever suffering across many European countries.
7. Acknowledging the growing threat from non-native species, the Convention on Biological Diversity provides a major driver for international action. One of its guiding principles calls for national strategies on INNS. At the EU level, the Invasive Alien Species Regulation (EC 1143/2014) that came into force on 1 January 2015, in which the UK had a major input, represents a step change in

approach and requires Member States to implement a range of measures for the prevention and management of INNS.

8. This Strategy is necessary as it provides the framework to support co-ordination of policy and action across GB. It takes account of the successes of the original 2008 Strategy as well as the outcomes of the 2013-14 review.

Successes of the 2008 Strategy

9. A key objective of policy in GB has been to develop a strong partnership approach, with the Strategy providing a framework for supporting and co-ordinating action. The achievements of the past seven years reflect this broad collaborative approach between government, industry, Non-Government Organisations and other stakeholders. Indeed, a key success has been to bring together a large number of organisations that have helped to deliver the Strategy's actions.
10. We have developed a unique risk analysis mechanism, funded strategic research and established an information portal and alert system. On the ground, three species have been completely eradicated from GB and a further five are in the process of being eradicated; this early action has saved the British economy millions, preventing further environmental damage and avoiding the cost of delayed action. Of particular note is the almost completed eradication of ruddy duck, an international exemplar (see case study below) and demonstration of GB's commitment to safeguard biodiversity at a European and international level.
11. The UK is the first EU Member State to develop and release biocontrol agents for invasive non-native plant species – Japanese knotweed and Himalayan balsam – and is funding similar efforts for other invasive non-native plants. We have also supported the establishment of a network of local action groups to facilitate strategic action at a local scale. Recognising the importance of awareness raising, we have launched and maintained two public awareness campaigns: 'Be Plant Wise' and 'Check, Clean, Dry'.
12. In addition, we have begun to improve integration with the other elements of biosecurity. Our risk analysis process is based on that used to tackle threats to plant health and we continue to integrate more closely in our assessment of risk with the regimes governing plant and animal health. Together with bee health colleagues, we devised a joint Asian hornet contingency plan which is the only national scale contingency plan in the EU for an invasive species outside plant and animal health, and we are increasingly collaborating on biosecurity communications (for example, jointly hosting a biosecurity 'Stop the Spread' garden with plant health colleagues at the Chelsea Flower Show in 2013).

Saving costs by responding rapidly to threats - the case of water primrose

Water primrose (*Ludwigia grandiflora*) is an ornamental plant associated with wetlands and the margins of watercourses. It is a serious problem in France and the risk assessment for GB concluded that it poses a high risk here, too. It spreads rapidly by vegetative fragments and forms dense carpets that exclude native biodiversity, increase flood risk and siltation and degrade amenity value.

An eradication campaign co-ordinated by the Environment Agency began in 2009 and to date the plant has been eradicated fully from three of the 23 sites where it has been found and control at the rest is continuing.

To date, the cost of removal has been less than £50,000 with costs being kept low by the use of volunteers and land-owners. Water primrose would spread widely if the current populations are not eradicated and consequently the cost of control would increase. The total cost of water primrose eradication if it became widespread is estimated to be around £250 million. Acting now is saving many millions of pounds in later control and management costs.



Chapter 2 - Strategic aims

13. The overarching aim of this Strategy is to minimise the risk posed by, and reduce the negative impacts of, INNS in GB. It follows the CBD hierarchical approach stressing prevention, followed by early detection and rapid response and finally long-term management and control.

14. The specific aims of the Strategy are:

- to provide clarity and co-ordination of responsibilities and functions within government and its associated bodies;
- to improve co-ordination of actions to tackle INNS in partnership with key interest groups outside government;
- to achieve an appropriate level of awareness of non-native species issues and promote appropriate changes in behaviour or attitudes throughout all relevant sectors;
- to reduce and, where possible, prevent the intentional and unintentional introduction of INNS;
- to ensure, where possible, that effective contingency response capabilities are in place to prevent the establishment of new invasions;
- to help ensure that strategic action to control established INNS is adequately resourced and delivered;
- to make optimum use of available capacity and resources to improve detection and monitoring capabilities; and,
- to identify gaps and priority areas for further development.

Chapter 3 - Prevention

15. The CBD Guiding Principles place a strong emphasis on prevention as the least environmentally damaging intervention, which maximises the reduction in adverse impacts and costs associated with tackling invasions. Prevention is particularly important in the marine environment where control and eradication are technically challenging. Taking action on pathways of introduction (both intentional and unintentional) and horizon scanning are key elements of prevention dealt with in this chapter. Other elements that contribute to prevention, including legislation, risk analysis, and public awareness are considered elsewhere in this Strategy.
16. The 2008 Strategy contains several actions related to pathways of introduction but there has been a lack of progress in this area, mainly due to lack of evidence to support pathway prioritisation and management. However, this evidence gap is being addressed through the Non-Native Species Information Portal (NNSIP) and other projects, including the classification of 37 broad introduction pathways and hundreds of sub-pathways. Furthermore, the EU IAS Regulation contains substantial provision for the regulation of intentional non-native species introductions and management of unintentional pathways and this will influence how we take forward this important area. Despite the stated priority given to identifying and preventing threats from new species that could be introduced to GB, it is still the case that resources are more focused on dealing with already established species.
17. Preventing the introduction and establishment of new INNS will continue to be a high priority in GB. We will seek to identify and give priority to those pathways that pose the greatest risk and develop Pathway Action Plans (PAPs) for priority pathways. Integration with the existing biosecurity regimes (plant, animal, bee health etc.) will be strengthened, for example at the UK Border, and we will continue to engage with other Member States to implement the pathway requirements of the EU IAS Regulation. We will also seek to assess and, if appropriate, re-prioritise our spending relative to long-term control.
18. With 10-12 new non-native species becoming established each year, being able to predict in advance which species are likely to invade, establish and have an adverse impact is crucial. Horizon scanning is thus a key element in prevention and is extremely important for guiding our efforts on risk analysis, pathway management and contingency planning. In 2013, the NNSIP project carried out a horizon scanning exercise, engaging with a range of experts to identify non-native species that were likely to arrive, establish and cause negative impacts in GB in the near future. By spring 2015, three of the top 10 species on the horizon scanning list had already arrived. We will continue to foster this approach, being mindful of developments across Europe, as well as other approaches to biosecurity, particularly the Plant Health Risk Register.

Asian hornet: the first contingency plan in Europe

The Asian hornet (*Vespa velutina*) is an aggressive predator of honey bees and other insects. It was introduced accidentally to France 10 years ago where it quickly became widespread and it has also now reached Spain, Belgium, Portugal, Italy and Germany.

There is great concern that this species will reach GB via imported goods or simply by flying across the Channel. Establishment would have a detrimental impact on the beekeeping sector and on the environment and would also pose a risk to public health.

