

TRANSFORMING WEEDS AFTER BUSHFIRE

A BASIC GUIDE TO WEED
MANAGEMENT AFTER FIRE IN
EAST GIPPSLAND

ACKNOWLEDGEMENTS

In 2020, The East Gippsland Landcare Network Inc (EGLN) received funding from the Victorian Government's Biodiversity Bushfire Recovery Grants Program to provide education and information on how to identify and treat weeds that occur after bushfire.

This guide was compiled by EGLN in conjunction with Regional Landcare East Gippsland.

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Front Cover photograph: Matt Stephenson (EGLN)

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INTRODUCTION

In the months following the 2019/2020 East Gippsland Bushfires, weed control was listed high on the priority list for many fire-impacted landholders across the region.

Before this event, many weeds were not widely distributed in East Gippsland and so they were not readily recognisable.

The fires left many landowners in need of information and advice as to how to deal with these new and emerging weeds. This booklet aims to assist landholders with post-fire weed identification and management practices.

PURPOSE

The purpose of this booklet is to provide landholders with practical advice and guidelines to allow them to make informed decisions on:

- The identification of the transformative weeds which thrive on fire-impacted ground
- The prevention of infestation
- Containing and managing weed infestations to minimise spread within their properties and the local area.
- Developing strategies and plans to enable effective weed control follow-up

SCOPE

This is a basic guide for landholders in fire-impacted areas of East Gippsland and aims to minimise the damage of transformative weeds in the landscape.

This guide is designed to complement other publications such as the references on page 24.

This guide does not provide direct instruction in the use of specific chemicals that may be used to control weeds - always refer to the Chemical Safety Data Sheets for best practice.

ROLE OF LANDCARE

Landcare has had, and will continue to have, an important role in the restoration of our landscape. Weed management can be a daunting task for individuals working alone. By working together as a group on both private and public land, Landcare members can achieve a great deal and foster a sense of community. Landcare facilitators and members have been working since the fires on projects involving fencing, erosion control, weed eradication, installing nest boxes and planting.



WHAT ARE TRANSFORMING WEEDS?

Weeds destroy our native plant communities and alter the natural landscapes that make East Gippsland unique. Weeds can provide hiding places for pest animals, which is a risk to our native species. Weeds can also carry diseases, alter the soil pH, and use more water than native plant species.

Weeds have always been an ongoing issue both in the bush and the home garden. Post bushfire, weeds are often better able to outcompete the indigenous species and may need even more attention than usual. In the absence of targeted weed control, weed species rapidly spread and can form a dense 'carpet', outcompeting native species transforming the landscape.

TYPES OF WEEDS

Weeds can be classed into 5 basic types:

1. DECLARED NOXIOUS WEEDS:

In Victoria are plants that have been declared under the Catchment and Land Protection Act 1994 which requires landholders to control and eradicate these weeds. These plants cause environmental or economic harm or have the potential to cause such harm. For example, Blackberry impacts the environment and agriculture. Blackberry forms dense thickets that exclude native species, leading to its complete dominance of the vegetation understorey and eventually the canopy. The thickets also limit people's access, alter fire regimes, and dominate the landscape.

2. NON-DECLARED WEED:

These invasive plants are usually widespread in a region. To prevent their spread, ongoing control measures are required. Landowners have the responsibility to take all reasonable steps to prevent the growth and spread of regionally controlled weeds on their land.

3. AGRICULTURAL WEEDS:

Agricultural weeds threaten crops, horticulture, and pasture production, and can be toxic to humans and stock. They are generally not transforming weeds whose numbers explode after bush fire, so they will only get a mention in passing in this booklet.

4. ENVIRONMENTAL WEEDS:

Weeds that threaten natural ecosystems (e.g. reduce biodiversity). They are capable of invading native plant communities and out-competing native species, resulting in a reduction of plant diversity and loss of habitat for native fauna. For example, in forests, vines (such as Bridal Creeper) smother native plants, resulting in a loss of understorey vegetation

This booklet focuses specifically on:

5. TRANSFORMATIVE WEEDS

This class contains weeds from all the above under certain conditions. Weeds which bring rapid, unexpected change to a landscape/eco system and turn a diverse plant community into a one-species-only zone. This in turn displaces wildlife by removing the usual food/habitat source.



