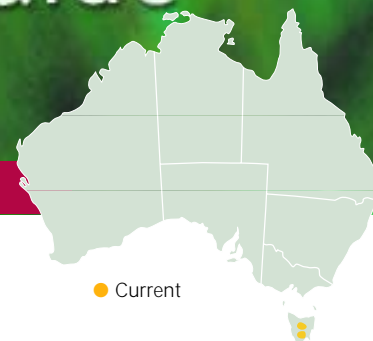


Weed Management Guide

Heather – *Calluna vulgaris*



Heather (*Calluna vulgaris*)

The problem

Calluna vulgaris 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.

Also known as red heath, Scotch heather or ling, *C. vulgaris* grows on poor undeveloped grassland on acid soils, and prefers frost flats, scrub and higher tussock grasslands where the winters are cold. Although *C. vulgaris* seedlings are very small and easily outcompeted by grasses, as a mature plant it forms a dense canopy which can reduce species diversity in sensitive open upland habitats. It is a major weed in many overseas regions, including the World Heritage Tongariro National Park in New Zealand where it is the most widespread exotic weed, and throughout North America. In Australia it has been deliberately planted in gardens and for erosion control, but so far has only naturalised in Tasmania.

The weed

C. vulgaris varies from low-lying mat-like forms to upright ball-shaped bushes and dwarf trees, depending on its environment. It generally grows 0.5–1.25 m tall and is an evergreen perennial shrub with woody, pliable stems. Young



The flowers of *C. vulgaris*, which are bell-shaped with four petals forming a tube, grow on narrow leafy stalks. Photo: Carl Farmer

growth is initially densely hairy but the plant becomes hairless later. Small, stalkless leaves grow in four vertical rows along the branches. The leaves are oblong, up to 3.5 mm long and occasionally downy. They are initially dark green and later turn brown.

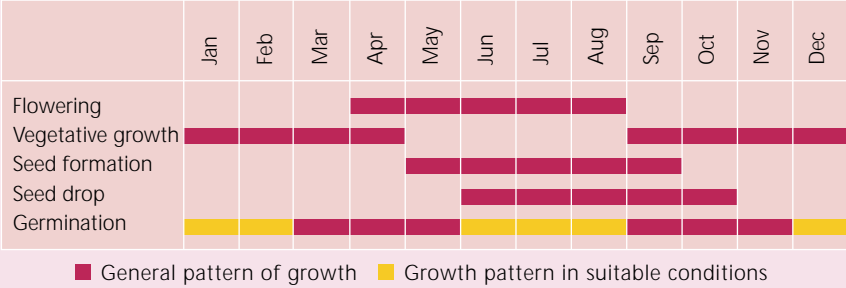
It has bell-shaped flowers, comprising four petals joined into a tube about 2 mm in diameter. The flowers are generally pale purple although pink – and white-flowered plants also occur. The flowers grow on narrow leafy stalks up to 90 mm long, which occur on the upper shoots.

The tiny seeds (0.7 mm long by 0.5 mm wide) are contained in small, hairy, round capsules which are made up of four compartments.

Key points

- *C. vulgaris* is an invasive weed which spreads rapidly and threatens Australia's alpine country.
- Prevention and early intervention are the most cost-effective forms of weed control.
- Although not yet widespread in Australia, *C. vulgaris* is a serious weed overseas.
- A large persistent seedbank of easily spread seed helps *C. vulgaris* to rapidly invade new areas.
- If you see a plant that may be *C. vulgaris*, contact your local council or state or territory weed management agency. Do not attempt control on your own.

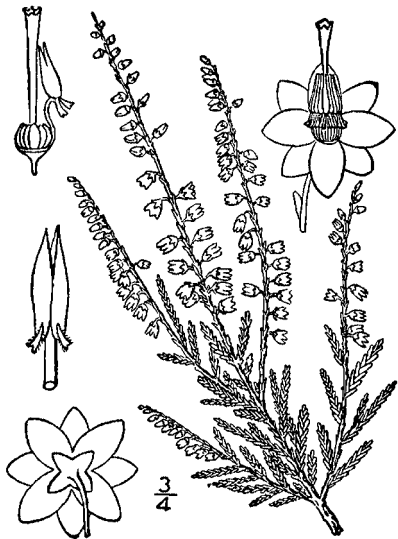
Growth calendar



C. vulgaris produces new leaves and shoots from spring to autumn. Flowers start to develop during autumn and buds open during mid to late winter. As the fruit ripens and seeds develop, the petals turn brown and dry out and the flower moves from hanging downwards (pendant) to an upright position.

