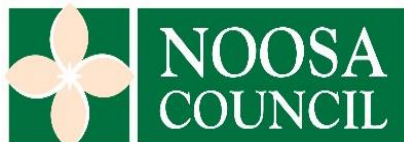




# KIN KIN CATCHMENT CATS CLAW CREEPER & MADEIRA VINE MANAGEMENT STRATEGY 2018-2023





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February 2018

## Acknowledgements;

This document and supporting digital mapping files has been prepared by Noosa & District Landcare Inc. with the guidance and support of Noosa Shire Council, Healthy Land & Water and the Noosa Biosphere Reserve Foundation.

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## Document Tracking

Item	Detail
Project Name	Kin Kin Catchment Cats Claw Creeper & Madeira Vine Management Strategy 2018-2023
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# 1.0 OVERVIEW AND BACKGROUND

## 1.1 STRATEGY OBJECTIVES

The plan objective is to outline an effective strategy for best practice management of the transformer species Cats Claw Creeper (CCC) (*Dolichandra unguis-cati*) and Madeira vine (*Anredera cordifolia*) given current conditions within the Kin Kin Creek catchment. Both vines are invasive weed species of riparian areas and occurs within the Kin Kin Creek riparian zones in infestations of varying degrees.

CCC and Madeira vines are major threats to endangered Lowland Rainforest ecological communities and are identified as a Priority Pest Species in Noosa Council's *Pest Management Plan* and listed as Weeds of National Significance (WONS). This plan aims to guide coordination of effort and support previous investment by various stakeholders in on-ground work in addition to programs such as the Noosa Landcare initiated Cat's Claw Creeper/Tingid Bug program.



## 1.2 CATS CLAW CREEPER & MADEIRA VINE DESCRIPTIONS

### 1.2.1 CATS CLAW CREEPER VINE

Cat's claw creeper, originating in central and south America, is an aggressive climbing vine with the habit of smothering other vegetation. It is what is called a 'transformer' weed in so far as its ability to transform entire vegetation communities both structurally and floristically.

The vine has a vigorous root and tuber system in addition to the ability to producing prolific seeds with papery wings (called samaras) which enable dispersal by water and wind. It can also reproduce vegetatively from tubers and creeping stems.

Further information on Cats claw creeper can be found within the Biosecurity Qld's Fact Sheet contained in Appendix 1.



FIGURE 1 - CATS CLAW CREEPER FLOWERS (ABOVE), SEED PODS & TUBERS (BELOW)

### 1.2.2 MADEIRA VINE

Madeira Vine also originates from tropical South America. It is an evergreen long-lived climber that rapidly grows from rhizomes. It is also known as a “transformer” weed that smothers trees causing structural damage and canopy collapse.

It reproduces vegetatively by the production of numerous aerial and subterranean tubers that can persist in the environment for several years after initial treatment. The vine does not produce viable seed in Australia.

Further information on Madeira Vine can be found within the Biosecurity Qld’s Fact Sheet contained in Appendix 2.

## 1.3 CATCHMENT BACKGROUND

The headwaters of Kin Kin creek and its tributaries have their origins in the Beenham, Wahpunga and the Wolvi Ranges. Major tributaries of Kin Kin Creek include Kin Kin Eastern Branch, Kin Kin Western Branch, Sister Tree Creek, Wahpunga Creek, Kinmond Creek, Sandy Creek and Eulama Creek. Total stream length of Kin Kin Creek and its associated tributaries is 93 kilometres (Earth Tech, 2002).

Kin Kin Creek drains a catchment area of approximately 160 square kilometres or 20055 hectares (NDLG, 2017).

The Kin Kin Catchment once contained large tracts of Lowland Rainforest of Subtropical Australia. This vegetation community is now recognised as being Critically Endangered due to land use practices post-European contact. The main ongoing threats to the Kin Kin Catchment and the Lowland Rainforest ecological communities are creek erosion, uncontained livestock, overgrazing and weeds.



FIGURE 2 - MADEIRA VINE SUCKERS (TOP), RHIZOMES (ABOVE) & FLOWERS (BELOW)



## 1.4 PREVIOUS ACTIVITIES

Awareness of Cats Claw Creeper vine and actions to manage infestations in the Kin Kin catchment have been occurring for many years. Within the last 5 years, significant investment from both Healthy Land & Water (ex SEQ Catchments), Noosa Landcare and Noosa Council have occurred.

A map identifying sites receiving on-ground chemical and manual control effort via Noosa Landcare is contained in Figure 3.

Madeira Vine historically has been less targeted for control in the Kin Kin Catchment, but has been typically treated where co-located with Cats Claw Creeper Vine.



FIGURE 3 - FRILLING OF CCC VINES - VINES ARE CUT AND SWABBED.

