B6. Pressure from invasive species

a. Freshwater invasive species

b. Marine (coastal) invasive species

c. Terrestrial invasive species

**Type:** Pressure Indicator

**Summary**

Of the 3,056 non-native species in Great Britain, 1,957 are considered to be established, and of those 183 are considered to be exerting a negative impact on native biodiversity in Great Britain.

Over the period 1960–2016, non-native species have become more prevalent in the countryside. The number of these invasive non-native species established in or along more than 10% of Great Britain’s land area or coastline has increased since 1960 in the freshwater, terrestrial and marine (coastal) environments, increasing the likely pressure on native biodiversity.

For the latest period 2010–2016, compared with 2000–2009, the number of these established in or along more than 10% of Great Britain’s land area or coastline has remained stable for freshwater species, at 12 species, and has increased for marine species, from 18 to 28. Terrestrial species have decreased from 58 to 56.

**Indicator Description**

Non-native species are those that have reached Great Britain by accidental human transport, deliberate human introduction, or which arrived by natural dispersal from a non-native population in Europe. Species that arrived since 1500 are included within this indicator. Most non-native species are considered benign or positive but some have a negative impact on native species through the spread of disease, competition for resources, or by direct consumption, parasitism or hybridisation and are termed invasive. Invasive non-native species have one or more of these negative impacts and a high capacity for spread to natural and semi-natural habitats. The indicator shows the change in number of invasive non-native species established across more than 10% of the land area of Great Britain, or more than 10% of the extent of the coastline.
Figure B6i. Number of non-native invasive species established in or along more than 10% of Great Britain’s land area or coastline, 1960 to 2016.

Notes: The last time period covers a shorter period than the other bars (2010–2016).

Source: Botanical Society of Britain & Ireland, British Trust for Ornithology, Centre for Ecology & Hydrology, Marine Biological Association, National Biodiversity Network.

Assessment of change in the number of non-native invasive species established in or along more than 10% of Great Britain’s land area or coastline

<table>
<thead>
<tr>
<th></th>
<th>Long term</th>
<th>Short term</th>
<th>Latest year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freshwater invasive species</td>
<td>1960–2016</td>
<td>Not assessed</td>
<td>Not assessed</td>
</tr>
<tr>
<td>Marine (coastal) invasive species</td>
<td>1960–2016</td>
<td>Not assessed</td>
<td>Not assessed</td>
</tr>
<tr>
<td>Terrestrial invasive species</td>
<td>1960–2016</td>
<td>Not assessed</td>
<td>Not assessed</td>
</tr>
</tbody>
</table>

Indicator description

The indicator (Figure B6i) shows the change in number of invasive non-native species established across more than 10% of the land area of Great Britain, or more than 10% of the extent of the coastline. The short-term trend is not assessed.

Relevance

The United Nations Convention on Biological Diversity (CBD) identifies invasive non-native species as a major threat to biodiversity. Many non-native species do not threaten biodiversity but invasive
non-native species can spread disease (e.g. signal crayfish *Pacifastacus leniusculus*), modify ecosystems (e.g. rhododendron *Rhododendron ponticum*), drastically reduce populations of native species (e.g. American mink *Mustela vison*), or hybridise with native species (e.g. ruddy duck *Oxyura jamaicensis*).

Under the CBD, the United Kingdom has an international obligation to address the impacts of invasive non-native species. In 2008, the UK Government published the Invasive Non-native Species Framework Strategy for Great Britain.

Background

The indicator and background charts are based on species distribution data available through the National Biodiversity Network (NBN), supplemented by expert knowledge and in house datasets of the Botanical Society of Britain and Ireland (BSBI), British Trust for Ornithology (BTO), Centre for Ecology & Hydrology (CEH), the Environment Agency (EA) and Marine Biological Association (MBA).

Trends in the extent of invasive non-native species, as presented in Figure B6i and B6ii were derived through a two-stage process. The number of invasive non-native species included within the indicator was substantially expanded from the 49 species used in the indicator published in 2009 (Hill *et al.* 2009). An initial list was derived from the GB Non-native Species Information Portal (GB-NNSIP) (Roy *et al.* 2014) by selecting all non-native species within the database that are noted to have, or potentially have, a negative or strongly negative ecological effect, including all 49 species from the original indicator. This list was subsequently reviewed by experts, species for which there was a high degree of uncertainty with respect to negative impact were removed and new species were added as deemed appropriate. The revised list in 2014 comprised 179 species, but has been subsequently amended in 2015 and 2017 to now comprise 183 species (see technical background document).