Following the completion of the risk assessment in 2011 and an assessment of the management options, Government decided on a general policy of preventing establishment of the species. In April 2012, the Asian Hornet Response Plan was finalised. This is unique in Europe insofar as it covers a species that is not a statutory pest and is not yet present in the country. The Plan's main objective is to rapidly intercept and prevent the establishment of this species in GB.

Early detection is vitally important to the success of the plan. We have established an alert system which allows the public to report sightings which are then identified by the National Bee Unit (NBU). To date all of the 1,000+ suspect reports have proved negative. There is also a network of sentinel apiaries that carry out active surveillance for the species.

If the Asian hornet is detected in GB, the NBU and staff at the Animal and Plant Health Agency will work together to locate and destroy nests. The Plan has been tested in one desktop and two field contingency exercises and the response team has also been trained in France.



Asian hornet.



Asian hornet nest in tree.

Objective

To minimise the risk of INNS entering and becoming established in GB by placing as much emphasis as possible on prevention.

Key actions:

We will:

Key Action 3.1

develop a robust approach to prioritising pathways based on potential impact of the species introduced and the effectiveness of pathway management;

Key Action 3.2

analyse priority pathways to identify how they operate (e.g. origins, route, volume, temporal, spatial trends) and how risk can be reduced most effectively;

Key Action 3.3

develop Pathway Action Plans for priority pathways in partnership with relevant stakeholders;

Key Action 3.4

seek greater engagement with other EU Member States and other countries to improve pre border prevention;

Key Action 3.5

implement border inspections for the species of most concern, seeking greater integration with the Animal and Plant Health regimes;

Key Action 3.6

adopt and implement a clear process for regular horizon scanning of emerging threats, involving a broad range of stakeholders;

Key Action 3.7

produce contingency plans for priority species in advance of incursions. These will be developed in consultation with stakeholders and set out clear roles and responsibilities;

Key Action 3.8

foster and develop expertise and capacity for delivering contingency responses across government and relevant stakeholders, for example by developing centres of excellence and sharing capacity with the animal and plant health regimes.

Chapter 4 - Early detection, surveillance, monitoring and rapid response

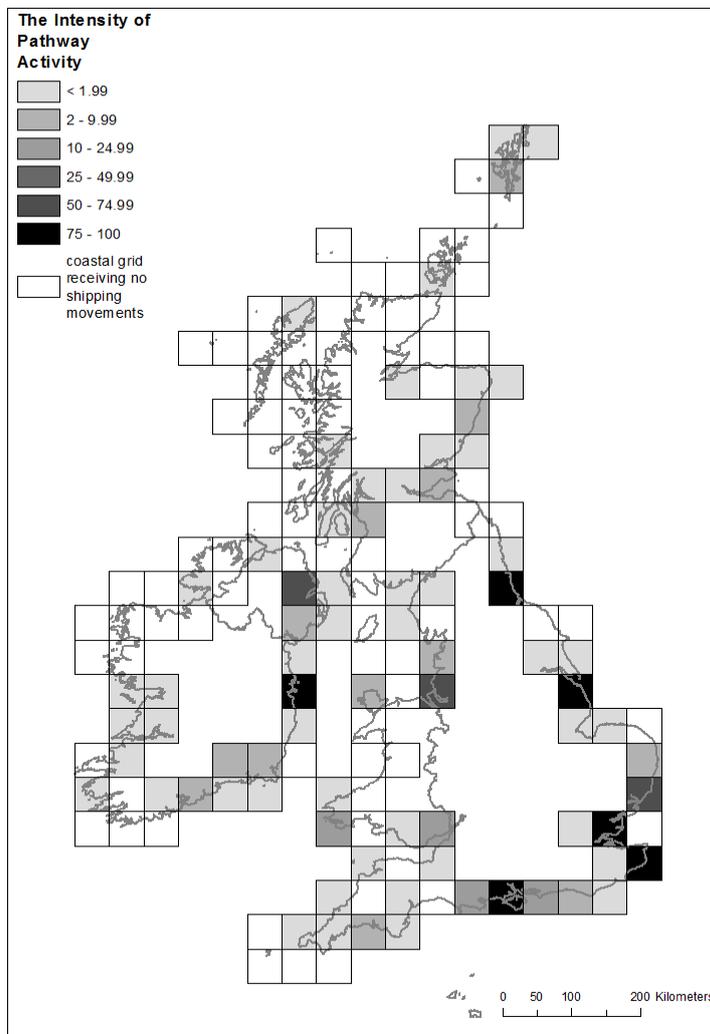
Early detection, surveillance, monitoring

19. There is a clear need for accurate, up to date information on non-native species distributions to underpin much of our decision making, such as when it is appropriate to attempt eradication. To this end, the NNSIP was established in 2008 to provide, with the National Biodiversity Network gateway, a central place for non-native species records in GB. It has made considerable advances in involving a wide range of organisations, increasing awareness of the need to submit data, developing methods and increasing the quantity and rate of flow of records including through citizen science. The development of a comprehensive database to collate information on past invasions has been vital for providing the information on which to base policy decisions. To support early detection of non-native species in GB, we have also developed an alert mechanism which has proved successful and has elicited a large number of records for priority species.
20. Considerable work is still required to maintain and develop the NNSIP, including engaging more organisations and, in particular, increasing data flow. The EU IAS Regulation and the Marine Strategy Framework Directive (MSFD) also impose additional surveillance requirements on the UK, including species-specific surveillance and monitoring of high risk pathways and likely points of entry.
21. We will continue to support the NNSIP and the growth of the alert mechanism so that it fits the needs of GB and fulfils, among other things, the early warning requirement of the EU IAS Regulation. We will seek to develop dedicated surveillance for high profile species and pathways.

Marine surveillance: the Marine Pathways Project.

Monitoring and surveillance for non-native species in the marine environment are often problematic but are vital for underpinning action on pathways of introduction and spread. Key marine pathways include commercial shipping, recreational boating and aquaculture. To help inform future monitoring (including for MSFD) the marine pathways project was established in 2013. Its main aim was the development of protocols and methodologies for the detection of non-native species both inshore and offshore. Four sub-projects were included and a study looking at the hotspots of introduction in the UK and Ireland was also undertaken.

A number of different methodologies were used including settlement panels in marinas and aquaculture sites as well as panels and scrapes on offshore buoys. Overall, the results of the project will enable better and more efficient targeting of future marine non-native monitoring and surveillance.



Heatmap of marine non-native species introduction pathway activity.



Offshore monitoring buoy.

Objective

To develop and maintain an early detection, surveillance and monitoring mechanism that facilitates management responses, including rapid response, and fulfils the requirements of the EU IAS Regulation.