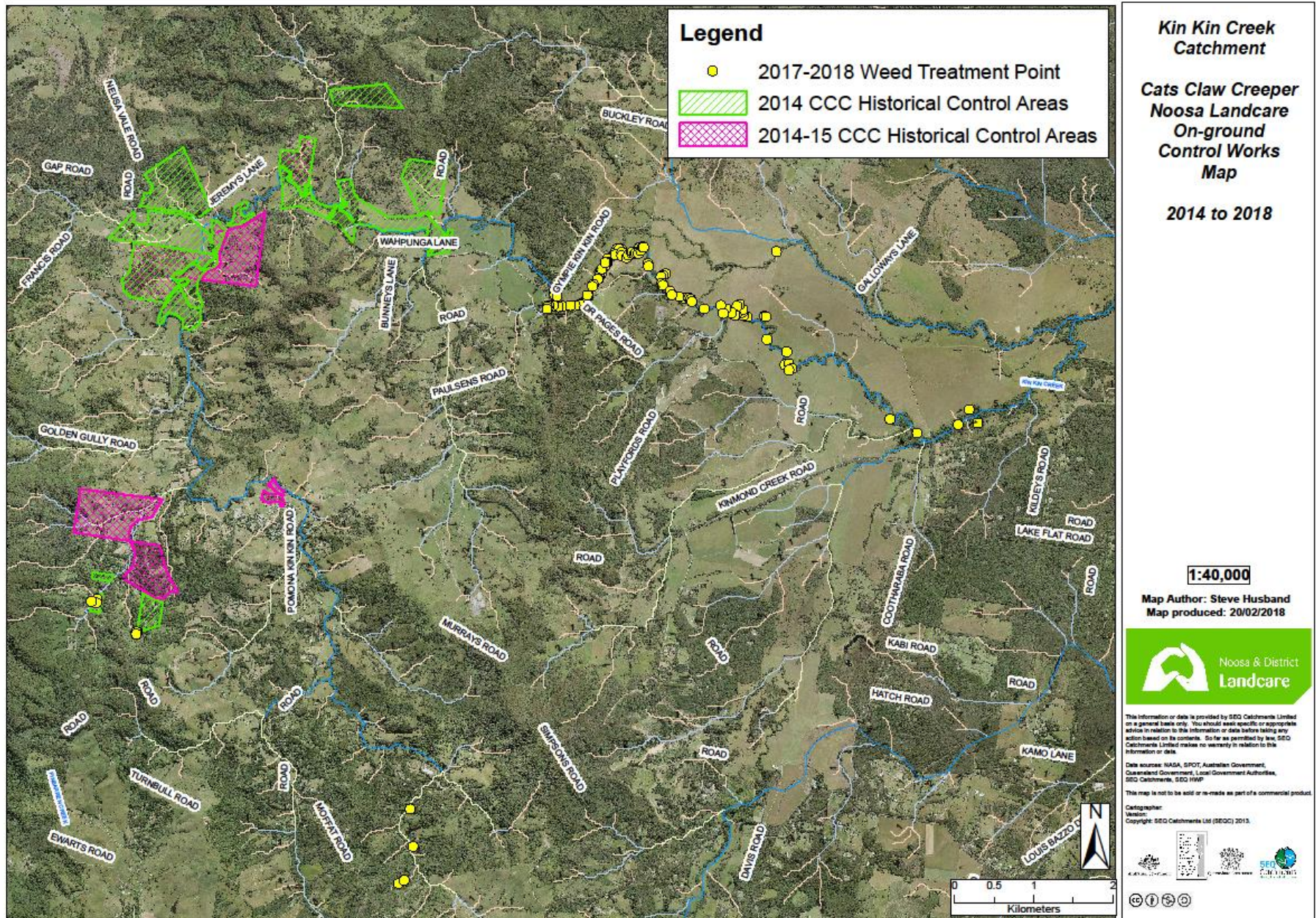


FIGURE 4 - PREVIOUS ON-GROUND CONTROL WORKS BY NDLC



# 2.0 SURVEY AND PRIORITISATION

## 2.1 INVASIVE VINE SURVEYS

Noosa Landcare with the support of Healthy Land & Water and Noosa Council has been undertaking Cats Claw management within the Kin Kin Catchment for a number of years and has in that time built a spatial dossier of locations of infestation sites. Spatial infestation data however, was not comprehensive across the catchment and it was determined that a ground survey was required. A survey was deemed necessary to provide a better picture of infestation across the catchment, and to enable the most strategic approach to Cats Claw and Madeira Vine investment and management be determined.

Over late 2016 and 2017 NDLG has conducted invasive vine surveys of Kin Kin creek catchment which identify and classify locations and types of vine infestations which occur.

Limited survey time was available and was prioritized to riparian systems; however, all known sites were mapped throughout the catchment including isolated infestations on private property away from creekline areas.

Surveyed areas are displayed within Figure 5.



FIGURE 5 – INVASIVE VINE SURVEYING IN THE KIN KIN CATCHMENT - STEVE HUSBAND (NDLG) & KEN ENGLISH (NSC)

Surveys were financially supported by the Noosa Biosphere Reserve Foundation and Healthy Land & Water.

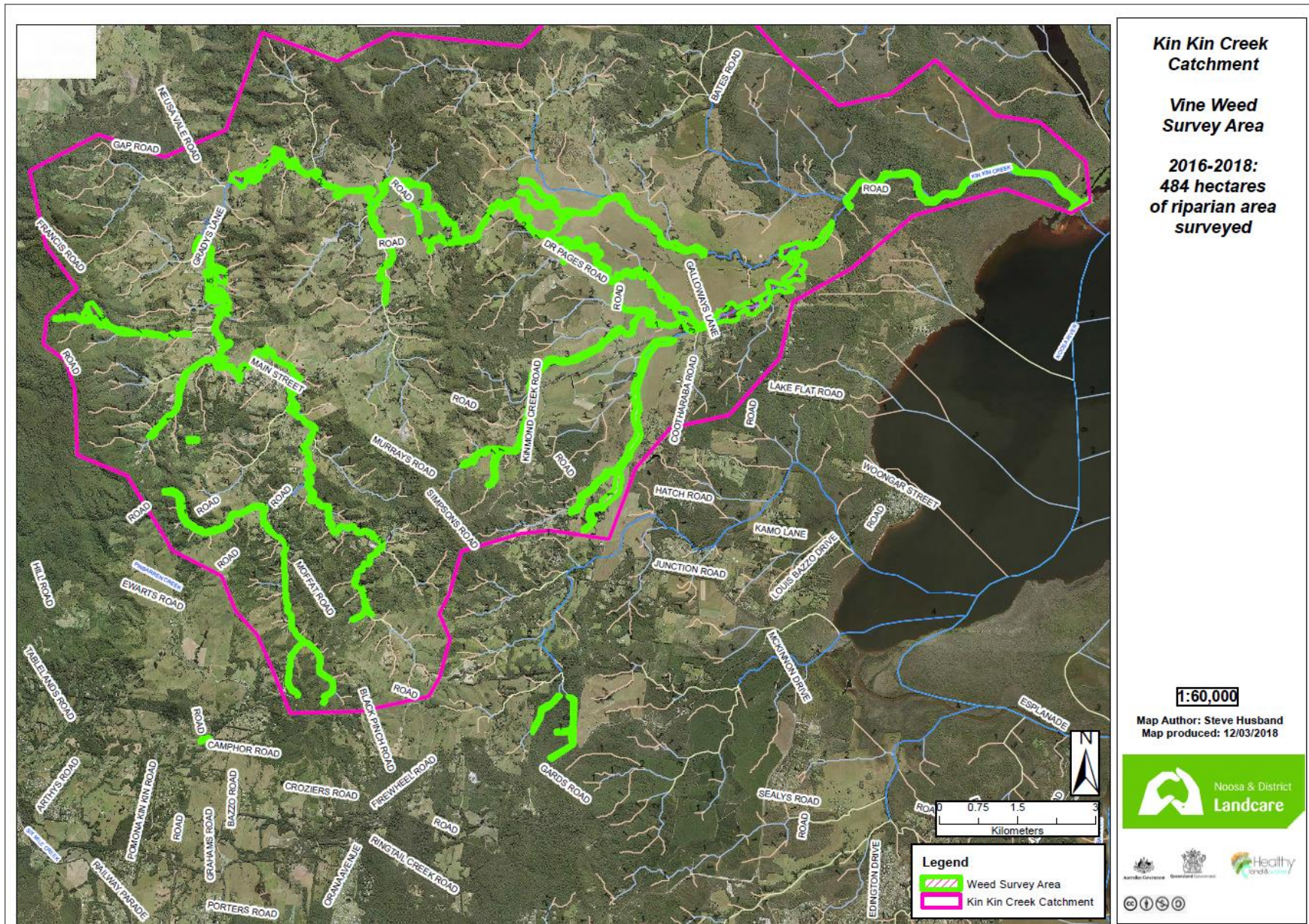


FIGURE 6 – INVASIVE VINE WEED SURVEY AREAS

## 2.2 PRIORITISATION

This plan prioritises weed infestations based on the characteristics of:

- location within the catchment - vines can spread along rivers, particularly from seeds (CCC) or vegetative matter (Madeira Vine) dispersed by floodwaters,
- infestation aggregation - seedlings and isolated plants or clumps,
- infestation maturity – timing of control before seed germination,
- viability for bio control releases – contain spread and protect assets.