Invasive non-native species were categorised according to the extent of the land area or coastline of Great Britain in which they were found in the decades of 1960–1969, 1970–1979, 1980–1989, 1990–1999, 2000–2009 and the present period of 2010–2016 (see Table B6i). The categorisation was achieved by combining assessment of modelled distributions based on data available from the NBN with expert opinion and the use of additional datasets where available (for more details see the technical background document).

Figure B6ii shows the number of species in each decade in each extent category listed in Table B6i. The indicator (Figure B6i) is compiled from those invasive non-native species established in 10% or more of the GB land area or coastline (i.e. extent categories 3 and 4).

There are limitations to this approach:

- The list of invasive non-native species has been derived through the rapid assessment of impacts based on expert opinion. A semi-quantitative approach is currently being developed to improve the certainty and reliability of the list.
- The extent value is based on relatively broad categories. The extent of some species can increase multifold within a single category, for example, the number of invasive non-native species in 10–50% of the land area of Great Britain, which can reduce the sensitivity of the indicator.
- The occurrence data obtained from the NBN may not be representative of the species distribution in each decade, especially for both the earlier and the most recent time period, because there is often a time lag before occurrence data appears on the NBN. Furthermore, the availability of occurrence data reflects the intensity of survey effort applied in a time period that has subsequently been submitted to the NBN. However, the attribution of extent categories has been supplemented by expert opinion and in some cases by more complete datasets.
Table B6i. Invasion extent of non-native species.

<table>
<thead>
<tr>
<th>Definition</th>
<th>Interpretation</th>
<th>Extent</th>
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<tbody>
<tr>
<td>Not present in territory</td>
<td>Absent</td>
<td>0</td>
</tr>
<tr>
<td>Present in territory and either not established or with established populations that have not spread more than ten kilometres from their source</td>
<td>Not or scarcely established</td>
<td>1</td>
</tr>
<tr>
<td>Established populations represent less than 10% of territory, with some having arrived from further than ten kilometres from their source; or if more widespread then populations scattered and sparse</td>
<td>Established but still generally absent or at most occasional</td>
<td>2</td>
</tr>
<tr>
<td>Established populations present in 10% to 50% of the territory</td>
<td>Established and frequent in part of the territory</td>
<td>3</td>
</tr>
<tr>
<td>Established in more than 50% of the territory</td>
<td>Widespread</td>
<td>4</td>
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</tbody>
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Figure B6ii. Changes in the extent of invasive non-native species in marine (coastal), freshwater and terrestrial environments, 1960 to 2016.

Notes:
1. Extent levels are defined as follows:
   1. Present in territory and either not established or with established populations that have not spread more than ten kilometres from their source.
2. Established populations represent less than 10% of territory, with some having arrived from further than ten kilometres from their source; or if more widespread then population scattered and sparse.
3. Established populations present in 10 to 50% of the territory.
4. Established in more than 50% of the territory.

The last time period covers a shorter period than the other bars, going from 2010–2016.

Source: Botanical Society of Britain and Ireland, British Trust for Ornithology, Centre for Ecology & Hydrology, Marine Biological Association, National Biodiversity Network.

Goals and targets

Aichi Targets for which this is a primary indicator

Strategic Goal B. Reduce the direct pressures on biodiversity and promote sustainable use.

**Target 9:** By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment.

Aichi Target for which this is a relevant indicator

None

Web links for further information

<table>
<thead>
<tr>
<th>Reference</th>
<th>Title</th>
<th>Website</th>
</tr>
</thead>
<tbody>
<tr>
<td>Defra</td>
<td>Developing an indicator of the abundance, extent and impact of invasive non-native species</td>
<td><a href="http://nora.nerc.ac.uk/7796/1/HillN007796CR.pdf">http://nora.nerc.ac.uk/7796/1/HillN007796CR.pdf</a> (PDF, 382kb)</td>
</tr>
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<td>EC 6th Framework Programme</td>
<td>Delivering Alien Invasive Species Inventories for Europe (DAISIE)</td>
<td><a href="http://www.europe-aliens.org/">http://www.europe-aliens.org/</a></td>
</tr>
<tr>
<td>National Biodiversity Network (NBN)</td>
<td>NBN Atlas</td>
<td><a href="https://nbnatlas.org/">https://nbnatlas.org/</a></td>
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</table>
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References


Full details of this indicator, including a datasheet and technical documentation are available at: http://jncc.defra.gov.uk/page4246.

Last updated: August 2017
Latest data available: 2016