

## **Reintroduction, translocation and introduction of species**

### **Scope of this policy**

1. This policy (2007) covers the Scottish Wildlife Trust's (SWT) views on the reintroduction, translocation and introduction of species. It replaces the Scottish Wildlife Trust *Policy on Introductions, Reintroductions and Translocations of Species (2000)*. This policy supports SWT's broader vision for Scotland's ecosystems as flourishing, ecologically functional landscapes.

### **Definition of terms**

"Re-introduction": an attempt to establish a species in an area which was once part of its historical range, but from which it has been extirpated or become extinct ("Re-establishment" is a synonym, but implies that the re-introduction has been successful)<sup>1</sup>.

"Translocation": deliberate and mediated movement of wild individuals or populations from one part of their range to another<sup>1</sup>.

"Re-inforcement/supplementation": addition of individuals to an existing population of conspecifics<sup>1</sup>.

"Conservation/benign Introductions": an attempt to establish a species, for the purpose of conservation, outside its recorded distribution but within an appropriate habitat and eco-geographical area. This is a feasible conservation tool only when there is no remaining area left within a species' historic range<sup>1</sup>.

"Introductions": The intentional or accidental dispersal by human agency of a living organism outside its historically known native range.

"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>2</sup>), and is found within the range it occupies naturally or could occupy without direct or indirect introduction or care by humans<sup>3</sup>.

"Non-native species": Species introduced either accidentally or deliberately by human actions (introductions by animals are considered to be a natural process); often also called alien species<sup>4</sup>.

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<sup>1</sup> From IUCN Guidelines for Re-Introductions (May 1995) - [www.iucnsscrg.org/images/Englishglines.pdf](http://www.iucnsscrg.org/images/Englishglines.pdf)

<sup>2</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.

<sup>3</sup> From SWT Non-native Invasive Species Policy (March 2007)

<sup>4</sup> This would normally mean the parts of Scotland which equate to the 'native range' of a species where this can be ascertained.

## Policy Statement

### Overview

2. SWT believes there is both a moral and ecological imperative for reintroducing species lost from Scotland<sup>5</sup> due to human persecution or anthropogenic habitat loss. The reintroduction of species can also be a valuable, cost-effective (in the long-term) means of reducing the need for management intervention and of increasing the robustness of ecosystems in the face of threats such as climate change. Any proposals for reintroduction should be assessed following the best scientific information, and decisions based on this and the merits of the individual case, following International Union for the Conservation of Nature (IUCN) guidelines and procedures<sup>5</sup>.
3. SWT believes that translocation of species as a potential means of assisting species survival where populations have become small and fragmented can be a useful conservation strategy but that re-inforcement/supplementation needs to be used with caution<sup>6</sup>. Where any form of translocation or re-inforcement/supplementation is being considered, decisions should be made using the best scientific information together with the merits of the individual case, following International Union for the Conservation of Nature (IUCN) guidelines and procedures.
4. SWT does not support the introduction of any non-native species into the wild. The management response to those species which have already established themselves should be guided by the details of the individual case<sup>7</sup>. However, SWT believes that while the definition of non-native should apply to those species not occurring naturally in the British Isles this may need to be reconsidered for species that might need assistance if it is thought that they are attempting to adjust their geographical range within the UK in the face of climate change.
5. SWT is well placed to provide an objective and reasoned contribution to the reintroductions debate including broad policy and advocacy on implementation of Article 22 of the EU Habitats Directive<sup>8</sup> which states that EU Member States should “study the desirability of re-introducing species in Annex IV that are native to their territory where this might contribute to their conservation”. Annex IV includes a number of keystone<sup>9</sup> mammal species including European beaver (*Castor fiber*), Eurasian lynx (*Lynx lynx*), brown bear (*Ursus arctos*), and the wolf (*Canis lupus*).

### Reintroduction of species

6. SWT believes that the loss of species naturally occurring in an ecosystem tends to reduce the resilience<sup>10</sup> of that ecosystem and its ability to function without human intervention. Often the greater the loss of species diversity, the more intensive and expensive the management intervention is needed. With over a thousand species now identified under the UK Biodiversity Action Plan as requiring conservation action<sup>11</sup>, it has become clear that this cannot be achieved on an individual species by species basis. The only alternative is to provide suitable habitats within which these species can survive. However, unless the

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<sup>5</sup> IUCN Guidelines for Re-Introductions (May 1995) - [www.iucnsscrg.org/images/Englishglines.pdf](http://www.iucnsscrg.org/images/Englishglines.pdf)

<sup>6</sup> This is due to the dangers of genetically adversely altering a population which has become adapted to conditions at a particular location.

