



## Non-Native Invasive Species Policy

### Policy Headline

SWT believes that non-native invasive species are a significant and increasing threat to biodiversity in both Scotland and the UK. Non-native invasive species affect our native biodiversity through competition, predation, herbivory, genetic pollution, the introduction of novel pathogens or parasites and the physical alteration or destruction of habitats. Their impacts also include economic cost and harm to human health.

SWT believes that non-native invasive species should be individually assessed by an agreed lead Statutory Authority as part of a Non-Native Invasive Species Strategy for Scotland<sup>1</sup>. Those species deemed to be of 'significant threat'<sup>2</sup> should be controlled or eradicated, with eradication the preferred long term aim.

### Scope of this Policy

1. This policy sets out Scottish Wildlife Trust's (SWT) views on non-native invasive species; it outlines the actions SWT feels are necessary - from Government, its agencies and other stakeholders, to take the measures needed to bring the current problems associated with invasive species under control and work towards preventing future problems. This document also details how the SWT will implement the policy through its reserve management and broader advocacy and partnership working.
2. The scope of the policy does not include issues relating to the prevention of introduction of non-native species in the first instance as this is largely outwith the remit and control of the SWT. This policy therefore focuses solely on the management and information issues relating to invasive species already present within Scotland or which are spreading northwards in the UK. However, as a broader policy line, the SWT strongly endorses a precautionary approach to non-native species introductions. SWT believes it is more cost effective and environmentally desirable to prevent the release of non-native species, than to take measures following introduction and establishment.

### Definitions

3. Native Species - A species which is a part of the original fauna or flora of an area (which in Britain refers to species which became established after the last Ice Age<sup>3</sup>), and is found within the range it occupies naturally or could occupy without direct or indirect introduction or care by humans. Species are not homogeneously distributed across Britain and can be locally non-native e.g. small-leaved lime (*Tilia cordata*) in Scotland, hedgehogs (*Erinaceus europaeus*) on the Uists. Gradual change in species distribution is a natural process (distinct from that of climate change); therefore the species considered native to a particular area can change through time. However anthropogenic effects often mask gradual natural changes e.g. sycamore (*Acer pseudoplatanus*) in South Scotland.

<sup>1</sup> Called 'the Strategy' in this Policy

<sup>2</sup> See paragraph 7.

<sup>3</sup> Taken as those arriving before 6,000 BP - see Webb, D. A. (1985) What are the criteria for presuming native status? *Watsonia* 15, 231-236.

4. Non-Native Species are those introduced either accidentally or deliberately by human actions (introductions by animals are considered to be a natural process); often also called alien species. They can be subdivided into:
  - ♦ Ancient introductions - introduced before AD 1500, such as corn marigold (*Chrysanthemum segetum*) and brown hare (*Lepus europaeus*)
  - ♦ Recent introductions - introduced after AD 1500, such as *Buddleia* spp. and American mink (*Mustela vison*)
5. Recently introduced species are more likely to be classed as invasive, whereas the ancient introductions have suffered relative decline, mostly due to changing land use practices<sup>4</sup>, for example, arable weeds declining due to recent agricultural intensification.
6. Invasive species refers to species that, once established into an environment, have harmful/deleterious impacts on native wildlife, due to their colonization vigour and competitive tendencies. These species may breed in the wild to produce viable progeny or spread by asexual or vegetative reproduction.
7. Significant threat species are those species considered by SWT to necessitate priority action due to a combination of factors, defined through an individual species risk assessment process.
8. Potential non-native invasive species are those species which are present in the domestic environment and by their behaviour elsewhere are considered to be capable of escape and spread. This category is especially important when considering future changes in climate, which may mean non-invasive become invasive. It also includes species invasive in other countries which are increasing their range and need to be monitored.

### Policy Statement

9. SWT welcomes recent international and national initiatives in this policy area and recognises that many significant advances have occurred in recent years including; the publication of IUCN guidelines on prevention and control, the formation of the Great Britain Non-native Species Programme Board, the Non-native Species Advisory Board (of the Scottish Executive) and the publication of the Nature Conservation (Scotland) Act, 2004. SWT calls for this momentum to be maintained and for guidance to be translated into ambitious programmes of practical action. A **Non-Native Invasive Species Strategy for Scotland** is needed as part of the UK wide approach. This needs to be fully implemented, with defined targets, adequate funding, and a clear timetable for action.
10. SWT believes that the eradication of non-native invasive species should be the main aim of the Strategy. However, due to constraints of time and resources, a strategic and pragmatic view must be taken when identifying the end objective of a proposed action. It must be accepted that eradication of well established invasive species will often not be economically or practically possible, leaving control as the only available alternative. The decision to embark on a programme of eradication or control should consider the likely long term success, the long term projected costs weighed against projected damage to the environment, and include a consideration of what can be realistically achieved with the technology available.
11. In summary, the key policy initiatives SWT calls for - outlined in further detail in paragraphs 12 to 19 are:-
  - ♦ Leadership from Government at both UK and Scotland levels to ensure a strategic approach is taken
  - ♦ Scottish Executive to develop and implement a Non-Native Invasive Species Strategy
  - ♦ A science backed assessment of the threat from individual species, leading to risk assessments
  - ♦ Action to be carried out on a landscape-scale (such as river catchment)

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<sup>4</sup> The Vascular Plant Red Data List for Great Britain, Christine M. Cheffings and Lynne Farrell (Eds).

