

AIM: How can invasive species change established ecosystems?

Invasive Species: not originally from the location they are found AND causes harm

Synonyms: invading introduced alien exotic non-indigenous

How do invasive species disrupt the natural, balanced relationships in an ecosystem?

- a. direct predation of native species
- b. no natural predators → unchecked, sometimes exponential, population growth
- c. **outcompete native species** and cause their populations to decline

Examples of Invasive Species:

1. **Rabbits in Australia**

Rabbits were introduced when Europeans first settled in Australia in 1859. They were brought there for two main reasons – the domesticated rabbit was a ready source of meat, and the wild rabbit introduced later for hunting. The rabbit populations exploded because they reproduced much quicker than they were hunted. To control the problem from spreading, an 1833km fence was built to try to prevent the rabbits from spreading, but it was a complete failure. Kangaroos and emus were negatively affected as they would get caught in the fence just like dolphins are affected by drifting nets in the ocean. The rabbits are partially blamed for the extinction of almost an eighth of the mammal species in Australia and have caused millions of dollars of agricultural and soil damage a year. To control the problem, a virus was injected into the rabbit population that usually killed the infected rabbit within 14 days, but could be spread to others by mosquitoes or fleas.

2. Water Hyacinth in Louisiana

The water hyacinth was first brought from South America to the U.S. as part of a fair held in New Orleans. They proved to be popular gifts and were transported to garden ponds around the city. The hyacinths reproduced and quickly spread to neighboring waterways. With no natural controls, such as disease or predators, it soon covered immense areas of Louisiana, clogging canals used for boating and fishing. Water hyacinths have been considerably reduced by the introduction of insects that would feed on the plants, heavy doses of herbicides, and physical removal.

3. Asian Longhorned Beetle in New York

Native to Eastern Asia, the long-horned beetle accidentally made its way to New York in wood packing material. Spread of the Asian long-horned beetle is accomplished through infested tree-based materials, including live trees, fallen timbers and firewood. This can be difficult to address, due to the larvae being deep within the wood. Larvae develop out of the eggs and chew “galleries” into the inner parts of the tree, on which they will feed during the overwinter process. Adults emerge during the spring through these holes that can be found on various spots on the tree, mainly around the branches and trunk of the tree. There can be thousands of the holes that the adults appear from in an infested tree. By making so many holes, adults cause the tree to lose nutrients to maintain its life needs, such as water and sap. To prevent the spread, tree removal and then quarantines are established which prohibit the movement of infected wood.

4. Brown Tree Snakes in Guam

Indigenous to Australia, Indonesia, and the Solomon Islands, the brown tree snake was accidentally transported from its native range in the South Pacific to Guam either as a stowaway in ship cargo or by crawling into the landing gear of Guam-bound aircraft shortly after World War II. Because of the absence of natural predators, brown tree snake populations reached unprecedented numbers. Snakes caused the local extinction of most of the native forest vertebrate species, especially birds (the Guam rail) and lizards. This, in turn, caused a spike in the spider population. To control the problem, mouse bait injected with Tylenol (which was poisonous to the snakes), was released in the environment.