<sup>7</sup> See also SWT Non-native Invasive Species Policy (March 2007)

<sup>8</sup> <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31992L0043:EN:HTML>

<sup>9</sup> A keystone species is defined here as one which affect ecosystem function in a significant manner through their activities; the effect normally being disproportionate to their numerical abundance. Their removal initiates changes in ecosystem structure and often loss of diversity.

<sup>10</sup> Ecosystem resilience is defined here as “the capacity of the ecosystem to absorb disturbance and reorganise while undergoing change so as to retain essentially the same function, structure, identity and feedbacks”.

<sup>11</sup> UK SAP Priority Species list 2007

ecosystems within which these habitats exist are robust, active management would be required indefinitely. Thus where keystone species for an ecosystem are lacking, the reintroduction of those species becomes a useful, and in the long-term cost effective, management tool.

7. SWT supports in principle the reintroduction of species that have been lost from Scotland providing:
  - suitable habitat exists or is created of a sufficient extent to support a thriving population of the species to be reintroduced;
  - a thorough assessment is made of any potential negative effects on existing native species that have been identified as requiring conservation in their own right<sup>12</sup>;
  - a thorough assessment is made of any potential impact of the reintroduction on existing land-use<sup>13</sup> in the area that may be occupied by the species and suitable precautions are taken to address this<sup>14</sup>.
  - reasonable endeavours are made to secure community support.
8. SWT believes that when reintroductions are being considered, priority must be given to those species for which suitable habitat is already available and which play a keystone, functional role in a habitat or ecosystem (for example wood ants, European beaver and Eurasian lynx).
9. SWT does not believe that large predators<sup>15</sup>, including large mammals, lost from the Scottish fauna due to human persecution or overexploitation<sup>16</sup>, should be treated as a special case, but that they must be subjected to the same rigorous assessment as any other species for proposed reintroduction.
10. SWT believes that a concerted effort must be made to restore Scotland's ecosystems, particularly its native forests, to create functional forest and other habitat networks (including extensive "re-wilded" areas) to create landscapes suitable for the reintroduction of other large mammals. This should be closely linked to research into the ecological requirements of these mammals.
11. SWT believes that although ecosystem conditions may currently be unsuitable for the reintroduction of a number of large charismatic mammals, such as wolf and brown bear, those required for European beaver and Eurasian lynx are already present<sup>17</sup> in many locations and these species should therefore be a priority. Further research is required into reintroductions of other large keystone mammals but SWT feels that if and when the ecosystem conditions for other species are met, there is both a moral and ecological imperative to return them to Scotland (see also Paragraph 2 above).
12. SWT believes that the reintroduction of species can have economic benefits for local communities. The well-documented case of the reintroduction of white-tailed sea eagles to the island of Mull for example has demonstrated this very convincingly with a worth to the local economy of between £1.4 million and £1.6 million annually<sup>18</sup>.

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<sup>12</sup> UK BAP, Scottish Biodiversity Strategy, SNH Species Framework

<sup>13</sup> Danger to livestock etc.

<sup>14</sup> Fencing, compensation schemes etc.

<sup>15</sup> Bear, wolf, lynx

<sup>16</sup> European elk, wild boar, beaver

<sup>17</sup> Hetherington, D. A., & Gorman, M. L. (2007) Using prey densities to estimate the potential size of reintroduced populations of Eurasian lynx. *Biological Conservation* 137 37-44

<sup>18</sup> See: [http://www.rspb.org.uk/Images/watchedlikeneverbefore\\_tcm9-133081.pdf](http://www.rspb.org.uk/Images/watchedlikeneverbefore_tcm9-133081.pdf) and

<http://www.scotland.gov.uk/News/Releases/2006/06/12104522> plus, for further links - [www.rspb.org.uk/ourwork/policy/economicdevelopment/economics/local\\_economies/index.asp](http://www.rspb.org.uk/ourwork/policy/economicdevelopment/economics/local_economies/index.asp)

13. SWT recognises a difference between unrestricted reintroduction of a species into the countryside and restricted, controlled reintroduction. Unrestricted reintroduction is where a species is able to spread by natural means and thereby occupy a much wider area. Restricted reintroduction is where a species is prevented from spreading beyond a certain point. This could be due to a natural barrier as with a reintroduction on an island or surrounded by a large area of unsuitable habitat, or an artificial barrier (such as a fence for example). SWT believes that for some species restricted reintroduction could provide a useful first step towards unrestricted reintroduction where concerns over the likely outcome of the latter remain, or where further research into the impacts of reintroduction is needed.

