



What makes a successful alien?



Alien arrivals

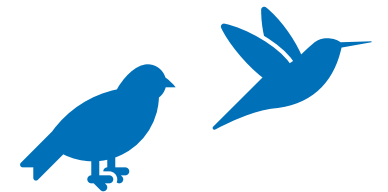


When an alien (non-native) species first arrives in a new country or ecosystem there are a few ways this could go. What do you think might be the things that could happen?

1. The alien doesn't survive. The alien species might find the new environment too hostile, it might be too cold or the predators too vicious, and the new species doesn't survive in the new place.



2. Alien survives alongside natives. The new arrival may survive and multiply just enough to establish itself in the food chain alongside native species, without having a significant impact.



3. The alien takes over. A small fraction of new species will go on to dominate. They out-compete the native species, take over their new environment and change the ecosystem and the way a food web functions.



Invasive characteristics - animals

Let's think about those aliens that take over and dominate, and what makes them a **successful invader**.

Can you think of any features invasive **animals** might have that makes them successful?



Lack of predators, diseases or competitors.

New Zealand flatworm is distasteful and not predated.



Aggressive and bold.

Asian hornet is aggressive and an effective predator of honey bees.



Will eat many types of food and prey.

Grey squirrel will eat unripe nuts (leaving none for red squirrels).



Good at dispersing (spreading).

Sika deer travel up to 50km and have spread across much of Scotland.



Well adapted to live in several habitats.

Mink hunt on both land and water.

Invasive characteristics - plants

Can you think of any features invasive plants might have that makes them successful?



Grow very tall and/or have big leaves, shading out native plants.



Strong root systems allow them grow in bare soil where native flowers can't grow.



Produce many flowers, with lots of seeds and have good seed dispersal mechanisms.



Some spread by rhizomes (sucker like roots). If broken a fragment of a rhizome can grow into a new plant.

more...

Invasive characteristics - plants

More features invasive **plants** have that make them successful...



Plants grow earlier in the year than native species and for a longer season.



Are not browsed (eaten by herbivores) due to toughness or toxic sap, and don't have pests or diseases that attack them.



Some can inhibit competition by releasing chemicals to poison neighbouring plants.



Can survive a wider range of temperature and climatic conditions than native species.

Invasive traits

Features that make a species invasive are known as **invasive characteristics** or **invasive traits**.

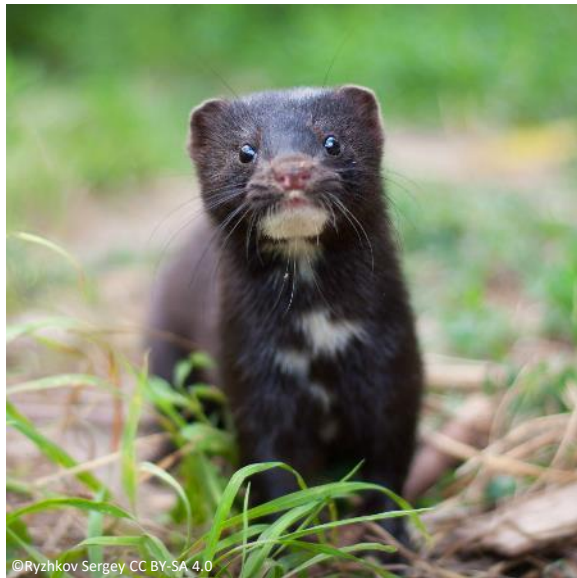
We can group both plants and animals under the following headings:

- **Lack of enemies.** A lack of predators, browsers, competitors, diseases or pests.
- **Good at spreading.** Animals travel big distances and plants produce lots of seeds with good dispersal mechanisms or have spreading underground rhizomes.
- **Are generalists.** Do well in a wide range of environments and climates, and/or eat a wide range of things.
- **Are pioneer species.** Can survive in poor conditions and wasteland type environments.
- **Are aggressive.** In the way they hunt (efficient well adapted predators) or grow (very big, quickly, early in year or poison neighbouring plants).

The most successful invasive species

As the **number** of invasive characteristics a species has increases, the more successful an invader it will be.

The American mink is a very successful invasive animal.
What invasive characteristics does it have?



Generalist – will catch and eat anything

No predators!

Voracious predator - will readily hunt prey

Pioneer – will live in any environment where there is food

Efficient on both land and water - runs fast, is nimble and swims well

Good at spreading – can travel up to 100km to find a territory

Is a semi aquatic mammal - only direct competitor is the otter

The most successful invasive species

Himalayan balsam is a very successful invasive plant.
What invasive characteristics does it have?



Generalist – will grow anywhere

Produces lots of flowers and 800 seeds per plant

No diseases or pests attack it

Grows very tall and dense - shading out native flowers

Good at spreading - exploding seed capsules throw seeds 7m from plant

Pioneer – will grow on bare waste ground, especially riverbanks

What next?

- You could look at some more examples of invasive species and list out their invasive characteristics.
- Do the activity – **Design your own invasive species.**
What invasive characteristics and adaptations will your creature have!
- Play **Invasive species top trumps.**
The cards score species by their invasive traits. Which plant grows the tallest? Which animal is the most invasive?
- Play the **Impact of mink** game.
This game looks more about impacts of the American mink on the native water vole.