Chapter 5

Case study 1

Creeper control at a catchment scale in South East Queensland

Dennis Gannaway and Leonard Ainsworth, Healthy Land & Water

Key points

- Managing cat's claw creeper is a long-term investment, and you need at least five years to achieve positive outcomes.
- Land managers need to know more about the impacts of cat's claw creeper. Managing invasions often becomes a priority only after large trees are conspicuously lost.
- Many catchments are still at risk of invasion by cat's claw creeper.
- Cat's claw creeper impacts the cost of living – particularly the provision of clean water to households, as the weed can ultimately lead to degraded water quality.

The situation

South East Qld (SEQ) is a highly biodiverse sub-tropical region with a rapidly growing population. More than 5.5 million people will likely call the area home by 2040. Land clearing for agriculture and infrastructure is pushing natural vegetation, which provides habitat and movement corridors for native fauna, to the margins of riparian zones. SEQ has five major rivers and many hundreds of smaller creeks and streams. Riparian zones are the last refuge for many of the region's vulnerable fauna and flora.

Cat's claw creeper has been present in SEQ for decades. It has spread prodigiously through the region's riparian zones. It's now found in an estimated two-thirds of SEQ's catchments at various stages of invasion, from new infestations to established ones.

The problem

Cat's claw creeper smothers and kills deep-rooted native riparian vegetation. The long-term presence of the weed is now the direct cause of the large-scale loss of mature riparian vegetation across the region. The loss of these trees causes significant riverbank erosion, which increases the amount of suspended sediments and nutrients in creeks and rivers. This is particularly true during adverse weather events, such as flooding, which regularly occur in the region. These sediments increase instream turbidity and eventually settle in Moreton Bay – an internationally significant wetland site – and smother seagrass.

The impacts of nutrients on water quality within SEQ is also a critical concern for the region's aquatic ecosystems. As urbanisation and agricultural activities continue to expand, riparian vegetation – and its filtering effect – is lost. As a result, nutrients, such as nitrogen and phosphorus, are increasingly found in water bodies. Excessive nutrient levels can trigger eutrophication – a process that leads to harmful algal blooms and oxygen depletion.

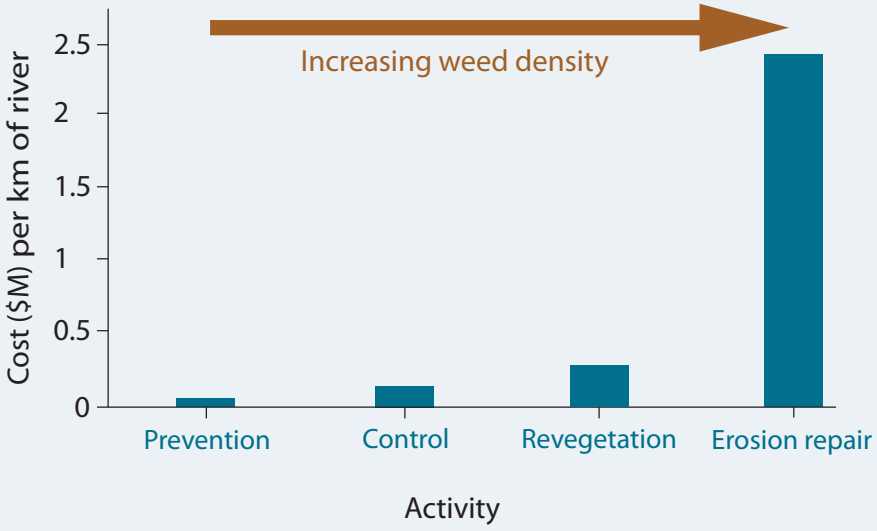


Figure 5.1 Indicative costs of various management approaches for cat's claw creeper in water catchments in South East Queensland.

The combination of sediments and nutrients degrades water quality. This impacts not only environmental and amenity values but also the economic cost of drinking water provision within SEQ. Seqwater, the bulk water supplier within SEQ, has identified that the presence of cat's claw creeper within 5–10 km upstream of a water offtake site increases the costs of water purification at that site. As cat's claw creeper continues to spread, deep-rooted native vegetation is lost, resulting in ever-poorer quality of the water arriving at purification plants. The poorer the water quality, the higher the cost of purification.

Figure 5.1 shows the costs associated with managing the impacts of cat's claw creeper on water quality at an offtake point. Preventing weed incursions – and retaining native vegetation – theoretically has minimal direct costs. As weed presence and density increases, so do weed management costs. If no action is taken and native vegetation is lost, the resulting cost of revegetating and repairing eroded banks is exponentially higher. Even greater are the costs of hard engineering improvements to water treatment plants that are required for the plants to cope with declining water quality.

The approach

Healthy Land & Water, the natural resource management body for SEQ, and Seqwater collaborated to manage cat's claw creeper at 11 sites across SEQ. These are the regional offtake sites for the provision of potable water (Figure 5.2).