In good conditions plants can produce seed within three years, especially following fire. Seeds can germinate all year round but most successful germination occurs during spring and autumn.

Young *C. vulgaris* plants have dense green shoots, which eventually become woody. Plants live for about 30 years.



C. vulgaris has small, stalkless leaves that grow in four vertical rows along the branches. They are oblong and usually hairless; initially dark green, they later turn brown.
Photo: USDA-NCRS Plants

How it spreads

C. vulgaris mainly reproduces by seed. Each plant can produce several thousand flowers and tens of thousands of seeds, with seed production potentially reaching one million seeds per square metre. The tiny seeds can remain viable for extended periods, up to 100 years, and are spread by wind, animals or walkers brushing against the plants. Seeds rarely germinate without exposure to light, and germination increases when seeds are heat treated.

Vegetative reproduction can also take place via a process known as layering, where branches in contact with moist soil can take root and form new plants. *C. vulgaris* also resprouts from surviving stem bases after fire.

Where it grows

C. vulgaris occurs in heathlands, woodlands and above the tree line. It can colonise up to altitudes of 1500 m and is thus a serious threat to Australia's alpine country. It is extremely frost hardy and tolerates waterlogging – it is found in wet bog communities. It is not a threat to improved pastures but could be a problem in alpine grazing lands. It does not tolerate shade and exhibits lower shoot production and reduced flowering in shaded conditions.



The flowers of *C. vulgaris* begin to develop during autumn and buds open during mid to late winter.
Photo: Ralph Forbes, www.habitas.org.uk/flora

Many varieties of heather are grown in cultivation worldwide. *C. vulgaris* is a native of Europe, Asia Minor and northern Africa. It is very adaptable and in Europe grows over a wide range of climates. In the uplands of the United Kingdom *C. vulgaris* forms the dominant component of the vegetation over some two million hectares, where it is considered a valuable food plant for hill sheep.

It is a weed in the high country of both the North and South Islands of New Zealand and has also naturalised in Finland and along the Atlantic coast of North America between Quebec and New Jersey. In Australia it has escaped from gardens in Tasmania and has been recorded in central Tasmania, Bruny Island and around Mt Wellington, flourishing on dark, volcanic soils.

Why we need to be 'alert' to *C. vulgaris*

Because it has a dense canopy during much of its life and forms persistent

leaf litter, sites with vigorous, mature *C. vulgaris* are often virtually devoid of other species. This ability to dominate leads to a severe loss of biodiversity by displacing native vegetation and reducing the range of habitat available to native fauna.

Aside from further spread in Tasmania, alpine and subalpine areas of Victoria, New South Wales and the Australian Capital Territory are threatened by *C. vulgaris*. Because of the cultural, environmental and recreational importance of these unique habitats, the majority are now protected in national parks throughout these regions.

C. vulgaris has been recorded as a weed in many overseas regions, including the high country of New Zealand where it covers an area of over 6000 square km. It is closely related to several other species that are weeds in Australia, including bell heather (*Erica cinerea*) and Spanish heath (*Erica lusitanica*). The latter is an invasive weed near Melbourne, Sydney and Canberra and has a very similar

growth pattern to *C. vulgaris*, although Spanish heath is better adapted to drier conditions.

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 *C. vulgaris*, into uninfested natural ecosystems.

C. vulgaris is being sold as a garden ornamental in some nurseries around Australia. These plants could spread from gardens or be inappropriately dumped into bushland. Notify the vendor or state or

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

territory weed control contacts if you find *C. vulgaris* for sale and plant suitable alternatives species instead (see p.5).

Early detection and eradication are also important to prevent infestations of *C. vulgaris*. 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, heather is currently a permitted import. However, importation of heather to Australia 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 *Calluna vulgaris*. Call 1800 803 006 or see the Australian Quarantine and Inspection Service (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.