Key actions:

We will:

Key Action 4.1

continue to maintain and develop the NNSIP;

Key Action 4.2

increase data flow for key species;

Key Action 4.3

continue to work with existing recording networks and citizen science initiatives to improve surveillance for non-native species;

Key Action 4.4

ensure the alert system in GB is more robust, with clear protocols, resources for verification and lines of reporting, and integrate it with other relevant schemes (e.g. Animal and Plant Health, EU IAS Regulation, etc.);

Key Action 4.5

review detection and surveillance capabilities in the light of policy requirements (including Water Framework Directive (WFD), MSFD and EU IAS Regulation), horizon scanning and pathway analysis;

Key Action 4.6

develop dedicated surveillance for high priority species and/or pathways (e.g. using hotspot analysis).

Rapid response

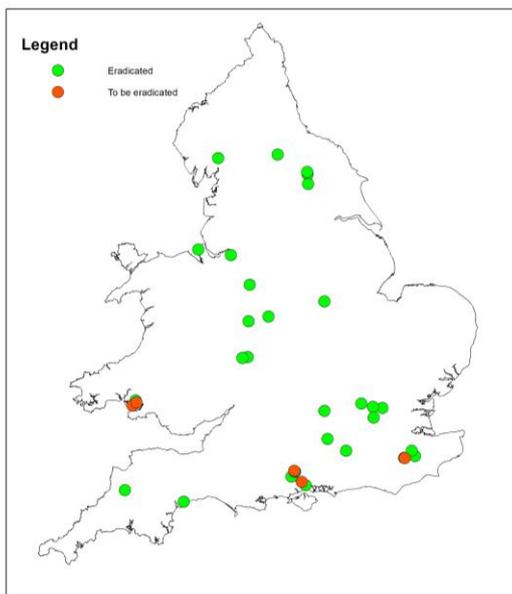
22. Measures to prevent the introduction of non-native species into GB will not always be successful, even if there were unlimited resources. The sooner action is taken to address any threat, the greater the chance of success and the less costly it will be. The precautionary approach in the CBD suggests that action should be taken to eradicate a non-native species or prevent its further establishment or spread where the risk assessment process concludes that it represents or is likely to represent a threat. This requires sufficient operational capacity and resources.
23. Since the launch of the Strategy in 2008, we have made considerable progress on rapid responses both to species newly arrived and those still of limited distribution. A working group, established in 2008, has developed a protocol to facilitate rapid responses and the Programme Board has agreed rapid eradication priorities for GB. We are leading the way in Europe in this area, having eradicated African clawed toad, fathead minnow and black bullhead with eradications continuing for water primrose, American bullfrog, topmouth gudgeon and monk parakeet. In delivering these responses we have developed specialist operational capacity, notably for fish and birds.
24. However, the review found that there were still shortcomings in our approach – in particular a lack of funding for rapid responses compared with long-term control and the need for more resources targeted towards eradicating species where this is considered feasible. Other barriers to rapid responses include problems with access to land, lack of capacity and expertise, and clear lines of responsibility, as well as problems with communications and restrictions on the use of eradication techniques.
25. We will reconvene the Rapid Response Working Group, review past and current rapid responses and seek to foster the development of greater capacity. Rapid responses to priority species will remain a clear priority for the Programme Board. We will also be mindful of the significant provisions relating to rapid eradication in the EU IAS Regulation.

Fish eradications

Topmouth gudgeon (*Pseudorasbora parva*) is a small coarse fish from Asia which was introduced to the UK in 1984. It is potentially one of the most damaging non-native fish species to invade Europe because of its easy dispersal, rapid sexual maturity and high fecundity. If topmouth gudgeon were to become established in UK waters, the impacts on native species and the fisheries they support could be severe.

Since its introduction, topmouth gudgeon has spread across GB through fish movements and the ornamental trade, with 23 populations identified throughout England and in south Wales. The Environment Agency started trial eradications using a piscicide in 2004. Owing to its success, a five-year eradication programme was started in 2011, with the objective of total removal of the species from GB by 2017. At present there remain only five confirmed topmouth gudgeon sites in England and Wales. The eradication programme is on schedule to remove this invasive species from England by 2017.

The development of such expertise, tools and techniques should allow rapid response eradications for new invasive fish and potentially for aquatic species such as amphibians, crustaceans and other invertebrates. To date, two other invasive fish have successfully been eradicated from GB: fathead minnow in 2008 and black bullhead catfish in 2014.



Map of topmouth gudgeon sites in England and Wales.



Black bullhead eradication in GB.

Objective

To prioritise rapid responses and maintain and develop capacity to carry them out.

Key actions:

We will:

Key Action 4.7

use risk management methods to help identify and prioritise more species for rapid eradication in GB;

Key Action 4.8

make rapid eradication of key INNS by the appropriate bodies a clear priority for the Programme Board. In doing so, the Programme Board will seek regular updates on progress;

Key Action 4.9

charge the Rapid Response Working Group with:

- reviewing lessons learnt from past and current rapid responses;
- reviewing and reinforcing protocols for undertaking rapid eradication;
- engaging with industry and Non-Government Organisations to define their roles in supporting rapid eradication initiatives;
- reviewing media and communications lessons learnt about sensitive eradication attempts and provide guidance for improvement;

Key Action 4.10

identify and foster capacity and expertise in carrying out rapid responses, including through sharing good practice within GB, across the EU and internationally.

Chapter 5 - Long-term management and control

26. Although the main emphasis of the Strategy is directed towards prevention and rapid response, there is still a need to manage the impacts of the large number of INNS that are already established in GB. There are four main types of long-term management: large scale eradication, containment, control, and mitigation, but there are many times when it is not appropriate or feasible to take any action.
27. At present, Government directly supports the management of about 20 species across GB (four of which are ongoing rapid responses at the GB scale), which represents about 10% of the most invasive species. We are the first European country to have developed biocontrol agents for the long-term control of invasive non-native plants, including the Japanese knotweed psyllid, released in 2010, and the Himalayan balsam rust, released in 2014. We have undertaken the large-scale eradication of ruddy duck (expected completion end 2015), one of the largest vertebrate eradication efforts worldwide, and the mink eradication in the Western Isles is nearing completion. In some cases, active management of species is not feasible and so biosecurity to slow spread is a priority, such as for killer shrimp, quagga mussel and carpet sea-squirt. In these cases we have helped to implement biosecurity measures and started to increase awareness, particularly through the 'Check, Clean, Dry' campaign (see Chapter 6). We have developed Invasive Species Action Plans (ISAPs) setting out key aims, objectives and actions for long-term control of several species to help ensure that action is strategic, and more plans are in development. We have also supported Local Action Groups which are carrying out control on a wide range of species.
28. However, some of the control action has lacked co-ordination, and strategic priorities for action at GB and national levels are still under development. The completion of ISAPs has also been slow, generally because the responses to many of these species are complex and involve many stakeholders. Compliance with good biosecurity practice is generally poor and in some cases there is no known effective biosecurity method. To deal with these issues, we will further develop and use tools to help set priorities for strategic long-term management, including cost/benefit analysis. Co-ordination of long-term management will be improved by producing ISAPs for all species that are strategic priorities. Where direct management is not feasible, as is often the case in the marine environment, we will seek to reduce the spread of species by improved and targeted biosecurity.

