

Factsheet – an introduction to the biodiversity crisis and climate change

Scientists recognise that species extinctions are currently happening at an unprecedented rate. The climate and nature crises are inseparable; they speed up one another.

Biodiversity provides us with the resources we need to live our lives – providing us with things such as food, water and recreation. During the pandemic and the resulting restrictions, there has been an increased connection to nature and in Jersey we are lucky to have accessible countryside and coastline.

Healthy ecosystems have a role to play in the global response to climate change - both in mitigation (reducing the size of the problem) and adaptation (ensuring that the impact from the problem is minimised).

Examples of mitigation include trees sucking up carbon from the atmosphere (carbon sequestration) and the management of ecosystems that prevent greenhouse gas emissions from being released.

Examples of adaptation include flood plains providing natural protection against extreme weather events and high levels of biodiversity increasing the resilience of the natural environment and helping it to cope with changes.

Protecting our natural environment and conservation efforts that support ecosystems are therefore an important part of our climate response.

Climate change impacts on species survival and range

Animals can react to climate change in three ways: they can move, adapt or die.

Many animals are moving to higher elevations and latitudes to escape warming temperatures. But climate change may be happening too quickly for most species.

Spring comes earlier with climate change and heatwaves more common, and these will result in consequences for animals. For example, there have been reports of dead great tit chicks in nests due to heatwaves during Spring.

Many species have started to breed earlier to match the climatic conditions. On average, the window of time when birds lay their eggs has moved earlier by almost two weeks over half a century.

The speed of evolutionary change is much slower than climate change. Species differ in their ability to adjust and so ecosystems become out of sync. This increases species and ecosystem vulnerability. This can include mismatches in the timing of life events. These include migration events, breeding, pest avoidance, and food availability. The impact of climate change on a particular species can ripple through a food web.

Climate change is one of the main causes of species extinction. Other activities including habitat destruction, land grabs, population increase and pollution, have all contributed. Studies suggest 20-30% of species are at risk of extinction if temperatures reach the levels predicted¹.

In Jersey, we have observed a decline in some butterfly species, such as the Grayling and Small Heath. We are also seeing an increase in some butterfly species, likely due to warmer temperatures. Our Island's agile frogs, toads and newts are likely to be affected by increased droughts.

Climate change, invasive species and pests

Climate change is one of the main drivers of the rise of non-native plants and animals and is also likely to increase the establishment of new invasive species.

Invasive species are one of the five drivers of biodiversity loss globally. Each year, more invasive species and diseases become established in our neighbouring countries. As pests they can also be a global threat to food security.

Estimates put the costs of the spread of invasive species in the UK at over £2 billion per year. This is due to impacts of damage, loss of crops, increased flooding and building construction costs².

Jersey has iconic species such as the red squirrel. The red squirrel has declined across the UK due to the introduction of grey squirrel. Island habitats are unique but are at greater risk from invasive species.

Rising sea temperature

The average global sea surface temperature has increased by approximately 0.13°C per decade over the past 100 years. Rising temperatures cause the loss of breeding grounds for marine fishes and mammals.

In Jersey, sea temperature has risen by 0.8°C in winter and 0.5°C in summer since the early 1960s. This may explain some of the shifts in fish that have been observed. There is evidence that southerly fish species have arrived or increased since WWII. Nineteen species are regularly reported now which have no record (or were rare) before WWII.

Ocean acidification

The ocean absorbs about 30% of the carbon dioxide released into the atmosphere. When this is absorbed, the concentration of hydrogen ions increases making the water more acidic. Since the industrial revolution began, the pH of surface ocean waters has fallen by 0.1 pH units. This change represents a 30% increase in acidity.

¹ <https://archive.epa.gov/epa/climate-impacts/climate-impacts-ecosystems.html>

² <https://www.wcl.org.uk/multi-billion-pound-bill-from-nature-invaders-set-to-soar-post-brexit.asp>

Ocean acidification is already impacting many ocean species. Organisms like oysters and corals struggle to make hard shells and skeletons. Acidification is having a devastating effect on coral reefs. This will have a huge effect on the large number of species reliant on this habitat for their survival.

Carbon sequestration

Carbon sequestration is the act of capturing carbon dioxide from the atmosphere, storing it, and preventing it from being re-released.

Natural carbon sequestration is a cycle that's been happening on the planet for billions of years. It's the process by which nature balances the amount of carbon dioxide in the atmosphere. Carbon is sequestered and stored naturally in our soils, forests and oceans.

Healthy ecosystems can store huge amounts of carbon. More trees help absorb the carbon dioxide in the atmosphere. In Jersey, activities such as tree and as hedgerow planting will help absorb carbon and will have positive impacts on biodiversity. Local sequestration projects do have an important role to play in achieving carbon neutrality, but it is important to recognise that Jersey's size limits the scale of this sequestration.

Coastal and marine ecosystem also absorb and store carbon dioxide. The scale of carbon storage in Jersey's offshore waters are currently being studied. Early results suggest that Jersey has some areas of seabed that are important carbon sinks.

Read more about biodiversity and climate change:

- **Addressing climate change: Why biodiversity matters**, United Nations Environment Programme
<https://www.uncclearn.org/wp-content/uploads/library/unep248.pdf>
- **Oceans warming**
<https://www.iucn.org/resources/issues-briefs/ocean-warming>
- **Ocean acidification**
<https://www.noaa.gov/education/resource-collections/ocean-coasts/ocean-acidification>
- **Carbon sequestration**
<https://climatechange.ucdavis.edu/science/carbon-sequestration/>