

## Key Area 7— Components of Biodiversity

Components of biodiversity are **genetic diversity**, **species diversity** and **ecosystem diversity**, as detailed in the following table.

Diversity component	Definition
Genetic	The number and frequency of alleles in a population
Species	The number of species (species richness) and the relative abundance of each species in an ecosystem
Ecosystem	The number of distinct ecosystems within a defined area

## Key Area 8—Threats to Biodiversity

### *(a) Exploitation and recovery of populations and their impact on their genetic diversity.*

Humans exploit natural resources for food, raw materials and space. **Overexploitation** is when resources are used up quicker than they can be replaced. Exploitation of cod turned into **overexploitaion** when overfishing caused depletion of stock. Quotas have been introduced by governments in recent years and there are some signs that cod stocks might recover.

### *The Bottleneck Effect*

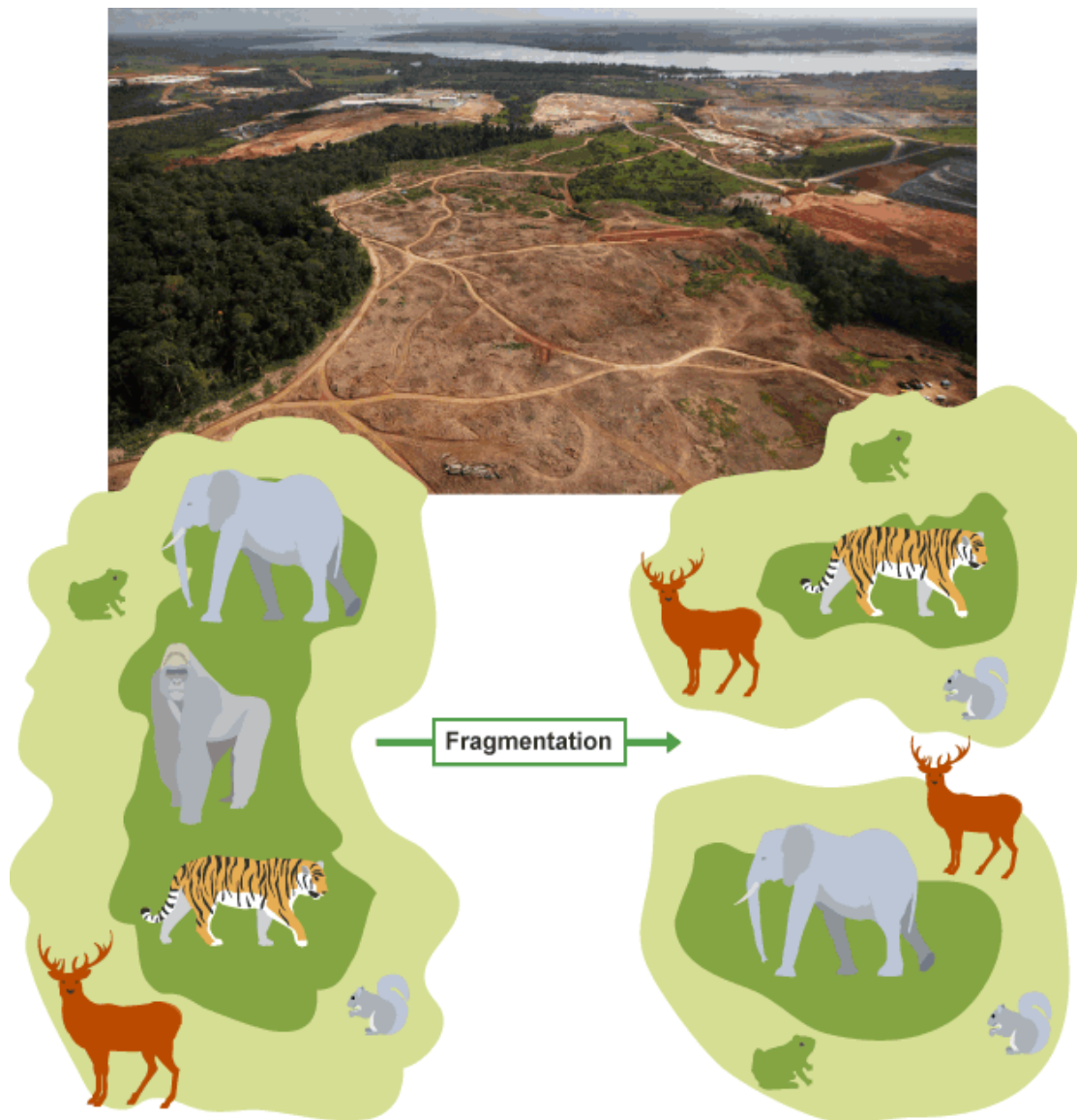
Small populations may lose the **genetic variation** necessary to enable evolutionary responses to environmental change.

Northern elephant seals have reduced genetic variation mostly likely due to being hunted. Hunting reduced their population size to as few as 20 individuals at the end of the 19th Century.



**(b) Habitat loss, habitat fragments and their impact on species richness.**

The clearing of habitats has led to **habitat fragmentation**. Degradation of the edges of the habitat fragments results in **increased competition** between species as the fragment becomes smaller. This may result in a **decrease in biodiversity**.



To remedy widespread habitat fragmentation, isolated fragments can be linked by **habitat corridors** to help increase species diversity as species can mate, find food and recolonize habitats.



**(c) Introduced, naturalised and invasive species and their impact on native populations.**

Introduced (non native) species are those that humans have moved either intentionally or accidentally to new geographic regions.

Some then become established in this new area and then are term **naturalised species**.

Some of these naturalised species can spread rapidly and outcompete or prey on native species—these are termed **invasive species**.

Japanese Knotweed

The invasive root system and strong growth can damage concrete foundations, buildings, flood defences, roads, paving, retaining walls and architectural sites. It can also reduce the capacity of channels in flood defences to carry water.<sup>1</sup>



Grey Squirrel



The grey squirrel (*Sciurus carolinensis*) is native to North America and was first released into the UK in 1876 by the Victorians.

The introduction of the grey squirrel has decimated the native red squirrel population as they outcompete them for resources.

Invasive species may well be free of the **predators, parasites, pathogens** and **competitors** that limit their native habitat. Invasive species may **prey** on native species, **out-compete** them for resources or **hybridise** with them.