At each site, commercial contractors were engaged to control cat's claw creeper in a three-stage process over five years. This included:

- Stage 1 – management in the first year targeted infestations in tree canopies. This protected trees from the imminent threat of being overwhelmed. Vines were controlled using skirting and cut-and-swab methods.
- Stage 2 – management in years 2–4 targeted regrowth from Stage 1 and used herbicide to spray cat's claw creeper on the forest floor. Control occurred 4–6 times per year, depending on regrowth.
- Stage 3 – management in the final year of the project focused on reinvasion and regrowth in managed areas.

Primary control used the cut-and-swab method, integrated with skirting (refer to Chapter 4 for more information). Foliar spray was used for follow-up

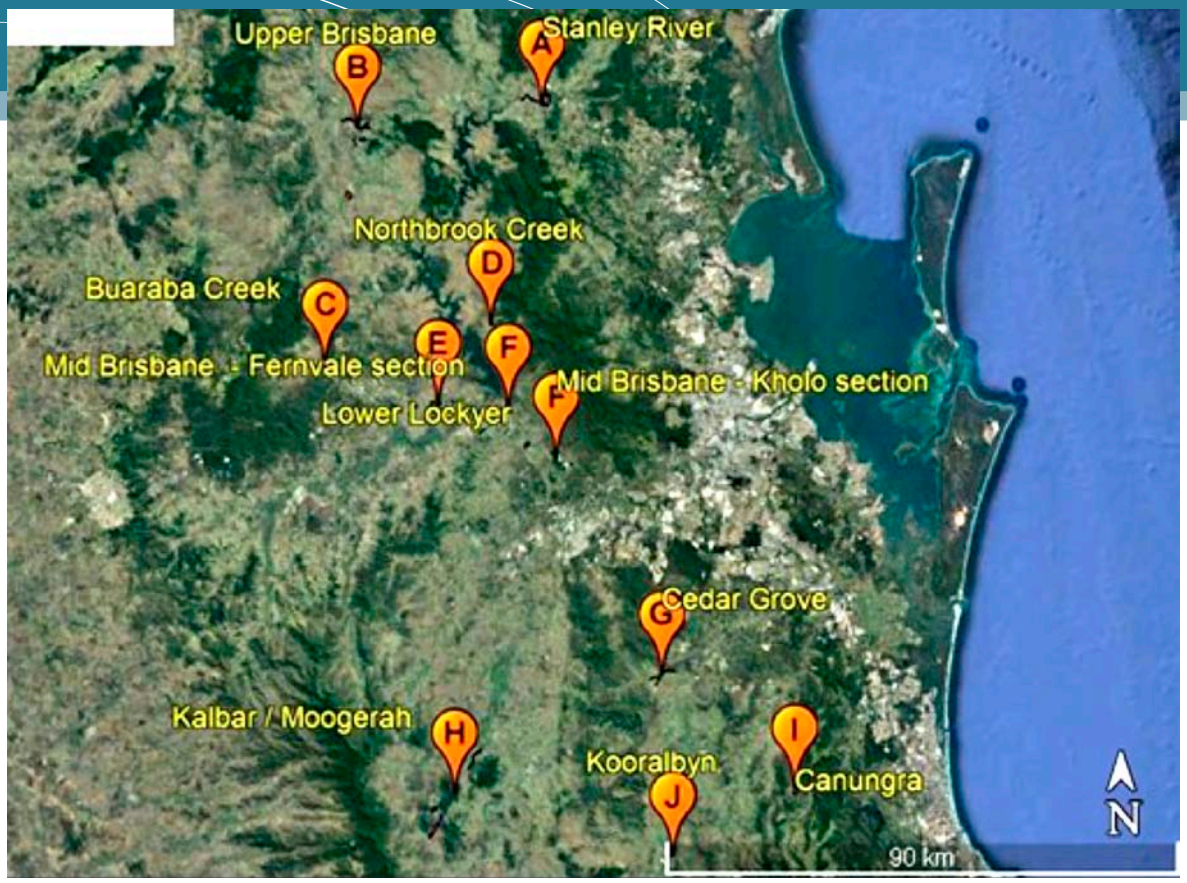
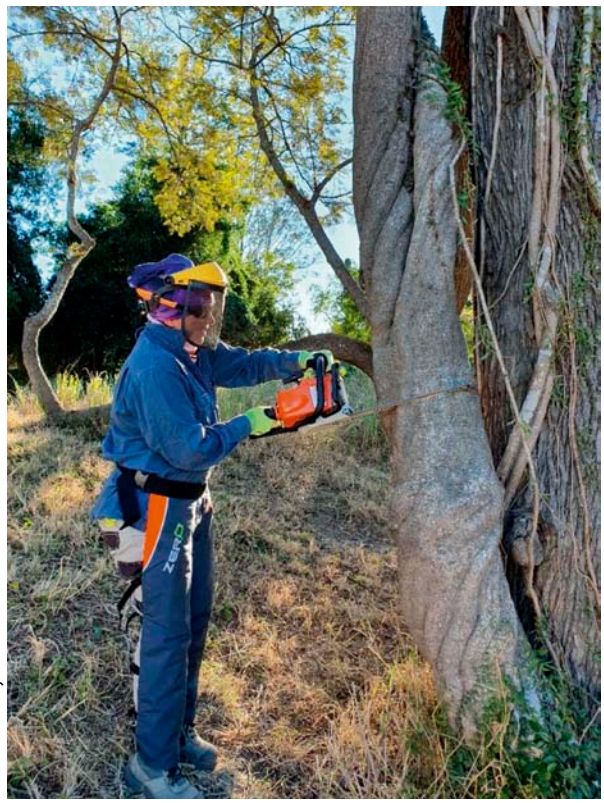