NATURAL REGENERATION AFTER FIRE

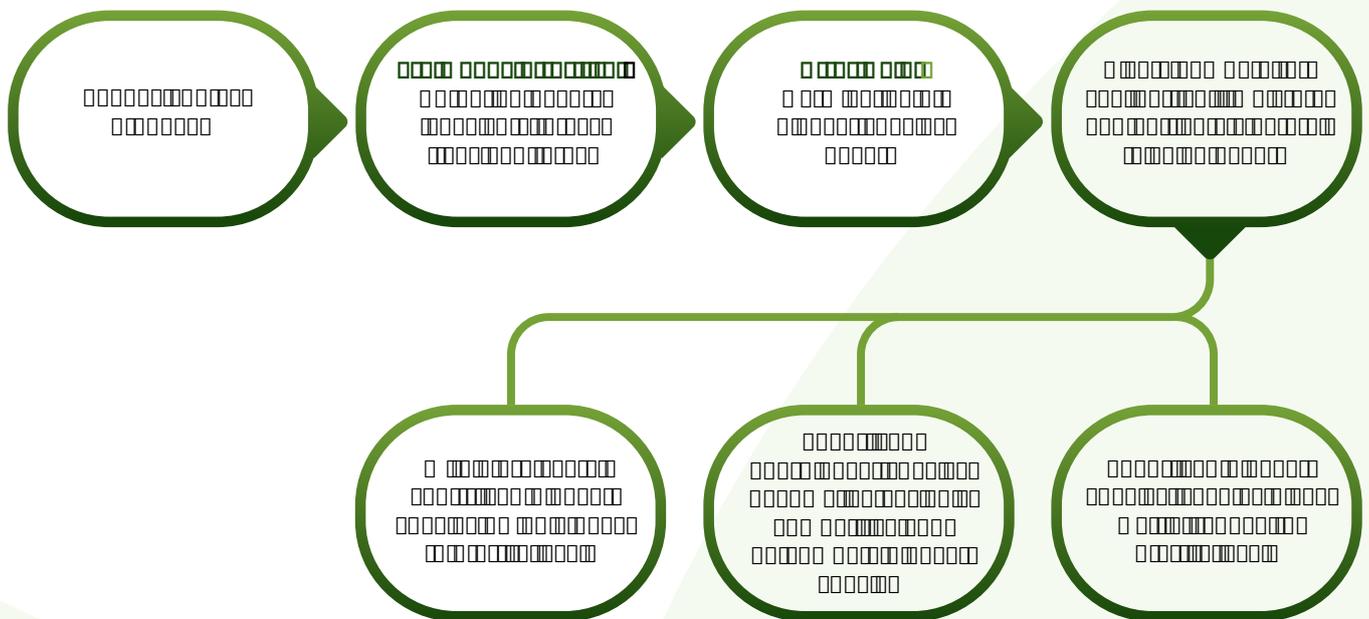
SUCCESSION AFTER BUSHFIRE

Many landholders are extremely concerned with high densities of certain species after fire, especially when they were not overly abundant or even present at all pre-fire.

However, we must also remember that this may be a natural occurrence. Succession means 'the process of going through phases of vegetation'. Much of Australia's flora has evolved to cope with fire, recovering by re-sprouting or setting seed. Some of these plants are referred to as pioneer species and, while they too can have an aggressive growing habit after fire, these plants are very important.



▲ Attending a weed workshop can be a great way to stay up to date with the latest information.



PIONEER SPECIES

After a bushfire, Pioneer species emerge first to both stabilise the ground from erosion and add organic matter to soil. Pioneer species are essential for replacing nitrogen lost during fire.

Pioneer species include:

- Incense, kangaroo apple, nightshade family, fleabane and sow thistle (short-lived)
- Black wattle (long-lived)

If we fight against succession, we may actually see long-term problems as fauna also tend to go through a succession process. If we get rid of all pioneering species, we leave bare

ground and so encourage MORE pioneer species. If we don't take action, such species will eventually thin out of their own accord.

So - we need to be able to distinguish between such pioneering species, and weeds that are likely to cause harm to our environment!



▲ Pioneer species Incense (*Calomeria amarantoides*) growing strongly after fire

SO, WHICH WEEDS SHOULD BE OF CONCERN?

If the land was disturbed or severely burnt then weeds in the following groups may be expected to grow vigorously for the first few seasons post-fire. They are also expected to decrease in abundance and vigour as the bushland re-establishes and matures further. Given this likelihood, control efforts may be a waste of time and resources that could be better directed towards more persistent and pernicious weed species.

HIGH PRIORITY WEED GROUPS

NEW AND EMERGING WEEDS

These weed species are unfamiliar and their (local) ecology poorly known. Following a bushfire, such weeds may emerge due to:

- Vehicles used in fire suppression and management
- Fodder brought into the area after fire either for stock or wildlife.
- Long term soil seed store, perhaps dating back to the last fire.
- Animals travelling further to find food, including into open pasture
- Stock that were removed from the area for protection during the fire and subsequently return
- Heavy rain can lead to flash flooding that washes seed down sloped and watercourses

It may be useful to note where a weed or plant is first noticed. Was it:

- Beside a vehicle track or fire management track?
- In a feed lot?
- Associated with old hay or fodder?
- Associated with ground disturbance from heavy vehicles?

WEEDS THAT RESPOND POSITIVELY TO FIRE

As with many native plant species, there are many weed species that exploit the favourable conditions immediately after fires and germinate prolifically and spread vigorously in the first few seasons after a fire. Such weed species are explored in the focus weeds section of this booklet.

These species gradually establish a long-term soil seed bank that is triggered to germination en-masse by the fires. In the absence of targeted control efforts in the first few seasons after fires, these species rapidly spread and reach a new, more intense level of landscape infestation. As a result, timely post-fire management action (usually within 18 months) is necessary for containment.

LOW PRIORITY WEED GROUPS

BOOM AND BUST WEEDS

The lowest priority for management actions in the first few seasons after fires applies to ephemeral, pioneer, disturbance-specialist species. These species may become locally abundant in the first few seasons after fires, as they vigorously exploit the reduced competition for light and moisture and luxuriate in increased soil nutrients. With the recovery of the native vegetation, many will decrease in abundance to virtual local disappearance (yet a soil stored seedbank may persist). No special management intervention is required to reduce such 'boom and bust' weed species. They will decrease as the effects of the fire disturbance dissipate.

ESTABLISHED WEEDS

Species that are already widespread in the landscape, for which there is no reasonable prospect of meaningful containment, are also a low priority group. If there is no reasonable prospect of containment nor eradication, management intervention may be a waste of time and effort at this time. However, these weeds may rise in priority if the fire creates an opportunity for local eradication due to improved access.

WEED CONTROL: PLANNING

Once you have correctly identified the weed/weeds, then you need to develop a management program for containment or eradication.

The management approach will ideally:

- Provide a long-term approach.
- May use more than one control method (integrated).
- Emphasise strategic rather than continual use of farm chemicals.
- Minimise costs.
- Minimise environmental damage.
- Involve working with neighbours to ensure containment and widespread control.