An overview of the three priority classes is contained in Figure 7. The highest priority will be given to **isolated, mature infestations in the headwater areas of the catchment.**

It is highly possible that infestations in the upper Kin Kin Creek (Eastern and Western Branch Creeks) are being populated from infestations in the Upper Pinbarren Catchment, located less than 1km away. Works are planned to be undertaken in this area, however at some stage into the future it would be advantageous to expand this Strategy to the Six Mile Creek Catchment and beyond.

**\*Note:** Project timing will be subject to project approvals and land access and will occur before peak growing period



FIGURE 7 - CCC VINE SHOOTS MAKING THEIR WAY TO THE CANOPY

FIGURE 8 - PRIORITISATION CHART

Priority	Zone & Description	Justification	Actions	Timeline & Frequency	Comments
Priority 1	New and Previously treated outlier infestations sites, clumps, isolated patches, etc. Note – all Madeira Vine infestations are considered ‘isolated’ infestations in Kin Kin.	Prevention and early detection are the most cost effective forms of weed management. Preserve past investment and effort and continue to reduce infestation area and density.	Chemical treatment: Treat isolated mature infestations high in the catchment that occupy the tree canopy and have the capacity to set seed and/or damage the existing forest structure. Build the capability of community to detect, report and implement control of CCC and Madeira Vines in areas impacted by vines.	2-3 times throughout years 1-5.	Ensure cat’s claw creeper is incorporated into hygiene protocols and other spread prevention guidelines.
			Biocontrol Release on new and existing sites.	September – April each year.	Dependent on seasonal conditions
			Monitoring: Survey lower order tributaries of Kin Kin Creek and minor creeks (e.g. Sandy Creek).	After third treatment sweep for the year.	Supported by NDLG Waterwatch Program – if existing.
Priority 2	Mature outlier infestations – concentrating around vector paths (riparian zones) and manage prior to seeding (late summer – autumn, however can occur twice yearly)	Reduce seed set and dispersal into the lower Kin Kin Creek and Great Sandy National Park. Sites with the greatest biodiversity significance are the highest priority for weed removal. Liberating mature native trees from vine weeds to enable recovery of the canopy is a key first step in restoring ecosystems.	Chemical treatment: Focus on canopy treatment initially to reduce seed set. Treat infestations that meet the priority criteria within lower order tributaries of Kin Kin Creek and minor creeks within catchment. Treat infestation aggregations in riparian areas that are in good condition and occupy large areas along the ground to prevent re-infestation of mature trees.	2-3 times throughout years 2-5	Dependent on seasonal conditions
			Biocontrol Release	September – April	Dependent on seasonal conditions
			Monitoring: Survey and assess previous treatment and Biocontrol Release sites.	Annually from previous survey.	Supported by NDLG Waterwatch Program
Priority 3	Mechanical, Manual, Chemical and Biocontrol in main infestation area (Kin Kin township to Wahpunga Park)	Sufficient material to sustain biocontrol agents – help to contain CCC spread from core infestation until resources available to undertake manual work. Preserve assets and improve natural resource condition.	Chemical treatment: Focus on canopy treatment initially to reduce seed set. Treat infestation aggregations that occupy large areas along the ground to prevent re-infestation of mature trees. Follow up treatment of infestations that previously occupied tree canopy.	2-3 times throughout years 3-5	Dependent on seasonal conditions
			Biocontrol Release	September – April	Dependent on seasonal conditions
			Monitoring: Survey and assess previous treatment and Biocontrol Release sites. Assess and recommend strategy for catchment CCC management for next 5 years.	Annually from previous survey.	Supported by NDLG Waterwatch Program.