### **Translocation of species**

14. SWT believes that the translocation of a species from several other sites to a new, suitable site or sites as a method of increasing both its range (and potentially its genetic diversity) could be a very useful tool in addressing some of the effects of both habitat fragmentation and climate change. This is particularly relevant where the range of a species is tending to adjust where the process is hindered by barriers that cannot be crossed without assistance. Also, where only small, highly fragmented populations of low genetic diversity survive, this form of translocation may provide a useful means of increasing genetic diversity and hence the ability of a population to adapt to changing conditions without threatening existing populations<sup>19</sup>. This would need to be assessed on a case by case basis with priority going to those species which either perform a keystone role or are rare in an international context.

### **Introduction of non-native species**

15. SWT believes that introduction of any non-native species into the wild can often have negative impacts on native wildlife. There are numerous, well-documented cases to support this, particularly where invasive non-native species have had an adverse economic as well as biological impact<sup>20</sup>. The management response to those species which have already established themselves should be guided by the details of the individual case. For animals, this will be based on the guidelines given in *The Killing of Wild Animals* published by The Wildlife Trusts.

### **SWT strengths and priorities for action**

#### **SWT wildlife reserves**

SWT will presume in favour of reintroducing species to its wildlife reserves where positive benefits are identified. Where a case is made for considering a reintroduction on an SWT reserve the Trust will follow and accept the general guidelines set out by statutory conservation bodies. These involve:

- background research to confirm that the receiving habitat is suitable, both in quality and extent, for the species to survive;
- having the resources of finance and expertise required for the re-introduction and the establishment phases;
- obtaining the individuals for re-introduction from an appropriate source without putting that population at risk;

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<sup>19</sup> In 2004, Forest Research, in partnership with SWT and The University of Aberdeen, translocated seeds of the hemiparasitic annual, small cow-wheat (*Melampyrum sylvaticum*) from isolated, vulnerable populations to new sites with a view to establishing new populations and at the same time increasing genetic diversity. The early results of experiments suggest that this might be a very valuable tool for conserving very rare plant species, particularly in the face of climate change. Theoretically the technique could also be applied to other species groups.

<sup>20</sup> See also SWT Non-native Invasive Species Policy (March 2007)

- ensuring that there are sufficient sustainable resources to manage the habitat in an appropriate way;
- recording, in an open and transparent manner, all appropriate information about the reintroduction and subsequent monitoring.

## **Wider countryside**

16. SWT believes that wildlife reserves and designated sites must be placed in the context of the wider countryside. Ecosystem-scale wildlife conservation, in conjunction with other measures, is vital to long-term sustainability and an essential step towards addressing some of the potential consequences of climate change. This means that a concerted effort is needed to restore Scotland's ecosystems into functional habitat networks, including extensive 're-wilded' areas, suitable for the reintroduction of large mammals, and other keystone species. This should be closely linked to research into the ecological requirements of these species.

## **Links to other SWT policies**

This policy should be read in conjunction with the following SWT policies:

- Agriculture
- Killing Wild Animals
- Non-native invasive species
- Pest Control
- Wild Deer and Wildlife in Scotland

## **References**

- IUCN Guidelines for Re-Introductions (May 1995) [www.iucnsscrg.org/images/Englishguidelines.pdf](http://www.iucnsscrg.org/images/Englishguidelines.pdf)
- UK BAP Priority Species List – [www.ukbap.org.uk](http://www.ukbap.org.uk)
- SNH Species Action Framework - [www.snh.org.uk/speciesactionframework/default.asp](http://www.snh.org.uk/speciesactionframework/default.asp)
- Fact Sheet: A Short History of the British Mammal Fauna. The Mammal Society - Derek W. Yalden - [www.abdn.ac.uk/mammal/history.shtml](http://www.abdn.ac.uk/mammal/history.shtml)
- IUCN/SSC Guidelines for Re-Introductions (May 1995) - [www.iucnsscrg.org/images/Englishguidelines.pdf](http://www.iucnsscrg.org/images/Englishguidelines.pdf)
- Name that sea eagle (The Scottish Government, 2006) – <http://www.scotland.gov.uk/News/Releases/2006/06/12104522>
- Watched like never before... the local economic benefits of spectacular bird species (RSPB 2006) - [http://www.rspb.org.uk/Images/watchedlikeneverbefore\\_tcm9-133081.pdf](http://www.rspb.org.uk/Images/watchedlikeneverbefore_tcm9-133081.pdf)
- What are the criteria for presuming native status? - Webb, D. A. (1985) - *Watsonia* 15, 231-236.