Key inclusions in your management plan are:

YOUR LEGAL RESPONSIBILITIES

The importance of determining if the target species is truly a weed cannot be overstated. Land managers have legal obligations under the *Catchment and Land Protection Act 1994* (CaLP Act) to control noxious weeds. Further information about the CaLP Act, as well as up to date lists of all declared noxious weeds can be found at www.agriculture.vic.gov.au

POTENTIAL OFF-TARGET IMPACT

Likely (or even only potential) adverse outcomes of weed management should be considered. These are particularly critical where listed rare or threatened species or vegetation type(s) are in the area affected by weed control works. No management action (or inaction) is without downsides. Management is always a balance between the expected positive outcomes and the expected negative outcomes, considered in association with costs. Rare and threatened species or communities may be adversely affected by weed control works, particularly through the use of herbicide and ground disturbance.

A number of existing documents are available to assist with the prioritisation and planning of weed control. See the reference section for further details.

MANAGING WEEDS / CONTROL METHODS

Weeds can be managed using a variety of tools and approaches, a variety of which are mentioned on the following pages. There are pros and cons for all methods and so often a combination of approaches is required as part of a weed management plan.



▲ Mechanical removal



▲ Growing seedlings for revegetation



▲ Agapanthus that has been hand-pulled



▲ Steam weeding

CONTROL METHODS: NON-CHEMICAL

Non-Chemical Control methods are suitable for a range of weeds. Such methods may include:

HAND PULLING / GRUBBING

Very effective in small areas or with isolated plants. Some plants will regenerate unless all root material is removed. In 'Grubbing', a hoe or shovel may be used to remove the whole plant from the ground.

SLASHING OR MOWING

A tractor, slasher or whipper snipper is used to cut plants. May be used to delay seed production until a more permanent means of control can be undertaken. Care must be taken as weeds can easily be spread.

MECHANICAL

Use of heavy machinery Suitable for initial removal of large infestations of woody weeds. Often followed by other forms of control.

Caution: Some weeds are spread through movement of contaminated machinery, ensure machinery is clean before shifting to a fresh site.

BURNING

Large tussocks may be burned to reduce the biomass (such as burning African Lovegrass tussocks to reduce the amount of chemical required to treat the new germinants before they go to seed).

SOLARISATION

A technique that blocks light and uses the heat from the sun to "cook" weeds. Usually involves a plastic sheet to cover the area, sealed tight by burying the edges and left in place for four weeks or more.

MULCHING / SMOTHERING

Involves placing a thick layer of material on the ground surface through which weeds struggle to penetrate.

PASTURE CROPPING / REVEGETATION

Plant competition is an important means of weed control. In a pasture situation, increasing competition through good grazing management and by addressing soil fertility will help to control many weeds. Often weed control programs should include revegetation with suitable, local native plants.

STEAM WEEDING

'Steam weeding' is an option on some sensitive sites where less chemical usage on weed control would be advantageous. Entirely chemical-free, steam weeding can quickly and safely eradicate any type of weed with long term results and no lasting chemical residue. Using low-pressure water super-heated to 120°C just the weeds you want to kill can be targeted without killing plants nearby, disturbing mulch, garden beds or upsetting soil biology.

CONTROL METHODS: CHEMICAL

IMPORTANT: If chemical control is necessary near drainage lines or streams, use extreme caution as the effects on aquatic life can be devastating even in minute amounts. Always seek expert advice. When using chemical always refer to Safety Data Sheets (SDS) for best practice to ensure your safety and follow the guidelines for personal protective gear (PPE).



▲ Example of PPE



▲ Weed spraying drone

CUT & PAINT

Suitable for many woody weeds and some climbing creepers. The plant is cut off close to the ground and herbicide applied immediately to the cut surface. A staggered pruning technique may be used for larger trees with herbicide applied at the last cut.

SCRAPE & PAINT

A variation of cut and paint that is more appropriate for treating large woody, vine-like weeds. The outside bark of a vine is removed with a knife and the exposed inner tissue immediately painted with herbicide.

DRILL & FRILL

Chips or frills are made into the trunk of a woody weed close to the base of the trunk with an axe or tomahawk with herbicide applied immediately. Cuts to penetrate through the hard outer bark and just into the soft bark. Alternately, an angled hole can be drilled into the sapwood just below the bark and herbicide applied immediately. Refer to the chemical label. This method wouldn't be needed in the early stages of a weed's growth.

SPRAY

An appropriate herbicide is applied as fine droplets to the surface of foliage using a knapsack or spray unit. Alternatively, drones can now be used for small, targeted spraying jobs.

When using chemical keep in mind:

- Some chemical products will require an Agricultural Chemical Users Permit.
- Always read the label on the product and follow the directions on usage and handling.
- Always wear protective clothing and use clean equipment.
- Chemicals should be used on weeds which appear on the product label.
- Always freshly mix the amount to do the job, most chemicals will lose their effectiveness within 24 hours.
- Apply herbicides at the appropriate rate as specified on the label and follow all safety precautions.
- Spray when plants are actively growing.
- Do not spray in high temperatures or if rain is forecast within 24 hours.
- Beware of spray drift reaching non-target species. Do not spray in strong winds or when wind is blowing towards sensitive areas or crops.
- If in doubt, contact your local Department of Environment, Land, Water and Planning office, local council or Landcare facilitator.

CONTROL METHODS: BIOLOGICAL

Weed biocontrol is considered by some to be a more sustainable approach to weed control. This utilises a weed's specialist natural enemies (such as insects or fungi) to reduce the impact of the weed. These 'biocontrol agents' are self-sustaining, making them an effective method for long-term weed control. However, it should be noted that control can take many years, perhaps decades, of commitment.

Scientific studies have demonstrated that different biocontrol agents can reduce weed populations with no adverse effects on native Australian flora and fauna or human health.