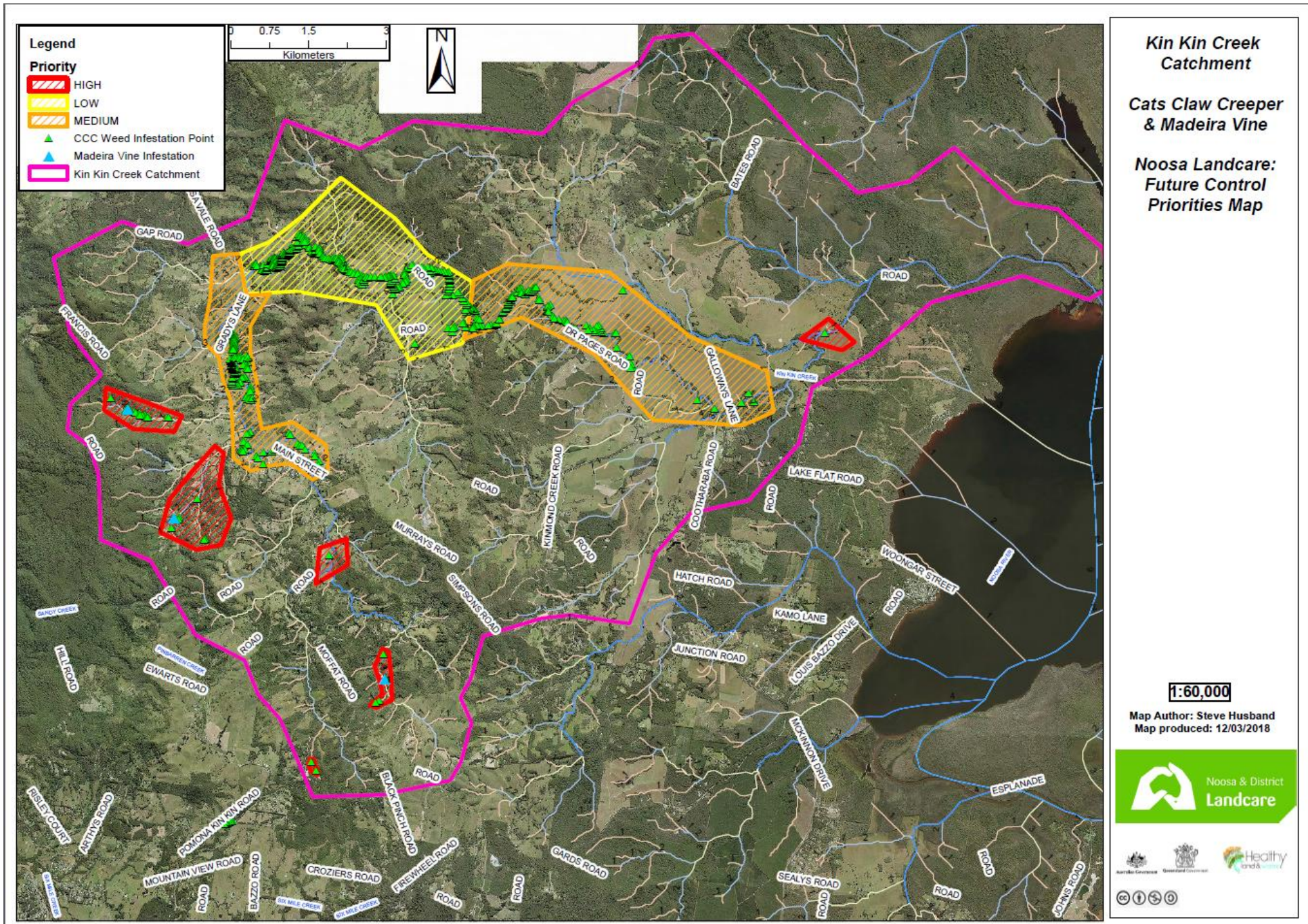


FIGURE 9 - PRIORITY AREAS FOR ON-GROUND CONTROL WORKS

# 3.0 IMPLEMENTATION

Cats Claw and Madeira Vine management poses a significant challenge and requires a multipronged approach. Comparative to other catchments in South East Queensland and the Burnett Mary region, infestations the Kin Kin Catchment, while significant, are in the project team's belief very much worth attempting to manage.

The rehabilitation of this catchment will be achieved by:

- 1) Detection: Extensive surveys and mapping of Kin Kin Catchment that identify priority areas.
- 2) Early intervention:
  - Priority outlier infestations are contained or eradicated.
  - Treating target species strategically to break the seed cycle and prevent spread from core infestations is prevented whilst preserving and encouraging integrity of ecologically sensitive areas.
  - Fostering strong populations of biocontrol to help control the rate of Cats Claw seed production and spread.
- 3) Educating and mentoring community involvement with managing weed infestations.



FIGURE 10 - VINE CUT FROM CARTERS RIDGE IN FEBRUARY 2018 – SECATEURS SHOW SIZE.

## 3.1 DETECTION AND DATA COLLECTION

Surveys of the catchment within priority landscape areas have occurred and results are mapped digitally. However there is the need to maintain this dataset and move forward. Additional surveys of areas away from creeklines are warranted to bolster this information.

Repeated surveys over 5 years will assist in detecting performance of the strategy and partner contributions. Aerial surveys may provide additional information and should be considered, particularly to identify isolated infestations in headwater areas.

New infestations identified by either community engagement results and/or further surveys and will be added to the database for consideration according to the prioritization framework for inclusion in all future works.

Preference for database management is utilizing the Spatial Pest Attribute Standard (SPA Standard) system and undertaking mapping and data entry through the field platform 'Collector' Application managed by Noosa Council.

Data to be collected and collated includes:

- Infestation site – including details of extent, spread (ground or canopy) and evidence of biocontrol activity
- On-ground control sites – including method, date and prevailing conditions
- Biocontrol release sites

## 3.2 ON-GROUND WORKS

The implementation program follows Integrated Pest Management (IPM) principles and the *National Cat's Claw Strategic Plan 2012 to 2017* to manage weed impacts by the most economical means, and with the least possible hazard to people, property, and the environment. The program recommended for this project uses chemical, mechanical, manual and biological methods to reduce and contain the targeted species.

Figure 8 identifies priorities for on-ground control in the Kin Kin Catchment.

The maintenance program is a guide only. It is subject to variables such as site situation (steep and uneven access), seasonal conditions, and plant (both weed and desirable) performance. Regular monitoring of the site is recommended to ensure maintenance interventions are timely, strategic and logistically viable.

### 3.2.1 BIOCONTROL AGENTS

The CCC biocontrols used for this program are the Tingid bug (*Carvalhotingis visenda*) and the Leaf-mining Jewel beetle (*Hylaeogena jureceki*). Each release will consist of approximately 200 insects of varying life cycles in order to initiate or maintain viable populations. Releases ideally are repeated a number of times at the same location for best results.



FIGURE 11 - NDLG'S BIOCONTROL BREEDING FACILITY

Biocontrols exist for Madeira Vine, however due to the isolated and small spatial area of Madeira Vine infestation in Kin Kin Catchment, priority is given to manual and chemical treatment as the control action.

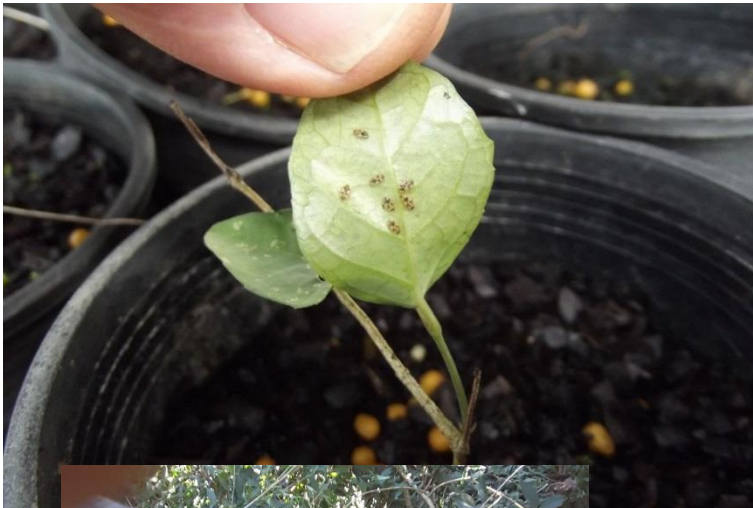


FIGURE 12 - BIOCONTROL AGENTS JEWELL BEETLE (ABOVE), TINGID BUG (LEFT), BIOCONTROL RELEASE IN KIN KIN (BELOW LEFT) AND EVIDENCE OF TINGID BUG DAMAGE (BELOW RIGHT)

### 3.1.2 CHEMICAL AND MANUAL TREATMENT TECHNIQUES

The delivery of the treatment tasks will be achieved using a systematic approach to ensure accurate coverage of all target plants within each infestation site. The application methods to achieve the priority goal will be a combination of cut and swab application technique and foliar spray application using either selective or non-selective herbicide, depending on site situation and infestation severity. All chemical application is to be carried out in accordance with DAF Biosecurity Queensland Guidelines contained in Appendix 1 and also updated at the following website - [https://www.daf.qld.gov.au/\\_data/assets/pdf\\_file/0003/63336/IPA-Cats-Claw-Creeper-PP139.pdf](https://www.daf.qld.gov.au/_data/assets/pdf_file/0003/63336/IPA-Cats-Claw-Creeper-PP139.pdf)

All foliar spraying operations will be conducted using 15 litre back pack sprayers with appropriate nozzle types.

