‘Incapables’
A new concept with no biological meaning

In the current political debate on the proposed EU Regulation on Invasive Alien Species, there have been proposals to exempt Member States from the Regulation’s obligations with respect to species, which are considered by these Member States to be ‘incapables’.

The term 'incapables’ has been coined to refer to those species that are supposedly not capable of becoming established, or of causing any harm in one country, although there is evidence that they are invasive and have caused significant damage to biodiversity and the economy elsewhere. Often the alleged reasons for the apparent non-invasiveness of those species are climatic (i.e. the species not being able to survive long periods of cold or dry weather), or simply empirical (i.e. the species has not been observed to behave like it does in other territories, for unknown reasons).

Incapables, quite simply, **do not exist**. Species are made of multiple individuals that live in environments, which are more or less variable, and that naturally adapt to those environments. In invasion biology, it is not possible to affirm that a given species – known to be potentially invasive given certain conditions – will not become invasive under different conditions, or through the intervention of a second species. Moreover, the genetics of introduced populations are complex, and may lead – through mutation – to the development of invasive genotypes.

Many impacts of invasive alien species occur only after a certain time lag

Introduced species sometimes remain innocuous and restricted in a range or habitat for decades or longer and then suddenly expand to become serious pests. Alarmingly, this means that introduced species, which are not currently regarded as problematic, but that are destined to become pests in the future, are found in many places[1].

Using extensive datasets of alien plants from the United Kingdom, Czech Republic, Germany, Ireland and Spain, several authors[2,3] have estimated that introduced plants reached their maximum range, on average, about 150 years after being introduced in those European countries. Consequently, if the mean time to reach equilibrium is 150 years, plants introduced in the last century with limited ranges and slow spread now, may nevertheless, in time, become widespread and possibly troublesome species. The present distribution is not necessarily a guide for the future[4], particularly in the context of climate change and increasing globalisation.

Impacts of invasive alien species can occur due to the intervention of a second species or the development of invasive genotypes

In some known cases, the species began to spread as a result of the introduction of a second species. For example, ornamental fig trees introduced in Florida remained infertile and therefore non-invasive until their pollinating Chinese banyan fig wasp (*Parapristina verticillata*) was introduced unintentionally several decades later[5].

In many other cases, the change is related to a chromosomal mutation. A good example is the mutation that caused sterile cordgrass in England to become a fertile, new, and invasive species, now known as common cordgrass (*Spartina anglica*). Sterile hybrids had been observed occasionally for many decades before the mutation occurred in one of them[6]. The same process occurred independently in France, although these French hybrid clones have not yet undergone a mutation to become a sexually reproducing new species.

---

[1] Simberloff, D. 2013. *Invasive species: what everyone needs to know*. Oxford University Press, Oxford.
[2] Williamson, M., Dehnen-Schmutz, K., Kühn, I., Hill, M., Klotz, S., Milbau, A., Stout, J., Pyšek, P. 2009. The distribution of range sizes of native and alien plants in four European countries and the effects of residence time. *Diversity and Distributions*, 15: 158–166.
[3] Gassó N, P Pyšek, M Vilà, Williamson, M. 2010. Spreading to a limit: the time required for a neophyte to reach its maximum range. *Diversity and Distributions* 16: 310-311.
[4] Diversitas. 2008.Managing the global risks of invasive species. Submission by Diversitas/Global Invasive Species Program to the C[onvention on] B[iological] D[iversity] in depth review of invasive alien species. www.cbd.int
[5] Simberloff, D. 2013. *Invasive species: what everyone needs to know*. Oxford University Press, Oxford.
[6] Gray, A. J., Marshall, D. F. and Raybould, A. F. 1991. A century of evolution in *Spartina anglica*. *Advances in Ecological Reseach* 21: 1-62.

There is strong evidence that mutations can produce an invasive genotype. For instance, it has been shown that the aquarium strain of 'killer alga' (*Caulerpa taxifolia*) is cold-tolerant and is thus able to survive the winters of the northwest Mediterranean, while populations from their native Pacific range are not[7]. This difference suggests that a mutation may have occurred during the approximately 15 years that the alga was cultured in aquaria before being released to the wild from the Oceanographic Museum of Monaco[8].