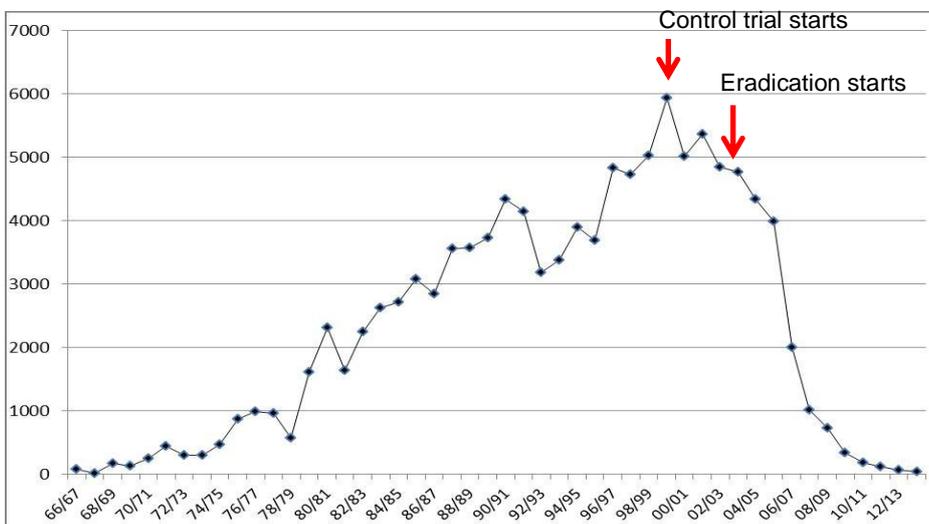
Ruddy duck



Native to North America, ruddy duck (*Oxyura jamaicensis*) was introduced into the UK in the 1950s for wildfowl collections, from which several birds escaped and formed a free-flying population. As ruddy duck numbers increased in the UK, migration to the continent increased and they formed populations in France, Belgium and the Netherlands. By the early 1990s, ruddy duck reached areas of Spain where the globally-threatened white-headed duck occurs. Cases of hybridization with white-headed duck in Spain became an annual occurrence, and hybridization is now regarded as the greatest threat to the survival of white-headed duck.

Following several years of research, a ruddy duck eradication programme began in 2005, jointly funded by the UK Government and the EU LIFE-Nature programme. Since then control of the species has taken place at more than 140 sites across the UK and numbers have fallen from almost 6,000 to an estimated 30 individuals in 2015. This work has seen a significant reduction in the numbers of ruddy ducks appearing in Spain, and no hybrids have been reported there since 2007.

The work is supported by conservation bodies in the UK such as the Wildfowl and Wetlands Trust (WWT) and the Royal Society for the Protection of Birds (RSPB). Control of ruddy duck also takes place in Belgium, the Netherlands, France and Spain, and all of these have agreed to join with the UK in aiming for complete eradication of this species in the wild in Europe by the end of 2015.



Number of ruddy ducks in the UK, 1966 – 2014.

Objective

To minimise and manage the impact of established INNS in a cost- effective and strategic manner.

Key actions:

We will:

Key Action 5.1

develop a decision support system to help prioritise strategic responses for well-established species at a GB, national and/or regional level;

Key Action 5.2

develop and facilitate key GB level long-term management programmes that are cost-effective, evidence-based and proportionate to the threat level;

Key Action 5.3

produce ISAPs to help communicate strategic priorities at a GB, national and regional level. These will:

- be developed in partnership with stakeholders;
- clearly set out the strategic approach (at a regional level if relevant) so that all stakeholders at varying scales can support the plan;

Key Action 5.4

improve awareness of, and compliance with, good biosecurity practice, by:

- assessing methods and pathways of internal spread within GB and prioritise them according to risk;
- reducing the risk of spread posed by priority pathways (e.g. by developing pathway management plans), focusing effort in key areas of spread (i.e. hotspots) and areas most likely to be affected (e.g. sensitive habitats);
- educating relevant staff and contractors working for government, Non-Government Organisations and industry, as well as the wider public;
- by developing and sharing good biosecurity practice;

Key Action 5.5

seek to record all species-specific actions under way in GB in a central database. This should be a minimum requirement of any government-sponsored control work;

Key Action 5.6

improve ways of supporting strategic local action;

Key Action 5.7

encourage habitat restoration, where appropriate, after control of an INNS.

Co-ordinating local action

Getting co-ordinated action on a large scale is vital when tackling established non-native species, and there have been several initiatives that have helped greatly with this. The RAFTS (Rivers and Fisheries Trusts of Scotland) biosecurity project has ensured co-ordinated action on invasive non-native species across much of Scotland, developing catchment-scale biosecurity plans that mirror the GB INNS Strategy in approach.

In England, Defra has provided £1.5 million over 4 years to support Local Action Groups (LAGs) tackling invasive species. Not only have these action groups controlled common species such as Himalayan balsam but they have also tackled a total of 15 species of plants and animals, put in place prevention and early detection mechanisms, instigated training, and supported awareness raising including through promoting the 'Be Plant Wise' and 'Check, Clean, Dry' campaigns. Some have even carried out research and others have joined forces with other groups from overseas to secure EU funding.

Volunteer involvement has been extremely important in the success of LAGs and they, as well as other groups carrying out local action, put in an estimated 130,000 hours of volunteer effort in 2012.



Local Action Groups carrying out management of invasive species in Britain.

Chapter 6 - Building awareness and understanding

29. Improved awareness and understanding of the issue of INNS is important in gaining support for relevant policies and programmes, and for engaging the public. It is also vital to ensure behaviour change where activities carry the risk of introduction or spread of INNS.
30. We have made significant progress in this area, including establishing the Non-Native Species Secretariat (NNSS) website, which is a single point of information for stakeholders in GB and an important and valued tool. We have carried out research on public attitudes which has been used to underpin the work of the Media and Communications Working Group, which developed and implemented a Communications Strategic Plan. We have also launched and maintained two awareness raising campaigns ('Be Plant Wise' and 'Check, Clean, Dry'), produced identification sheets for 69 species, developed training materials and given numerous talks to stakeholders and the public. There is already evidence to suggest some significant success. For example, research has shown that water users aware of the Check Clean Dry campaign are more likely to carry out good biosecurity measures than those who are not.
31. The review, however, found that our current approach lacks the boldness of that in countries such as Australia or New Zealand. If the resources devoted to awareness raising and behaviour change could be increased they would have a greater impact on achieving our aims. We will, therefore, seek to produce more ambitious awareness-raising and communication plans with the support of Non-Government Organisations. We will continue to support and grow the existing campaigns with our key target audiences and aim to ensure they are sufficiently resourced. We will maintain the NNSS website as the hub for non-native species information in GB and re-invigorate the Media and Communications Working Group. We will also work more closely with Animal and Plant Health colleagues to maximise opportunities for raising awareness within the scope of better biosecurity.