- ◆ Significant improvement of education and awareness of this issue amongst the general public and industry
- ◆ Provision of non-native invasive species legislation in any forthcoming Marine Act for Scotland
- ◆ Research into, and promotion of, best practice for control and eradication
- ◆ Monitoring and review processes to inform the risk assessment process and monitor changes in threat level

SWT believes:

12. Accountable leadership is needed to deliver effective action for the control or eradication of non-native invasive species. This should preferably be through the Scottish Executive's existing Scottish Working Group which should work closely with the Great Britain Non-native Species Programme Board to ensure joined-up delivery across both Scotland and the UK.
13. Control or eradication programmes should be part of an overall Non-Native Invasive Species Strategy which must be adequately funded. Best use of current Government support mechanisms (such as funding under the Scottish Rural Development Plan) should be tailored to deliver effective action 'on the ground' and promote the objectives of the Strategy. SWT also recommends that individual control programmes (which should form part of the Strategy) should also make full use of other, non Government, funding and resources.
14. A scientifically rigorous risk assessment process should provide the basis for decisions about priorities for control and eradication of individual species. This risk assessment should be undertaken by specialist groups. It should detail the current population and geographical spread, estimate a threat level from the impact the species has upon native habitats and species, summarise known best practice for control of the species, detail any further research needed and formulate plans for any mitigation necessary following eradication. This process will allow for action plans to be formulated which also include timescales and costings. SWT recommends that more resources and effort should be given to those non-native invasive species that, after assessment, are categorised as 'significant threat' to the natural functioning of Scotland's habitats and ecosystems, particularly where these occur in areas of high nature conservation value.
15. Any approach taken to control or eradicate a 'significant threat' non-native invasive species must not be solely site based, it must be both strategic and landscape scale based to have a sustained and cost-effective impact. The river catchment should be the scale of preference for terrestrial species.
16. Sustained and targeted education and awareness programmes, involving all relevant sectors, are required to raise awareness and buy-in regarding the issues surrounding the need for control, and methods of control, which should be as ethical and humane as possible. This is particularly important when charismatic larger mammals and birds are involved.
17. Tackling non-native invasive species in the marine environment has yet to be satisfactorily covered in any strategic way, although some legislation is in place or being developed (see Annex 2). Marine ecosystem objectives should be developed to include measures for monitoring, surveillance and control of non-native invasive species. Such ecosystem objectives should be part of a Marine Act for Scotland which SWT strongly believes is required for effective management of the nature conservation value of our seas and coastal areas.
18. The most up to date, cost effective and/or environmentally sensitive practical management operations for the removal of non-native invasive species should be used wherever possible. The potential environmental impacts of operations, such as the persistence of toxins and long-term changes to habitat composition and structure, must be assessed before operations commence, and mitigation measures then put in place as necessary. Communication and collaboration between stakeholders on best practice management techniques should be promoted as part of the Strategy.

19. Central to the successful control of non-native invasive species<sup>5</sup> is the provision of adequate monitoring and surveillance arrangements throughout Great Britain. This also necessitates the provision of funding for 'expertise development', data management and dissemination, and research to further build the evidence base to inform policy and practice.
20. Relevant stakeholders should be encouraged to actively contribute to the development of the national (and regional/sub-regional as appropriate) invasive non-native species Strategy. Consultation processes should be inclusive of all available specialist local knowledge, expertise and experience.

### **SWT priorities for action**

SWT will:

21. Continue to make the case to Scottish Parliament and Scottish Executive and its agencies for stronger legislation, strategic-focussed policy initiatives and adequate funding for the prevention and management of non-native invasive species consistent with this policy.
22. Endeavour, after the risk assessment process has been carried out, to eradicate/control 'significant threat' species on our own wildlife reserves.
23. Work with a wide range of stakeholders to control or eradicate 'significant threat' species at a catchment or landscape scale, particularly where we have reserves with such species present.
24. Press for the delivery of more direct practical control programmes from Government, local authorities, third-sector organisations and private landowners to promote the eradication/control of non-native invasive species. For public bodies a strong case will be made that they have a requirement to act to implement the biodiversity duty under the Nature Conservation (Scotland) Act, 2004.
25. Continue to raise awareness of non-native invasive species issues with the general public, members, staff, partners and government.

### **Links to other SWT Policies**

This policy does not replace any particular Scottish Wildlife Trust (SWT) Policy, but overlaps with and reflects SWT policy on:

- ◆ Ruddy Duck (2003)
- ◆ Mink Control (2002)
- ◆ Introductions, Re-Introductions and Translocations of Species<sup>6</sup> (2000)
- ◆ Killing of wild animals on wildlife reserves (1995)
- ◆ Pest Control (1994)
- ◆ Field Sports (1995)
- ◆ Genetically Modified Organisms (2003)

### **References**

26. For a (non definitive) list of UK invasive non-native species see the Invasive Alien Species Project <http://138.253.199.114/IAAP%20Web/IAAPwebsite/index.asp> at the University of Liverpool.
27. The European Union led DAISIE project project aims to establish a common clearing house, the elements of which are determined by the Global Invasive Species Programme (GISP) and IUCN. It is hoped that this will be delivered through the National Biodiversity Network (NBN). The overall aim is to monitor and rank species but does not involve any new data collection. <http://www.europe-aliens.org/>

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<sup>5</sup> including potential invasive species, such as those currently present in the environment becoming invasive following climatic changes

<sup>6</sup> See this Policy for issues relating to the protection of genetic diversity (e.g. the sourcing of local provenance stock) and the problems of translocation and control/mitigation of local non natives e.g. ruffe, hedgehog.