Figure 5.2 The location of cat's claw creeper management sites in South East Queensland.



Dennis Gannaway

A contractor cutting a very large cat's claw creeper stem.

Dennis Gannaway

Skirting vines for control.

Case study 1

control. All methods were integrated with biocontrol for areas that were difficult to access.

Chemical control of cat's claw creeper was supported by the release of a biocontrol agent, the jewel beetle (*Hedwigiella jureceki*), purchased from community-run Landcare groups. These beetles were released in weed infestations surrounding the managed sites, where other weed management actions were unlikely to be undertaken. These release areas were typically on private property, nearby tributaries, or areas unsafe for subcontractors to access. The objectives were to slow the expansion of these weed infestations and reduce the risk of them providing seed for reinvasion into the managed sites. This action also resulted in the establishment of viable populations of the beetle, which will eventually spread across the region.

Chapter 4 has more information on the jewel beetle.

The result

Over the project's five years, 154 km of creek bank were physically treated, and more than 300,000 leaf-mining jewel beetles were released at 60 sites.

Infestation levels were significantly reduced in areas where chemical control occurred. Only minor regrowth is now present. This reduction in weed pressure significantly improved the health of native vegetation, and native seedlings are now growing in areas that had been dominated by weedy groundcover.

Results were mixed at the sites where jewel beetles were released as a biocontrol agent. Some sites now have well-established beetle populations, with extensive damage to the vines. Beetles have disappeared entirely from other sites, or have been found in infestations kilometres away from release sites. It's still too early to evaluate the impact of biocontrol releases.

Dennis Gannaway

Contractors managing an on-ground infestation.

Dennis Gannaway

Native species regenerated after management.

The future

While the project had five years of funding and made significant gains to suppress cat's claw creeper in the managed sites, ongoing maintenance is critical. Despite best efforts, cat's claw creeper hasn't been eradicated. Regrowth from underground tubers remains a constant threat, as does reinfestation from seed originating from untreated areas. Continued investment in maintenance is key. Collaboration with landholders and interest groups in adjacent areas will encourage action at a catchment scale. This is the best chance to achieve a long-term solution to the loss of native riparian vegetation caused by cat's claw creeper. On-ground management must also be supported by the release of biocontrol agents, despite the jewel beetles not having significant impact on weed populations. Research must continue to find more effective agents. For more information, visit hlw.org.au/news/combating-the-vine-invasion-a-success-story-in-south-east-queensland.

Case study 2

Lessons learnt protecting remnant rainforest at 'Coombra', Far North Queensland

Leasie Felderhof, land owner

Key points

- Extensive surveying to determine weed extent on your property and surrounding areas is essential to making good management decisions.
- It's important to be realistic about your management objectives and have the flexibility to change your objectives or your management approach.
- Conduct annual, ongoing control efforts where cat's claw creeper is well established.
- Vine control needs to be carried out by experienced and dedicated managers. It requires detailed attention to see individual seedlings and vines among other vegetation on difficult and sometimes precarious terrain.
- Control work is made more difficult by factors such as temperature and environmental hazards such as snakes, ticks, mosquitoes and leeches.
- Management requires a concerted effort from all landholders.

The situation

'Coombra' is a 350-ha grazing property on the outskirts of Atherton in Qld's wet tropics. The property contains a mixture of basalt and clay soils that previously supported rainforest and eucalypt woodlands. 'Coombra' is divided by Mazlin Creek (perennial) and Middle Creek (intermittent). The average rainfall is 1,500 mm per year, with most rain falling during the wet season (December to April). There can be extensive periods of drizzle between April and July, and occasional frosts in late July and August, but these don't occur every year.

Mazlin Creek has rainforest vegetation along most of its riparian area within and bordering the property. This is the result of both natural regeneration and an active revegetation program to widen the rainforest corridor and connect the creek lines to the adjoining state forest.

The problem

In the early 1990s the property owners, Leasie and Bill, noticed a smothering vine climbing rainforest trees along the creek near the farm house. They identified the vine as cat's claw creeper – a well-established weed in South East Qld but with limited occurrence in Far North Qld.

Case study 2

'This was pre-internet, so we consulted hard-copy books for information. The pictures of the impacts to rainforests elsewhere concerned us greatly and motivated us to place the control of this plant to one of the highest land management priorities on the farm'. Leasie Felderhof

Leasie Felderhof

Management at 'Coombra' is preventing current infestations reaching high densities and impacting on the rainforest.

