

In Depth – Main Threats to Biodiversity

Habitat Loss and Degradation

This has been, and still is, the greatest factor affecting biodiversity. Habitat loss and degradation affect 86% of all threatened birds, 86% of all threatened mammals and 88% of all threatened amphibians¹. Some of the main causes are:

- **Changes in agriculture**

Feeding the large human population has inevitably led to many areas of land being cleared which has considerably lowered its biodiversity. In the UK, modern agriculture has intensified, with larger fields and increased use of chemicals. This has resulted in hedgerow destruction, loss of wildflower meadows, drainage of wetlands and increased pollution.

- **Commercial forestry**

Extensive plantations of non-native trees can produce high timber yields, but they are, in many cases, virtual deserts in biodiversity terms as few native UK species can utilise them as suitable habitats. Improvements are, however, being made to increase the biodiversity value of many of these forests through management practices such as thinning.

- **Development pressure**

The UK is a relatively small collection of islands with a large human population where there are many demands on the land. The building of roads, industry or housing has often taken priority over nature conservation. Even if habitats are not wholly destroyed they may be fragmented (broken up) into very small areas, which may be too small for their plant and animal communities to remain viable.



Industry, housing and intensively farmed land has fragmented much of our countryside (Dot Potter)

Over-exploitation of natural resources

In modern times, humans have rarely given consideration to conserving the environments they inhabit or species they utilise. In the age of technological progress and mass consumerism, little thought has been given to our natural environment and its ability to withstand the pressures of human activities and lifestyle. Internationally, the felling of rainforest for tropical hardwood has destroyed huge expanses of our most species-rich habitat, and quarrying and mining can destroy habitats at an alarming rate. Many fish populations in waters around Britain, such as cod, have been reduced to critically low levels through over-fishing. Once a population has crashed it may take decades to recover, if it recovers at all. For example, some fish species are being fished from our waters before reaching sexual maturity, thus preventing natural replenishment of populations.

The Living Planet Report, produced by WWF, the Zoological Society of London and the Global Footprint Network, contends that our demands on natural resources overreach what the Earth can sustain by almost a third. It says that more than three quarters of the world's population lives in countries where consumption levels are outstripping environmental renewal, making them 'ecological debtors'. The report concludes that we will need two planets by 2030. The UK has the 15th biggest ecological footprint – the amount of the Earth's land and sea needed to provide the resources we use and absorb our waste - in the world, equating to 5.3 hectares per person. This is more than twice the 2.1 hectares available for the global population².

Invasive non-native species

Exotic plants and animals that have arrived from other parts of the world (often because humans have transported them) are described as non-native, introduced or alien species. Most do not cause any problems, but a few have the ability to become highly invasive and these can have devastating effects on native wildlife.

In the UK, plants like Japanese knotweed and Himalayan balsam have spread along the banks of many of our rivers, choking out the native species and creating mono-cultures which have little or no benefit to our native animals as they do not provide effective food or shelter. They also cause erosion problems when they die back in winter. American mink is an introduced animal species that has devastating effects on native wildlife. Having been introduced to the UK in the 1920s for fur farming, mink have spread to almost every part of Britain, with the exception of a few isolated islands. Their presence has caused dramatic declines in numbers of certain ground-nesting birds and, in particular, water voles, now believed to be Britain's fastest declining mammal. The grey squirrel is another infamous alien, being strongly linked to the decline of the native red squirrel in the UK. In addition to the effects of predation of and/or competition with introduced species, there is also concern about the interbreeding of introduced species with native organisms. Unnatural hybrids may differ greatly from well-adapted native plants and animals.



The American mink has spread across virtually the whole of Britain (GB Non-native Species Secretariat)

Pollution

One consequence of industrialisation has been the release of chemicals into the environment which, more often than not, have had adverse effects on wildlife. The otter, for example, nearly went extinct in Wales during the 1980s due to the pollution of water ways. The situation has improved, and there are laws and regulations in place to safeguard against such polluting activities, though accidents and deliberate dumping do continue to pose threats to wildlife. A more widespread problem is diffuse pollution.

Single source pollution, such as sewage or industrial effluent can be easily monitored but



The UK has done a lot of work to clean up rivers, but some rivers in other countries are heavily polluted such as the Yangtze River in China (High Contrast)

diffuse pollution, which arises from many different sources is harder to pin-point and therefore control.

This includes run-off from transport, activities such as car washing, discharges from contaminated land, effluent from fish farms and particularly pesticides and herbicides from agriculture. Work is being carried out by the Department for the Environment, Food and Rural Affairs (DEFRA) and the Environment Agency among others to look at this issue through initiatives such as catchment sensitive farming.

Climate Change

Most scientists agree the planet is warming, and that this is partly due to increased carbon dioxide emissions from human activities, such as the burning of fossil fuels. Whilst fluctuations in climate over the Earth's history are a natural phenomenon, it is believed that this process is being accelerated and exacerbated through the actions of man.

It is predicted that climate change will become one of the main causes of biodiversity loss in the future, with over a million species estimated to be lost in the next 50 years. It is already recognised as a serious threat to some habitats and species such as coral reefs. Increases or decreases in temperature cause corals to expel their symbiotic algae upon which they depend for most of their food. It is estimated that even with the best case scenario predictions for global warming, the Great Barrier Reef, the largest coral reef in the world, will lose 95% of its corals by 2050.

Other affects of climate change will include the loss and alteration of habitats, for example, glacial retreat threatening polar species and the shifting of ecological zones where forests creeping north will displace Arctic tundra and the species relying on it. This means that there is an even greater need to reduce habitat fragmentation to allow species to disperse and establish new locations as the climate changes.

The length and timing of seasons is also likely to change which will affect migration behaviour, breeding seasons and the availability of food. Most species time breeding to coincide with peaks in the availability of food which they can feed to their young. The effects of loss of this synchronicity are already being observed in seabird populations in Scotland. In 2008 kittiwakes, Arctic terns and Arctic skuas suffered a terrible breeding season which could see them wiped out in the UK. According to the Royal Society for the Protection of Birds (RSPB) changes in food supply, which are likely to be linked to climate change, are seriously threatening the future of these birds in our waters. As Scotland hosts 45% of the EU's breeding populations of seabirds this could be catastrophic.

We will be more likely to experience weather extremes, for example, decreasing or increasing snow or rainfall, changing temperatures, flooding and storms. It is predicted that Snowden could lose its snow within 5 years. Finally, for those species unable to adapt quickly enough to these changes, with a restricted geographical range or a Northern distribution, extinction is a very real possibility.

Lack of awareness

It may be argued that many of the environmental problems we face today (including all those mentioned above) have come, in part, from a lack of mainstream awareness and understanding of the fragility and true (non-financial) value of our natural environment. The more aware we become of biodiversity and how to conserve it, the more equipped we will each be to play our part in protecting and enhancing this precious resource.

1 – Millennium Ecosystem Assessment (2005) <http://www.maweb.org/en/index.aspx>

2 – Hails, C. (Ed.) Living Planet Report 2008. WWF, Global Footprint Network, Zoological Society London.