28. For a (non definitive) list of UK marine invasive non-native species see the marine aliens page of the Marine Life Information Network for Britain and Ireland ( MarLIN ) website  
[http://www.marlin.ac.uk/marine%5Faliens/marine\\_aliens.htm](http://www.marlin.ac.uk/marine%5Faliens/marine_aliens.htm)

**This policy will be reviewed in 2010**

**Approved by Council 29<sup>th</sup> March 2007**

## Annex 1: Background Information

29. Numbers of alien species belonging to different classes of biota that occur in Scotland, and for which specific control programmes are undertaken (taken from Welch, D. et al. (2001), An Audit of Alien Species in Scotland. SNH Review Series No. 139. Scottish Natural Heritage, Battleby.

	Number of species recently recorded in Scotland	Number of species having targeted control programmes
Vascular plants	824	7
Bryophytes	6	0
Fungi	>2	0
Mammals	13	8
Birds	49	2 (+2SPO)
Amphibia	1	0
Fish	16	1 (+11SPO)
Insects	22	0
Molluscs	50	0
Other Invertebrates	>5	2
Total	>988	20

SPO Species regularly culled for sport

30. There are non-native invasive species recorded on 58 (out of 124) SWT reserves – a total of 134 records, of 29 species. The most commonly found species was Grey Squirrel (*Sciurus carolinensis*) with 16 records, followed by Japanese Knotweed (*Fallopia japonica*) and American Mink (*Mustela vison*) both with 14 records. Non-native invasive species are known to be under-recorded, so this may not be an accurate picture of the extent of the situation on SWT reserves.

## Annex 2: Legislation and Policy Context

### National and International Legislation

31. Several pieces of legislation, both national and international relate to this policy area. The most relevant are summarised below:
32. The **Convention on Biological Diversity (1992)**, calls for the prevention of introduction, control and eradication of non-native species which threaten ecosystems, habitats and species. Implementation is left to signatory governments; however it has published guiding principles which follow the precautionary approach: prevention of the establishment of non-native invasive species is generally more cost effective and environmentally desirable than measures taken following the introduction and establishment of a non-native invasive species. Following on from this, is a three stage hierarchical approach: prevention, detection/surveillance and control/eradication – this requires monitoring to ensure detection, rapid appropriate response, availability of experts, sharing of information, research into appropriate control and capacity building.
33. The **Wildlife and Countryside Act 1981** – Section 14 covers the introduction of new species – making it an offence to introduce into the wild, animals not ordinarily resident / a regular visitor, as well as those present on Schedule 9 (Part I) and plants present on Schedule 9 (Part II).
34. In Scotland this act was updated by the **Nature Conservation Act (Scotland) (2004)**, which included provision for Ministers to prohibit the sale of non-native invasive species, and issue guidance in relation to non-native species; during Stage 2 of the Nature Conservation (Scotland) Bill, after consultation, it was agreed to add 13 plant species to Part II of Schedule 9 in June 2005.
35. The **Water Framework Directive** deals indirectly with non-native invasive species, where water bodies are at risk of not meeting the required ecological status due to “other significant anthropogenic impacts”.

36. The proposed **EU Marine Strategy Directive** (COM (2002) 539) may also oblige member states to address non-native invasive species in marine waters in order to achieve good environmental status (Consultation ended May 2005).
37. **Natura 2000** sites (Special Areas of Conservation and Special Protection Areas) are sites related to the EU Habitats Directive and Birds Directive. Member states have implied obligations relating to the control of non-native invasive species in that they must take the necessary steps to prevent disturbance to species or deterioration of site status.
38. The **Town and Country Planning Act (1990)** Section 215: provides local authorities with a discretionary power to require landowners to clean up 'land adversely affecting the amenity of the neighbourhood' which could be relevant to the control of non-native invasive species. Local authorities also have the power to undertake clean-up works themselves under Section 215 and recover costs from the landowner.
39. The **Natural Environment and Rural Communities (NERC) Act 2006** updates Section 14 of the Wildlife and Countryside Act 1981 in England and Wales. It gives the power to restrict the sale of certain invasive non-native species (Clause 50) and the provision for the Secretary of State to issue codes of practice concerning invasive non-native species (Clause 51). No new species were added to Schedule 9 directly, but a Part III was added, this is to include species that are present in the wild, an actual or potential threat to the conservation of flora or fauna, or an actual or potential threat to social or economic well-being. Within three months of a species being added to Part III of Schedule 9, the Secretary of State must nominate an appropriate body that within one year will produce an action plan that identifies how the species should be eradicated, controlled or contained in order to protect threatened flora, fauna, social or economic well-being.
40. **OSPAR (1992)**, the Oslo and Paris Convention for the Protection of the Marine Environment of the North-East Atlantic is concerned with the protection and conservation of marine ecosystems and biodiversity, involved in the control of non-native invasive species through studies into issues such as ballast water management.
41. Action to control certain non-native invasive species was mentioned in SNH's "**A Five Year Species Action Framework: Making a difference for Scotland's species**". This states that direct management is appropriate for species that are not native to a particular area and threaten biodiversity aims. Six species were specified as meeting criteria where clear targeted action would currently be most helpful - American mink, Grey squirrel<sup>7</sup>, North American signal crayfish, *Rhododendron ponticum* and its hybrids, *Sargassum muticum*, and New Zealand pygmyweed. Hedgehog (on islands only) was considered for inclusion during the consultation process.