The approach

Following confirmation of the presence of cat's claw creeper, Leasie and Bill immediately commenced planning their control by surveying the extent and density of the infestation on the property. The initial survey was largely limited to the creek line near the house. The weed was thought to be contained to an approximately 300-m stretch of riparian vegetation and an infestation in the house yard, climbing up 100-year-old mango trees along the driveway. The vines had reached the canopies of the trees, but there was no sign of tree loss. From this initial assessment, the decision was made to manage the infestation for eradication from the property.

'Many of the vines were as thick as a man's thumb, and the problem was more extensive once we looked in greater detail'. Leasie Felderhof

The second step was to decide how to control it. Leasie and Bill obtained advice from the local agricultural supplies shop and chose to undertake cut-stump (cut-and-swab) treatment (refer to Chapter 4 for more information). This involved walking up and down the creek line, cutting mature vines with secateurs and applying herbicide to the stems at label rates. The majority of the vines were left in the tree – these died after cutting the bases. Seedlings weren't removed, as the creek banks are steep and the task appeared overwhelming, especially in conjunction with other farm work.

'The initial control effort was intensive with all hands on deck (four people) over a few weeks. During control, an additional isolated infestation was found further up the creek line, which was also treated'. Leasie Felderhof

Follow-up treatment occurred opportunistically for the next two years, using the same method, until vines (tree-top flowers or living stems on trees) were no longer readily apparent. At this time, attention shifted to other land management and income-producing priorities.

A few years later, during a recreational walk on the property, cat's claw seedlings were noticed in the understorey of the rainforest along the creek. Further investigation revealed a few large vines had been missed in the initial control. These were likely the source of new seedlings. Vines were also making their way up trees in previously treated areas. An extensive property survey – beyond the initial surveyed area – helped inform the second phase of control. The survey concluded that the weed was also present on neighbouring residential properties that backed onto the creek. This meant that seeds would continue to arrive onto the property.

Leasie Felderhof

Cat's claw creeper resprouting from tubers and beginning to climb towards the tree canopy.

This new discovery led to a reassessment of the control approach and the management objective.

> *'We needed to ask ourselves if eradication on our property was achievable, given the weed's density on adjoining properties. We decided it wasn't, so the next best thing was to make sure our management would minimise the impact on the rainforest on our side of the creek. This meant managing existing infestations to prevent flowering and seeding, as well as minimising how much cat's claw creeper was getting to the canopy of the rainforest. We also wanted to stop spread beyond current infestation areas'.* Leasie Felderhof

The renewed program consisted of daily control for a two-month period, working methodically up and down the creek banks. This time, control focused on pulling vines from trees where they hadn't established in the canopy and it was safe to do so. Stems were left attached to tubers, gathered on the ground in a pile, and sprayed with glyphosate at label rates. Any seedlings or small plants were also sprayed. The cut-stump technique wasn't used, because vines were only slender. This approach was carried out along both sides of the creek bank, from the water's edge to where the rainforest abutted the paddock. Follow-up treatment of spraying with glyphosate and opportunistically digging up small plants was undertaken the following year and continues today, around once per year as any new plants or re-sprouting tubers are spotted.

Leasie Felderhof

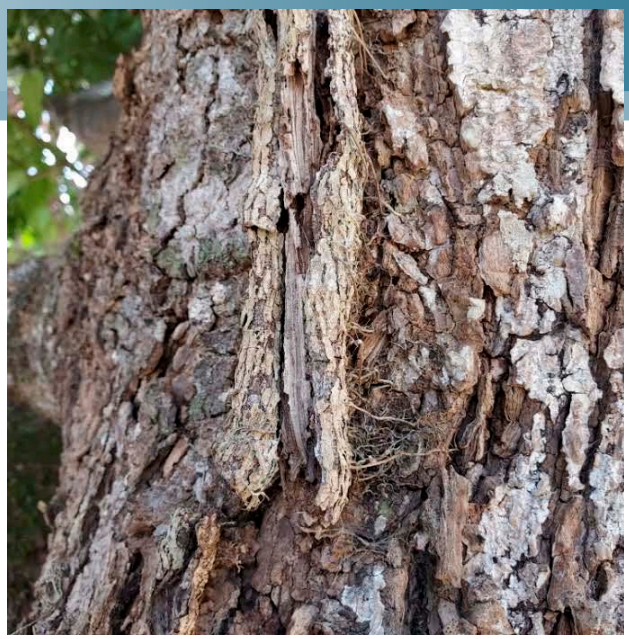
Small tubers were dug out by hand.

In addition to treating vines on 'Coombra', permission was also sought to treat an infestation on a neighbouring property for one year.

The result

This intensive control program successfully prevented flowering and seeding of established infestations, and it's curbed cat's claw creeper from re-entering and modifying the canopy of the rainforest. Even though cat's claw creeper is present, its density is very low, and there's minimal impact on the rainforest. Annual surveillance and treatment is required to maintain the infestation at low levels.

