

# Biodiversity Loss and Ecosystem Degradation

**Human activity is accelerating biodiversity loss and ecosystem degradation at unprecedented rates, reducing the natural world's resilience and threatening the functioning of society and economies.**

Globally, the combined effects of human activity, including changes in the way land is used and managed, farming, fishing and hunting, exploitation of natural resources and pollution, have had profound negative impacts on biodiversity and ecosystems. Further pressure is expected from continued development and the effects of climate change. Between 1970 and 2008 global biodiversity declined by 30%, a more rapid decline than in any previous period in human history, with no signs of slowing. Current and projected rates of species loss are said to constitute a sixth major extinction and is the first to be driven primarily by human activity<sup>3</sup>. Habitat loss and impacts on species have been observed across all biomes, with impacts most severe in freshwater habitats that are relied upon by billions for food and water<sup>4</sup>.

Healthy and genetically diverse ecosystems are of huge value in their own right but we also depend on them for our own health and well-being, and for the contribution they make to the economy<sup>1</sup>. Goods and services provided by healthy ecosystems range from climate regulation to the provision of food and fuel, clean water, flood regulation, and fertile soils. They are also of significant cultural value and have an important relationship with leisure, recreation and tourism. The total annual economic cost of biodiversity loss and ecosystem degradation was estimated between \$2 - 4.5 trillion in 2008.

## Challenges

- ★ Will it prove beyond our capacity to slow or halt species loss and ecosystem degradation, while maintaining economic and population growth?
- ★ Can ecosystems be put at the heart of planning and land management to ensure biodiversity and habitats are protected and enhanced?
- ★ Can biodiversity be integrated into new developments and how might this be balanced with commercial drivers?
- ★ How should investment be prioritised so that it targets the most vulnerable or important ecosystems?
- ★ Can continued urbanisation and agricultural intensification be managed without compromising critical ecosystem services?



## Key Facts:

- 1. Biodiversity has declined by 30% between 1970 to 2008, due to natural resources use, pollution, climate change and invasive species<sup>1</sup>.**
- 2. Biodiversity loss has been more rapid in the last 50 years than in any period in human history, with no signs of slowing<sup>2</sup>.**
- 3. Since the advent of the Anthropocene, the rate of species extinction has increased by 100-1,000 times the background rate<sup>3</sup>.**
- 4. Vertebrate species have declined by 52% between 1970 to 2010, with freshwater species showing the largest reductions<sup>4</sup>.**
- 5. Around 20-30% of plant and animal species could be at high risk of extinction due to climate change<sup>2</sup>.**
- 6. Total annual economic cost of biodiversity loss and ecosystem degradation was estimated between \$2-4.5 trillion in 2008<sup>1</sup>.**

It has been estimated that the cost of global biodiversity decline under a business as usual scenario could be **14 trillion euros** by 2050<sup>5</sup>

England supports at least **55,000 species** (excluding micro-organisms) within a wide range of habitats and ecosystems, including about **10% of all the world's species of bumblebees**, 18% of the world's heathland and more chalk rivers than any other country in Europe<sup>5</sup>



## LDA Design Insights:

The UK's natural environment is heavily influenced by past and present human activity, and few habitats exist today that have not been artificially modified or created to some extent.

★ The UK supports a wide range of habitats, species and protected areas, some of international importance. However, human activity and the effects of a changing climate are causing major declines in wildlife, degradation of priority habitats, and a rise in non-native invasive species<sup>5</sup>. Other threats include eutrophication, water pollution and reductions in pollinators. Afforestation and new habitat creation are leading to increased numbers of some species<sup>5</sup> but efforts are falling short. More landscape scale projects, such as the Great Fen, are needed to realise Prof Sir John Lawton's<sup>5</sup> vision for bigger, better and more connected habitat networks. Strategic planning is key to this. At the local scale, good design underpinned by green infrastructure principles can ensure that development, regeneration, energy and infrastructure projects deliver protection and enhancement, as well as new habitats.

★ Agricultural land covers 70% of the UK. Some farming activities cause pollution and contribute to flooding, while the loss of habitats and degradation of ecosystems on farmland persists. Traditional management practices have been abandoned and farm environment schemes are insufficient to mitigate this<sup>5</sup>. Farmers are an important part of a diverse set of organisations that must come together to manage farmland, with the objective of benefiting biodiversity and habitats, and managing the effects of climate change.

★ Marine and freshwater ecosystems are essential for food and water, irrigation, habitats, hazard protection and culture, but they are threatened by pollution, overuse and climate change. Many river catchments are in poor condition<sup>5</sup> and management schemes are struggling to combat this, while over fishing and coastal erosion has severely depleted fish stocks<sup>4</sup>. Management practices must be improved, and infrastructure provision and development designed with ecosystem enhancement as a core objective.

★ Climate change poses a long term threat to biodiversity. Extreme weather patterns, flooding, coastal erosion and invasive species will accelerate habitat degradation and worsen existing pressures. It may also create new opportunities and force us to act more proactively. Larger ecological networks and habitat links will support species adaptation, as will improving urban green spaces and restoring climate regulating ecosystems, such as catchments or forests. Long term strategic planning and innovative funding and delivery mechanisms will be critical.

## What is LDA Futures?

The world is changing in response to a set of environmental, economic, social and technological drivers, and these are shaping the types of infrastructure and development we need and the way we use land.

*LDA Futures* explores these drivers and their implications to enable us to make appropriate responses through our projects and the advice we give to clients.



## References

1. Innovate UK (2013). Horizons Cards.
2. Ministry of Defence (2014). Global Strategic Trends - Out to 2045 (5th Edition).
3. Rockstrom et al (2009). Planetary boundaries: exploring the safe operating space for humanity. *Ecology and Society*.
4. WWF (2014). Living planet report 2014.
5. Lawton (2010). Making space for nature: a review of England's wildlife sites and ecological network. Submitted to the Secretary of State, DEFRA 16 September 2010.