### Recent policy developments

42. **2001** – SNH commissioned audit of alien species in Scotland: Welch, D., Carss, D.N., Gornall, J., Manchester, S.J., Marquiss, M., Preston, C.D., Telfer, M.G., Arnold, H. & Holbrook, J. (2001). An Audit of Alien Species in Scotland. SNH Review Series No. 139. Scottish Natural Heritage, Battleby.
43. **2001** - In recognition of the government's obligations, in 2001 a working group was set up by DEFRA to review invasive non-native species policy throughout Great Britain.
44. **2001** – "Review of Non-Native Species Legislation and Guidance" undertaken by Ecoscope Applied Ecologists for DEFRA
45. **2002** – Convention on Biological Diversity (CBD) adopted fifteen "Guiding principles for the prevention, introduction and mitigation of impacts of alien species that threaten ecosystems, habitats or species" to provide an international framework for governments and other organisations to develop effective strategies to prevent the introduction of, and promote control and eradication of Invasive Alien Species (IASs).

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<sup>7</sup> Counted due to the presence of Red Squirrel in the list (Species for Conservation Action) as much of the action required to enhance the red squirrel will involve direct action on the grey squirrel population.

46. **2003** – DEFRA working group “Review of non-native species policy” made eight key recommendations for further action, which were set out in “A Review of Non-Native Species Policy” published in March 2003
47. **2003** - The Scottish Executive consulted on legislative measures (Key Recommendation 5 of the Review) during August and September 2003. A number of new provisions dealing with non-native species were subsequently incorporated into the Nature Conservation (Scotland) Act 2004.
48. **2004** - The remaining recommendations from the Review were consulted on, in a second exercise, between March and June 2004 - Scottish Executive’s “Consultation on government response to the working group report of the review of non-native species policy, including species for inclusion on Schedule 9 of the Wildlife & Countryside Act 1981”
49. **2004** - In response to a key recommendation from the DEFRA Review of Non-Native Species Policy, DEFRA funded a one-year project starting in January 2004 to develop a scheme for assessing the risks posed by any non-native organism to species, habitats or ecosystems in all or part of the UK. This scheme provides the first structured framework for evaluating the potential for any non-native organism, whether intentionally or unintentionally introduced, to enter, establish, spread and cause significant impacts in all or part of the UK.
50. **2004** – 1st Consultative Forum on Non-Native Species Policy, February 2004, run by DEFRA
51. **2004** – Ad Hoc Technical Group established to address gaps in the international regulatory frameworks on IAS – to report to the CBD Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA) with recommendations prior to the CBD Conference of Parties in 2008 where IAS will be addressed as an issue for in-depth consideration.
52. **2004** - The Great Britain Non-native Species Programme Board was set up. This group is currently progressing the GB non-native species strategy - a framework for a more streamlined and co-ordinated way of dealing with non-native species in Britain (membership is given on p.12).
53. **2004** – The UK BRAG Non-native Species subgroup held its first meeting (18<sup>th</sup> December). This subgroup was established to examine research issues and identify priorities for future research action, in relation to the most significant, negative impacts of non-native, translocated and purposely-bred and released species.
54. **2005** - On June 1 2005 a new Horticultural Code of Practice covering non-natives was launched - this was developed in co-operation with DEFRA, the Welsh Assembly Government, trade and environmental interests. It was designated under section 14B of the Wildlife and Countryside Act 1981 which allows the Scottish courts to take account of the Code when considering cases involving non-native species.
55. **2005** – Following the 2004 consultation, thirteen species proposed were added to the Wildlife and Countryside Act 1981 by means of subordinate legislation on June 30 2005. This made it an offence for any person to plant or cause to grow in the wild any plant of the species listed, or any hybrid of such a plant.
56. **2005** – 2nd Consultative Forum on Non-Native Species, March 2005. Here the setting up of a GB Programme Board on non-native species was announced - to ensure that policy and action on non-natives is joined up across government and its agencies. It will produce a GB-wide strategy and a work programme for action on non-native species, and will take forward outstanding recommendations from the 2001 working group review.
57. **2005** - A Scottish Working Group was also set up to ensure effective policy co-ordination and practical implementation within the specific legal and administrative context which exists in Scotland. Initially to review and improve the co-ordination of existing non-native policy-making and public sector action in Scotland, as well as to feed into GB discussion via the SE representative on the GB Board. Further work will contribute to the advancement of the key recommendations from the GB Review (membership is given on p.13).

58. **2005** - The UK Biodiversity Research Advisory Group (non-native species subgroup) addresses both natural science and socio-economic research needs (although the interests of the Board will be wider than this). A research contract to develop a comprehensive risk assessment methodology was completed in February 2005, and will shortly be subject to peer review and further testing through work sponsored by DEFRA and the Scottish Executive.
59. **2006** - GB Programme Board began drafting GB Non-Native Species Strategy, a pre-draft of which SWT made comments on in August, 2006.
60. **2006** - Natural Environment and Rural Communities Bill (2006) passed - powers to restrict the sale of certain invasive non-native species (Clause 49) and the provision for the Secretary of State to issue codes of practice concerning invasive non-native species (Clause 50).
61. **2006** - The International Council for Exploration of the Sea (ICES) released a Working Group Report on Ballast and Other Ship Vectors (<http://www.ices.dk/iceswork/wgdetail.asp?wg=WGBOSV>).
62. **2007** - Publication of “A Five Year Species Action Framework: Making a difference for Scotland's species” by SNH. This details several non-native invasive species for targeted action “focusing on those where we expect significant gains to overall biodiversity”.
63. **2007** – Beginning of the consultation on the draft Invasive Non-Native Species Framework Strategy for Great Britain from DEFRA, the Scottish Executive and the Welsh Assembly (drafted by the GB Programme Board).