Points to consider when planning for Biological control:

- The use of biocontrol agents alone may not be sufficient to meet legal obligations to manage certain weeds as required by law.
- Minimal site disturbance is required post release to ensure the establishment and dispersal of the agent. In agricultural settings, fencing may be required to exclude livestock from the release site.

There are some great detailed manuals on biological control, some which can be found in the Reference section on page 24.



▲ *Biological control of bridal creeper with rust spore*

FOCUS PLANTS

This section focuses on 13 plants that were noted as highly prolific after the Black Summer fires. The weed species were generally classed as high priority for control.

However, it is important to note that not everything that grows prolifically after fire is a weed and/or requires control. It can be very challenging to tell the difference between native and weed plants that respond to fire.

We acknowledge that there are many weeds that are not included here and each situation will vary. Further plants are listed in the 'Table of Common East Gippsland Plants' on page 23.

The following methods of treatment/control are suggested for the focus plants. They are represented by the symbols below:



Herbicide application – applying chemical to a plant usually by foliar spray. Can also be applied by cut and paint method as described below.



Physical control – usually hand pulling weed and removing whole plant from ground (such as Boneseed seedlings)



Cut and paint – cutting stump or trunk and applying chemical (such as cutting Cape Ivy stems and applying chemical to cut stem or cutting large Willows and applying chemical to stump)



Grubbing – use hoe or shovel to remove whole plant from ground (such as isolated Chilean Needlegrass germinants in native grass areas)



Slashing – use tractor and slasher or whipper snipper to cut plants (such as annual weeds like fleabane to reduce their capacity to disperse seed)



Cropping – use pasture grasses etc to out compete weeds (such as Rye grass to out compete African Lovegrass)



Burning – burn large tussocks to reduce biomass (such as burning African Lovegrass tussocks to reduce the amount of chemical required to treat the new germinants before they go to seed)

FOCUS PLANTS: WEEDS

TRANSFORMING WEEDS AFTER BUSHFIRE

WEED NAME: BLACKBERRY (*Rubus fruticosus*)

Description: Blackberry is a perennial, semi-deciduous, prickly, scrambling invasive shrub, with arching and entangling stems arising from a woody crown and forms thickets up to several metres high. The root and crown system is the only perennial part of the plant. 5-petalled white to pink flowers.

Dispersal: Blackberry fruit are eaten by birds, foxes and other mammals which distribute seeds over wide areas. Seeds are transported by water along creeks, drains and rivers and also movement of contaminated soil can spread blackberry.

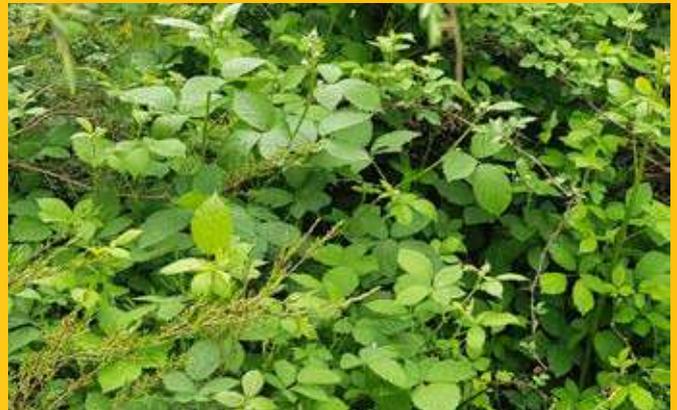
Impact: Blackberry is a serious environmental threat and is highly invasive. It can provide harbour and a food source for pest species, as well as serve to outcompete and eliminate other vegetation by excluding light from the soil surface. In its early stages of infestation, blackberry will grow over, or occupy gaps in, native vegetation and, in later stages, can severely restrict regeneration in native forests.

After Fire: Regenerates from underground bulbs after fire. Can also regenerate from seed.

Suggested methods of control:



Optimum suggested Treatment Methods and Timings for East Gippsland Area: Best time for herbicide application is during flowering (typically from October to December) but can be done from October to April. Any time for other treatments.



▲ Blackberry



▲ Blackberry stem



▲ Blackberry leaf

FOCUS PLANTS: WEEDS

WEED NAME: BLUE PERIWINKLE

(*Vinca major*)

Description: Ground cover, a trailing herb. Smooth dark green oval-shaped leaves, 4-8cm long and 1-5cm wide. Blue-purple flowers with 5 petals, 3-5cm in diameter.

Dispersal: Stems set roots when in contact with the ground. Stems can be transported by machinery and water. Poisonous to stock.

Invades: Fertile soils, primarily in damp, shaded areas in forests, coastal areas, woodlands and along waterways, drainage lines and roadsides.

Impact: Can dominate the understorey and exclude native species.

After Fire: Will regenerate after low-moderate intensity fires. May be killed by high intensity fires.

Suggested methods of control:



Optimum suggested Treatment Methods and Timings for East Gippsland Area: Best time for herbicide application is September to November – requires ongoing grubbing of regrowth.



▲ *Blue Periwinkle*



▲ *Blue Periwinkle foliage and flower*

FOCUS PLANTS: WEEDS

TRANSFORMING WEEDS AFTER BUSHFIRE

WEED NAME: BONESEED (*Chrysanthemoides monilifera*)

Status: Priority Weed - Regionally prohibited in East Gippsland

Description: Woody Shrub up to 3m. Fleshy leaves 3-9cm long with irregular toothed edges. Yellow flowers (2-3cm in diameter) with 4-9 petals, round fruit that are black when mature. Seed is 'bone'-coloured when dry. Plants can live for 10-20 years.

Dispersal: Fire stimulates seed germination. Mature plant can produce 50,000 seeds that are readily dispersed by animals and birds. Seeds are very long-lived.

