



Introduced Species Issues



Plant and animal species have been introduced into Australia for many different reasons. These include garden plants, domestic animals, pasture grasses and aquarium species. Other species arrived accidentally, such as in shipments of imported grain or in ballast water. Introduced plants that become weeds invade areas and compete with native plant species for space, light, water and nutrients. Weeds have higher reproductive rates and tend to grow faster than native plants so they can often establish populations quickly and smother native plants. Eventually these weeds can become the major species in an area and lead to declines in biodiversity. Weeds cost the state over \$600 million per year.

A number of native plants and animals can also become pests if they are introduced into areas they do not come from. For example, the Cootamundra Wattle comes from the eastern states of Australia, but is invading and damaging bushland in South Australia.

Some weed species have been present in the ecosystem for a long time. Over time, some native animals have come to depend on them for habitat and food when the native plants have been lost. For example, the blackberry plant provides an ideal habitat for the threatened southern brown bandicoot. Therefore, weed management needs to happen over time and must also include some habitat regeneration.

Introduced animals compete with native animals for habitat and food. Often the introduced animals have higher rates of breeding, so their populations can grow rapidly. Many of the animals introduced to Australia have hard hooves that cause damage to the fragile soils and vegetation in our landscapes.

Introduced fish have created major environmental problems for inland rivers and streams. Many were introduced for recreational fishing and have spread into inland waterways. Here they compete with native fish for food and habitat, and reduce water quality.

Trends



Rabbit numbers are increasing.



Feral cat numbers are increasing in the Adelaide and Mount Lofty Ranges and arid lands.



Fox numbers are down in high priority conservation areas and stable in other parts of the state.



Feral camel numbers are up.



Feral goat numbers are increasing in the arid zone, but decreasing on Kangaroo Island.



Numbers of identified marine pests have remained stable since 2003.

“ Introduced animals compete with native animals for habitat and food. ”



Introduced Species

What is the Current Introduced Species Situation?

Pressure indicators

Distribution of key terrestrial pest animals

- The European rabbit is still Australia's most widespread and destructive pest animal. Rabbit Haemorrhagic Disease (RHD) was developed to reduce the rabbit population and numbers have decreased by more than 70% since its introduction. However, rabbits are still found throughout most of South Australia. Outbreaks of RHD have been less common during the drought and this has resulted in higher rabbit numbers across the state since 2005.
- The European red fox is found in most regions of the state. Fox control is costly, labour intensive and must be maintained continuously. In some conservation areas, such as the northern Flinders Ranges, there have been large-scale baiting programs that have seen a decline in numbers over the last 10 years. Elsewhere in the state, foxes remain a problem.
- Feral goats are found in the southern and central regions of the state, particularly in the Gawler and Flinders Ranges areas. In the arid zone, numbers have been declining since 1990, but in the last three years the number of goats has increased. On Kangaroo Island, the 2008 bushfires provided an opportunity to reduce goat numbers and a major program is underway to try and eradicate goats from the island.
- Feral deer numbers have increased due to escapes and deliberate releases from deer farms. The size of the increase and the numbers of feral deer in South Australia is not known. Deer can be found in areas of native vegetation, including conservation areas.
- Feral camel numbers in the far north of the state are believed to have doubled in the last 8 years and are growing at a rate of 10% per year. South Australia is thought to support around 18% of the estimated 750,000 feral camels in Australia.

- Feral cats are common in all regions of the state. Numbers have fallen since the introduction of RHD, as rabbits are a main source of prey but feral cats still remain a problem. Feral cat numbers are increasing in the Adelaide and Mount Lofty Ranges region.
- Starlings are a bird pest in horticulture and viticulture as well as an environmental pest. Starlings can also cause social and health problems in urban communities.

Distribution of terrestrial pest plants (weeds)

There are 20 Weeds of National Significance (WoNS) considered to be a major threat to biodiversity – ten of these are established in South Australia. A further 90 plants are also declared under the Natural Resources Management Act 2004, which means that their spread must be contained and/or the plants must be destroyed if they are not yet well established. The following weeds pose the biggest threat to biodiversity in South Australia:

- Bridal creepers are the most significant weeds in South Australia. They are climbing plants that smother native vegetation and compete for space, light, water and nutrients. Bridal creeper is common in all areas of the state and control is extremely difficult. A rust fungus has been introduced to control bridal creepers and in general the plant populations are now stable due to the fungus - this is known as biological control.
- Blackberry is an extremely aggressive invading plant that is hard to control. It provides an ideal habitat for the southern brown bandicoot, so it is vital that its eradication is conducted in conjunction with habitat restoration.
- Boneseed is a big problem in the Mount Lofty Ranges, but it also affects other areas of the state. Birds and foxes can disperse the plant seeds when they eat the boneseed fruit, and the seeds can remain in the soil for a long time – this is

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What is the Current Introduced Species Situation?

