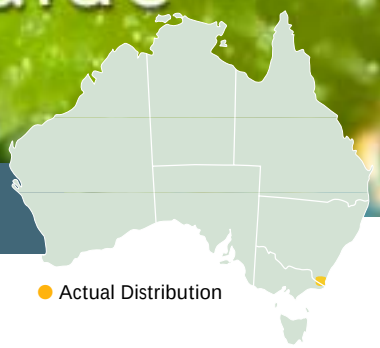
Weed Management Guide

Blue hound's tongue – *Cynoglossum creticum*



Blue hound's tongue (*Cynoglossum creticum*)

The problem

Blue hound's tongue is on the *Alert List for Environmental Weeds*, a list of 28 non-native plants that threaten biodiversity and cause other environmental damage. Although only in the early stages of establishment, these weeds have the potential to seriously degrade Australia's ecosystems.

Blue hound's tongue is a biennial herb that has been reported to be a problem weed in Argentina and Chile. It could cause problems if it becomes established in Australia as its leaves are toxic to livestock. It was first recorded in Sydney, New South Wales, in 1898. In 1933 a naturalised population was noted in Eden, NSW, and its presence was confirmed until 1976. Two new infestations have been recorded in 2004 upstream from Eden, along the Towamba River. At least one other closely related species, *C. officinale* (hound's tongue), is a troublesome pasture weed, particularly in Canada and northern central United States. It invades grasslands and suppresses native grasses. Like blue hound's tongue, this plant has burrs that attach to cattle, causing irritation.

The weed

Blue hound's tongue is a biennial plant which grows up to 600 mm high. Its stems are densely covered with fine hairs. It has dark-green leaves, up to 200 mm long and 25–35 mm wide, covered with long coarse hairs. The base of the leaf is heart-shaped and clasps the stem. The leaves are alternately placed and decrease in size up the stem. Blue hound's tongue has a long taproot which is used to store energy reserves.

In the first year of growth, blue hound's tongue forms a rosette; this is followed by one or more tall flowering stems during the second growing season. The flower, a 10–11 mm long tube, is pink to blue and has darker hairless veins and stamens growing from the base of the tube. Each flower produces four 'nutlets' covered with short, hooked or barbed prickles when mature. The seeds are oval and 6–8 mm long, and their outer surface is thickly covered with prickles.

The flower of blue hound's tongue is pink to blue and has darker hairless veins and stamens growing from the base of the tube.
Photo: José Darnaude

Key points

- Although only found near Eden in southern New South Wales, blue hound's tongue is a threat to agriculture in southern Australia.
- The closely related weed hound's tongue (*Cynoglossum officinale*) is a major weed of pastures in North America.
- It is toxic to stock and invades grasslands, suppressing native grasses.
- Prevention and early intervention are the most cost-effective forms of weed control.
- If you see a plant that may be blue hound's tongue, contact your local council or state or territory weed management agency. Do not attempt control on your own.

Natural Heritage Trust
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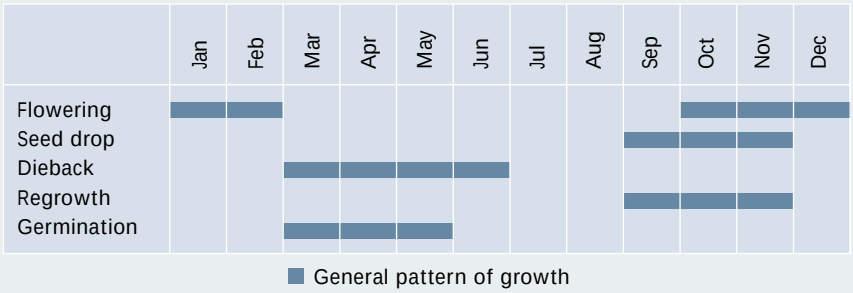
Alert List For Environmental Weeds ALERT

Growth calendar



Blue hound's tongue is a biennial plant, ie it has a life cycle that is completed in two years or seasons, with the second season usually devoted to flowering and fruiting. It germinates in autumn and flowers in spring–summer. The stimulus for flowering is a combination of summer moisture, rosette size and vernalisation (exposure to a period of low temperatures). The rosettes may not flower, but pass the winter to flower in the following year. The plant dies after flowering, but seeds may stay attached until the following spring, delaying germination for a year.