Objective

To raise awareness of INNS issues among the general public and key target audiences and, where appropriate, to bring about behaviour change.

Key actions:

We will:

Key Action 6.1

build on the successes of existing campaigns, evaluating and revising them where necessary;

Key Action 6.2

use more targeted communications (including novel means of communication) aimed at key sectors and pathways;

Key Action 6.3

promote better access to information about INNS – especially for sectors and interest groups involved in key pathways;

Key Action 6.4

continue to assess public attitudes and evaluate the effectiveness of communication campaigns to inform the communications strategy;

Key Action 6.5

charge the Media and Communications Working Group with reviewing its existing plan and obtaining input from Non-Government Organisations/trade and specialists in further communications support;

Key Action 6.6

work with Non-Government Organisations/trade bodies to make better use of existing mechanisms to disseminate consistent messages;

Key Action 6.7

work with Animal and Plant Health colleagues to develop consistent messaging around biosecurity and maximise opportunities for collaboration;

Key Action 6.8

maintain, update and develop the NNSS website;

Key Action 6.9

continue to develop training tools including online resources.

Chapter 7 - Cross-cutting provisions

Governance and co-ordination

32. One of the key recommendations of the 2003 Non-native Species Review was that there was a need for a single co-ordinating body. This led to the creation of the GB Non-native Species Programme Board and its Secretariat in 2005/06, and later to the Risk Analysis Panel (NNRAP), Media and Communications Working Group and a Stakeholder Sounding Board. The Stakeholder Forum, bringing together representatives from a range of sectors to discuss strategic issues, has been running since 2004. Other working groups have been set up by the Programme Board as necessary. Working groups in Scotland and Wales (and formerly England) deal with non-native species issues for those countries and, although closely tied to the GB work, are not governed by the GB Programme Board. More information on the mechanism supporting the GB Strategy is set out at Annex 2.
33. Whilst the review of the 2008 Strategy indicates that there is general agreement that the model of co-ordination has worked well, stakeholders have raised concerns including the strategic nature of the board, a lack of transparency and stakeholder involvement in some decision making, and the current lack of an England Working Group. Furthermore, many stakeholders have stated that insufficient funding would inhibit action, particularly in the light of the growing threat and the new demands of the EU IAS Regulation.
34. We have decided, therefore, to continue with the present system of co-ordination, but led by a more strategically focused Programme Board assisted by its Secretariat. The importance of stakeholder involvement will continue to be reflected in the use of working groups and the annual Stakeholder Forum. We will help to develop an England Working Group to complement those in Scotland and Wales. The Programme Board will oversee a review of expenditure and the requirements needed to implement this updated Strategy and the EU IAS Regulation.

Objective

To co-ordinate action on non-native species issues across GB to maximise effectiveness and collaboration.

Key actions:

We will:

Key Action 7.1

ensure the Programme Board focuses on strategic issues. The Board will:

- re-evaluate its membership (including seniority) and terms of reference;
- undertake an assessment of the resources needed to support the GB Strategy and implement the EU IAS Regulation;
- oversee working groups that report to it;
- better integrate INNS work with other biosecurity initiatives;
- maintain an overview of agency work relevant to non-native species management;

Key Action 7.2

reconstitute the England Working Group to complement the Scotland and Wales Working Groups;