Invades: Coastal dunes, estuarine areas, heath, woodland, dry and wet sclerophyll forest. Does not tolerate water-logged conditions.

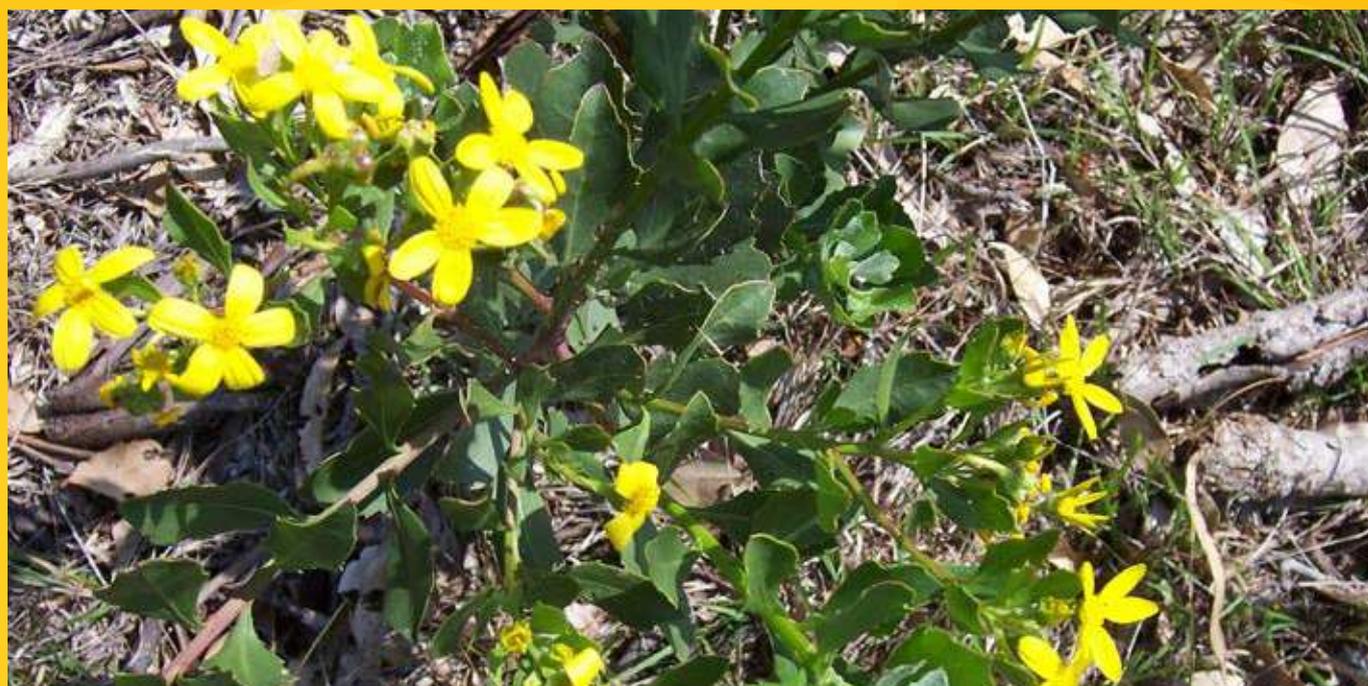
Impact: Dense infestations of boneseed reduces the ability of native trees and shrubs to regenerate. It outcompetes native understorey plants.

After Fire: Depends on the timing of the fire - fire before they set seed will assist to control the plant but otherwise a very successful invader of native bushland especially after a disturbance such as fire which can trigger mass germination events. Outcompetes and displaces native vegetation.

Suggested methods of control:



Optimum suggested Treatment Methods and Timings for East Gippsland Area: All year control - Plants should be hand pulled or grubbed whenever found to keep infestation area as small as possible. Boneseed does not persist when grazed or cultivated. Need to reduce the size of the seedbank and prevent fresh seed fall - follow-up control of seedlings is critical.



▲ *Boneseed in flower*

FOCUS PLANTS: WEEDS

WEED NAME: CAPE BROOM

(*Genista monspessulana*)

Description: Evergreen, perennial shrub up to 3m, can form into dense thickets. Young stems are ridged, green and lightly hairy, becoming woody and hairless with age. Leaves are trifoliate (three-leaflets) on a central short stalk, with the centre leaflet being slightly longer than the outer two. Leaves are hairy mainly on their undersides, are oblong in shape and often end in a short point. Flowers are bright yellow and pea-like 8–12 mm long growing in clusters of 3 to 9. Pods are hairy all over, brown to black in colour, 15–25 mm long and 3–5 mm wide containing 5–8 seeds.

Dispersal: Fire stimulates mass germination of long-lived seeds.

Invades: Forest margins and riparian areas.

Impact: Infestations shade and crowd out smaller shrubs and ground-flora species.

After Fire: Fire usually kills the adult plant, but persistent soil seedbank is triggered to germinate leading to massive seedling recruitment. Site disturbance during fire suppression activities will encourage germination.



▲ Cape Broom

Suggested methods of control:



Optimum suggested Treatment Methods and Timings for East Gippsland Area: All year control - Plants should be hand pulled, grubbed or sprayed with herbicide whenever found to keep infestation area as small as possible.



▲ Cape Broom seedling

FOCUS PLANTS: WEEDS

TRANSFORMING WEEDS AFTER BUSHFIRE

WEED NAME: FLEABANE

(*Conyza bonariensis*)

Description: Annual or perennial erect herb, to 1m, in the daisy family. On maturity produces compact seed heads with a parachute of fine hairs. A short-lived herbaceous plant developing a basal rosette of leaves at first. Seedling leaves are football shaped. Upright branched stems are densely hairy. Mature lower leaves (4-10 cm long) are elongated in shape, bluntly toothed and grey to green in colour. Small flower-heads (6-12 mm across) do not have any obvious 'petals' and turn whitish and fluffy as they mature.