All cut and swab applications will use 1 litre hand sprayers with shrouds. All herbicide products are registered for use in these situations under the product registrations and/or Off Label Permit # 11463 and # 82307.



## 3.2 COMMUNITY ENGAGEMENT

Enhancing and maintaining the capacity and ability of the community to engage in identification of CCC and Madeira Vine, implementing and monitoring activities to support the achievement of this strategy's objectives is a priority.

It is important that future feedback and comment is noted and addressed in some capacity either through follow up awareness sessions or attached to this strategy as it evolves. It is recommend NDLG and partnering invested bodies engage the local residents through presentation sessions, field days or workshops and ask for their assistance in the implementation process of this strategy to maintain the strong stewardship values in the community.

NDLG will not only oversee the progress of the works but can also act as another conduit for information to residents through facilitation of flow-on activities, such as;

- Hold weeding working bees with the supervision of a qualified professional.
- Organise workshops for residents to attend, such as: Plant ID, propagating natives, basket weaving, etc.
- Dispersal of timely, clear and catchy fact sheets to the community asking for feedback on CCC infestation sightings while providing control advice and information.

Careful consideration of weed management methods (backpack spraying) is required in the catchment. Previous work within this catchment has highlighted an issue with using herbicides in regards to some residents' sensitivities.

## 3.3 MONITORING AND EVALUATION

The objectives of the plan will be measured by re-surveying and recording of all identified infestation sites along Kin Kin Creek and its lower order tributaries after a period of 5 years.



# 4.0 REFERENCES

Department of Agriculture and Fisheries (2016). *Cat's claw creeper Fact Sheet*. The State of Queensland, Brisbane.

Department of Agriculture and Fisheries (2016). *Madeira Vine Fact Sheet*. The State of Queensland, Brisbane.

Earth Tech, (2002), *Sub-Catchment Stream Rehabilitation Plan – Kin Kin Creek*, report, Department of Natural Resources and Mines, Brisbane.

Noosa & District Landcare Group Inc., 2013, *Sunshine Coast FarmFLOW Water Quality Monitoring - Kin Kin Creek Catchment*, Noosa & District Landcare Group Inc., Pomona.

Noosa & District Landcare Group Inc. et al. (2017) *Noosa Shire Waterways Assessment 2017*, Noosa & District Landcare Group Inc., Pomona.

Threatened Species Scientific Committee. (2011). *Commonwealth Listing Advice on Lowland Rainforest of Subtropical Australia*. Canberra: Department of Sustainability, Environment, Water, Population and Communities.

# 5.0 APPENDIX 1 – BIOSECURITY QLD FACT SHEET – CATS CLAW CREEPER VINE.

# Cat's claw creeper

*Macfadyena unguis-cati* (L.) A.H.Gentry  
(syn. *Dolichandra unguis-cati* (L.) L.Lohmann)



Cat's claw creeper is a native of tropical America and is an aggressive climber that was used as an ornamental in older-style Queensland gardens. This vine has the ability to completely smother native vegetation, even growing up over trees, and many bushland areas already have serious infestations of this weed. The vine has a vigorous root and tuber system, which adds to difficulties in controlling the weed.

Cat's claw creeper has been recognised as a Weed of National Significance due to its invasiveness and potential impacts.

## Legal requirements

Cat's claw creeper is a restricted invasive plant under the *Biosecurity Act 2014*. It must not be given away, sold, or released into the environment without a permit. The Act requires everyone to take all reasonable and practical steps to minimise the risks associated with invasive plants and animals under their control. This is called a general biosecurity obligation (GBO). This fact sheet gives examples of how you can meet your GBO.



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At a local level, each local government must have a biosecurity plan that covers invasive plants and animals in its area. This plan may include actions to be taken on certain species. Some of these actions may be required under local laws. Contact your local government for more information.

## Description

Cat's claw creeper is a vine with long slender stems. Older stems become very woody with time. Its leaves each have two leaflets, with a three-clawed tendril (the cat's claw) growing between them. It has large, bright yellow, bell-shaped flowers in spring. The vine bears very long, narrow and flat pods containing many papery seeds.

## Life cycle

Seed capsules mature in late summer to autumn, approximately 8–10 months after flowering. Seed begins to drop in late May, with peaks in July and August. Seeds germinate best when not buried and will germinate readily in moist leaf litter. Although seed viability is low, seed production is high and some seeds produce multiple seedlings.

Established plants can reproduce vegetatively from tubers and creeping stems. Detached tubers and cuttings may re-sprout in moist conditions. Roots start to develop tubers in their second year and plants may be well established before they start to flower.

## Method of spread

Cat's claw creeper produces numerous seeds with papery wings that aid dispersal, particularly by water and wind.

## Habitat and distribution

Cat's claw creeper is native in Central and South America and the West Indies. It is widely naturalised around the world, occurring in southern Africa, south-eastern USA and Hawaii, Asia, the Pacific Islands, Republic of Cape Verde, Mascarene and recently in Europe. Cat's claw creeper grows in a range of soil types, but does not tolerate poorly drained soils. Plants are capable of surviving heavy frost but seed germination is reduced at low temperatures.

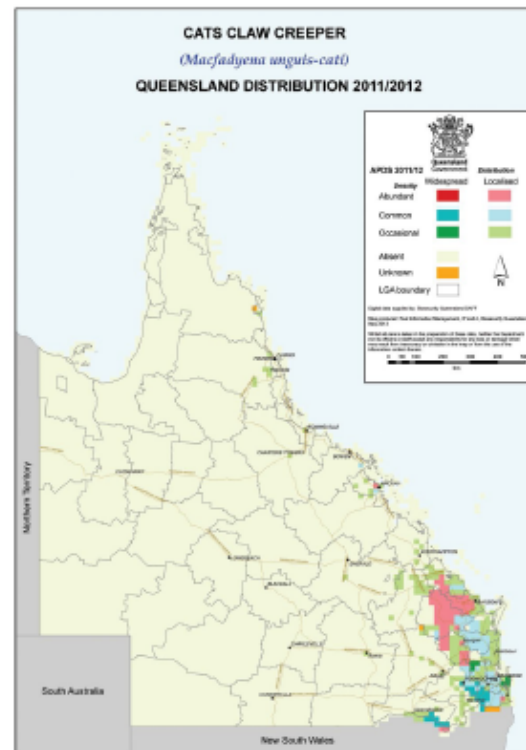
Cat's claw creeper prefers warm-temperate, tropical and sub-tropical areas. It can be found in gardens, over fences, along roadsides, waterways and in disturbed rainforests. It occurs in coastal and sub-coastal areas of south-eastern Queensland, and in central and northern Queensland.