The level of success demonstrates that, by integrating control of cat's claw creeper into broader farm or property management plans, individuals can protect assets on properties from invasive vines and scramblers.



Leasie Felderhof

Leasie Felderhof

Remnants of cat's claw creeper stems remain on tree trunks for years after control. This can be useful for locating historical infestations and knowing where to be extra vigilant with surveillance.

The success of this control has also increased local awareness of the potential impacts of cat's claw creeper, and invasive vines and scramblers more generally, however ongoing awareness raising is needed.

The future

Cat's claw creeper will be managed into the future by annual inspection and control. This has been incorporated into the farm and weed management plan.

> '*I have since found seedlings in crow's nest ferns, high up in the trees, after the tree has fallen. This highlights the impossibility of eradicating cat's claw from my property and my acceptance that annual control will be required long into the future. However, the success of the effort to date means cat's claw creeper is no longer flowering, the population is greatly diminished, and the rainforest is extremely healthy. This means we are achieving our management objective and this motivates me to continue. The main difficulty is finding people active and energetic enough to climb up and down steep creek banks covered in roots and vines, and tolerating scratches, ticks, leeches and the anticipation of a big carpet snake where you next place your hand*'. Leasie Felderhof

Continued surveying, monitoring and adaptive management will be key to success at the farm scale. But what happens on the farm is influenced by the surrounding landscape. Control can't be maintained outside the property boundary without significant coordinated effort and public education. This is beyond the scope of an individual property owner. Cat's claw creeper is now well established in parts of north-east Qld, and it will require a concerted ongoing effort by land managers to minimise its impacts.

Cat's claw creeper doesn't have a high profile in the region. Some landholders are unaware of its impacts, while others may not share the same values or have the financial or physical capacity to manage it.

> '*Individual neighbours all have their own busy lives and interests, and without a strong push or support, the level of landscape-scale impact reduction that is needed will not be achieved. I hope the future may bring an organisation that can help raise the awareness of all weed issues impacting these important rainforests and coordinate actions of individuals – that's what we need for long-term success*'. Leasie Felderhof

Case study 3

Madeira vine control in the Deua River Valley on the New South Wales South Coast

Emma Patyus and Paul Martin,
Eurobodalla Shire Council

Key points

- A cross-tenure approach takes careful planning and is best supported by working groups to ensure that surveys, control work, follow-up and monitoring are conducted on a broad scale to prevent reinvasion.
- Follow up is essential, so only begin control if you can commit to long-term maintenance.
- Mapping and monitoring are important to track change and celebrate success.
- The site featured in this case study is remote and subject to extreme climatic conditions, so it may not be indicative of change experienced in more stable and accessible environments.
- Staff continuity is important for building relationships and developing trust when working with land managers in rural areas.

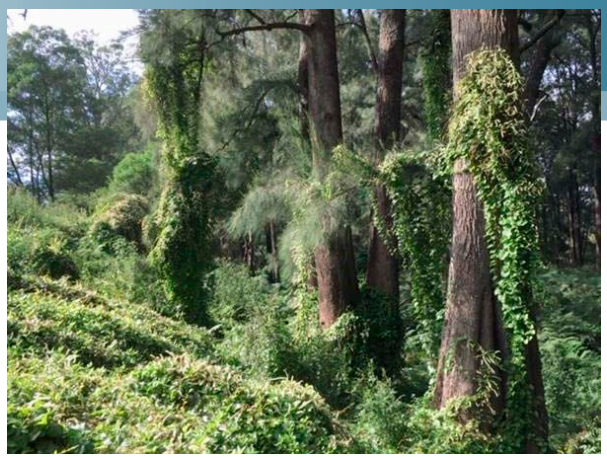
The situation

The 124-ha Schmidt family property is located within the Merricumbene area of the Deua River Valley, roughly 40 km west of Moruya on the South Coast of NSW. The property consists of several lots, including 20 ha of mostly cleared land managed for viticulture and 104 ha managed for biodiversity conservation. Colluvial soils support Lowland Grassy Woodland across most of the property, while alluvial soils closer to the Deua River support River-Flat Eucalypt Forest. Both ecological communities are listed as endangered in NSW. Madeira vine occurs on the alluvial soils at the upper flood mark in the riparian zone, where soil moisture levels are typically higher. Average rainfall in the Merricumbene area is around 900 mm per year, with severe flood events associated with east coast lows often exceeding minor flood levels and distributing topsoil across the alluvial flats.