Water hyacinth – An 'Incapable'?

Originating from South America, the Water hyacinth (*Eichhornia crassipes*) is one of the worst aquatic weeds in the world[9]. Its beautiful, large purple and violet flowers make it a popular ornamental plant for ponds. It is now found in more than 50 countries on five continents. Water hyacinth is a very fast growing plant, with populations known to double in as little as 12 days. Infestations of this weed block waterways, limiting boat traffic, swimming and fishing. Water hyacinth also prevents sunlight and oxygen from reaching the water column and submerged plants. Its shading and crowding of native aquatic plants dramatically reduces biological diversity in aquatic ecosystems.


© Confederación Hidrográfica del Guadiana

Already established in France, Italy, Spain and Portugal[10], it is reputedly incapable of establishing viable populations in more northern countries like the UK, where suitable habitat exists. The horticulture industry in the UK is pushing for an exemption for the water hyacinth, because it is alleged to be naturally limited by the low temperatures of the winter months and therefore incapable of becoming established in that country, i.e. an 'incapable'. It is an assumption that Water hyacinth capacity to become established is limited by temperature, but this might not be the case; it could be limited by some other factor that could be subject to change. Moreover, there is increasing likelihood that winter temperatures might change to the point of making populations viable (an increase of 1-2 degrees would suffice). It is also possible that a mutation occurs or a hardier version is bred by the horticulture industry. Human-caused movement of plant propagules between the UK and the countries where the species is now established could also cause the efforts to control water hyacinth in those countries to be compromised. In the Guadiana river catchment alone (South West of Spain), for example, 300,000 tonnes of Water hyacinth were removed from the wild between 2004 and 2012 with a total cost of over 23 million Euros[11].

Prevention is better than cure

The EU Biodiversity Strategy to 2020 and the Aichi Biodiversity Target on invasive alien species are based on the principle that preventing damage is far better, and many times cheaper, than attempting to solve problems after they have occurred. Basing a policy on the concept of 'incapability', with no biological meaning, is a departure from the preventative route and a likely cause of bigger, and potentially expensive problems in the future. **We urge the European Parliament and EU Member States to strongly resist attempts to make this legislation ineffective through the introduction of derogations based on 'incapability'.**

For more information, please contact:
Carles Carboneras, Species Policy Officer - Invasive Non-native Species, RSPB (BirdLife in the UK) –Carles.Carboneras@rspb.org.uk, phone: +44 (0)1767 693234, mobile +44 (0) 7718 423273
Martina Mlinaric, Senior Policy Officer – Biodiversity, Water and Soil, European Environmental Bureau (EEB) –martina.mlinaric@eeb.org, phone: +32 (0) 2289 1093, mobile: +32 (0) 476 972 050
Staci McLennan, Wildlife Policy Officer, Eurogroup for Animals – s.mclennan@eurogroupforanimals.org, phone: +32 (0) 2 740 0895, mobile: +32 (0)471 281 240
Joanna Swabe, EU Director, Humane Society International (HSI) – jswabe@hsi.org, mobile +31 651 317004, mobile +32 491 068576

[7] Komatsu T, Meinesz A, Buckles D. 1997. Temperature and light responses of alga Caulerpa taxifolia introduced into the Mediterranean Sea. Mar Ecol Prog Ser 146:145–153.
[8] Simberloff, D. 2013. *Invasive species: what everyone needs to know*. Oxford University Press, Oxford.
[9] Lowe S. J., M. Browne, Boudjelas, S. .2000. *100 of the World's Worst Invasive Alien Species*. IUCN/SSC Invasive Species Specialist Group (ISSG). Auckland, New Zealand.
[10] DAISIE European Invasive Alien Species Gateway, 2014. *Eichhornia crassipes*. Available from: www.europe-aliens.org/speciesFactsheet.do?speciesId=5380# [Accessed 13th February 2014].
[11] Confederación Hidrográfica del Guadiana. 2012. Continúan las actuaciones de control del Jacinto de Agua (*Eichhornia crassipes*) en la cuenca del Guadiana. Available from www.chguadiana.es