Pressure indicators (continued)

called a seed bank. Even when all the plants in an area are removed, seeds from the seed bank can keep germinating over many years.

- Gorse is found in many agricultural areas of the state, but it is more common in areas of high rainfall. Spider mite and gorse thrips have been released for the biological control of gorse in the Mount Lofty Ranges. The overall distribution of gorse is declining due to intensive control programs.
- Feral olives are descendants of olive trees planted for fruit production and they can establish in native vegetation. Feral olives form a dense canopy which can replace some native communities such as SA blue gum and grey box trees. Feral olives also contribute to a fire risk as they form highly flammable

thickets.

Distribution of key marine pests

The coastal waters of South Australia are under threat from a range of introduced pest marine species. There are currently 38 marine pest species recorded in South Australia and they can have a major impact on biodiversity and seafood production. Once a pest has been established it is rarely possible to eradicate it and control is very expensive. Many pest species have been introduced through ballast water or on the hulls or anchor ropes of vessels.

Invasive seaweed (*Caulerpa taxifolia*) is the most significant marine introduced pest in South Australia. It was discovered in West Lakes and the upper Port River in early 2002. It has the potential to spread over large areas and it has been associated with the collapse of fisheries overseas. The weed has been eradicated from West Lakes, but it is still present in the Port River and it has recently been identified at North Haven marina.

Distribution of key freshwater pests

There are a number of pest fishes that are having a significant impact on freshwater ecosystems in South Australia. These species compete with native

fish for food and habitat and they can reduce water quality. The worst ones are the European Carp, Eastern Gambusia, Redfin Perch, Rainbow Trout, Brown Trout and Tench. Release of any of these species after catching them is illegal under the Fisheries Act 1982.

Introduced biological diseases

Mundulla Yellows is a disease that affects eucalypts and other native plants. It was first seen in a place called Mundulla in the 1970s. When it attacks plants, their leaves go yellow and after 10 years or so, the canopy of the tree dies back. Plants infected with Mundulla Yellows always die.

Chytridiomycosis is a potentially fatal skin disease of amphibians, which affects South Australia's native frogs. It is caused by a fungus, which was first observed in the 1970s and it is now believed to be widespread. Frog death rates due to the fungus increase in cooler temperatures.

Introduced Species



Responding to Introduced Species

- **The Natural Resources Management Act 2004** provides guidelines for the management of key pest plants and animals in South Australia. There are eight Natural Resource Management (NRM) Boards throughout the state, which are responsible for managing introduced species. Declarations are enforced by the NRM Boards in conjunction with other state government departments as well as industry and community groups.
- Animal and plant pest control activities occur throughout the state and coordination of control efforts and program funding is vital to ensure success. Control approaches are often carried out together in an integrated pest management program. This means using a balance of cultural, chemical and biological control. Animal and plant pest control activities include:
 - Baiting, such as for foxes,
 - Releasing diseases specific to animals (eg Rabbit Haemorrhagic Disease),
 - Biological control – releasing insects or pathogens to attack weed species,
 - Further research about introduced species,
 - Monitoring of fences on deer farms, and
 - Risk assessment of potential pest species, planning for prevention and early intervention.

Impacts of Losing our Threatened Species

Any loss of native plants and animals contributes towards a loss of biodiversity which is important to the processes that make life possible.



Biodiversity

Introduced species are the leading cause of biodiversity loss worldwide. Weeds smother native vegetation and compete for space, light, habitat, water and nutrients. Rabbits, feral goats and deer prevent plant regeneration by eating seedlings, while feral camels, pigs and deer trample native vegetation.



Land Resources

Weeds change the composition of soil quality and increase fire hazards. Feral animals such as goats, rabbits, deer, pigs and camels cause soil erosion and the loss of soil resources through trampling and overgrazing.



Water

Weeds degrade watercourses and affect water quality. Some pest fish species also reduce water quality.



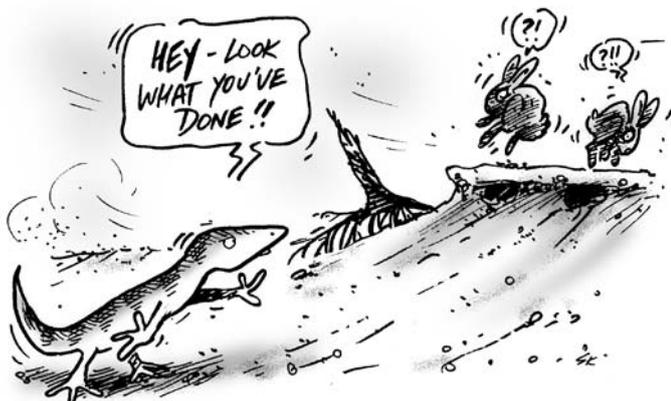
Economic

Weeds cost South Australian agriculture an estimated \$600 million per year. These costs come from reduced crop yields, poisoning of stock, tainting of meat and milk, and reduced wool values if wool is contaminated with burrs and seeds.