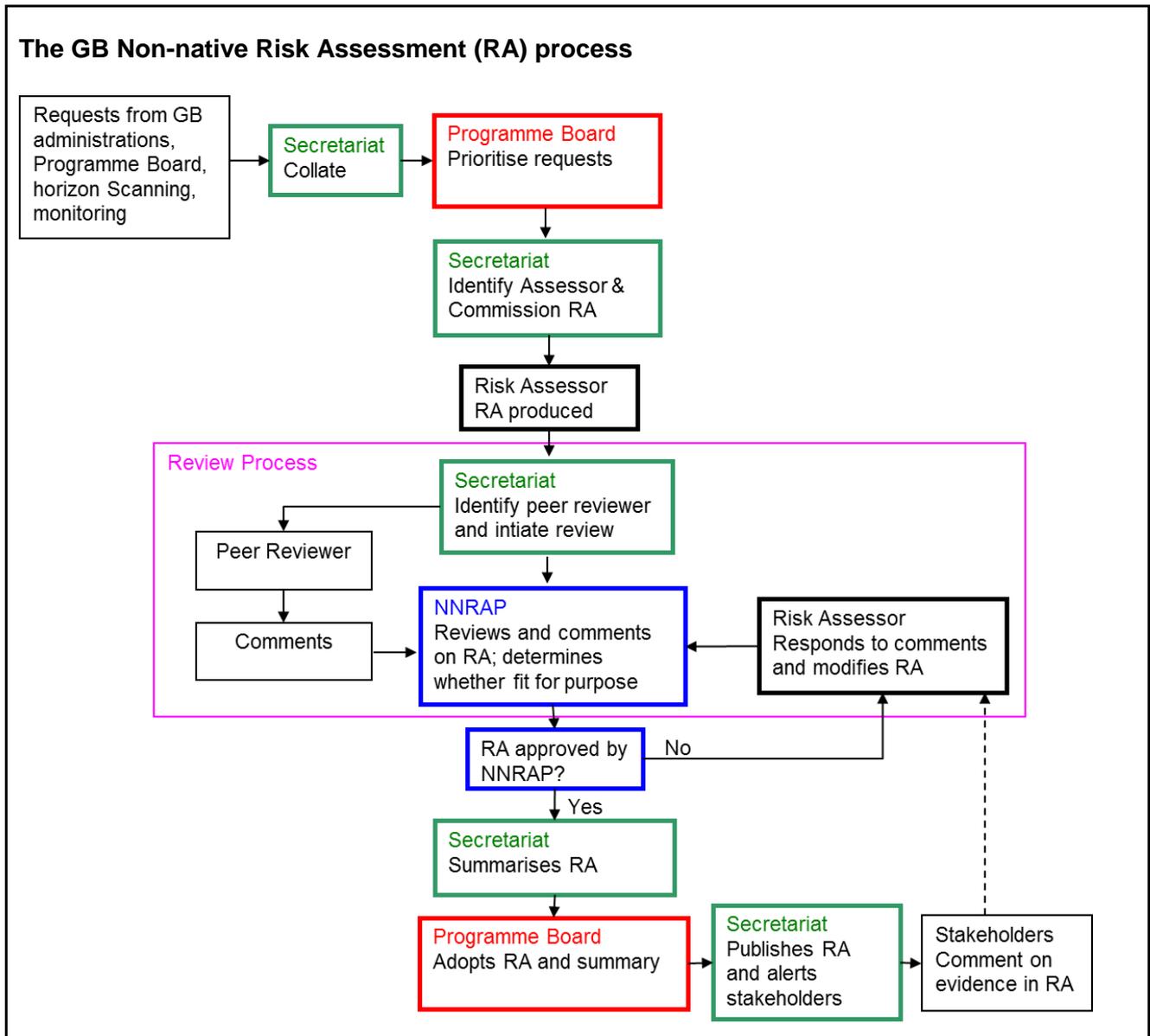
Key Action 7.3

maintain the annual Stakeholder Forum as an essential means of informing stakeholders of progress and gauging opinions.

Prioritisation and risk analysis

35. There are nearly 2,000 non-native species established in GB, approximately 300 of which have known adverse impacts, and more will arrive and have an impact in future. Without limitless resources, it is essential to set priorities for achieving the greatest benefit.

36. In GB risk assessments are used to help prioritise effort, and our methods of risk analysis are probably the most advanced in the EU.



37. However, the assessment process continues to evolve and there are still a number of areas that can and should be improved:

- although the process has produced more than 60 assessments since its inception (with 40+ additional assessments in progress), individual assessments can take a long time to be completed;

- on their own, risk assessments are of limited use for agreeing priorities as they do not take into account factors such as how feasible or cost effective it is to respond to an INNS. For this, a risk management process is required;
- better communication of the link between risk analysis and decision making in GB will improve the transparency of the process and its effectiveness.

38. We will improve the risk analysis process by concentrating on rapid risk assessments, finalising a risk management process, increasing transparency within the process, and communicating the results of the risk analysis more effectively.

Objective

To maintain, and further develop, a risk analysis framework to support legislation, decision-making and prioritisation.

Key actions:

We will:

Key Action 7.4

further develop the risk analysis mechanism to support strategic prioritisation of resources, in particular through developing a risk management tool (which incorporates cost/benefit analysis);

Key Action 7.5

make risk assessments more robust in the assessment of long-term ecological threats, in particular to vulnerable and protected species, sites and habitats (e.g. islands);

Key Action 7.6

make the link between risk assessments, risk management and policy decisions more transparent and communicate them more clearly;

Key Action 7.7

continue to review and revise the risk assessment mechanism in the light of international developments (particularly in relation to the EU IAS Regulation, and those of Animal and Plant Health);

Key Action 7.8

increase the speed of the risk analysis process (e.g. by focusing on the production of rapid risk assessments).

Legislation

39. A coherent legislative framework is essential to tackling the threats posed by INNS; however, relevant legislation is currently widely dispersed. Furthermore, unlike animal and plant health, there has been no EU legislative framework to underpin domestic legislation. However, since 2008 there have been a number of significant developments affecting the legislative framework in GB:

- The Wildlife and Natural Environment (Scotland) Act 2011 strengthened the offences relating to release of species and added new measures on keeping, notification and control of non-native species, including the introduction of species control orders;
- In 2011, the Law Commission began its Wildlife Law Project looking at modernising and consolidating the legal framework in England and Wales. It will make recommendations in due course in respect of non-native species;
- In 2013, five highly invasive aquatic plants were banned from sale in England, using for the first time powers introduced in 2006;
- The Infrastructure Act 2015 introduced species control orders in England and Wales;
- The adoption of co-ordinated measures across Europe for the first time through the EU IAS Regulation, which came into force on 1 January 2015.

40. The UK played a leading role throughout the preparation and negotiation of the EU IAS Regulation. It imposes legal requirements on EU Member States relating to prevention (e.g. by prohibiting sale, etc. of listed species, and developing pathway action plans); early warning and rapid response, and management of established species. In addition to an EU list of prohibited species, Member States will be able to create their own national lists of species, as well as regional lists to help co-ordinate responses with other Member States. Although the Regulation has direct application in the UK (i.e. there is no need to transpose it into national law as there would be with a Directive), some additional national legislation will be needed to ensure that the measures can be implemented effectively.

41. It is important not only to develop new legislation but also to make the best use of existing powers. This will be improved by ensuring that regulators take a consistent approach and by improving co-ordination and collaboration with enforcement agencies.

42. The work of the Law Commission will provide an opportunity to consider how legislation in England and Wales might be improved. Implementing the EU IAS Regulation may help to align GB legislation, where appropriate, with that of animal and plant health to develop consistent and rationalised processes such as border inspection.

Objective

To assist in developing a legislative framework in GB for addressing INNS that is coherent, comprehensive and flexible.

Key actions:

We will:

Key Action 7.9

support legislators in considering the measures proposed by the Law Commission's Wildlife Law Project in England and Wales;

Key Action 7.10

support legislators in developing ways to implement the EU IAS Regulation effectively;

Key Action 7.11

make better use of existing powers through improved co-operation and co-ordination between regulators, particularly by developing a consistent approach to enforcement;

Key Action 7.12

ensure that any changes in the legislative framework are effectively communicated to relevant stakeholders.

Chapter 8 - Research

43. Research is key to informing action on INNS. It is vital that policy is underpinned by a strong evidence base, and research outcomes will often be a key component informing risk assessment, surveillance, detection, monitoring, control and eradication strategies, as well as public awareness activities.
44. Considerable progress has been made on some elements of strategic research, notably work on economic impacts and public attitudes, but more is needed to address gaps in our knowledge. Research funding requires greater co-ordination, and the research community needs a clearer description of research priorities from those funding the work.
45. The 2003 non-native species policy review and the UK Biodiversity Research Advisory Group (BRAG 2003) both set out some priority areas for research, but while progress has already been made in many of those areas we believe it is time to rethink and update them. We should also consider the research needs generated by the EU IAS Regulation, as well as collaborating on research projects with our neighbours, in particular those in the Republic of Ireland as well as other EU Member States.
46. We propose the establishment of a working group to help identify gaps and set research priorities and collaborate more effectively with our neighbours.

Objective

To encourage robust, strategic and coherent research activities to support GB non-native species policy and action.

Key actions:

We will:

Key Action 8.1

establish a working group with responsibility for improving co-ordination, developing a strategic plan, communicating with the research community, and influencing funders of research;

Key Action 8.2

publish strategic research requirements set against the priorities of the GB Strategy and other policy needs (e.g. EU IAS Regulation, WFD, MSFD);

Key Action 8.3

collate and maintain a publicly-available database of commissioned research on INNS in GB (and elsewhere where relevant)

Key Action 8.4

seek opportunities to collaborate with other countries in order to maximise benefits and reduce duplication of effort;

Key Action 8.5

encourage practitioners to record, report and share good practice.

