

African boxthorn (*Lycium ferocissimum*)

Also known as boxthorn.



Lateral branches of African boxthorn. The leaves are mostly longer than 10 mm and end in a stout spine. Photo: Craig Magnussen.

Key points

- African boxthorn is one of Australia's most widespread weeds, invading natural areas, grazing lands and roadsides.
- African boxthorn can injure livestock, harbour feral animals, puncture vehicle tyres and in some cases, reduce road access.
- African boxthorn is a hardy, drought-tolerant plant that has been recorded in all Australian states and territories.
- All boxthorn species in Australia are thorny shrubs which produce berries, with white or purple flowers and petals joined in a tube at the base.
- Management of African boxthorn is complex, not least of which because it provides harbour for native animals such as penguins and mutton birds.

The problem

African boxthorn (commonly known as boxthorn) is widespread in regional Australia. African boxthorn is considered a major problem because it invades native vegetation, alters habitat and overruns pastures and other areas. It forms dense, impenetrable thickets that exclude

other plants; provides shelter and food for feral animals such as foxes, rabbits, starlings and sparrows and reduces access for stock, native animals, people and vehicles. Its large thorns can also injure livestock and puncture vehicle tyres and several pest insect species breed in its fruit.

Native fauna requirements should be taken into account during management of African boxthorn infestations. For example, African boxthorn in coastal regions can interfere with seabird breeding and displace native shrubs such as nitre bush. However, in some situations where much or all of the original native vegetation cover has been removed, African boxthorn's dense foliage may be used as habitat by native fauna such as fairy wrens and the fruit may be a food source for native animals.

African boxthorn is a declared noxious weed in all Australian states and territories. Many agencies, community groups and individuals invest considerable resources each year on boxthorn control.

The weed

African boxthorn was originally introduced to Australia from South Africa and planted as hedges for fencing and windbreaks. It spread from the initial plantings and by 1904 was declared a noxious weed in parts of Victoria.

All boxthorn species in Australia are perennial thorny shrubs which produce berries, with white or purple flowers and petals joined in a tube at the base.

The native species, Australian boxthorn (*Lycium australe*) grows across southern mainland Australia, mainly in drier areas west of the Great Dividing Range.



African boxthorn produce orange to red coloured berries. Photo: Craig Magnussen.



Each fruit can produce between 20 and 70 seeds. Photo: Craig Magnussen.

How to identify African boxthorn

African boxthorn is a perennial shrub and contains many branches. It commonly grows two to three metres, but may grow up to six metres high. Branches are hairless and stiff and end in sturdy thorns. Numerous thorns also occur at right angles along the branches.

African boxthorn leaves are generally 10 to 40 mm long and four to 10 mm wide, bright green in colour with a smooth and rather fleshy texture. They are oval in shape with a rounded tip and occur in clusters along branches and at the base of thorns.

African boxthorn mainly flowers in spring and summer but flowers may be present any time of year. Flowers hang on stalks, singly or in pairs. They are white to mauve with a tubular base, usually five-lobed and about 12 mm in diameter. Fruit is a smooth round berry, five to 12 mm long, green ripening to bright orange-red, containing more than 20 seeds. The deep, woody taproot is branched and re-sprouts vigorously if broken or cut.

Do not confuse African boxthorn with spiny native shrubs that may look similar and occupy similar types of habitat. None have spines as large and rigid as those on mature African boxthorn, which may be up to 15 cm long on main stems.

How it spreads

African boxthorn produces large numbers of orange-red berries that are eaten by native and non-native birds and other animals. The seeds pass through the gut and are thus spread into native vegetation. Some of the birds can travel vast distances. Infestation is common under trees, shrubs, posts, fences or powerlines where birds perch, however is not limited to these situations.

What to do about it

Effective, long term control requires the integration of a number of control methods. There are a number of methods available, but any one in isolation will not provide long term control of African boxthorn.

Herbicide

There are over 400 herbicides registered for use on African boxthorn. Always check the label of any herbicide you consider using for application rates and other critical information.

Foliar: spray plants to the point of run-off. Ensure plants are actively growing and have good leaf cover. Do not spray during hot, dry periods or at other times when plants are stressed.

Basal bark: useful in environmentally sensitive areas, but can be made difficult as thorny branches limit access to the plant's stem base. Each stem must be sprayed carefully from the ground to a height of 30 to 40 cm, ensuring the stem is covered all the way around. Incomplete coverage of the stem will result in regrowth.

Cut stump: useful in environmentally sensitive areas and for treating small numbers of plants, but can be made difficult as thorny branches limit access to the plant's stem base. Cut each stem off as close to the soil surface as possible.