## Control

### Managing cat's claw creeper

The GBO requires a person to take reasonable and practical steps to minimise the risks posed by cat's claw creeper. This fact sheet provides information and some options for controlling cat's claw creeper.

**Map 1. Distribution of cat's claw creeper in Queensland**



## Physical control

Use a pruning saw, machete or brush hook to cut all leads/stems up the trees. All above the cut will die, but regrowth will occur from the underground tubers.

Digging the tubers out is not practical in most cases. Don't allow the regrowth to reach host tree's canopy; if they get away you will have to re-cut them.

## Herbicide control

The regrowth is best treated with a foliar spray. Glyphosate 360 (mixed at a rate of 83 mL to each 1 L of water) can be applied in a cut stump method. It is best done in pairs. Cut the lead as close to the ground as possible and spray/paint on the herbicide.

The glyphosate must be applied within 15 seconds of cutting—while the sap is running—to take the poison down into the roots and tubers. If not within 15 seconds, re-cut lower and try again.

Because of the multitude of tubers the herbicide tends to knock them down one at a time with new regrowth coming from the next tuber. Be prepared to continue control over the next five years.

The herbicides listed in the table that follows are permitted to be used in the listed situations. Before using any herbicide always read the label carefully. All herbicides must be applied strictly in accordance with the directions on the label and the conditions in the APVMA permit.

## Biological control

Cat's claw creeper is currently a target for biological control. The tingid bug *Carvalhotingis visenda*, the moth *Hypocosmia pyrochroma* and a leaf-mining jewel beetle *Hylaeogena jureceki* have been released. The tingid is widely established in majority of release sites and cause visible effects in some areas.

## Further information

Further information is available from your local government office, or by contacting Biosecurity Queensland on 13 25 23 or visit [www.biosecurity.qld.gov.au](http://www.biosecurity.qld.gov.au).

**Table 1. Herbicides for the control of cat's claw creeper**

Situation	Herbicide	Rate	Comments
Pasture, non-crop situation PER10533	Glyphosate 360 g/L (e.g. Weedmaster Duo)	10 mL/L water	Foliar application Ensure vines are actively growing at time of treatment and not under stress of drought, waterlogging or cold. (0–2 m height) High-volume (knapsack or handgun) spray to wet foliage, ensuring complete coverage over top growing terminals.
		83 mL/L water	Cut stump Ensure vines are actively growing at time of treatment and not under stress of drought, waterlogging or cold. Cut vine close to ground and immediately wet stump surface thoroughly using splatter gun, spray, swab or brush. Remove any branches on the stump and treat any cut surface.
	Dicamba 500 g/L (e.g. Kamba 500)	4 mL/L water	Foliar application Ensure vines are actively growing at time of treatment and not under stress of drought, waterlogging or cold. (0–2 m height) High-volume (knapsack or handgun) spray to wet foliage, ensuring complete coverage over top growing terminals.
		33 mL/L water	Cut stump Ensure vines are actively growing at time of treatment and not under stress of drought, waterlogging or cold. Cut vine close to ground and immediately wet stump surface thoroughly using splatter gun, spray, swab or brush. Remove any branches on the stump and treat any cut surface.
Non-agricultural areas, domestic and public service areas, commercial and industrial areas, bushland/native forests, roadsides, rights-of-way, vacant lots, wastelands, wetlands, dunal and coastal areas (PER11463)	Fluroxypyr 200 g/L (e.g. FMC Fluroxypyr 200 Herbicide)	35 mL/L diesel/kerosene	Basal bark spray

Persons who wish to prepare for use and/or use products for the purposes specified in APVMA permits PER11463 or PER10533 must read, or have read to them, the details and conditions of the permit. APVMA permit PER11463 expires on 30 June 2018 and PER10533 expires on 31 July 2018. Both are available from the APVMA website at [www.apvma.gov.au](http://www.apvma.gov.au)

**Read the label carefully before use and always use the herbicide in accordance with the directions on the label.**



This fact sheet is developed with funding support from the Land Protection Fund.

Fact sheets are available from Department of Agriculture and Fisheries (DAF) service centres and our Customer Service Centre (telephone 13 25 23). Check our website at [www.biosecurity.qld.gov.au](http://www.biosecurity.qld.gov.au) to ensure you have the latest version of this fact sheet. The control methods referred to in this fact sheet should be used in accordance with the restrictions (federal and state legislation, and local government laws) directly or indirectly related to each control method. These restrictions may prevent the use of one or more of the methods referred to, depending on individual circumstances. While every care is taken to ensure the accuracy of this information, DAF does not invite reliance upon it, nor accept responsibility for any loss or damage caused by actions based on it.

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# 5.0 APPENDIX 2 – BIOSECURITY QLD FACT SHEET – MADEIRA VINE.



# Madeira vine

*Anredera cordifolia*



Madeira vine is an invasive, South American vine that blankets and smothers trees, shrubs and understory species. It grows prolifically at rates of up to one metre per week and the weight of the vine can cause canopy collapse of mature native trees. It produces large numbers of subterranean and aerial reproductive tubers that persist in the environment and make effective management difficult.

The impacts of Madeira vine can be so severe that it causes irreversible damage to the invaded ecosystem, leading to its categorisation as a transformer species.

Madeira vine is considered one of Australia's worst environmental weeds and has been listed as a Weed of National Significance.

## Legal requirements

Maderia vine is a restricted invasive plant under the *Biosecurity Act 2014*. It must not be given away, sold, or released into the environment without a permit. The Act requires everyone to take all reasonable and practical steps to minimise the risks associated with invasive plants and animals under their control. This is called a general biosecurity obligation (GBO). This fact sheet gives examples of how you can meet your GBO.

At a local level, each local government must have a biosecurity plan that covers invasive plants and animals in its area. This plan may include actions to be taken on certain species. Some of these actions may be required under local laws. Contact your local government for more information.



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## Description

Madeira vine is also known as potato vine or lambs tail vine. It has fleshy, waxy green, heart-shaped leaves which are usually 4–5 cm in length. The stems are slender and hairless, initially herbaceous but becoming woody with age.