The flowers of *C. vulgaris* are usually pale purple, although pink- and white-flowered plants also occur. Photo: Ralph Forbes, www.habitats.org.uk/flora



Raising community awareness

Some 65% of weeds, including *C. vulgaris*, which have recently established in Australia have escaped from plantings in gardens and parks. The detrimental impacts of these weeds far outweigh any potential horticultural benefits. The public should be made more aware of these impacts, and other issues such as how to identify *C. vulgaris* and what to do if they find it.

C. vulgaris can be found in different forms, ranging from low-lying mats to upright shrubs, depending on prevailing weather conditions, degree of grazing and density of nearby vegetation.

Flowers occur on the end of the main stem on short stalks from mid-autumn to the end of winter. They are normally pale purple, although pink and white flowers also occur. The flowers have separate petals, whereas other similar looking closely related heathers (*Erica* species) have a tubular or urn-like flower of fused petals.

New infestations of *C. vulgaris*

Because there are relatively few *C. vulgaris* 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 *C. vulgaris* without their expert assistance. Control effort that is poorly performed or not followed up can actually help spread the weed and worsen the problem.

Methods to control *C. vulgaris*

Because research has been limited, little is known about successful control methods for *C. vulgaris*. Most traditional methods are generally considered inadequate and too expensive. Any attempted control of *C. vulgaris* should be undertaken cooperatively with your state or territory weed management agency or local council. Ongoing follow-up monitoring and control will be required to manage the long-lived seedbank.

Physical control

It is hard to pull or dig *C. vulgaris* because of its fibrous root system. Pieces of roots tend to break off and regrow. Pulling out the plants generally loosens the soil and releases large quantities of seeds, ensuring that *C. vulgaris* is usually the first plant to return.

Frequent slashing encourages resprouting and will not kill plants.

Grazing

Intense sheep grazing pressure, especially in spring, will suppress new growth and flowering and may eventually eliminate *C. vulgaris* after a number of years. Large mature plants may have to be slashed first to give sheep access to new shoots. Light grazing will not be helpful.

Herbicide

In New Zealand herbicide is used to kill *C. vulgaris*. However, there are currently no herbicides registered for use in Australia. Contact your state or territory weed management agency for up-to-date advice.

Fire

Fire helps spread the plant as it requires high temperature for seed germination. In the United Kingdom controlled burning is used to rejuvenate older plants, which resprout following fire, especially if less than 15 years old. In established populations regular fires will actually favour the continued dominance of *C. vulgaris* – therefore fire is not recommended as a control method.

Biological control

The heather beetle *Lochmaea suturalis*, a natural predator of *C. vulgaris* in the United Kingdom, was released in New Zealand in 1996 but has had limited success so far. Trials in New Zealand are investigating integrated management using herbicides and biological control.

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 *C. vulgaris* in Australia, where the weed is targeted for eradication.



C. vulgaris covers over 6000 km² in the high country of New Zealand.

Photo: Landcare Research New Zealand

Replacement from gardens

If you have this plant in your garden, remove it and replace it with a non-weedy species. In Tasmania the Department of Primary Industries, Water and Energy recommends the following local native plants: sweet wattle (*Acacia suaveolens*), native indigo (*Indigofera australis*), guitar plant (*Lomatia tinctoria*), common aotus (*Aotus ericoides*), sunshine wattle (*Acacia terminalis*) and prickly beauty (*Pultenaea juniperina*).

There are also many native heaths (*Epacris* spp.) which are closely related to the non-native species and may be suitable as replacements. Check with your state or territory weed management agency or conservation department for details.

Legislation

There is currently no legislation to control *C. vulgaris* 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), Nigel Ainsworth (DPI Vic/Weeds CRC), Paul Peterson (NZ Landcare Research), Linda Iaconis (DPI Vic) 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 heather

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 *C. vulgaris* are:

- pale purple, bell-shaped flowers with four petals forming a tube
- seeds inside tiny round capsules made up of four compartments
- dark green leaves growing in vertical rows on the branches.

Reporting occurrences

Once identified, new occurrences of *C. vulgaris* 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 *C. vulgaris* 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 from the long-lived seedbank does not occur.



C. vulgaris varies in shape from low-lying mat-like forms to upright ball-shaped bushes and dwarf trees depending on its environment.
Photo: Kate Blood

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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