African boxthorn flowers are 10 to 12 mm long. Photo: Craig Magnussen.



Growth habitat of African boxthorn. Photo: Craig Magnussen.

Immediately (within 15 seconds) apply a registered herbicide to the cut surface by painting or spraying. Should the herbicide not be applied immediately, the plant will heal the cut and the herbicide will not be able to translocate to kill the plant.

Soil application: not suitable in many environmentally sensitive areas or where desired tree species are located close by. Apply a registered herbicide between the drip line and the base of the plant, preferably when the soil is moist. Native tree species are very susceptible to soil applied herbicides. Always follow the herbicide label information to determine situations that are safe to use these products

Other control methods

Mechanical: large stands of African boxthorn are most cost-effectively controlled by mechanical removal of plants and their roots. This can be done by dozing, stick raking or blade ploughing. Follow up treatment with one or more of herbicide, cultivation or revegetation is required however as regrowth will occur from seed and broken root fragments.

Burning: African boxthorn is not thought to be controlled by fire, however burning vegetative material removed by mechanical means should be carried out to eliminate feral animal harbour.

Revegetation: revegetating treated African boxthorn infestations with native species is beneficial on two fronts. Firstly, it encourages competition to discourage African boxthorn recruitment. Secondly, the gradual or staged replacement of African boxthorn with appropriate native species will minimise impacts to native animals using it as harbour.

Hygiene: the main spread vectors for African boxthorn are birds and foxes. Although seeds are not thought to be long-lived in the soil, weed hygiene protocols should be adhered to such as washing vehicles and machinery free of soil and vegetative matter when moving from infested to clean areas. When conducting control operations, take care to ensure cut stems are not left in contact with soil as they may take root.

Legislation

African boxthorn is a declared noxious weed in all Australian states and territories except Western Australia. Declared noxious weeds are often prohibited from sale and accidental or deliberate movement, and control by landholders is required.

In most states where African boxthorn is widespread, legislation encourages involvement of all landholders in coordinated, long-term programs to reduce the weed's impacts and minimise spread into uninfested areas. Weed control that could significantly damage native vegetation may be regulated by legislation.



Project area showing good kill rate and low seedling recruitment. Photo: Craig Magnussen.



Rossmore Station owner and manager Roger Sendell. Photo: Craig Magnussen.

Case study: Rossmore Station, Burren Junction, NSW

Roger and Genevieve Sendall own and manage Rossmore Station and have been battling African boxthorn since the early 1990s. The station, located in north western New South Wales, is a mixed farming enterprise, including approximately 8000 hectares of sheep and cattle grazing and cropping located.

'Past African boxthorn management practices, particularly set stocking rates of sheep contributed to a decrease in ground cover and a subsequent increase in boxthorn. The usual culprits birds and foxes spreading seeds hasn't helped. We give up a deal of good grazing country to the boxthorn as a result,' Roger says.

The Namoi Catchment Management Authority initially provided Roger with a small amount of funding to control African boxthorn in an area containing Weeping Myall (*Acacia pendula*), an endangered vegetation community under threat from weed encroachment.

Roger introduced a system of cell grazing on Rossmore which sees the establishment of smaller paddocks that are grazed and spelled on a rotational basis which is aimed at retaining good ground cover levels. He attributes this, along with the spraying regime undertaken with the Namoi Catchment Management Authority funding to the early successes the project promises.

'I put down to the need to spray during the window when boxthorn is actively growing. It is important to ensure you get full herbicide coverage of the plant; otherwise it will re-shoot from the base. However, if the plant is sprayed properly, at the right time, it can be killed with this relatively inexpensive herbicide,' Roger explains.

The rotational grazing practice has noticeably reduced seedling recruitment in the project area. Another benefit of herbicide treatment over mechanical treatment is the skeletons of the sprayed African boxthorn plants provide shelter to the emergence of native saltbush and other species from browsing sheep and kangaroos.

'We know now we can apply what we've learned in the Namoi Catchment Management Authority project area to the rest of Rossmore, but we also know we've got some years of follow up ahead of us yet.'



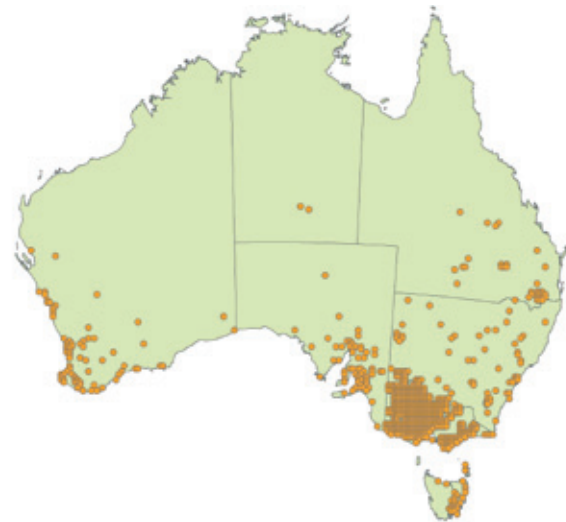
African boxthorn berries are five to 10 mm in diameter. Photo: Craig Magnussen.