Clusters of 5 mm to 25 cm aerial tubers are produced along the length of the stem. These are light brown or green, and 'warty' in appearance. The vine also produces potato-like subterranean tubers which can grow up to 20 cm in diameter and at depths of up to one metre.

Madeira vine produces dense blankets of creamy flower spikes from December to April. The flower spikes are approximately 10 cm long and are made up of numerous small flowers along a drooping, central stem.

## Distribution and habitat

Madeira vine is common in urban areas where it has been introduced as a garden plant. It typically invades riparian vegetation, the edges of rainforests, tall open forests and damp sclerophyll forests.

In Queensland, Madeira vine infestations are most highly concentrated in the coastal and hinterland regions of south east Queensland. However it has also invaded regions of central Queensland and is found as far north as Cairns and the Atherton Tablelands (see Map 1).

Potential distribution modelling suggests the possibility of significant range increases in Queensland if spread is not actively contained (see Map 2).

## Control

### Managing Madeira vine

The GBO requires a person to take reasonable and practical steps to minimise the risks posed by Madeira vine. This fact sheet provides information and some options for controlling Madeira vine.

### Management strategies

Successful management of Madeira vine requires exhaustion of the tuber bank. Tubers can remain viable for up to 15 years and can be easily spread through poor green waste management or via gravity and water movement from ridges and watersheds or during floods.

A management plan should be carefully designed and include a commitment to regular, long-term follow-up control. The disturbance caused by control work stimulates particularly vigorous vine growth and if management isn't carried out appropriately may lead to an even greater problem. Plan to:

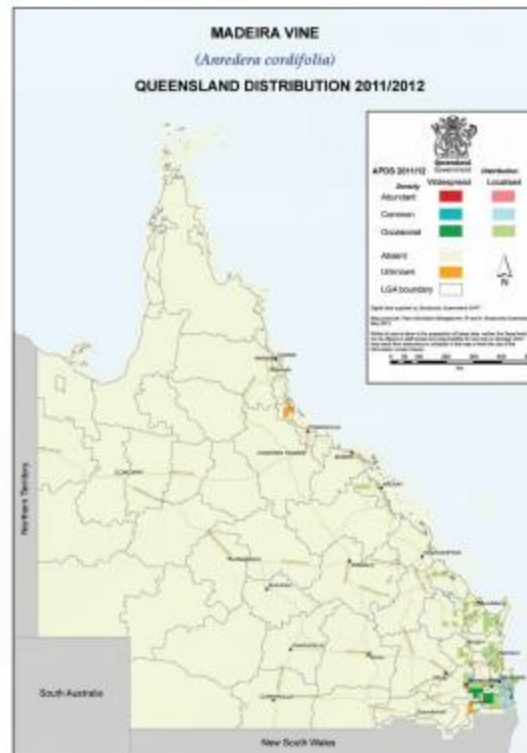
#### 1. Prevent Madeira vine spread

Identify isolated plants or sparse populations and control these first. Also consider the topography of the landscape and prioritise isolated infestations on high ground or at the top of catchments.

#### 2. Reduce established infestations

Weed strategically, protecting the better quality native vegetation first e.g. treat Madeira vine infesting trees that are still living. Where possible, work from the edge

Map 1. Distribution of Madeira vine in Queensland



of the infestation toward the core – the exception may be where you need to protect isolated areas of high biodiversity value.

### 3. Follow-up, rehabilitate and monitor

The size of the area targeted at each stage should be manageable enough to enable thorough follow-up control two to three times a year. Ensure activities do not spread the tubers.

Monitor the site to ensure effective native plant regeneration (highly degraded sites may require active replanting) and early detection of invasion by other weed species.

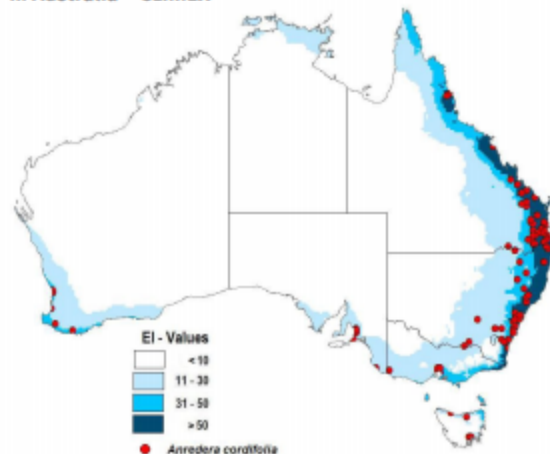
### Physical control

Physical control of Madeira vine is difficult because of the extent of underground tubers and ease of fragmentation of the vine and root system. However, it may be practical for smaller or immature infestation sites or as a follow-up to remove persistent tubers.

Cutting and pulling the vines from the canopy is not generally recommended because it results in a rain of viable tubers and may be dangerous if dead and dying branches are pulled down with the vine. However, this may be necessary where there is extreme stress on the host plant. In this case, tarpaulins should first be laid on the ground to collect as many of the aerial tubers as possible.

Tubers and vegetative material must be disposed of appropriately as they will shoot in contact with moist soil. Ideally tubers and vines should be composted on-site to reduce the risk of further spread. Compost sites should be

**Map 2. Current and potential distribution of Madeira vine in Australia – CLIMEX**



established away from other vegetation where they can be easily and frequently foliar sprayed. Alternately, double bag the plants and tubers in non-biodegradable plastic bags and dispose of them in landfill waste. **Do not** dispose of Madeira vine in council green waste bins as this may spread the weed.

## Biological control

The leaf feeding beetle *Plectonycha correntina* was first released in Queensland in 2011. Both the adult and larval stages feed on the leaves of Madeira vine and it is expected that large reductions in leaf area will reduce the plant's ability to produce energy and cause it to deplete the resources stored in its tubers. Significant defoliation should also promote canopy recovery in host plants. Releases of the insect have occurred in New South Wales and Queensland and at many of these sites the beetle has established and significant leaf feeding damage has been observed.

## Herbicide control

Herbicides can be effective if they are carefully chosen and selectively applied. The main application techniques are scrape and paint and foliar spray, although basal barking and cut stump are also used.

A range of selective, non-selective; residual and non-residual herbicides are available for spot spraying madeira vine regrowth and seedlings. There are pros and cons associated with each of these that must be considered on a site by site basis:

### • Non-selective and non-residual herbicides

These are herbicides like glyphosate which will affect most plant species they come in contact with but don't remain active in the soil. In most instances glyphosate is the preferred herbicide for madeira vine management because there are few restrictions on who can use it and where it can be used (frog friendly versions like Roundup® Biactive are available for areas adjacent to waterways). However, care must be taken to avoid contact with desirable species

as in-discriminate spraying will open up bare ground for opportunistic weed invasion.