Blue hound's tongue is a biennial herb which grows up to 600 mm high.
Photo: José Darnaude

How it spreads

Blue hound's tongue spreads by seeds, mature plants each producing several hundred. The seeds have hooks that attach to clothing and hair very easily, so they can be spread long distances attached to people or animals. Because most seeds germinate soon after formation and seed viability is only 2–3 years, there is little development of a soil seedbank. Seedlings are fast growing.

In North America cattle and wildlife are important dispersers of the closely related *C. officinale*. This is likely also to be the case in Australia, a view supported by the fact that blue hound's tongue is spreading to upstream areas in New South Wales. Seeds may be transported by animals or people into disturbed areas where they find suitable conditions for germination.

Blue hound's tongue flowers each produce four 'nutlets' covered with short, hooked or barbed prickles when mature.
Photo: José Darnaude

Where it grows

Blue hound's tongue is a fairly typical plant of nutrient-rich Mediterranean to warm temperate grassland communities which occur at altitudes of 0–1000 m. It is a native of southern Europe.

Information from overseas indicates that blue hound's tongue most commonly grows on disturbed sites such as roadsides, sand dunes or open woodlands, where it establishes and spreads quickly. It can tolerate dry conditions.

In North America the closely related *C. officinale* has been successful in habitats disturbed by logging, grazing and other activities. It depends on the continual creation of these areas and dispersal of seeds to maintain or expand populations. It is most prevalent in cool temperate climates with dry summers and a long growing season.

Why we need to be 'alert' to blue hound's tongue

The leaves of blue hound's tongue contain pyrrolizidine alkaloids that kill cattle and horses. While cattle usually avoid it in the field, the problem occurs when they are fed hay or chopped forage containing the plant. It also hinders the establishment of new pasture.

Blue hound's tongue is a weed in Argentina and Chile. If it became widespread in Australia, it could potentially survive in the humid temperate and subhumid zones of southern Australia. Grazing and dairy farms throughout this region would potentially be affected by a loss of pasture and stock.

The severe impacts of *C. officinale* overseas suggest that the closely related *C. creticum* could also be a problem in Australia. For example, in Canada *C. officinale* has become a major economic problem, with logged forests providing ideal habitat for seedling establishment.

Other factors, such as seed dispersal by cattle, a favourable climate and a topography that hinders mechanical and chemical control, have helped the plant spread from a few sparsely scattered weeds in the 1960s to a current infestation of 2000 ha.

Another closely related species, *C. coeruleum*, is also considered a weed, and its importation into Australia is banned by the Australian Quarantine and Inspection Service (AQIS).

What to do about it

Prevention is better than the cure

As with all weed management, prevention is better and more cost-effective than control. The annual cost of weeds to agriculture in Australia, in terms of decreased productivity and management costs, is conservatively estimated at $4 billion. Environmental impacts are also significant and lead to a loss of biodiversity. To limit escalation of these impacts, it is vital to prevent further introduction of new weed species, such as blue hound's tongue, into uninfested natural ecosystems.

Early detection and eradication are also important to prevent infestations of blue hound's tongue. Small infestations can be easily eradicated if they are detected early but an ongoing commitment is needed to ensure new infestations do not establish.

Quarantine to prevent further introductions

Although on the Alert List, blue hound's tongue is currently a permitted import. However, importation is not encouraged due to its potential to be a serious environmental weed.

Do not buy seeds via the internet or from mail order catalogues unless you check with quarantine first and can be sure that they are free of weeds like blue hound's tongue. Call 1800 803 006 or see the

The Alert List for Environmental Weeds

The Federal Government's *Alert List for Environmental Weeds* was declared in 2001. It consists of 28 weed species that currently have limited distributions but potentially could cause significant damage. The following weed species are therefore targeted for eradication:

Scientific name	Common name	Scientific name	Common name
Acacia catechu var. *sundra*	cutch tree	*Koelreuteria elegans* ssp. *formosana*	Chinese rain tree
Acacia karroo	Karroo thorn	*Lachenalia reflexa*	yellow soldier
Asystasia gangetica ssp. *micrantha*	Chinese violet	*Lagarosiphon major*	lagarosiphon
Barleria prionitis	barleria	*Nassella charruana*	lobed needle grass
Bassia scoparia	kochia	*Nassella hyalina*	cane needle grass
Calluna vulgaris	heather	*Pelargonium alchemilloides*	garden geranium
Chromolaena odorata	Siam weed	*Pereskia aculeata*	leaf cactus
Cynoglossum creticum	blue hound's tongue	*Piptochaetium montevidense*	Uruguayan rice grass
Cyperus teneristolon	cyperus	*Praxelis clematidea*	praxelis
Cytisus multiflorus	white Spanish broom	*Retama raetam*	white weeping broom
Dittrichia viscosa	false yellowhead	*Senecio glastifolius*	holly leaved senecio
Equisetum spp.	horsetail species	*Thunbergia laurifolia*	laurel clock vine
Gymnocoronis spilanthoides	Senegal tea plant	*Tipuana tipu*	rosewood
Hieracium aurantiacum	orange hawkweed	*Trianoptiles solitaria*	subterranean Cape sedge