## **Date of approval of policy by Council**

Agreed by Council 23 April 2008

## **Annex 1**

### **Context**

#### **Reintroduction**

Following the last ice age, Britain was colonised (or re-colonised) by a wide range of species and this colonisation, to some extent, continues to the present day. This is a form of natural reintroduction as conditions become more favourable for certain species. As the colonising species became established they did not do so in isolation, but alongside all others, forming intricate links which to varying degrees support one another. The robustness (ability to survive or adapt to change) of ecosystems relates directly to the maintenance of such links. A healthy, thriving ecosystem is therefore a biologically diverse ecosystem.

As humans began to enter this post-glacial environment they rapidly began to modify it far more than any other species before.

It is within the last few centuries that humans have brought about the loss of some of the country's most notable species. Of these first went the lynx (200 A.D.), then the brown bear (500 A.D.), beaver (1300 A.D.), wild boar (1500 A.D) and lastly wolf around 1700 A.D.<sup>21</sup> (The elk was lost around 3400 years ago.) All of these were lost as a direct result of hunting, and most were keystone species forming a vital component of an ecosystem which now functions less efficiently in their absence. For example, the need constantly to cull deer is the direct result of the loss of large predators. Such management is costly, inefficient and will have to be continued indefinitely. In contrast, in other parts of the world such as Alaska where ecosystems remain far more intact, little or no management is needed, with minimal costs and maximum benefit to the local economy through tourism. The reintroduction of organisms once well-established but since lost from Scotland should therefore be seen as a move towards re-establishing ecosystem linkages towards a state where management costs are greatly reduced. Thus, where circumstances make this appropriate, the short-term investment of habitat preparation and species reintroduction may be offset many-fold by greatly reduced management costs. Indeed, as most species that might be considered for reintroduction in Scotland are fairly iconic, local communities are likely to benefit enormously from an increase in visitor numbers.

#### **Translocation**

While reintroduction involves the movement of species which have completely disappeared from a region or country, translocation relates to the movement of native species that are already established in some places. In its most basic form this involves introducing new individuals to an existing population. This can cause problems if the recipient population is small and closely adapted to a particular site as the introduction of new DNA can reduce its ability to survive there.

However, where a new, suitable site is found and species (individuals or seeds) are translocated from a number of existing sites, this can not only create a new population, but can increase genetic diversity. This can be extremely useful where populations of rare species have become small and fragmented, and in the near future could also be a helpful tool in addressing some of the effects of climate change. With changing climate it is likely that species will tend to move either north or higher up hills or mountains to compensate as warming occurs. However, in today's fragmented landscape this will often not be possible, and translocation in the form of assisting species to cross barriers to reach new habitats could prove to be a valuable method for ensuring their survival.

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<sup>21</sup> See <http://www.abdn.ac.uk/mammal/history.shtml>

In the past translocations have been carried out (sometimes on a large scale) without any real concern as new woods are planted and wildflower meadows created. For some time now questions have been raised about the genetic provenance of the material used. The IUCN Guidelines state that the source population for translocations (or re-introductions) should be closely related genetically to the original native stock and show similar ecological characteristics of morphology, physiology, behaviour and habitat preference to the original population. Although this is reasonable, the genetic question in particular may pose problems as with a rapidly changing climate species may be forced to shift their ranges and will undoubtedly encounter barriers within Scotland's fragmented landscape.

Translocation has been so widespread over the centuries that for many common species there is no longer such a thing as "local stock". Good examples are oaks (*Quercus* spp) and the red squirrel (*Sciurus vulgaris*). More recent examples include species of birdsfoot trefoil (*Lotus* spp) and kidney vetch (*Anthyllis vulneraria*) stock used in wildflower mixes which are physically clearly very different from native plants. In reality, where the provenance of a species is far removed from a location where it is to be established it is better viewed as a reintroduction and assessed accordingly.