#### Wildlife and Countryside Act (1981): Section 14

“(1) Subject to the provisions of this Part, if any person releases or allows to escape into the wild any animal which –

(a) is of a kind which is not ordinarily resident and is not a regular visitor to Great Britain in a wild state: or

(b) is included in Part 1 of Schedule 9 of the Act which require licences

he shall be guilty of an offence.

(2) Subject to the provisions of this Part, if any person plants or otherwise causes to grow in the wild any plant which is included in Part II of Schedule 9

he shall be guilty of an offence.”

Species listed on Schedule 9 of the Act which require licences (list at 20 February 2003<sup>8</sup>)

Part I - Animals which are established in the wild

Scientific name	English name	Year scheduled
<i>Aix sponsa</i>	Carolina wood-duck	1981
<i>Aix galericulata</i>	Mandarin duck	1981
<i>Alectoris chukar</i>	Chukar partridge	1981
<i>Alectoris graeca</i>	Rock partridge	1981
<i>Alopochen aegyptiacus</i>	Egyptian goose	1981
<i>Alytes obstetricans</i>	Mid-wife toad	1981
<i>Ambloplites rupestris</i>	Rock bass	1981
<i>Arthurdendyus triangulatus</i> <sup>9</sup>	New Zealand flatworm	1992
<i>Astacus astacus</i>	Noble crayfish	1992
<i>Astacus leptodactylus</i>	Turkish crayfish	1992
<i>Bombina variegata</i>	Yellow-bellied toad	1981

<sup>8</sup> Some animal or plant species may be added to this list and confirmation should be sought from Defra or the JNCC.

<sup>9</sup> Formerly known as *Artioposthia triangulate*

<i>Branta canadensis</i>	Greater Canada goose	1981
<i>Cervus nippon</i>	Sika deer (including any hybrid 1999)	1992
<i>Cervus spp*</i>	Any deer or hybrid of genus <i>Cervus</i> .	1999
<i>Chrysolophus amherstiae</i>	Lady Amherst's pheasant	1981
<i>Chrysolophus pictus</i>	Golden pheasant	1981
<i>Colinus virginianus</i>	Bobwhite quail	1981
<i>Cynomys species</i>	Prairie marmot or prairie dog	1981
<i>Elaphe longissima</i>	Aesculapian snake	1992
<i>Emys orbicularis</i>	European pond terrapin	1981
<i>Glis glis</i>	Fat dormouse	1981
<i>Haliaeetus albicilla</i>	White-tailed eagle	1981
<i>Hyla arborea</i>	European (common) tree-frog	1981
<i>Hystrix cristata</i>	Crested porcupine	1981
<i>Hystrix hodgsonii</i>	Himalayan porcupine	1981
<i>Lepomis gibbosus</i>	Pumpkinseed, sun-fish or pond-perch	1981
<i>Lophura nycthemera</i>	Silver pheasant	1981
<i>Macropus rufogriseus</i>	Red-necked wallaby	1981
<i>Melopsittacus undulatus</i>	Budgerigar	1981
<i>Meriones unguiculatus</i>	Mongolian gerbil	1981
<i>Micropterus salmoides</i>	Large-mouthed black bass	1981
<i>Muntiacus reevesi</i>	Muntjac deer	1997
<i>Mustela vison</i>	American mink	1981
<i>Myocastor coypus</i>	Coypu	1981
<i>Nycticorax nycticorax</i>	Night heron	1981
<i>Oxyura jamaicensis</i>	Ruddy duck	1981
<i>Pacifastacus leniusculus</i>	Signal crayfish	1992
<i>Podarcis muralis</i>	Common wall lizard	1981
<i>Psittacula krameri</i>	Ring-necked parakeet	1981
<i>Rana esculenta</i>	Edible frog	1981
<i>Rana ridibunda</i>	Marsh frog	1981
<i>Rattus rattus</i>	Black rat	1981
<i>Rhodeus sericeus</i>	Bitterling	1981
<i>Sciurus carolinensis</i>	Grey squirrel	1981
<i>Siluris glanis</i>	Wels or European catfish	1981
<i>Stizostedion lucioperca</i>	Zander	1981
<i>Syrnaticus reevesii</i>	Reeves' pheasant	1981
<i>Tetrao urogallus</i>	Capercaillie	1981
<i>Triturus alpestris</i>	Alpine newt	1981
<i>Triturus camifex</i>	Italian crested newt	1992
<i>Tyto alba</i>	Barn owl	1992

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\* ONLY applies to Outer Hebrides, Arran, Islay, Jura and Rum.

