

European red fox

Foxes (*Vulpes vulpes*) were first introduced to Australia in the 1850s. They have spread to become one of Australia's major pest animals and are a major threat to the agricultural industry and native wildlife across the SA Arid Lands region.



The South Australian Arid Lands Landscape Board is committed to reducing the impact of foxes to native wildlife, the region's biodiversity and agriculture.

A fox's diet consists of one-third wildlife, one-third pest animals like mice and rabbits and one-third livestock. They can survive as omnivorous scavengers.

Where do they live?

The fox thrives in many different habitats, including urban, alpine and arid areas. Outside urban areas, it appears to be most abundant in lightly wooded areas that are typically found in agricultural landscapes offering a wide variety of shelter and food.

Foxes are mainly active at night. During the day, the fox sleeps in dens, logs and other shelters. The fox scavenges and preys on whatever food sources are available. Its main food source is small animals, but it also eats insects and fruit, particularly in summer when preferred prey is less abundant.

Both males and females are sexually mature at the age of one. Litters, averaging four cubs, are born during late winter or early spring, and emerge from the den in late spring. The cubs move away from the family territory in late summer or autumn.

What is the impact?

In Australia, the European fox is an agricultural, environmental and social pest. Foxes have been implicated in the decline and extinction of many small and medium-sized Australian native animals.

They also prey on many bird species. Of the threatened species listed under the *Environment Protection and Biodiversity Conservation Act 1999*, foxes are considered a threat to 14 species of birds, 48 mammals, 12 reptiles and 2 amphibians.

Foxes pose a threat to livestock by preying on poultry, lambs, kids and even calves at calving. They may also be a health risk to humans and

pets in high density areas, through transmission of diseases.

In the SA Arid Lands region, EPBC-listed ground-dwelling birds like Malleefowl, marsupials and small mammals such as Western Quoll and Kowari are highly susceptible to fox predation. Other birds, small mammals and reptiles are also at high risk from foxes.



Foxes can also spread disease and weeds. Being omnivores and scavengers, they will feed on fruits from weeds such as feral olives, African boxthorn and blackberry, spreading the seeds.

The combined environmental and agricultural impacts of foxes, and the effort expended on attempts to reduce that impact, costs Australia more than \$200m each year.

How can you help?

The best approach to managing a fox problem is through an integrated fox control program using a variety of fox control methods such as ground shooting, baiting and fumigation of dens. Other options may include using guard animals, trapping and exclusion fencing. Most effective control occurs if multiple methods are used and by teaming up with your neighbours in a coordinated approach at a landscape scale.

It helps to identify the location of warrens that may harbour foxes. A territory for a fox is generally not more than 8km in diameter. During the birthing season, adult red foxes usually remain within 0.8km of the den. Ranges are largest during the winter.

To achieve the best results, a control plan should be prepared in advance so the control methods can be carried out at the

appropriate time and in the correct sequence. Always choose the most appropriate control methods for your situation.

The Biosecurity team from the South Australia Arid Lands Landscape board can help you plan a program.

When a fox is destroyed, another will move into its territory within a relatively short period of time. Consequently, control work needs to be widespread, timely and persistent, particularly if protecting livestock or native species during their vulnerable periods, such as just after their birth or hatching.

Timing of control is also an important consideration as foxes are at their most vulnerable during spring to autumn, coinciding with peak activity.

While pests, foxes must still be controlled in a humane manner. If in doubt seek advice from the Pest Smart website at www.pestsmart.org.au/animalwelfare/

What are the options?

Shooting

Ground shooting can be an option to remove foxes especially when used in conjunction with additional control methods.

Although shooting may be useful when fox numbers are already low, it is labour intensive and likely to quickly educate foxes and make them wary. This often results in difficulty estimating fox numbers as they will be less visible.

Spotlight shooting, particularly in late summer and early autumn, can account for large numbers of foxes. Young cubs can be easily attracted with a fox whistle at this time. The number of foxes taken from an area drops rapidly after a few nights and it tends to target mainly young, vulnerable foxes that are likely to die in their first year of life.

Shooting can be used year-round but should not be done while baiting is in progress, because it can disrupt animal behaviour and reduce the effectiveness of your baiting program.



For animal welfare reasons, shooting should not occur while vixens have dependant young.

Shooting can be a humane method of destroying foxes when it is carried out by experienced, skilled and responsible shooters; the animal can be clearly seen and is within range; and, the correct firearm, ammunition and shot placement is used. The use of firearms to control foxes must conform to relevant firearm legislation and animal welfare standards.

Fumigation

Fumigation of breeding, or natal dens with carbon monoxide (CO) gas is sometimes used to kill young cubs. Although den fumigation may locally reduce the number of foxes or problem animals, it is not effective as a standalone fox control method.

Foxes habitually re-use dens year after year. A vixen is likely to begin excavating prospective dens in April to May as cubs are born during August to September. The vixen may have two or three other dens that can be used if the main breeding (natal) den is disturbed.

Fumigation should be used when the vixen and cubs are confined to the den during August to October. The vixen is likely to be killed in the den only during the first three weeks after the birth of her cubs. Where it is accessible to appropriate machinery, deep

ripping should be used to destroy it. You should revisit dens each year in May to June and August to September to measure the fox activity and to fumigate and destroy dens.

Operators must strictly follow the directions on the approved label when using carbon monoxide cartridges. They must not be used for any other purpose than the destruction of foxes in natal dens.

Trapping

Trapping is an important tool to remove problem foxes such as mature adults who are wary of baits and spotlight shooting.