Dispersal: Light fluffy seeds are readily dispersed by wind. Also spread by water, garden waste and vehicles.

Invades: Occurs typically on disturbed sites such as roadsides, and riverbanks. Essentially a fresh-water species, but also found fringing saltmarsh and saline swamps and lakes.

Impact: Grows quickly. Dense stands can smother native vegetation, particularly in grassy remnant vegetation of farming areas. However, it is a poor competitor and undergoes significant decrease with increasing competition

After Fire: Short-lived Pioneer that grows quickly in disturbed areas.

Suggested methods of control:



Optimum suggested Treatment Methods and Timings for East Gippsland Area: Best time to control is Spring before seeding - Preferred method of control is to slash before flowering and seeding. Herbicides can be used but this may be difficult as glyphosate resistant. Attack all parts of weed life cycle and keep seedbank low.



▲ Fleabane in flower



▲ Fleabane seedling



▲ Flaxleaf fleabane after fire

FOCUS PLANTS: WEEDS

WEED NAME: GREAT MULLEIN *(Verbascum thapsus)*

Description: Hairy biennial plant that can grow to 2.5m. Leaves are grey-green densely covered with matted layers of hairs. Young plant is large rosette, mature plant has ovate to elliptical leaves, 8-50cm long at the base which graduate to smaller leaves higher up the plant. Yellow flowers. Plant can produce 250,000 seeds. Plant poisonous to stock. Once established, grows vigorously.

Dispersal: Seed easily moved by water and soil movement. Seeds have long-term viability but most fall within 1 metre of parent plant.

Invades: areas of low fertility (rocky outcrops, roadsides or unimproved pastures.) Mullein is a potential inhabitant of nearly any vegetation or community type if ground disturbed in areas of low canopy cover.

Impact: Once established can be difficult to eradicate due to long-term nature of seedbank. However, the mullein plant is a short-lived member of disturbed communities whose abundance decreases with increased time since disturbance. Can affect the recruitment of natural flora and grasses.

After Fire: Plant capable of spreading quickly if seedbank present, especially in areas of disturbed habitat with little other vegetation. High level of germination possible in a wide range of temperatures.

Suggested methods of control:



Optimum suggested Treatment Methods and Timings for East Gippsland Area: All year-round control - herbicide application is possible but preferable to grub out as usually limited numbers. Early treatment advised before seeds form. Great mullein is easily controlled through pasture improvement



▲ Great Mullein



▲ Great Mullein
Image: Forrest and Kim Starr, Starr Environmental, Bugwood.org

FOCUS PLANTS: WEEDS

TRANSFORMING WEEDS AFTER BUSHFIRE

WEED NAME: INKWEED

(*Phytolacca octandra*)

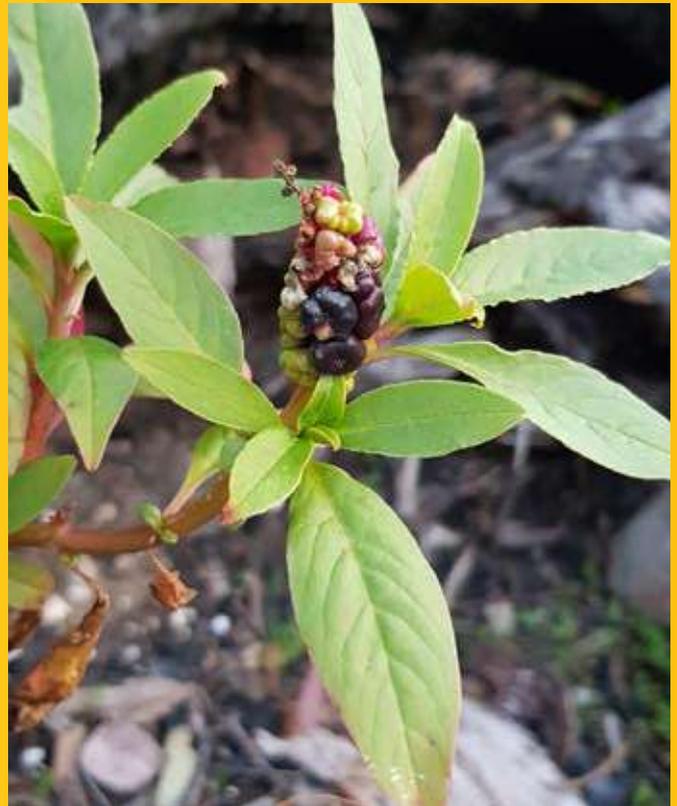
Description: Short-lived erect perennial herb up to 2m. Green oval leaves that are 4-25cm long turning red with age. Several erect spikes of small greenish-white 5 petal flowers. Flower head stalk 5-15mm long. Fruits turn reddish-black when mature.

Dispersal: Seed dispersed by birds with potential to colonise large areas of bare ground.

Invades: Common on newly cleared land - likes disturbed sites including roadsides and pastures. Prefers sandy soils. Grows and matures quickly, producing many well dispersed, long-lived seeds. Tolerates damage, wind, fire, all loose soils, and wet to moderately dry conditions, but is intolerant of deep shade, deep humus and heavy frost.

Impact: May be toxic to cattle but not proven. Competes for space and nutrients in pioneer plant communities and can temporarily inhibit the establishment of seedlings of native plant species. Normally followed by native species, but can also be followed by vines or other weeds.

After Fire: Plants reshoot from the base.



▲ Inkweed fruit ripens to a black colour

Suggested methods of control:



Optimum suggested Treatment Methods and Timings for East Gippsland Area:

All year-round control - Herbicide application is possible, but grubbing is preferable. Be careful to remove all taproot as the plant may regrow.