<i>Xenopus laevis</i>	African clawed toad	1981
<b>Part II - Plants</b>		
<i>Asparagopsis armata</i>	Hooked asparagus seaweed	1992
<i>Codium fragile tomentosoides</i>	Green seafringers	1992
<i>Fallopia japonica</i>	Japanese Knotweed	1981
<i>Heracleum mantegazzianum</i>	Giant Hogweed	1981
<i>Laminaria japonica</i>	Japanese kelp	1992
<i>Macrocystis angustifolia</i>	Giant kelp	1992
<i>Macrocystis integrifolia</i>	Giant kelp	1992
<i>Macrocystis laevis</i>	Giant kelp	1992
<i>Macrocystis pyrifera</i>	Giant kelp	1981
<i>Pikea californica</i>	Red Californian seaweed	1992
<i>Porphyra</i> species	Laver seaweeds	1992
Except native species		
<i>P. amethystea</i>		
<i>P. leucosticta</i>		
<i>P. linearis</i>		
<i>P. miniata</i>		
<i>P. purpurea</i>		
<i>P. umbilicalis</i>		
<i>Sargassum muticum</i>	Japanese Seaweed	1981
<i>Undaria pinnatifida</i>	Wakame	1992

### Nature Conservation (Scotland) Bill

64. During Stage 2 of the Nature Conservation (Scotland) Bill 2004 consultation responses provided overwhelming agreement to species being added to Schedule 9, and consequently the following list of 13 plant species were added to Part II of the Schedule in June 2005.

<i>Allium paradoxum</i>	Few-flowered leek	2005
<i>Azolla filiculoides</i>	Water fern	2005
<i>Cabomba caroliniana</i>	Fanwort	2005
<i>Carpobrotus edulis</i>	Hottentot fig	2005
<i>Crassula helmsii</i>	Australian swamp stonecrop	2005
<i>Eichhornia crassipes</i>	Water hyacinth	2005
<i>Gaultheria shallon</i>	Shallon	2005
<i>Hydrocotyle ranunculoides</i>	Floating pennywort	2005
<i>Lagarosiphon major</i>	Curly waterweed	2005
<i>Myriophyllum aquaticum</i>	Parrot's-feather	2005
<i>Pistia stratiotes</i>	Water lettuce	2005
<i>Robinia pseudocacia</i>	False-acacia	2005
<i>Salvinia molesta</i>	Giant salvinia	2005

## Membership of the GB Working Group on Invasive Non-Native Species

The Review Group was first convened on 18 June 2001, comprising representatives from various relevant sectors both governmental and non-governmental (a full list of the organisations represented can be found below).

- ◆ Department for Environment, Food and Rural Affairs
- ◆ Department of Trade and Industry\*
- ◆ Scottish Executive
- ◆ National Assembly for Wales
- ◆ Maritime and Coastguard Agency\*
- ◆ British Waterways
- ◆ Central Science Laboratory
- ◆ Countryside Council for Wales
- ◆ English Nature
- ◆ Environment Agency
- ◆ Forestry Commission
- ◆ Joint Nature Conservation Committee
- ◆ Scottish Natural Heritage
- ◆ National Environmental Research Council\*
- ◆ Scottish Environmental Protection Agency\*
- ◆ Horticultural Trades Association
- ◆ Kew Gardens
- ◆ Marine Conservation Society\*
- ◆ Plantlife
- ◆ Royal Society for the Prevention of Cruelty to Animals
- ◆ Scottish Society for the Prevention of Cruelty to Animals
- ◆ The Wildlife Trusts
- ◆ Wildlife and Countryside Link
- ◆ Zoos Forum
- ◆ Association of National Parks\*
- ◆ Centre for Aquatic Plant Management\*
- ◆ Country Land and Business Association\*
- ◆ Local Government Association\*
- ◆ Ornamental Aquatic Trade Association
- ◆ The Pet Care Trust
- ◆ The National Botanic Garden of Wales\*
- ◆ The National Farmers Union\*
- ◆ The Salmon and Trout Association\*
- ◆ Gardening Which?\*
- ◆ University of Liverpool\*

- ◆ The Royal Horticultural Society\*
- ◆ The National Marine Aquarium\*

\*indicates corresponding member of the Review Group

### **Membership of the Scottish Working Group on Invasive Non-Native Species**

- ◆ Scottish Natural Heritage
- ◆ Forestry Commission Scotland
- ◆ Fisheries Research Service – Freshwater and Marine representatives
- ◆ Scottish Association for Marine Science
- ◆ Argyll and Bute Council (on behalf of CoSLA)
- ◆ Royal Botanic Garden Edinburgh
- ◆ Secretariat GB Programme Board
- ◆ Deer Commission Scotland
- ◆ Ministry of Defence
- ◆ Scottish Environment Protection Agency
- ◆ Scottish Agricultural Science Agency
- ◆ SE Water Division - Water Pollution Control Branch
- ◆ SE Freshwater Fisheries and Aquaculture Division - Salmon and Freshwater Fisheries
- ◆ SE Agriculture and Food Division – EPHAS – Plant Health; Agricultural Pests
- ◆ SE Rural Communities Division – Farm Woodlands, Deer and Land Tenure Branch
- ◆ SE Rural Development Division – Agri-environment and Organic Produce Branch
- ◆ SE Science and Analysis – Ecology, Environmental Research and GIS
- ◆ SE Landscapes and Habitats Division – Wildlife Crime and Species Licensing; Nature Conservation Strategy and Protected Areas; Countryside Team
- ◆ SE Marine Division – Marine Management
- ◆ SE Sustainable Development and Biodiversity Division – Biodiversity Policy Branch – Chair and Secretariat

## **Annex 3: Examples**

### **Good Practice Example: The Tweed Invasives Project**

65. The Tweed Invasives Project is an initiative, undertaken by the Tweed Forum (a grouping of over 850 farmers, landowners, fisheries, anglers and other interest groups within the catchment) designed to tackle non-native invasive species within the entire Tweed Catchment in a long term sustainable manner. The River Tweed is 160km (100 miles) long - the second largest river basin in Scotland and the sixth largest in mainland Britain, with a total catchment area of 5000 square kilometres (1930 square miles). The project provides training, certification, and licensing as well as support and advice and the development of best practice for the control of non-native invasive species.