However, it is not an effective way to reduce high numbers of foxes quickly as it requires a significant amount of time and effort. Jawed traps have stipulations regarding soft-jaws and jaw types. All traps must be checked regularly and foxes contained must be destroyed humanely. Once trapped, it is an offence to release the fox alive.

Baiting

Baiting is the main form of fox control. A coordinated baiting program over a short time can reduce short term impacts from foxes and limit the social impact of baiting.

It is recommended to plan early as there is an approval and notification process to complete before baiting can be undertaken. It is

essential to adhere to directions for use. This includes a mandatory requirement to notify neighbours and specific distance requirements to assist with safety for dogs, and in some instances, wildlife.

Bait types and where to access them

There are two main chemicals used for fox control; Sodium Fluoroacetate (1080) and Para-aminopropiophenone (PAPP).

Landholders can only access the regulated chemical 1080 and PAPP through local landscape boards, as strict conditions of use apply. Non-target animals, particularly domestic dogs, may be killed as a result of consuming 1080 and PAPP bait.

All baits (including uneaten and unused) must be used in accordance with the 'Directions for Use' of 1080 and PAPP pest animal bait products in South Australia.

Board Biosecurity officers are able to supply 1080 fox baits, PAPP fox baits and canid pest ejector capsules.

It is important to read and follow instructions on the product label and accompanying information for full directions of use and safety information for all baits. For effective long-term control, baiting should be followed by ongoing control methods.

When to bait

Best practise is to apply baiting at least twice a year during early spring when vixens require more food, and early autumn when young foxes are starting to spread from the den, looking for new territory, food and are easily attracted to baits.

Look to bait six to eight weeks before the anticipated peak impact. If the aim of baiting is long-term control, then regular baiting needs to be carried out across an entire region with two to four pulses per year (eg two months baiting, one month rest, repeat).

Canid Pest Ejectors

Canid Pest Ejectors (CPEs) are used in the same way as baits and are a relatively new tool to manage foxes and wild dogs.

CPEs are a mechanical device designed to deliver a measured dose of 1080 directly into the mouth of foxes. The device is activated when a fox pulls firmly (with a force greater than 1.6kg) in an upward motion on the lure head. This triggers a spring-loaded mechanism that drives a piston into the poison-filled capsule, which propels its contents directly into the mouth of the animal.

CPEs can be an important tool if there are cases of bait caching or bait avoidance by problem foxes.

Poison capsules are sealed and protected from the weather, meaning the toxin remains viable until the CPE is activated by a fox or wild dog.

CPEs pose a risk to domestic dogs as they can also achieve the required pull force required to activate the device.

The device is driven into the ground with only the lure head protruding, therefore it cannot be easily moved or cached by target or nontarget species.



Bait caching

Stockpiling is instinctive survival behaviour of foxes. It is possible for one fox to remove and hoard several baits for later consumption.

Bait caches may be located outside the boundary of the property where foxes are being poisoned, thereby exposing non-target animals, in particular domestic dogs, to toxic baits. To reduce the likelihood of bait caches leading to non-target damage, do not continue to replace repeatedly taken poison baits over an extended period of time.

If you suspect bait caching is occurring, consider removing baits for a short time before resuming baiting later (pulse baiting) or incorporating the use of canid pest ejectors.

Guardian dogs and alpacas

Some producers have successfully used trained guard dogs (Anatolian shepherds, Maremma sheepdogs) and alpacas to protect their flocks from fox predation. Guardian animals will either directly confront a predator using intimidation or disrupt the predators hunting behaviour by becoming noisy and active.

Guardian dogs should not be confused with herding dogs. A guardian dog's sole purpose is to protect 'their' livestock from predators while working unsupervised and independently of humans.

Den ripping

Den destruction is the most important part of effective and long lasting fox control. Thorough ripping is the best way to destroy dens and holes. This advice does not authorise the clearance or damage of any native vegetation.

Your situation may require approval for native vegetation clearance or you may wish to notify the Department for Environment and Water of your intention to undertake a ripping program. This can be done at: www.environment.sa.gov.au/

You may also wish to notify your local council and landscape board of your intentions.

A den can be destroyed by collapsing it in on itself with earthmoving machinery or hand tools, and then filling and levelling the area.

Contact 'Dial Before You Dig' to check for underground cables, pipes and other services before carrying out ripping on roadsides or property. Check dens on a monthly basis and treat any reopened holes. Reopened dens can be re-ripped or treated with a fumigant to keep them closed.

Exclusion fencing

Wire exclusion fences can be used to keep foxes out and prevent damage to high value assets, but will not reduce fox numbers. Foxes are agile animals capable of passing through, digging under, jumping over, or even climbing various types of fences.

Wire netting with mesh size not exceeding 80mm (3inches) will prevent most foxes passing through. Exclusion fences to protect poultry should be fully enclosed to prevent foxes climbing inside.

Exclusion fencing may also trap native wildlife and should be checked regularly for unintended impacts. Wildlife protection fencing should be at least 1.8m high with a 60cm 'floppy top' and a 'bottom apron or skirt' extending out 40cm to prevent foxes digging under.

Landholder responsibility

In South Australia, foxes are declared for control under the *Landscape South Australia Act 2019*. It is the legal responsibility of the landowner to control foxes on their property. It is also illegal to keep foxes as pets.

Acknowledgements

This fact sheet includes content sourced from the Limestone Coast, Northern and Yorke and Murraylands and Riverland Landscape Boards.

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