The problem

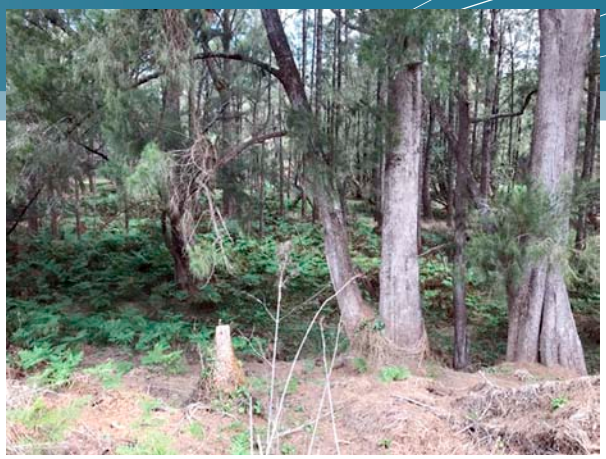
Helgi Schmidt and his family have been on the land for many decades, managing their property for viticulture and conservation purposes. Madeira vine originally colonised a 40-m long area along the top of the bank of the Deua River, where it adjoins the property. Madeira vine has been present in the property's riparian zone for at least 10 years, and plants had climbed into the canopy of the River Oak Open Forest and were smothering the forest floor.

The origins of Madeira vine at the property are unclear. Historical records indicate Madeira vine was most likely introduced to the Deua River Valley in the latter half of the 1900s, and it's since become



Eurobodalla Shire Council

Before: Madeira vine scrambling along the ground and climbing up the trees along the Deua River (May 2019).



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After: Site following Madeira vine control.

established there. Despite Madeira vine being present in the valley for more than 50 years, its distribution remains scattered, and it's considered in the early stages of invasion. It's establishment may be limited or slowed by the climate, soil type or some other localised factor.

Madeira vine greatly impacts the vegetation communities it invades by climbing into the canopy and smothering native trees, reducing their ability to photosynthesise. Over time, mature trees senesce and die. Additionally, infestations of Madeira vine that smother the ground reduce germination of desirable species. The loss of seedling recruitment and mature trees would result in the collapse of the vegetation communities at the property. Plant diversity, visual amenity, and flood and erosion mitigation would be lost. This would increase the delivery of sediments and nutrients to the river, contributing to downstream impacts on seagrass meadows, which support estuarine life and economically important activities such as recreational angling.

While access to this site isn't problematic, many similar riparian sites in the Deua River Valley feature steep escarpments, flood water, landslides and impenetrable scrub, limiting or preventing access for control purposes.

The approach

Planning

The multi-pronged approach to Madeira vine control started in 2015, when infestations were first mapped via kayak. Additional kayak surveys were undertaken in 2018 and 2021, supplemented by foot-based surveys.

Permits to enter and conduct control work were obtained and contractors engaged through the Deua River Maintaining Momentum and Bridging Gaps project, funded by the NSW Government's Environmental Trust.

Surveys over multiple years assistied with weed mapping and planning. Source: Eurobodalla Shire Council.

Herbicides

A range of application techniques were used at the property, based on the location and height of Madeira vine plants.

- Stem-scraping (scrape-and-paint) was conducted using Apparent Glyphosate Green 360 (200 mL) mixed with Apparent Woody (80 mL) and a penetrant (20 mL), neat with dye.
- Low-volume knapsack foliar spraying (spot-spraying) of plant material on the ground was carried out with Apparent Woody at 5 mL/L, plus penetrant.

Refer to Chapter 4 for more information on control options.

Follow-up control has been critical, with five applications between 2019 and 2023. The use of stem-scraping followed by low-volume foliar spraying has proven to be a very effective method of control for various invasive vines such as cat's claw creeper and Madeira vine, provided follow-up is conducted.

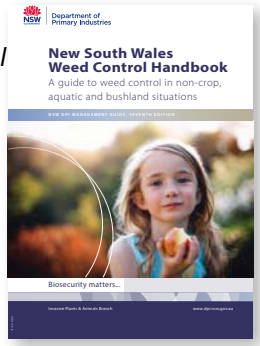
Monitoring

Photo-point monitoring was established at the early stages of the project to visually measure change over time.

Partnerships and advice

The Deua Rivercare Group has been controlling Madeira vine as part of a five-year tenure-neutral program over a 42-km stretch of the Deua River, both upstream and downstream of the Schmidt property. Working with neighbours is critical in preventing reinvasions from tubers and stem fragments, which are a major mechanism for long-distance dispersal of Madeira vine. Getting help and advice from experts has also been important. The NSW Department of Primary Industries *Weed control handbook* was consulted, in addition to local expert advice and control trials elsewhere.

The NSW Department of Primary Industries *Weed control handbook* provides guidance on control methods for Madeira vine. It can be found at: dpi.nsw.gov.au/__data/assets/pdf_file/0017/123317/weed-control-handbook.pdf



Learning from other experiences

Biological control with the leaf-feeding beetle (*Plectonycha correntina*) has been trialed without

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Photo-point monitoring demonstrating change over time. (a) Wildfires burnt the property, scorching many trees (January 2020). (b) The site after fire, showing the annual weed load (May 2020).

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Annual weeds germinating in autumn.