66. Between 2002 and 2004, the well established species Giant Hogweed and Japanese Knotweed were targeted in riparian woodlands and riverbanks, both through practical works (undertaken by both contractors and local groups) and the development of best practice. This was mainly funded through the Heritage Lottery Fund, matched funding from other partners and in kind labour, with a total of £380,000 spent. Further work on the control of Himalayan Balsam has been funded through the Countdown 2010 Biodiversity Action Fund (2006 – 2008). Also planned or considered are actions to deal with the parasite *Gyrodactylus salaris*, Swamp Stonecrop, Mitten Crab, Signal Crayfish, Zebra Mussel and Killer Shrimp (*Dikerogammarus villosus*).
67. A native of Japan, Japanese Knotweed (*Fallopia japonica*) occupies more than half of the 10 km squares used to map plant distribution in the British Isles and is only absent from the Orkney Islands. Its distribution covers much of mainland Europe, many States in the USA and Canada, and is increasingly being reported as a nuisance weed in New Zealand and Australia. It is an offence in the UK to cause this plant to grow in the wild under the 1981 Wildlife and Countryside Act and any waste material, such as that arising from cutting, mowing or excavation, should be disposed of according to the Environmental Protection Act 1990 (Duty of Care) Regulations.
68. In the UK, Japanese Knotweed regenerates vegetatively. Very small fragments of rhizome (as little as 0.7g) and fresh stem material are able to produce viable shoots and roots, making the use of equipment such as a flail mower for control, strictly advised against. Control/eradication is best achieved using a chemical treatment; herbicides such as glyphosate may be used in riparian areas providing consent is obtained – during the 2002 to 2004 period the Tweed Invasives project obtained a blanket licence from SEPA for all its trained operatives. Japanese Knotweed requires a number of herbicide treatments over several years before it is completely eradicated as it can regenerate from its rhizome system.
69. The British Government's Non-Native Species Policy Review gives an estimate of the costs to control knotweed countrywide of £1.56 billion which gives an indication of the extent of the problem and the high costs associated with control were it to be attempted. At the current rate of treatment (2ha/yr) the current infestation will take 50 years to treat without accounting for its rapid spread (more than 2ha/yr). The costs of removal from development sites are very large - One 30mx30m site cost developers an extra £52,785 to deal with the knotweed on the site<sup>10</sup>.
70. Giant Hogweed (*Heracleum mantegazzianum*) is found throughout the UK, especially along watercourses and transport corridors; seed dispersal is generally only a few metres around the plant unless carried along rivers or paths. Plants can live for up to four years, and seed banks can remain viable for several years (an individual seed head can carry up to 50,000 seeds). It is an offence in the UK to cause this plant to grow in the wild under the 1981 Wildlife and Countryside Act and any waste material, such as that arising from cutting, mowing or excavation, should be disposed of according to the Environmental Protection Act 1990 (Duty of Care) Regulations.
71. Giant Hogweed is also controlled by glyphosate – spraying/wiping was carried out on the spring growth to prevent the plant maturing and setting seed. This was carried out regularly each year with the aim of stopping the replenishment of the seed bank. Remediation work focused on the replanting needed to restabilise riverbanks and restore the understorey in the woodlands.
72. It is thought that the devastation caused by dutch elm disease on the riparian ash/elm woodlands of the River Tweed, opened a niche for the non-native invasive species to exploit in an explosive manner. It is hoped that these few years of concerted effort have put this habitat back on the path to recovery.

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<sup>10</sup> CABI *Bioscience* - [http://www.cabi-bioscience.org/html/japanese\\_knotweed\\_alliance.htm#dist](http://www.cabi-bioscience.org/html/japanese_knotweed_alliance.htm#dist)

## Specific Species Examples

### 73. Grey squirrel *Sciurus carolinensis*

- ◆ First introduced to Scotland from North America in three places: Argyll (1892), Fife (1919) and Edinburgh (around 1919).
- ◆ It has since spread south into the Borders and north into Perthshire. Grey squirrels are now widespread in central and southern Scotland with isolated pockets in Aberdeen and Deeside. Their spread is likely to continue<sup>11</sup>.
- ◆ The impact of grey squirrels on reds is exacerbated by the fact that the grey squirrels are thought to be hosts and carrier of the squirrel poxvirus (SQPV) which is fatal for red squirrels and has been implicated in many population crashes and local extinctions.
- ◆ Approaches to grey squirrel control are becoming more strategic, focussing effort in on the peripheries of those areas where red squirrels retain strongholds<sup>12</sup>.

### 74. Rhododendron *Rhododendron ponticum* and hybrids

- ◆ Rhododendron is a large woody shrub, introduced from Spain/Portugal in the 18th Century
- ◆ Considered invasive as it colonises aggressively and out competes native vegetation, through shading out ground flora and changing soil chemistry.
- ◆ No herbivores and very few invertebrates can exploit the leaves
- ◆ Spreads both vegetatively (lateral growth can be root forming) and via seed (a large bush can produce several million seeds a year, which remain viable for several years).
- ◆ Physical control is necessary, which produces a large volume of debris. Herbicidal control is often used in conjunction, but due to resistance this must be reapplied over several years to be effective.
- ◆ Following eradication, remediation is needed for the soil/humus layer

### 75. American mink *Mustela vison*

- ◆ The American Mink was introduced to the UK to be bred in captivity for its fur
- ◆ Listed in Part I of Schedule 9 (1981)
- ◆ Escapes occurred, leading to Mink becoming establishing across most of Great Britain, apart from some areas of the far north.
- ◆ Particular concern is the effect Mink have had on Water Vole and ground breeding bird populations.
- ◆ Control is mainly carried out through live trapping and shooting – to avoid “bycatch” of otters.