NOTE: As a pioneer plant, if found on a regenerating shady site or if ground cover is becoming dense, it will be outcompeted.



▲ Inkweed seedling



▲ Immature inkweed fruits



▲ Inkweed

FOCUS PLANTS: WEEDS

WEED NAME: JAPANESE HONEYSUCKLE *(Lonicera japonica)*

Description: Robust scrambler or climber reaching up to 10m. Oval shaped leaves up to 8cm long and 4cm wide. Fragrant white flowers are in pairs with two lips. Upper lip has 4 lobes. Fruit are oval shaped, 1cm long and black when ripe.

Dispersal: Mass germination after fire, reshoots from roots and suckers.

Invades: Disturbed areas including moist gullies, forests and bushland.

Impact: Smothers and out-competes native vegetation and prevents the regeneration of native species. Toxic to humans, causing discomfort and irritation but is not life threatening.

After Fire: Out-competes native vegetation for light and soil nutrients. Fire may remove aboveground vegetation and reduce new growth but does not destroy roots, which will continue to produce sprouts.

Suggested methods of control:



Optimum suggested Treatment Methods and Timings for East Gippsland Area: All year-round control - Herbicide application is possible but it is preferable to cut and paint stem at base.



▲ *Japanese Honesuckle*



▲ *Japanese Honesuckle flower*

FOCUS PLANTS: NATIVES

TRANSFORMING WEEDS AFTER BUSHFIRE

Following the 2019-20 Black Summer fires, the following plants were found in abundance in the region and landholders were unsure whether this was an issue. Remember: some pioneer species are native plants and will grow in abundance following fire in order to stabilise the soil and enable other natives to thrive at a later time. Over time, these plants will return to pre-fire levels so control is generally not necessary or the best course of action. Any action taken will be location dependent - for example, some thinning may be advisable in areas close to houses.

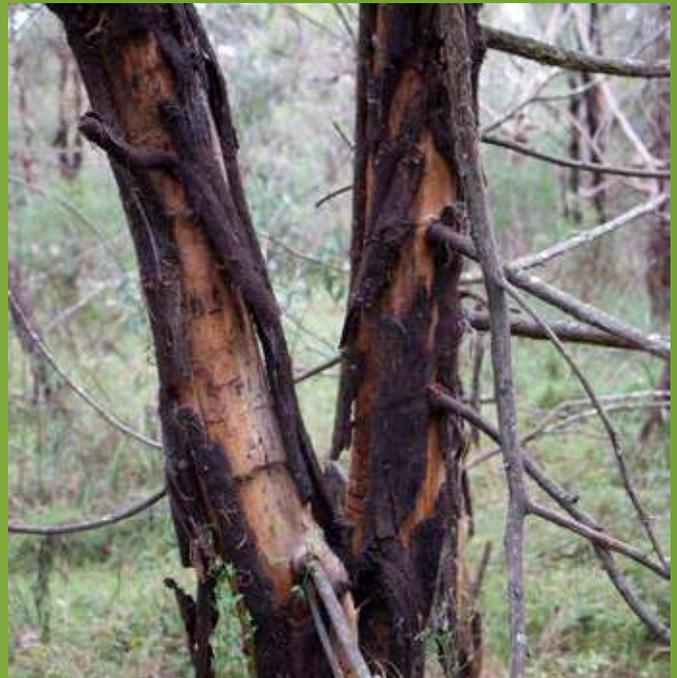
NAME: BLACK WATTLE
(*Acacia mearnsii*)

STATUS: NATIVE

Description: Tree - up to 15m

Benefits: This early coloniser species has nitrogen-fixing nodules on the root nodes. This is important for nutrient cycling and the regeneration of other tree species. Regenerates freely via seed or suckers, especially after disturbance such as fire or earthworks. Has the ability to improve soil fertility through 'fixing' nitrogen. While relatively short-lived (15-20 years), this fast growing species is an excellent habitat plant and food source attracting seed and insect-eating birds, native butterflies and moths, gliders and possums. As they mature, the peeling bark forms a safe harbour for insects and microbats. The thick growth of this pioneer species forms a deterrent to weed growth.

After Fire: PIONEER SPECIES that grows quickly.



▲ Mature Black Wattle bark can be a safe harbour for insects and microbats



▲ Black Wattle leaf



▲ Young Black Wattle green bark



▲ Black Wattle regrowth

FOCUS PLANTS: NATIVES

NAME: FIREWEED
(*Senecio linearifolius*)

STATUS: NATIVE

Description: This native *Senecio* is often confused with the weed Fireweed (*Senecio madagascariensis*) and demonstrates the importance of correct plant ID. The native species is up to 900mm higher than the weed species. Also the petals of the native species are shorter and fewer (8 or fewer, compared to 13) with much larger leaves that are conspicuously veined on the upper surface and the margins are fine, regularly toothed and recurved. The differences in the leaves are apparent in seedlings as well as mature plants.

After Fire: PIONEER SPECIES - Regenerates from seed in cool moist soils in foothill forests and woodlands. Colonising plant especially after fire and other disturbance.



▲ Native fireweed growing prolifically after fire



▲ A comparison of the flowers of the native *Senecio linearifolius* (left) and invasive *Senecio madagascariensis* (right)

FOCUS PLANTS: NATIVES

NAME: INCENSE PLANT
(*Calomeria amaranthoides*)

STATUS: NATIVE

Description: Biennial erect herb from the daisy family up to 3m. simple, alternate leaves and large, branched pyramid-shaped panicles of very small, tubular flower heads in summer. sticky stems and leaves which are green above and whitish beneath and are up to 12-25 cm long and 8-10 cm wide. Flower heads are 40-60 cm long with branches drooping and with numerous small (1mm diameter) brown to rose pink flowers. Crushed leaves are reported to smell like either incense or cat wee.