Eurobodalla Shire Council

Casuarinas recovering after fire, with grasses and forbs forming most of the groundcover.

success elsewhere in the Eurobodalla Shire. While it would be interesting to trial this control method in the Deua River Valley, it won't be used at this stage, primarily due to the local eradication goals.

The result

Through chemical control, Madeira vine is being successfully managed at this site. Photo-point evidence from 2021 shows casuarina trees starting to regenerate (after fire), with herbs and forbs covering the ground where once there was a carpet of Madeira vine.

Black Summer fires burnt through almost 80% of the shire in 2019–20, including the Schmidt property. Although other weed species, such as turkey rhubarb and wild tobacco, have since expanded across the site, Madeira vine appears unaffected by the fires. Madeira vine vigorously regrew in areas previously treated, but infestations haven't spread. It's assumed that any aerial tubers present on site were burnt during the fire. However, it's unknown whether the heat rendered them unviable.

Monitoring in 2023 indicates that Madeira vine is climbing back up the casuarinas, demonstrating the tenacity of this weed and the need for continual surveillance and ongoing maintenance.

The future

The Deua River is a true wild river, with High Ecological Value Aquatic Ecosystem status (NSW DCCEEW, 2024). Recent environmental DNA sampling of the river detected the Australian grayling (*Prototroctes maraena*), a fish listed as vulnerable under the Australian *Environment Protection and Biodiversity Conservation Act 1999*. Madeira vine at this site will continue to be controlled through the Rivercare Group, who intend to trial different herbicides to assess any difference in efficacy, including combinations of glyphosate, fluroxypyr and metsulfuron-methyl.

A significant amount of work has been undertaken on this section of the Deua River over the past decade. However, timing and grant funding is important to support this community in their vision for a healthier riparian zone.

Eurobodalla Shire Council

Despite five years of control and wildfires, vigilance is needed to manage Madeira vine regrowth (July 2023).

Case study 4

Eradicating Madeira vine from Bana Gindarja Creek in Far North Queensland

Kea Lewry and Dave Lloyd, Cairns Regional Council

Key points

- Understanding the extent of an infestation, through surveys, is a critical first step in an eradication program.
- Finding an appropriate control method, or integrating a range of methods, will greatly assist your successful control. This may involve trialing methods or herbicides to find the right approach.
- Thoroughly removing underground tubers will limit or prevent regrowth.
- Regularly follow up at established sites to manage Madeira vine tuberlings.
- Engaging experienced weed managers in control programs brings a range of benefits, even when dealing with new weed incursions.

The situation

Bana Gindarja Creek in Far North Qld runs through Edmonton, a former sugarcane-growing town that's now a suburb of Cairns. The name 'Bana Gindarja' refers to the cassowary, an important cultural species to the Gimuy Walubara Yindinji people, Traditional Owners of the area.

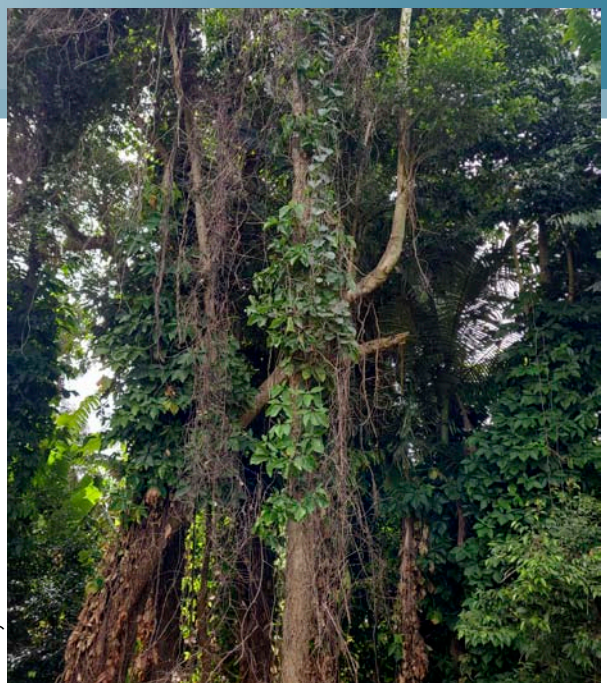
Edmonton is located in the wet tropics of Far North Qld. It has a tropical climate, with hot and humid summers and milder, drier winters. Average temperatures range from 17°C to 30°C throughout the year. Over 2,000 mm of rain can fall between December and March, sometimes leading to flooding of local creeks and rivers.

Bana Gindarja Creek, managed by Cairns Regional Council, begins in the foothills west of Edmonton, eventually flowing out to the Trinity Inlet in Cairns. The creek features non-remnant riparian forest with a disturbed canopy. The creek is in an urban area, surrounded primarily by housing. It neighbours a cane plantation.

The problem

The Cairns Regional Council was first alerted to the Madeira vine infestation along Bana Gindarja Creek around 2018 following a report from a visitor who knew of the weed from the Brisbane area. Herbarium records indicate Madeira vine has been present around Edmonton since at least 1999. Initially, plants were found near an old fruit orchard. Council staff suspect it was planted as a food source (leaves and tubers of Madeira vine are eaten in its native South America and elsewhere).