Cultural

Introduced species have reduced Aboriginal and recreational use of native ecosystems.



Introduced Species



Taking Action for Introduced Species

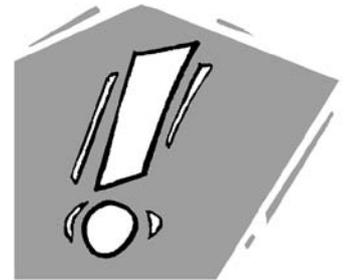
- Have a look at your garden at home. Write a list of the species that are introduced and the ones that are locally native. Which list is bigger?
- Try and encourage your family to plant only locally native trees and shrubs. This will also help to bring native birds and animals to your garden.
- Do you have a cat? Think about the potential impact your cat could have on the environment. What are the ways that you can be a responsible cat owner and make sure your cat doesn't impact on biodiversity?

“Weeds cost the state over \$600 million per year.”

Attention!!

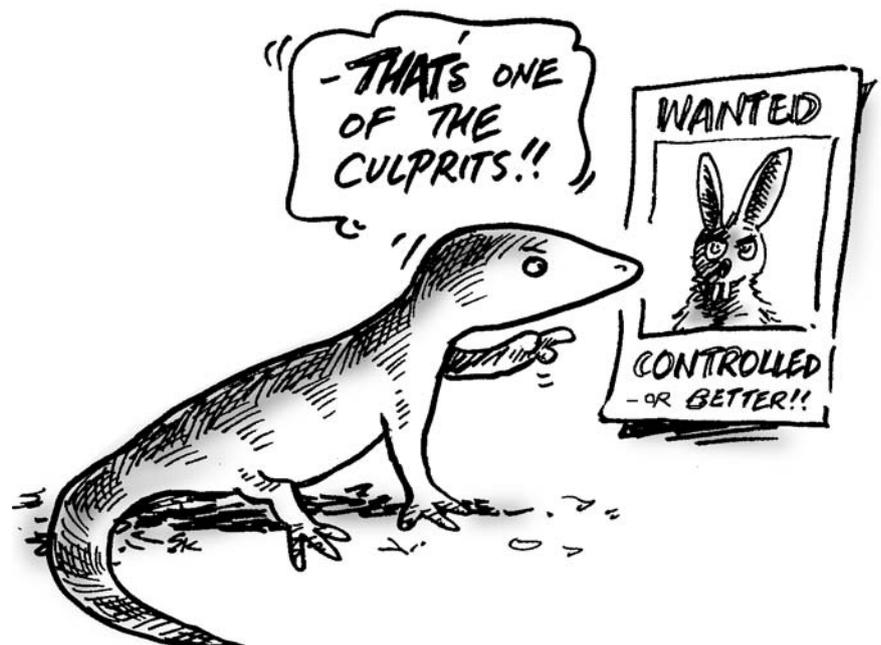
Rabbits are on the rise!

The European rabbit is still our most widespread and destructive pest animal. Rabbits are common and widespread over 85.5% of South Australia. Two diseases have been introduced to control rabbits - myxomatosis and Rabbit Haemorrhagic Disease (RHD). RHD was introduced in 1995 and it is now common throughout the state. Outbreaks occur regularly each year, particularly in the arid zone.



During the drought years of 2005 to 2007, outbreaks of RHD were less common and, as a consequence, rabbit numbers rose. Current research is trying to determine if this change in outbreak patterns is due to genetic changes in the rabbit or the virus, or whether it is related to seasonal conditions. To complement the biological controls (myxomatosis and RHD), rabbit baiting and warren destruction programs are also in place. This is an example of integrated pest management using biological, chemical and cultural controls. Kangaroo Island is currently rabbit free and regular monitoring is required to make sure it stays that way.

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Introduced Species



Research Ideas about Introduced Species

- 1 What are 'introduced species'?

- 2 What impact have introduced species had on the environment?

- 3 Why have some native animals come to depend on some introduced species?

- 4 Why do some native plants and animals become pests in other parts of Australia?

- 5 How have human activities impacted on the numbers of introduced species in your community, South Australia, Australia and globally?

- 6 What does the State of the Environment report tell us about introduced species in South Australia?

- 7 What might happen in the future if things continue as they are?

- 8 What are government, business and industry doing to address introduced species numbers in South Australia?

- 9 What can we do individually, or in communities, to reduce the impact of introduced species in South Australia?

Resources

For more detailed information on the issue and actions you can take see the State of the Environment report for South Australia 2008.

This is available at:
www.epa.sa.gov.au/soe



This fact sheet is part of a set of 20 fact sheets about the key environmental issues identified in the State of the Environment report 2008, produced for the Environment Reporting Education Resource. You can access the fact sheets and learn more about taking action for the environment at the Education Resource website:
www.epa.sa.gov.au/soe.
For more information call the Environmental Education Unit of the Department for Environment and Heritage (08) 8463 3911.



Government of South Australia
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