After Fire: PIONEER SPECIES. A coloniser species of flood-prone riverbanks or damp forests regenerating after fire.



▲ *Incense seedling*



▲ *Incense regenerates after fire*



▲ *Incense regrowth*



▲ *Incense plants can grow to around 3m*

FOCUS PLANTS: NATIVES

NAME: KANGAROO APPLE
(*Solanum aviculare*)

STATUS: NATIVE

Description: Shrub - up to 3m. Thin shiny dark green leaves

Fire stimulates mass germination of long-lived seeds. It is a fast-growing, short-lived plant that provides shelter for the germination of shade dependent plant species after fire. Also provides bird habitat. However, unripe fruits are poisonous and may be poisonous to cattle.

After Fire: PIONEER SPECIES



▲ Kangaroo apple



▲ Kangaroo apple leaf

NAME: NATIVE PASSIONFRUIT
(*Passiflora cinnabarina*)

STATUS: NATIVE in Eastern Victoria but can be regarded as an environmental weed in outside its native range. (A tricky one to classify!)

Description: A vigorous tendril climber or scrambler. Tri-lobed leaves which are dark green in colour and up to 10cm long. Red flowers are seen mainly in spring to summer, about 5cm in diameter and followed by ovoid, greyish-green fruits about 3cm in diameter containing greyish pulp and numerous black seeds. The pulp is edible but not especially palatable.

After Fire: Readily re-germinates from seed after fire.



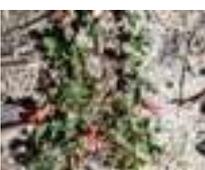
▲ Native passionfruit flower. Image: John Hermans



▲ Distribution of native passionfruit

TABLE OF COMMON EAST GIPPSLAND PLANTS AFTER FIRE

Other plants may also be noticed after fire. Some are listed below.

NAME	METHOD OF CONTROL	WEED OR NATIVE?	NOTES
African Lovegrass 	   	Weed	Densely tufted perennial grass to 120cm high Easily spread by vehicles after fire. All year-round control is required but some chemicals are more appropriate at certain times of year (read label) Grubbing isolated plants is preferable. For heavier infestations burn then apply herbicide. Cropping can be successful and competitive pasture established.
Chilean Needlegrass 	   	Weed	Perennial grass to 1m high. All year-round control is required but some chemicals are more appropriate at certain times of year (read label) Grubbing isolated plants is preferable. For heavier infestations burn then apply herbicide. Cropping can be successful and competitive pasture established.
Cape Ivy 	  	Weed	Non-woody, scrambling vine to 10m, Reproduces via seed and/or stems. Physical removal can be undertaken anytime. Any herbicide application should be done at flowering. Stems can be cut and painted.
Spanish Heath 	 	Weed	Woody Shrub to 2m. Regenerates from seed and suckers from roots. All year-round control. Plants should be hand pulled or grubbed when found to maintain as small an infestation area as possible.
Apple of Sodom 	 	Weed	Shrub to 2m. Herbicide application September to March. Physical removal all year round.
Hop goodenia 		Native	Shrub to 2m. Early coloniser providing shade and food source.
Eastern Nightshade 		Native	Small shrub to 1.5m. Matures quickly. Food source for birds and lizards.
Running Postman 		Native	Ground cover /climber to 3m. Important food source for butterflies and moths.

USEFUL INFORMATION AND REFERENCES

WEED/PLANT IDENTIFICATION APPS

If you are unsure of the identification of a plant, then there are a number of apps available for use. However, only two of these are Australian. You can generally upload a photo of the plant and the app will provide identification suggestions. When using such apps, please remember that no ID app is perfect - you still need to check the similarities and differences in the plants to determine identification.

FREE APPS:



PlantNet
(www.identify.plantnet.org)



Leafsnap
(<https://plantidentifier.info>)



Flower Checker (3 free IDs then fee per ID)
(www.flowerchecker.com)



PlantSnap
(www.plantsnap.com)



Plant Identification Australia
Facebook Page

PAID APPS:



Picture This (www.picturethisai.com)



Plant Identification Australia
(only available on IOS/Apple)



iPlantfile Pro
(Australian but does not allow photo ID)
(www.plantfile.com.au)

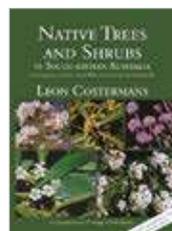


Early Invader Manual (WESI)



WESI Weed Management After Fire Webinar Series

(available as recordings): <https://tinyurl.com/WeedsAfterFire>



Native trees and shrubs of south-eastern Australia

Leon Costermans



Biocontrol Manual

NSW Department of Primary Industries



<http://www.weedfutures.net> - a decision-support tool that provides users with the ability to interrogate individual profiles for over 700 non-native naturalised and invasive plant species within Australia and assess weed threats for regions of interest under current and predicted future climates.



Agriculture Victoria Weeds Information:

agriculture.vic.gov.au/biosecurity/weeds



Weed Society of Victoria:

www.wsvic.org.au



Vicflora - Royal Botanic Gardens Victoria:

www.vicflora.rbg.vic.gov.au

USEFUL CONTACTS

East Gippsland Landcare Network: landcarevic.org.au/groups/eastgippsland/egln

Far East Victoria Landcare: fevl.org.au

Snowy River Interstate Landcare Committee:
snowyriverinterstatelandcare.net

East Gippsland Catchment Management Authority:
egcma.com.au

DELWP: delwp.vic.gov.au

East Gippsland Shire Council (Environment department):
eastgippsland.vic.gov.au

Agriculture Victoria: agriculture.vic.gov.au

Weeds at Early Stage of Invasion (WESI): environment.vic.gov.au/invasive-plants-and-animals/early-invaders