### • Selective and residual herbicides

Residual herbicides are more effective at controlling Madeira vine tubers – enabling more rapid management of infestations; and selective herbicides, if used correctly, allow non-susceptible species to persist, providing competition to future weed invasion.

For example, research indicates that foliar sprays of triclopyr (300 g/L) + picloram (100 g/L) ± aminopyralid (e.g. Grazon Extra®), even at sub-label mix rates of 20–40 mL/10 L of water is particularly effective for the management of regrowth, juveniles and tubers. At these rates non-susceptible species like grasses, ferns, rushes and sedges should be unaffected. However, it may impact other woody plants and vines, particularly in the immature stages and the use these herbicides should be avoided at more sensitive sites. In degraded and heavily infested sites where native species recolonisation from adjacent areas or active revegetation will be required, these selective and residual herbicides should provide a better control option.

### Application techniques

#### Scrape-paint application

This approach is suitable for medium to large basal stem sizes and provides the safest management option in sensitive environments. It is however extremely labour intensive as every vine must be treated individually.

Scrape 10–20 cm sections of the vine down to the white fibrous layer and immediately paint the exposed areas with concentrated herbicide (see Table 1 for recommended chemicals and rates). Repeat the process as high up the stem as can be reached, and where possible, scrape areas on both sides of the stem. Be careful not to ring bark the stem as this will halt the spread of the herbicide.

#### Foliar spray

Traditionally, foliar spray has been used as a secondary treatment to manage prostrate growth and seedlings once the primary stems have been treated using scrape and paint techniques. However, some practitioners now recommend the use of foliar spray as a stand alone treatment. This approach has been developed to increase the cost effectiveness of management but does carry the risk of off-target damage. Decisions on the applicability of this management approach should be made on a site-by-site basis, considering the vegetation composition and sensitivity of the site, as well as the skills of those applying the herbicide.

Handheld equipment (handgun and hose or knapsack) is useful to spot spray prostrate stems, seedlings and regrowth.

Some selective herbicides can be used to treat vines climbing over non-susceptible (or weedy) host plants; however extreme care must be taken.

### Further information

Further information is available from your local government office, or by contacting Biosecurity Queensland on 13 25 23 or visit [www.biosecurity.qld.gov.au](http://www.biosecurity.qld.gov.au).

**Table 1. Herbicides for the control of Madeira vine**

Method	Herbicide	Rate	Registration status	Comments
Basal bark (scrape and paint)	Picloram 44.7 g/L + aminopyralid 4.47 g/L (e.g. Vigilant II® herbicide gel)	Neat – 3–5mm layer of gel applied to scraped surface	Registered Australia wide (rhizomatous plants)	Appropriate for medium sized to well established vines with tubers.
	Glyphosate 360 g/L (e.g. Ken-up Aquatic 360, Roundup® Biactive, Weedmaster Duo®)	667 mL/1 L water (1:1.5)	PERMIT 11463	Apply herbicide to scraped section of vine within 15 seconds.
Basal bark	Fluroxypyr <sup>s</sup> 333 g/L (e.g. Starane Advanced®)	21 mL / 1 L diesel/ kerosene	Registered	Appropriate for medium sized to well established vines with tubers.
	Fluroxypyr <sup>s</sup> 200 g/L (e.g. Flagship® 200, FMC Fluroxypyr 200 Herbicide)	35 mL/1 L diesel	PERMIT 11463	Always treat vines away from the host tree.
Cut stump	Picloram <sup>s</sup> 44.7 g/L + aminopyralid 4.47 g/L (e.g. Vigilant II® herbicide gel)	Neat – 3–5mm layer of gel applied to scraped surface	Registered (rhizomatous plants)	Appropriate for young vines without aerial tubers; or vines with immature tubers.
	Glyphosate 360 g/L (e.g. Ken-up Aquatic 360, Weedmaster Duo®)	500 mL/1 L water (1:2)	PERMIT 11463	Only use for mature vines where prompt follow-up treatment of new growth arising from fallen tubers is possible.  Where possible, apply in spring before new tubers proliferate.  Apply herbicide to the cut surface of stem within 15 seconds.
Foliar application	Fluroxypyr <sup>s</sup> 200 g/L (e.g. Flagship® 200, FMC Fluroxypyr 200 Herbicide)	50 mL/10 L water	Registered	Appropriate for madeira vine treatment in disturbed areas of native vegetation or spot spraying of seedlings and prostrate growth.
	Fluroxypyr <sup>s</sup> 333 g/L (e.g. Starane Advanced®)	21 mL/10 L water	Registered	
	Fluroxypyr <sup>s</sup> 400 g/L (e.g. Nufarm Comet 400, Decoy 400)	25 mL/10 L water	Registered	Apply to healthy actively growing vines only.
	Glyphosate 360 g/L (e.g. Ken-up Aquatic 360, Weedmaster Duo®)	100 mL/10 L water	PERMIT 11463	Apply only when supporting plant and understory is dead or weedy.
	Metsulfuron-methyl <sup>SR</sup> 600 g/kg (Associate, Ken-Met 600)	1–5 g/10 L water + non-ionic surfactant	PERMIT 82307	Apply early autumn (March–April). Do not spray beyond the point of runoff.
	Glyphosate 360 g/L + Metsulfuron-methyl <sup>SR</sup> 600 g/kg	200 mL glyphosate + 1.5g metsulfuron-methyl /10 L water	PERMIT 82307	
	Triclopyr 300 g/L + Picloram 100 g/L +/- Aminopyralid 8 g/L <sup>SR</sup> e.g. Grazon Extra® or Triclopyr 300 g/L + Picloram 100 g/L (e.g. Farnoz Fightback®, Nufarm Conqueror®)	35–50 mL/10 L water	PERMIT 11463	

<sup>s</sup>Selective herbicide

<sup>SR</sup>Residual herbicide

Prior to using the herbicides listed under PER11463 you must read or have read to you and understand the conditions of the permit. To obtain a copy of this permit visit [www.apvma.gov.au](http://www.apvma.gov.au)

**Read the label carefully before use. Always use the herbicide in accordance with the directions on the label.**



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Fact sheets are available from Department of Agriculture and Fisheries (DAF) service centres and our Customer Service Centre (telephone 13 25 23). Check our website at [www.biosecurity.qld.gov.au](http://www.biosecurity.qld.gov.au) to ensure you have the latest version of this fact sheet. The control methods referred to in this fact sheet should be used in accordance with the restrictions (federal and state legislation, and local government laws) directly or indirectly related to each control method. These restrictions may prevent the use of one or more of the methods referred to, depending on individual circumstances. While every care is taken to ensure the accuracy of this information, DAF does not invite reliance upon it, nor accept responsibility for any loss or damage caused by actions based on it.

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