

THE ECOLOGICAL EMERGENCY

“Ever since we arrived on this planet as a species, we’ve cut them down, dug them up, burnt them, and poisoned them. Today we’re doing so on a greater scale than ever .”

Sir David Attenborough

Summary

Humans are part of nature and rely on natural systems, processes, and materials for existence. Most of nature’s contributions to people are not fully replaceable, and some are irreplaceable. Nature plays a critical role in providing food and feed, energy, medicines, and genetic resources, as well as a variety of materials fundamental for people’s physical wellbeing and for maintaining our culture.

The terminology of natural capital helps to describe our relationship with nature, our part within a natural world, and their inseparability. Natural assets are a way of describing the ‘hardware’ of nature. From these assets flow various ecosystem services that are essential to life and wellbeing.

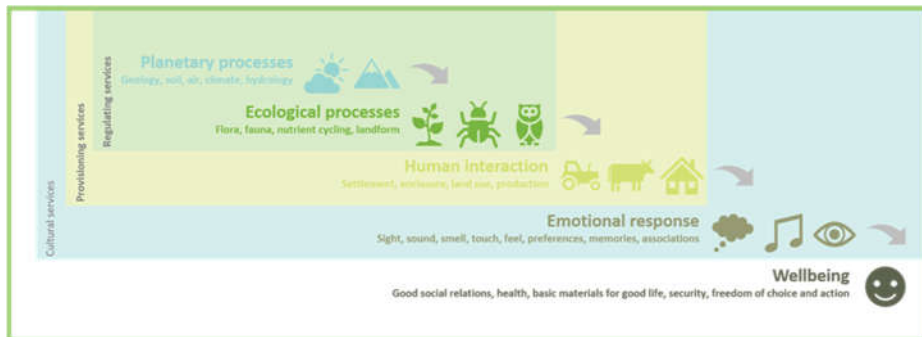


Figure 10

The ecological and climate emergencies are intertwined. Burning fossilised carbon is placing stress on the regulatory services provided by the ecosystem on the climate. Significant carbon dioxide released into the atmosphere is caused by land use change, which is also a key driver for ecological loss. Climate change is causing additional stress for many organisms which cannot adapt or migrate due to fragmented landscapes, which acts as a driver for further ecological loss.

We are entering a period of mass extinction, with a significant loss of species and a reduction in species diversity. The extinction rate has been rising steadily over the last few centuries (see Fig 11), which reflects the expansion of human settlement and land use change since the Industrial Revolution. There has been a sharp acceleration in the degradation of nature since the 1970s. This is in addition to a huge loss in abundance. In the UK, the total abundance of widespread butterfly species declined by 58% on farmed land between 2000 and 2009, despite a doubling in conservation spending. Clouds of certain butterflies, widely reported in living memory, are now reduced to small numbers.

Species loss (from Ceballos et al 2015)

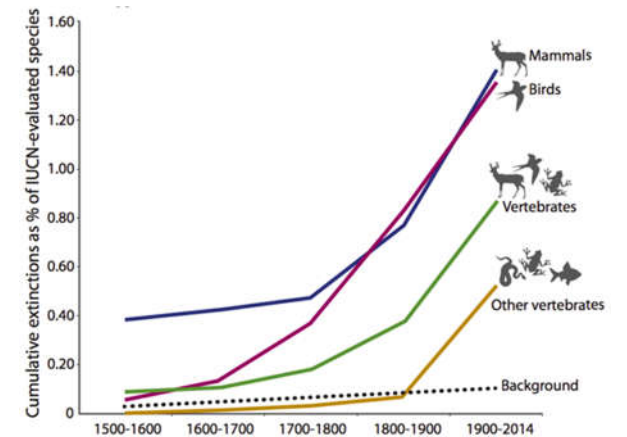


Figure 11

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Dorset is a relatively wildlife-rich county, albeit in one of the most nature-depleted countries on earth. Complacency is easy when surrounded by apparent natural beauty, but this belies the scale of loss over the last 70 years. We have a responsibility to conserve that relative richness and enhance it, not only for the fabric of the natural environment, but for the health of our future economy. Bournemouth University studies have shown that of four future scenarios, ranging from high investment in nature recovery to high agricultural intensification, the highest economic returns are found by investing in nature.



Key causes

Land use change is the prime driver. A huge loss of undisturbed ecosystems or wildlands occurred in this country in the Neolithic and Bronze Ages, as agricultural land use spreads to feed growing populations. This process is still occurring across the world, most significantly in tropical rainforests. Another significant loss of semi-natural habitats occurred in this country during the Second World War and the decades which followed. For example, Dorset lost 71% of its chalk grassland and rough grazing between 1946 and 2002, largely due to agricultural intensification. As habitats are lost, key ecosystem services are compromised.

Ecosystems are also damaged by pollution from industry, agriculture, transport, and households. This ranges from the poorly understood effects of microplastics, which are now present at every place on Earth, to the toxicity of some agrochemicals.

Climate change, itself caused by a sort of pollution (excess atmospheric CO₂), is also a driver of species loss, as migration across a landscape is hindered by fragmented ecological networks.



The impacts of ecological decline

Biodiversity loss and ecosystem degradation causes impacts to the UK's native wildlife and availability of the vital goods and services provided by natural capital, including food, timber, and fibre, as well as clean water, carbon storage, and the cultural benefits derived from landscapes. Such losses exacerbate and amplify other observed risks, as regulatory and provisioning services become less effective. For instance:

FLOODING

Urban, arable, and even pastureland cover commonly allows less rainfall to percolate into the soil, from where it would travel very slowly into streams, rivers, and the sea. This factor, combined with modified and canalised water-courses, causes water from intense rainfall events to end up in low-lying areas at speed, exacerbating flooding

NOVEL PESTS & DISEASES

Rising base temperatures and the global movement of people, animals, and commodities are increasing the likelihood of novel pests and diseases appearing. Depleted local natural systems are less resilient and can suffer disproportionately. As an example, ash trees in diverse landscapes appear more resistant to ash dieback

REDUCTION IN POLLINATING INSECTS

Four major UK crops are reliant on insect pollination (oil seed rape, field beans, apples, and strawberries). The first three are important in Dorset. On a national scale, wild pollinator contribution to these crops is valued at £690M/yr. This value and the food crops that it represents are at threat from rapidly falling insect populations

REDUCTION IN PEOPLE'S EMOTIONAL CONNECTION TO NATURE

Nature depletion is also making it harder for people to connect with nature. Forming an emotional connection with nature and retaining memories of the enjoyment of nature are important factors in maintaining mental health. It is also an important determinant in forming pro-environmental behaviour, essential for the wellbeing of future generations.



Figure 14