

# Ecology

with Dr Mathew Leibold

## Talking points

### Knowledge & Comprehension

1. What is biodiversity?
2. What is a community?
3. What is the concept of a metacommunity, and why is it important for ecology?
4. Why is ecology now able to collect and analyse more complex datasets than in previous decades?

### Application

5. To what extent do you think it is possible to create an ecological model that includes all the interactions and variables happening in an ecosystem, and why?
6. In what ways do ecosystems and biodiversity benefit humans?

### Analysis

7. What do you think are the limitations of eDNA? What sort of information does it not provide?
8. Why do you think that chance has more of an effect on communities at the local level than the regional level?

### Evaluation

9. Many environmentalists argue that we should consider humans as part of the environment, not separate from it – the ‘ecocentric’ idea. They suggest that this would help us appreciate our place in, and reliance on, the natural world and take better care of it. What do you think? To what extent do you think that ecology could have a part to play in changing this mentality?
10. To what extent do you think it could be possible to apply the theory of metacommunities fully to human populations? For example, to examine trends in health, politics or immigration?

## More resources

- This article from the UK's Natural History Museum explores how eDNA works and how it is changing ecology and conservation: [www.nhm.ac.uk/discover/what-is-environmental-dna-edna.html](http://www.nhm.ac.uk/discover/what-is-environmental-dna-edna.html)
- This video from CrashCourse introduces the main themes of community ecology, covering important principles such as competition, ecological niches, mutualism and commensalism: [www.youtube.com/watch?v=GxE1SSqbSn4](https://www.youtube.com/watch?v=GxE1SSqbSn4)
- This article from the World Bank explains how nature-based solutions, which involves the conservation and restoration of ecosystems, can help combat the climate and biodiversity crises: [www.worldbank.org/en/news/feature/2022/05/19/what-you-need-to-know-about-nature-based-solutions-to-climate-change](https://www.worldbank.org/en/news/feature/2022/05/19/what-you-need-to-know-about-nature-based-solutions-to-climate-change)

## Activity

### Design a hypothetical ecosystem

Draw some fictional organisms – at least four, to start off. You can base them on real-life organisms or be imaginative. Give them unique features and think about the roles they fulfil in the ecosystem.

Then, use labelled arrows to show how one organism interacts with another. The following real-life examples may give you inspiration:

- Pumas prey on deer
- Deer eat young saplings
- Ticks parasitise deer
- Insects pollinate flowers
- Birds eat fruit and disperse the seeds
- Coyotes compete with foxes for prey such as rodents
- Fungi decompose dead plants and animals
- Plenty more that you may know of from nature documentaries, books or the classroom.

You will soon notice that the number of ecosystem interactions quickly grows, creating a complex web of different interactions and effects.

Now, think about what would happen if one of your species went extinct. What would be the effect on the other species? Which would benefit and which would be in trouble? And would the winners always be winning, or would they reach a stage where further knock-on effects begin to disadvantage them?

Use your thoughts to write a narrative passage about the extinction of one of your species, and how this affects other species in the ecosystem. Swap passages with a classmate. How does their imaginary scenario differ from yours? Can you think of any potential effects in the scenario of your classmate's that they have not thought of, and vice versa?