Chapter 9 - Information exchange and integration

47. Promoting best practice is needed to ensure the efficient use of resources and so that lessons learned in one area can be applied elsewhere. It is important, too, that research outputs are widely disseminated.
48. Keeping up to date with best practice abroad is important so that the most effective methods can be used to combat INNS in GB. Furthermore, as a global problem, links need to be maintained with other global networks and initiatives such as the Invasive Species Specialist Group of the International Union for Conservation of Nature (IUCN ISSG). Best practice developed in GB might also be used to help the UK's Overseas Territories and Crown Dependencies and countries outside GB, for example other EU Member States, whose approach to invasive non-native species may be less developed. We already collaborate with our neighbours, especially Republic of Ireland, including through the British-Irish Council and we propose to continue to pursue this approach.

Objective

To ensure that GB keeps up to date with non-native species developments domestically and internationally, and disseminates information effectively.

Key actions:

We will:

Key Action 9.1

continue to contribute to wider GB policy and biosecurity initiatives;

Key Action 9.2

continue to work closely with Irish counterparts including through the British-Irish Council;

Key Action 9.3

support an annual forum of Member States with shared objectives (consistent with the EU IAS Regulation and the need for regional co-ordination);

Key Action 9.4

develop a message board to improve information exchange;

Key Action 9.5

strengthen support for the Overseas Territories and Crown Dependencies, for example by:

- continuing Defra support of the overseas territories identification service for invertebrate plant pests, delivered by Fera;
- sharing technical expertise;
- providing training, including biosecurity training;

Key Action 9.6

continue to enhance and improve the NNSS website as a resource for all stakeholders.

Chapter 10 - Implementation and review

49. This Strategy addresses a wide variety of issues and its actions cover a range of scales – in time, in geographical extent and in the diversity of people with a role to play. Many aspects of the Strategy will be best taken forward at a GB level, but others will be better dealt with by individual countries, at a catchment scale or by considering islands and other isolated ecosystems individually. The GB Programme Board will provide the strategic overview and promote GB initiatives.

50. We will develop a plan to guide implementation and report regularly on progress – all relevant information will be available on the NNSS website.

51. The Strategy will be reviewed periodically to make sure it is working effectively and that the measures are sufficiently flexible to respond to changing circumstances. The Programme Board will continue to evaluate the Strategy every five years.

Key actions:

We will:

Key Action 10.1

develop and maintain an implementation plan to deliver the key actions of this Strategy;

Key Action 10.2

evaluate and further develop the Strategy every five years.

Annex 1 - Key recommendations from the “Review of non-native species policy: report of the working group”, Defra, 2003.

Key Recommendation 1: The Government should designate or create a single lead co-ordinating organisation to undertake the role of co-ordinating and ensuring consistency of application of non-native species policies across Government.

Key Recommendation 2: Develop comprehensive, accepted risk assessment procedures to assess the risks posed by non-native species and identifying and prioritising prevention action.

Key Recommendation 3: Develop codes of conduct to help prevent introductions for all relevant sectors in a participative fashion involving all relevant stakeholders.

Key Recommendation 4: Develop a targeted education and awareness strategy involving all relevant sectors.

Key Recommendation 5: Revise and update existing legislation to improve handling of INNS issues.

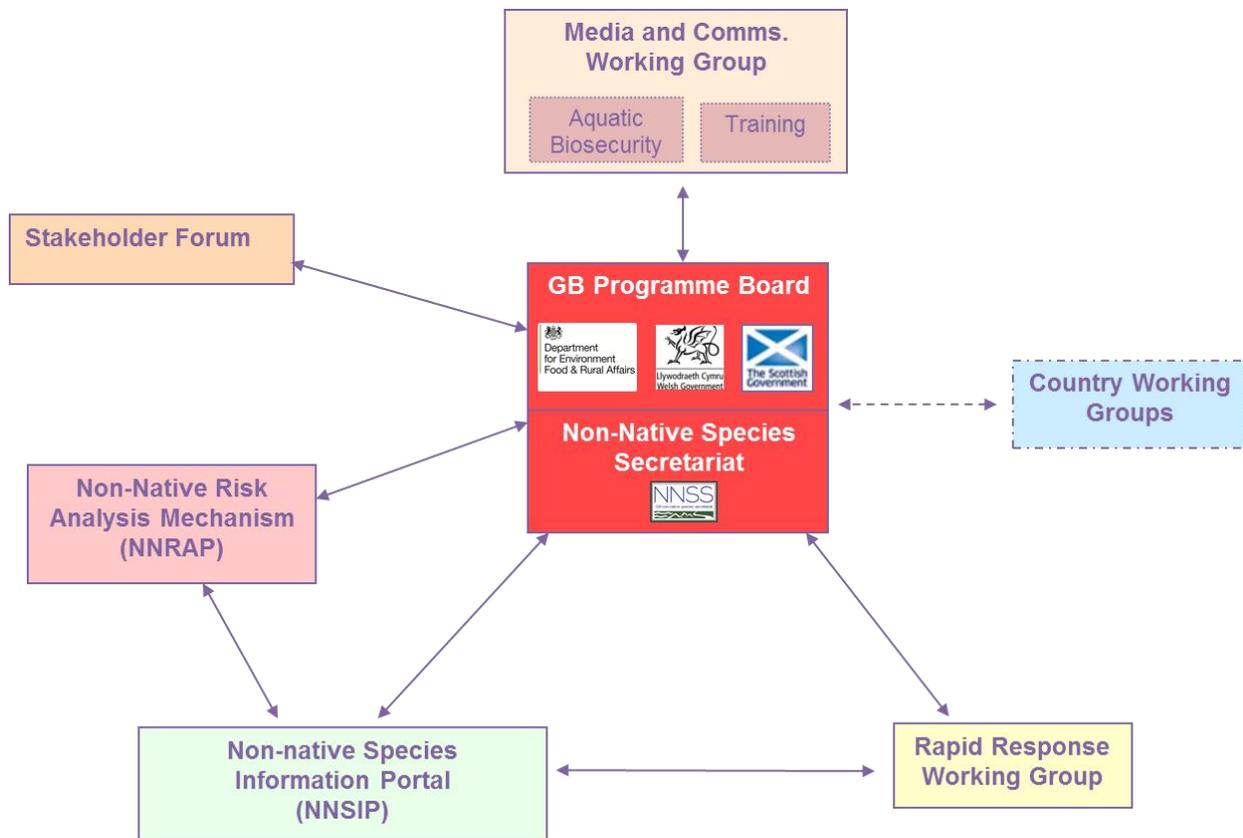
Key Recommendation 6: Establish adequate monitoring and surveillance arrangements for non-native species in GB.

