Introduction

An ecosystem is an incredibly intricate and delicate affair. They are finely balanced and rely constantly on the everyday interactions of all the organisms within it. In the following activity, you will see how disrupting the ecosystem can have far reaching and even disastrous effects.

Basic Food chains

Which organism is the top or apex predator?

Which organism is the producer?

What type of organism is the producer nearly always?

Name all the organisms that are carnivores.

Name all the organisms that are herbivores.

Which organism is the primary consumer?

What is the original source of energy for nearly all ecosystems?

Introducing new organisms: A cats tail

Cats were first domesticated for agricultural reasons. Farmers did so to help control their ecosystem in order to make farming more efficient.

www.oxfordsparks.ox.ac.uk/content/when-did-cats-arrive-britain
It was believed that the introduction of cats on the farm would help keep the number of mice down. Do you agree with this? State why.

Why would decreasing the mouse population make farming more efficient?

Cats proved very effective pest controllers. It was believed that domestic cats were being used in Britain in the Iron Age, as long as 2500 years ago. Recent research at the University of Oxford, however, has now shown that domestic cats were not introduced to Britain until the Roman occupation of Britain nearly 500 years later.

While a seemingly simple method for controlling pests, introducing animals into existing ecosystems is rarely that simple. Below is a diagram of another food chain that the domestic cat influences.

For each organism, suggest and explain what effect the introduction of the domestic cat is likely to have on population number?

Hint: Work backwards through the food chain from the apex predator.
It is easy to see from your above answer that introducing new species has many effects on the existing ecosystem and food chain. So far, however, we have only been looking at isolated food chains. Predicting the effects of introducing new organisms gets more complex when food chains are combined to produce a food web! See below the food for organisms feeding from just a single species of tree!

Introductions can go horribly wrong. Because species are so interdependent and food webs are so complex, it is almost impossible for humans to predict all the impacts of introducing a new species into the ecosystem. In the worst cases, introductions can even result in one or many species becoming extinct. Introduction of new species by humans is thought to be one of the biggest causes of extinctions happening today!

**Introduction Disasters**

**Scottish Wildcats**

Since the introduction of domestic cats in the UK, the number of wildcats has decreased dramatically. Wildcats used to be found commonly across Britain, however, now, only very small populations can be found in the most remote areas of Highland Scotland and many scientists predict that the populations will become extinct in the wild in the near future.
Looking at the food web above, suggest why wildcats are particularly at threat from domestic cats.

Cichlids in Lake Victoria

The Nile Perch was introduced into Lake Victoria in 1950 to improve fishing. The species is, however, highly predatory and in a 10-year period, had hunted over 200 species of Cichlid in the lake to extinction. To make things worse, these species of Cichlid are found nowhere else on Earth!

The Cane Toad

Probably the most famous example of poor introductions is that of the Cane Toad to Australia. Brought in to help control beetle pests, Cane Toad populations grew hugely and started eating other native prey and plants, disrupting the ecosystem significantly. Although only 102 young Cane Toads were originally released, their population in Australia now exceeds 200 million!

Using your knowledge of food webs, suggest whether introduction of organisms at the top or bottom of the food chain is likely to have more impact on the organisms within it. Explain your decision.

Hint: Top answers will use the words resources and competition