Madeira vine isn't known to occur anywhere else in the Cairns region, and this infestation is considered the weed's northern-most occurrence in Australia.



K. Lewry

Madeira vine climbing into the creek-line canopy, among native and other weedy plants.

Due to its extremely limited distribution in the Cairns region, Madeira vine is considered a priority weed and is targeted for eradication by the council.

Madeira vine plants are scattered along approximately 3 km of creek line, with plants occurring in discrete patches. The creek substrate is generally rocky, with Madeira vine preferring to grow in the pockets of alluvial sediment that are deposited in wash-out areas of the creek. A mown buffer runs alongside the creek, containing Madeira vine to the creek line itself.

The discovery of Madeira vine in the region represents a new incursion, and the focus is on eradicating it. The primary concern for the council is mitigating the potential for further spread of Madeira vine throughout the region. Although plants are believed to be less aggressive than in other parts of Qld (possibly because it's growing on the northern edge of its range of suitability), Madeira vine spreads easily and rapidly along riparian areas. There's also concern about the potential impact Madeira vine may have on riparian vegetation and watercourse health, which is already under pressure from other invasive vines such as thunbergia (*Thunbergia grandiflora*) and kudzu (*Pueraria montana* var. *lobata*), and aquatic weeds.

The approach

Once they became aware of the presence of Madeira vine, council staff surveyed the creek line to determine the extent of the infestation. The survey began upstream of the detected plants, to ensure all propagules were detected, reducing the chance of downstream reinvasion.

Once the infestation was delimited, staff researched the appropriate control methods and the herbicides that were permitted for use. Control work began on mature vines – some stems were as thick as forearms. Initial control included the following approaches.

Treatment of mature vines

- Large, mature vines were cut and underground tubers dug out. Fortunately, council staff had experience managing thunbergia and knew the importance of removing the whole tuber to prevent regrowth.
- Smaller vines were treated with the scrape-and-paint method, using a vegetable peeler to expose the cambium layer of the plant and applying Vigilant® gel to the exposed plant.

Treatment of tubers

- Fallen aerial tubers and tuberlings (sprouted aerial tubers) were raked into piles and bagged for disposal.
- Tarps were laid on the ground and vines shaken to dislodge aerial tubers for collection and disposal.
- Tuberlings were spot-sprayed (using a quick-spray unit) with a tank mix of 200 mL of glyphosate and 1.5 g of metsulfuron-methyl per 10 L of water.

Plant material was bagged and disposed of at the council-managed deep-burial waste facility. Refer to Chapter 4 for more information on weed control and disposal options.

K. Lewry

A vegetable peeler and Vigilant® herbicide were used to control vines with the scrape-and-paint method.

In some instances, a foliar spray was applied to the areas to open up the already-weedy groundcover to search for tuberlings. Care was taken in sensitive sites to reduce off-target damage. Fortunately, Madeira vine plants typically occur on the edge of the riparian vegetation and are relatively easy to access for control.

K. Lewry

Aerial tubers are a helpful way to identify Madeira vine plants in thick riparian vegetation, where many other vine species are present.

K. Lewry

Searching for tuberlings for bagging and disposal.

Weed surveys along Bana Gindarja Creek captured Madeira vine and other weed infestations. Source: Cairns Regional Council (internal mapping).

Case study 4

The result

Council staff know there are still aerial tubers at the site, and that flooding can spread aerial tubers downstream. As a result, the site is revisited as frequently as possible (approximately monthly) to control any tubers that have sprouted. Staff start work at the top of the infestation and move downstream. Staff are now grubbing out very small numbers of tuberlings during each visit.

Control methods have been very successful. There are now no mature vines and no vines with aerial tubers at the site, which significantly reduces the risk of further spread. Young plants (with stems finger-width or less in size) and tuberlings still remain and are controlled on a regular basis. Staff believe they've removed all underground tubers from previously treated mature vines, with no regrowth observed.

Many aerial tubers that drop to the ground rot before they can sprout. Although Cairns experiences a similar temperatures and rainfall to Madeira vine's native range in South America, staff believe the wet climate assists in the fast breakdown of tubers, with tubers either sprouting straight away or rotting. Other observations indicate a staggered sprouting of tubers (not all sprout at once), with possible reasons including light availability or warmth.

Although staff are limited to the herbicides available for use in riparian areas, Vigilant® has given excellent results. Extended wet seasons can impact on timing of follow-up visits, with some sites inaccessible at times due to flooding. Staff need to remain flexible and visit the site when the opportunity presents.

The future

The priority is to manage the potential for further spread throughout the region. Council staff are very happy with the results and plan to continue with current methods of hand removal or spot-spraying of tuberlings, depending on their location and density.

K. Lewry

Carpets of tuberlings are spot-sprayed for efficiency.

K. Lewry

Management is now focused on manual removal or spot-spraying of tuberlings.

K. Lewry

Small tuberlings can grow vigorously.