Key Recommendation 7: Policies should be established with respect to management and control of INNS currently present or newly-arrived in the wild, and operational capacity be developed to implement these policies.

Key Recommendation 8: Stakeholders should be fully consulted and engaged in development of INNS policies and actions through a mechanism such as a consultative forum.

Annex 2 - The GB non-native species mechanism

Diagram of the main bodies of the GB non-native species mechanism



Governance

The GB Non-native species mechanism was developed to improve co-ordination of non-native species policy and action across GB. It does not introduce new powers or responsibilities, but instead works with the existing roles and responsibilities of organisations in GB. The function of the mechanism is to co-ordinate action on non-native species that are not otherwise covered by other mechanisms (e.g. the animal and plant health regimes).

GB Programme Board for Non-native Species

Established: 2005 | Chair: Defra | Composition: Government | Meetings: c.2 per year

The GB Programme Board for Non-native Species is the main organ of the mechanism. Its main function is to provide a forum for non-native species policy co-ordination across the three countries and setting priorities for key GB level strategic action. It comprises senior policy officials from the three countries, as well as representatives from government

agencies. The Board has no statutory basis and so policy decisions and implementation remain the responsibility of the individual organisations it is comprised of.

GB Non-native Species Secretariat

Established: 2006 | Size: 2.6 staff | Funder: Defra

The GB Non-native Species Secretariat (NNSS) is the secretariat to the GB Programme Board. The main duties of the NNSS are to support the actions and to undertake a programme of work to meet the aims of the Programme Board. The Secretariat is the focal point for communication and co-ordination between the Programme Board, working groups and stakeholders.

Stakeholder engagement

Non-government stakeholders are a vital part of the GB Mechanism, delivering many aspects of the work as well as providing crucial support, advice and evidence. Within the mechanism, key methods of engagement include:

- regular input through the use of working groups (task and finish as well as standing);
- regular contact with the NNSS, which helps link stakeholders and government bodies;
- the annual stakeholder forum, which is a key tool for updating stakeholders on progress and engaging them in future plans.

Non-native Species Risk Analysis Panel

Established: 2006 | Chair: Imperial College London | Composition: Government and non-government experts | Funder: Defra

The Non-native Risk Analysis Panel (NNRAP) is a core group of risk analysis experts that oversee the GB risk analysis mechanism. Their role is to ensure risk assessments provided to the Programme Board are robust and fit-for-purpose. The NNRAP meets several times a year to review and approve risk assessments, which are completed and peer reviewed by independent experts. They also oversee improvements to the risk analysis mechanism process.

Non-native Species Information Portal

Established: 2009 | Status: Funded until 2016 | Project lead: Centre for Ecology and Hydrology | Project partners: British Trust for Ornithology, Marine Biological Association, Botanical Society of the British Isles

The Non-native Species Information Portal (NNSIP) is key to delivery of early detection, surveillance and monitoring for GB. Roles of the NNSIP include providing a central repository for non-native species information and distribution data, increasing the flow of

distribution data into central databases, providing a horizon scanning function and maintaining an alert system. Much of the work of the NNSIP is visible through the NNSS website, where information on all non-native species recorded in GB can be found as well as detailed factsheets for 300 species.

Working groups

Working groups are established by the NNSS on behalf of the Programme Board as and when required to examine specific issues or to deliver specified outcomes. To date the following working groups have been established:

Rapid Response Working Group

Established: 2008 | Status: Task and Finish from 2008-2010; reconstituted 2015 | Chair: Scottish Natural Heritage | Composition: Government

The Rapid Response Working Group was established with the main aim of drafting the Rapid Response Report for the Programme Board, a protocol on establishing a clear process for implementing rapid responses against INNS in Britain. This was completed in 2010 and the group has not met since then. However, in 2015 the group is being reconstituted to review progress and provide further recommendations.

Media and Communications Working Group

Established: 2008 | Status: Standing | Chair: Scottish Natural Heritage | Composition: Government and non-government | Meetings: c. 2 per year

The Media and Communications Working Group was established to produce the Media and Communication Strategic Plan for the Programme Board. Since the plan was published many of the actions have been delivered, with support from members of the Working Group. The group now maintains an oversight of communications work in GB, meeting several times a year to review progress, provide further recommendations and support action. Two subgroups have been established:

- Aquatic Biosecurity Subgroup (*Established: 2010 | Status: Standing*)
 - o This sub-group was set up specifically to help support the response to killer shrimp after it was detected in GB in 2010. It developed and continues to support the Check, Clean, Dry campaign.
- Training Subgroup (*Status: Task and Finish 2010 - 2012*)
 - o Following a recommendation of the Media and Communications Strategic Plan this sub-group was established to provide recommendations for training. This task and finish group produced its recommendations in 2012, delivery of which is now overseen by the Media and Communications Group.

Country working groups

Outside of the GB Mechanism, and independent of the GB Programme Board, country working groups have been established in England, Scotland and Wales. These focus on determining and implementing priorities at a national level.

Annex 3 - Glossary of Key Terms

Alert mechanism – a system used for rapid notification of specified invasive non-native species.

Biocontrol - the use of a natural enemy or predator to control an invasive non-native species.

Citizen science – the collection and analysis of data by members of the general public, typically as part of a collaborative project with professional scientists.

Contingency plan – a high level plan to respond to a future threat posed by an invasive non-native species.

Horizon scanning – a systematic process used to identify future threats from invasive non-native species not already established in Britain.

Hotspot analysis – a systematic approach to identifying areas at greatest risk of invasive non-native species impact or introduction.

Invasive Species Action Plan – a high level plan setting out the broad policy aim and management actions for a particular invasive non-native species.

Monitoring – a series of observations over time (often relating to species distributions) usually used to measure trends.

Pathway – a broad term used to describe the way in which an invasive non-native species is introduced or spread (encompasses, for example, the purpose, route and mode of introduction).

Pathway Action Plan – a high level plan setting out the broad policy aim and actions designed to reduce the risk posed by a particular pathway.

Rapid response – the instigation of action against an invasive non-native species threat at a stage when a locally, regionally or nationally important strategic win might still be achievable.

Risk analysis – the overall process that provides decision makers with evidence to help determine priorities for invasive non-native species management (comprises: hazard identification, risk assessment, risk management and risk communication).

Risk assessment – part of risk analysis, systematically assesses the risk posed by a non-native species (does not take into account benefits of non-native species or potential management responses).

Risk management – part of risk analysis, systematically assesses the options available for managing invasive non-native species including cost/benefit analysis.

Surveillance – close observation, usually to detect a particular change or event such as the arrival of a new invasive non-native species.