Where it grows

African boxthorn is a hardy, drought-tolerant plant that has been recorded in all states and territories from temperate, subtropical and semi-arid regions. Its current distribution includes inland and coastal areas in southern Australia and extends into sub-coastal Queensland. It generally occurs where the average annual rainfall is greater than 200 mm. It is also a major weed in New Zealand.

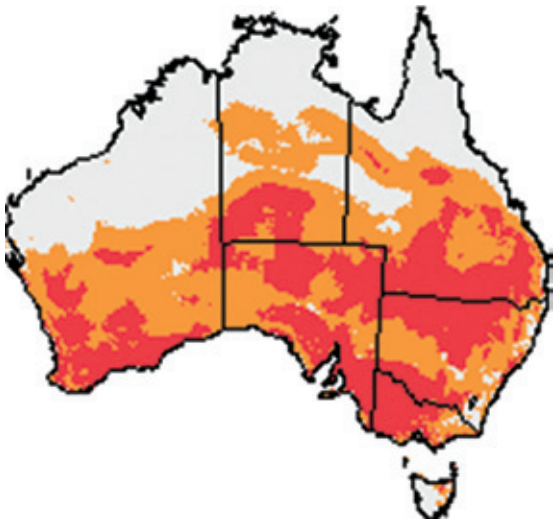
African boxthorn is mainly a weed of open areas such as woodlands, rangelands, coastal areas including offshore islands, watercourses, roadsides, rail reserves and pastures that are not cultivated. It grows on all soil types but prefers lighter (sandy or loamy) soils.

Map 1: Current distribution of African boxthorn in Australia



- Present and past reported occurrence
- No reported occurrence

Map 2: Potential distribution of African boxthorn in Australia



- Low climate match
- Moderate climate match
- High climate match

Potential distribution

Without effective control programs, African boxthorn has the potential to become more abundant within its current range and to spread into new areas. Climate matching indicates that it could spread through much of Australia other than forests and the tropics. However, in arid regions it generally grows near watercourses.

Growth cycle

African boxthorn grows in regions having maximum rainfall in summer or winter, or uniform throughout the year. Active growth is mainly in autumn through to spring, but its growth cycle may vary. Plants sometimes lose their leaves temporarily under moisture stress or in winter. African boxthorn generally flowers and seeds in spring to summer but may do so at any time of year depending on local conditions. Seeds may germinate at any time of year and seedlings take two or more years to commence fruiting. There is no evidence that seeds are long-lived in the soil.



African boxthorn infestation. Photo: Craig Magnussen.



Untreated paddock. Photo: Craig Magnussen.

Acknowledgements

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All photos: Craig Magnussen Queensland Department of Employment, Economic Development and Innovation (DEEDI).

Maps: Data provided by state and territory weed management agencies. Production by Chris Auricht. Potential distribution Climex modelling by CSIRO.

Key references: CRC Weed Management, 2007, *Weed Management Guide: Parsons, W.T., Cuthbertson, E.G., 1992, Noxious Weeds of Australia*. Weed Society of Queensland, 2011, *Weeds of Southern Queensland*.

Weed control contacts

Contact the weed control authority in your state for up to date information on pesticides and legislation.

	Department	Phone	Website
National	Australian Pesticides and Veterinary Medicines Authority	02 6210 4701	www.apvma.gov.au
ACT	Department of the Environment and Sustainable Development	13 22 81	www.environment.act.gov.au
NSW	Department of Primary Industries	1800 680 244	www.dpi.nsw.gov.au
NT	Department of Natural Resources, Environment, the Arts and Sport	08 8999 4567	www.nt.gov.au
Qld	Department of Agriculture, Fisheries and Forestry	13 25 23	www.dpi.qld.gov.au
SA	Department of Primary Industries and Regions SA	08 8303 9620	www.pir.sa.gov.au
Tas	Dept of Primary Industries, Parks, Water and Environment	1300 368 550	www.dpipwe.tas.gov.au
Vic	Department of Primary Industries	13 61 86	www.dpi.vic.gov.au
WA	Department of Agriculture and Food	08 9368 3333	www.agric.wa.gov.au