Weed control contacts

State / Territory	Department	Phone	Email	Website
ACT	Environment ACT	(02) 6207 9777	EnvironmentACT@act.gov.au	www.environment.act.gov.au
NSW	NSW Agriculture	1800 680 244	weeds@agric.nsw.gov.au	www.agric.nsw.gov.au
NT	Dept of Natural Resources, Environment and the Arts	(08) 8999 4567	weedinfo.nreta@nt.gov.au	www.nt.gov.au
Qld	Dept of Natural Resources and Mines	(07) 3896 3111	enquiries@nrm.qld.gov.au	www.nrm.qld.gov.au
SA	Dept of Water, Land and Biodiversity Conservation	(08) 8303 9500	apc@saugov.sa.gov.au	www.dwlbc.sa.gov.au
Tas	Dept of Primary Industries, Water and Environment	1300 368 550	Weeds.Enquiries@dpiwe.tas.gov.au	www.dpiwe.tas.gov.au
Vic	Dept of Primary Industries/Dept of Sustainability and Environment	136 186	customer.service@dpi.vic.gov.au	www.dpi.vic.gov.au www.dse.vic.gov.au
WA	Dept of Agriculture	(08) 9368 3333	enquiries@agric.wa.gov.au	www.agric.wa.gov.au

The above contacts can offer advice on weed control in your state or territory. If using herbicides always read the label and follow instructions carefully. Particular care should be taken when using herbicides near waterways because rainfall running off the land into waterways can carry herbicides with it. Permits from state or territory Environment Protection Authorities may be required if herbicides are to be sprayed on riverbanks.

AQIS import conditions database <www.aqis.gov.au/icon>. Also, take care when travelling overseas that you do not choose souvenirs made from or containing seeds, or bring back seeds attached to hiking or camping equipment. Report any breaches of quarantine you see to AQIS.

Raising community awareness

It is not known exactly how blue hound's tongue was first introduced into Australia. Some 65% of recently naturalised weeds are species that were first introduced into parks and gardens and have since escaped. A comparatively small percentage of weeds first arrived as agricultural species (7%) and as seed contaminants (2%).

The detrimental impacts of invasive plants that escape cultivation invariably outweigh the horticultural benefits. The public should be made more aware of these impacts, and other issues such as how to identify blue hound's tongue and what to do if they find it. For help in identifying it, see below.

Blue hound's tongue is a small herb growing up to 600 mm which can be recognised by its very hairy leaves and stem. The leaves are oblong, and the base of the leaf is heart-shaped where it clasps completely around the stem. Its small pink to blue flowers are present between October and February.

Cynoglossum australe is a native Australian species that is classified as rare in some states and is very similar in appearance to blue hound's tongue. Extreme care should therefore be taken to correctly identify the plant before any control measures are undertaken. *C. australe* has small, slightly fragrant, light blue to white flowers and oval to round fruit. The fruit split into two halves, are smaller than those of blue hound's tongue at 2.5 to 3.5 mm, have many spines around the rim and a variable quantity on the concave surface.

The leaves of blue hound's tongue are toxic to livestock.
Photo: José Darnaude

...case study

The invasion of blue hound's tongue in New South Wales

Blue hound's tongue was first recorded in Australia in the Royal Botanic Gardens in Sydney in 1898. A naturalised population was first noted on a weed-infested slope near Eden in 1933 and was confirmed as present at least until 1976.

While this infestation has not been recently sighted, another has been discovered 10 km to the west, upstream along the Towamba River. It is imperative to ensure that correct identification is made of any species prior to management, especially where native species exist of similar appearance. Samples from this new infestation were sent to the National Herbarium of New South Wales in order to confirm its identity as blue hound's tongue.

In the new location, blue hound's tongue occurs in pasture on two sites near the Towamba River. There are several hundred plants covering about 0.5 ha, with other plants scattered in the surrounding 20–30 ha. The upstream location of these new outbreaks indicates that seed is likely to have been transported there by animals or human activity. These newly discovered sites of naturalised populations of blue hound's tongue represent new sources of seed for further dispersal. This case study highlights the importance of early detection of Alert List species.