## Introduction

The establishment of plant and animal species following the last Ice Age was a natural process and in such cases species adapt to interact as parts of healthy, functioning ecosystems. Even today colonisation continues with species arriving by their own means, often following an expansion within Europe. Recent examples include the collared dove (*Streptopelia decaocto*), egret (*Egretta* sp) and a number of species of moths and dragonflies that have established themselves along the south coast of England. There are also natural expansions of species within the UK into areas where they have never been recorded before. Recent detailed biological recording has demonstrated that large scale, dynamic fluctuations in the extent of certain species, particularly insects, appear to be normal and are often surprisingly rapid. However, intentional introduction by humans is quite different as the species in question do not establish themselves as a natural part of an ecosystem. At one extreme, many such species would simply die out; at another they can become firmly established. In this case there is a danger of them becoming serious pests as they lack natural predators that would otherwise keep them in check.

Two types of introduction should be distinguished.

**Intentional introductions** are those where the species have been released specifically to multiply and spread in the general countryside. There are relatively few examples in this group although they do include some ancient ones such as the rabbit (*Oryctolagus cuniculus*) and the brown hare (*Lepus europaeus*), but also the pheasant (*Phasianus colchicus*), the little owl (*Athene noctua*) and the zander (*Stizostedion lucioperca*).

**Accidental introductions** are those where the species have either been transported by chance, often with imported materials, or have "escaped" from captivity. This is by far the largest group and includes a huge number of naturalised alien flowering plants which have spread into the wild.

The reason for conservation concern over introductions is because of the impact these species can have on existing habitats and species. Specific problems have arisen over direct competition with native species within the habitat, spreading of the alien species into a variety of different habitats, genetic contamination by interbreeding with closely related native species, introduction and spreading of diseases affecting native species and general expansion beyond any practical method of control. Although the species known to cause problems are relatively few, when problems do arise they are sometimes extreme and the species can be very difficult to control.

Rarely is total eradication feasible, and this has a considerable economic impact as well as an adverse effect on native species.

The SNH Species Action Framework<sup>22</sup> recognises six invasive non-native species of particular concern: American mink (*Mustela vison*), grey squirrel (*Sciurus carolinensis*), North American signal crayfish (*Pacifastacus leniusculus*), New Zealand pygmyweed (*Crassula helmsii*), *Rhododendron ponticum* and its hybrids, and wireweed (*Sargassum muticum*). In addition, other species which are known to create particular problems include Japanese knotweed (*Fallopia japonica*), Giant hogweed (*Heracleum mantegazzianum*), New Zealand flatworm (*Arthurdendyus triangulatus*, previously *Artioposthia triangulata*), Canada goose (*Branta canadensis*), and muntjac (*Muntiacus reevesii*).

It is not possible to predict the fate of an introduction as it depends on subtle ecological conditions of land use or climate as well as partially unknown characteristics of the introduced species and those that it interacts with. However, although most species never get established (such as the majority of plants introduced into gardens, or others such as the black-veined white butterfly (*Aporia crataegi*) which linger on and die out eventually), and a considerable number do become established have no apparent deleterious effect, the fact that the process is almost impossible to reverse once a threat is identified means that the precautionary principle must be followed.

There are also cases of species native to the UK being introduced to habitats where they do not naturally occur and having an effect similar to that of alien species. Such “unauthorised” releases of species into the wild by individuals are likely to continue to affect the management of our countryside. For instance, the release of ruffe (*Acerina cernua*) into Loch Lomond which has put the native powan (*Coregonus clupeoides*) at risk. Thus any proposed translocation should be carefully assessed in case it actually turns out to be a damaging introduction.

SWT's policy on introductions follows the accepted standards set by the Wildlife and Countryside Act (1981) and IUCN's Position Statement on the Translocation of Living Organisms (1987). These both state that there should be no deliberate introductions into any natural habitats. There are also a number of other regulations and quarantine procedures to prevent the accidental introduction of species with imports. Despite this there are still a number of new species recorded each year in the United Kingdom, a worrying number of them marine organisms brought with ballast water<sup>23</sup>. Those species which do establish themselves to the detriment of native species or habitats, particularly those that threaten biodiversity priority species or habitats, should be considered on a case by case basis following, in the case of animals, the related Guidelines issued by The Wildlife Trusts on “Killing Wild Animals”.

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<sup>22</sup> SNH (2007) A FIVE YEAR SPECIES ACTION FRAMEWORK: Making a difference for Scotland's Species. See <http://www.snh.org.uk/speciesactionframework/default.asp>

<sup>23</sup> 'Advice note on species re introduced with ballast water', S Pollard, 2000, Marine Conservation Society.