### 76. Australian swamp stonecrop *Crassula helmsii*.

- ◆ Also known as New Zealand Pigmyweed, *Tillaea recurva* and *Tillea helmsii*.
- ◆ Added to Part II of Schedule 9 during Stage 2 of the Nature Conservation (Scotland) Bill in 2005, making it an offence to introduce into the wild (includes accidental release).
- ◆ Imported for use as an ornamental aquatic plant, probably released accidentally.
- ◆ Aggressively invasive in ponds and ditches – forms dense mats up to 3m in depth – ‘chokes’ native plants, depletes oxygen, restricts fishing and can cause flooding.
- ◆ Thought to be widespread in Southern England and spreading north.

<sup>11</sup> SNH – Naturally Scottish series: Red Squirrels

<sup>12</sup> See Scottish Executive’s Scottish Red Squirrel Action Plan (2007-2011) at <http://www.snh.org.uk/pdfs/species/Squirrel/Red%20Squirrel%20Action%20Plan%20-%20final%20version%20-%20July%202006%20.pdf>

- ♦ Vegetative propagation – can be from tiny fragments – mechanical control not an option – herbicidal control currently the only effective option but not ideal/appropriate in watercourses as it impoverishes freshwater environments for an extended period.

77. Spanish Bluebell *Hyacinthoides hispanica* (and its hybrid *Hyacinthoides hispanica* x *H. non-scripta*)

- ♦ Considered invasive due to its ability to hybridise and produce viable offspring with the native bluebell species *Hyacinthoides non-scripta*. There is no other known adverse effect to native wildlife.
- ♦ Widely used as a garden plant, escapes into the wild have occurred, especially through the careless disposal of garden waste.
- ♦ The degree to which native woodlands are contaminated with Spanish Bluebell and hybrids is unknown.
- ♦ Distinguishing between the native and Spanish Bluebell (and hybrid) is difficult. The Spanish Bluebell is often paler, larger and has flowers arranged all round the stem, not hanging to one side and broader leaves than the native bluebell species *Hyacinthoides non-scripta*.
- ♦ Current control methods are focused on prevention of spread, education and working towards the prevention of sale. Bulbs should be dug up and burned as composting is not always effective.

### List of Commonly Known Non-Native Invasive Species

78. This list has been composed from a variety of published lists and is not intended to be exhaustive. It is presented here to give examples of the commonly known non-native species present or thought likely to arrive in Great Britain, not currently included on Schedule 9 of the Wildlife and Countryside Act (1981).

#### Animals

<i>Australoplana sanguinea</i> var. <i>alba</i>	Australian flatworm
<i>Dreissena polymorpha</i>	Zebra mussel
<i>Lepus europaeus</i>	Brown Hare introduced before the Roman invasion <sup>13</sup>
<i>Oryctolagus cuniculus</i>	Rabbit introduced in the 13th Century
<i>Rana catesbiana</i>	American Bullfrog

#### Plants

<i>Azolla caroliniana</i>	Water Fern (possibly found in the UK)	(freshwater)
<i>Campylopus introflexus</i>	(a moss)	
<i>Castanea sativa</i>	Sweet Chestnut	
<i>Crocsmia x crocosmiiflora</i>	Montbretia	
<i>Chrysanthemum segetum</i>	Corn Marigold	
<i>Doronicum pardalianches</i>	Leopard's-bane	
<i>Elodea nuttallii</i>	Nuttall's pondweed	(freshwater)
<i>Elodea canadensis</i>	Canadian pondweed	(freshwater)
<i>Hippophae rhamnoides</i>	Sea Buckthorn	
<i>Hyacinthoides hispanica</i>	Spanish Bluebell	
<i>Impatiens glandulifera</i>	Himalayan Balsam	
<i>Myriophyllum brasiliense</i>	closely related to Parrots Feather	(freshwater)

<sup>13</sup> Yalden, D. (1999) The History of British Mammals. T. & A. D. Poyser Natural History. Academic Press, London.

<i>Myriophyllum propinacoides</i>	“	(freshwater)
<i>Myriophyllum propium</i>	“	(freshwater)
<i>Papaver rhoeas</i>	Common Poppy	
<i>Petasites fragrans</i>	Winter Heliotrope	
<i>Quercus pubescens</i>	Southern European Oak	
<i>Rhododendron ponticum</i>	Rhododendron	
<i>Symphoricarpos albus</i>	Snowberry	
<i>Trapa natans</i>	water chestnut	(freshwater)

**Marine**

<i>Eriocheir sinensis</i>	Chinese mitten crab	(catadromous)
<i>Caprella mutica</i>	skeleton shrimp	
<i>Styela clava</i>	leathery stalked sea squirt	
<i>Perophora japonica</i>	colonial sea squirt	
Genus <i>Didemnum</i>	colonial tunicate (currently found off the Irish Coast)	
<i>Crassostrea gigas</i>	Pacific Oyster	