Mature plants can produce several hundred seeds. Because the seeds have hooks that easily attach to clothing and hair, they can be spread long distances attached to people or animals.
Photo: José Darnaude

New infestations of blue hound's tongue

Because there are relatively few blue hound's tongue infestations, and it can potentially be eradicated before it becomes established, any new outbreaks should be reported immediately to your state or territory weed management agency or local council. Do not try to control blue hound's tongue without their expert assistance. Control effort that is poorly performed or not followed up can actually help spread the weed and worsen the problem.

Preventing spread

Detailed studies on the ecology of blue hound's tongue in Australia are needed to improve the likelihood of its successful control.

Maintaining a competitive pasture will help reduce the opportunities for undesirable plants to invade. Paddocks infested with blue hound's tongue should not be used for livestock during and after flowering, to prevent the spread of seed. Additionally, where cattle come in contact with blue hound's tongue, they must be thoroughly inspected and cleaned before being transported or moved to new areas.

Biological control

Although insects generally tend to avoid the plant because of the alkaloids in its leaves, some specialist insects are not affected. In Canada biocontrol agents have been released to attack hound's tongue.

Because biological methods are slow-acting processes allowing ongoing control rather than eradication, it is not envisaged that they will be used in the management of blue hound's tongue in Australia, where the weed is targeted for eradication.

Legislation

There is currently no legislation to control blue hound's tongue but, as part of the *Alert List for Environmental Weeds* it is marked for eradication and should not be imported into Australia or further spread.

Acknowledgments

Information and guide revision: Andy Sheppard (CSIRO/Weeds CRC) and John Thorp (National Weeds Management Facilitator).

Map: Base data used in the compilation of distribution map provided by Australian herbaria via Australia's Virtual Herbarium.

If you find a plant that may be blue hound's tongue

Quick reference guide

Identification

You will first need to confirm its identity. Contact your state or territory weed management agency for help in identifying the plant. You will need to take note of the characteristics of the plant in order to accurately describe it. Some important features of blue hound's tongue are:

- dark-green, drooping leaves that are oblong, grow to 200 mm long and 25–35 mm wide and are covered with long coarse hairs; the leaves wrap around the stem at the base
- small (10–11 mm long) pink to blue flowers
- four 'nutlets', or seed capsules, covered with short hooked prickles when mature
- a total height of 600 mm and stems with a thick coat of fine hairs.

Reporting occurrences

Once identified, new occurrences of blue hound's tongue should be reported to the relevant state or territory weed management agency or local council, who will offer advice and assistance on its control. Because blue hound's tongue spreads so easily and poses such a serious threat, its control should be undertaken with the appropriate expertise and adequate resources.

Follow-up work will be required

Once the initial infestation is controlled, follow-up monitoring and control will be required to ensure that reinfestation does not occur.

The stems of blue hound's tongue are covered in fine hairs.
Photo: José Darnaude

Collecting specimens

State or territory herbaria can also identify plants from good specimens. These organisations can provide advice on how to collect and preserve specimens.

State/Territory	Postal Address	Phone	Web
Australian National Herbarium	GPO Box 1600 Canberra, ACT, 2601	(02) 6246 5108	www.anbg.gov.au/cpbr/herbarium/index.html
National Herbarium of New South Wales	Mrs Macquaries Rd Sydney, NSW, 2000	(02) 9231 8111	www.rbgsyd.nsw.gov.au
National Herbarium of Victoria	Private Bag 2000 Birdwood Avenue South Yarra, Vic, 3141	(03) 9252 2300	www.rbg.vic.gov.au/biodiversity/herbarium.html
Northern Territory Herbarium	PO Box 496 Palmerston, NT, 0831	(08) 8999 4516	http://www.nt.gov.au/ipe/pwcnt/
Queensland Herbarium	c/- Brisbane Botanic Gardens Mt Coot-tha Rd Toowong, Qld, 4066	(07) 3896 9326	www.env.qld.gov.au/environment/science/herbarium
South Australian Plant Biodiversity Centre	PO Box 2732 Kent Town, SA, 5071	(08) 8222 9311	www.flora.sa.gov.au/index.html
Tasmanian Herbarium	Private Bag 4 Hobart, Tas, 7000	(03) 6226 2635	www.tmag.tas.gov.au/Herbarium/Herbarium2.htm
Western Australian Herbarium	Locked Bag 104 Bentley DC, WA, 6983	(08) 9334 0500	http://science.calm.wa.gov.au/herbarium/

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