Environmental Protection Authority
Te Mana Rauhī Taiao

# Information for Submitters – APP203667

Have your say on an application submitted under section 34 of the HSNO Act (1996)

## Introduction

Waikato Regional Council has submitted an application to the EPA to introduce the root-feeding moth plant beetle *Freudeita* cf *cupripennis* (Chrysomelidae) as a control agent for the weed moth plant (*Araujia hortorum*). The application will be processed by the EPA through a publicly notified pathway.

This document provides information to help you understand the application, the HSNO Act process for considering the application, and how you can participate in that process.

## What is the application for?

The application seeks approval to release the moth plant beetle, *Freudeita* cf *cupripennis*, as a biocontrol agent for moth plant, *Araujia hortorum*. An abridged version of the summary in the application form follows below. We summarised the benefits, risk and costs of the moth plant beetle in the Appendix. Further, we performed a preliminary assessment of the risks and costs to the environment from the proposed release of the beetle after conducting an initial literature review and analysis of the information in the application and in the Appendix. We invite submitters to comment on our preliminary analysis and provide information that would support our full assessment to be published in the EPA staff assessment report (expected 12 April 2019).

### Background and aims of introducing *Freudeita* cf *cupripennis* in New Zealand.

Moth plant is widely naturalised in New Zealand from Nelson and Marlborough northwards, and is abundant north of Tauranga. It is considered a significant threat to conservation values and urban environments, and is already considered one of the most dangerous weeds in Auckland and Northland. Moth plant is a tough, perennial climber from South America and is an emerging weed in several regions of the world. It can grow up trees to reach over 5 metres tall, and forms a heavy mass of foliage that can break down underlying trees. The mass shades and kills underlying foliage. Moth plant grows equally well creeping over the ground, or shading out low-stature vegetation such as regenerating seedlings.

This weed adversely affects the health of forest margins, as well as many vulnerable habitats with smaller shrubs and herbs. It is a significant threat to the integrity of reserved land managed by the Department of Conservation (DOC) and local authorities. Moth plant is also a hated weed in the urban environment in northern New Zealand. It straggles over backyard fences, walls and power poles and has to be controlled. The latex sap from broken stems can cause skin burns, and it has caused poisoning of humans in New Zealand. It is also an issue in orchard shelterbelts.

Spraying this vine can result in unacceptable damage to underlying vegetation on land reserved for conservation. The options available to weed managers are therefore limited. Treatment by hand and collection of seed pods is viable where volunteers protect land of high local importance, but these methods quickly become impractical for the protection of biodiversity values nationwide. Biological control is the only sustainable option if the damage caused by this weed is to be contained.

Introduced natural enemies must be safe to import if this weed management tactic is to be environmentally acceptable. Significant adverse environmental or economic effects would occur if feeding in the roots by beetle larvae caused significant damage to valued non-target plants, whether native or introduced. The beetle has only been recorded from South America.

Tests conducted in the laboratory to determine the host range of the beetle confirmed that it can only develop on plants belonging to the same sub-tribe as moth plant. If the beetle was released in New Zealand, these tests suggest that damage to the ornamental plant tweedia (*Oxypetalum caeruleum*), which is occasionally grown in New Zealand gardens, cannot be ruled out. Three *Parsonsia* spp. are the only New Zealand native plants in the same family as moth plant, but they belong to a different sub-family and so are not closely related. One of these was chosen for testing to represent the genus, and was not attacked by the moth plant beetle. No other valued plants are at risk. The application considers other environmental risks of introduction, but none are considered to be significant.

## Where to find the application

The full application can be found on the EPA website (www.epa.govt.nz).

You can also contact the applicant representative directly if you have questions about the technical information in the application. The applicant's representative is Richard Hill who can be contacted by email (HillR@landcareresearch.co.nz) or phone (021 1376 919).

You can contact the EPA if you have any questions about the application process, making submissions, or the hearing process. The application leader is Aubanie Raynal, who can be contacted by email (Aubanie.Raynal@epa.govt.nz) or phone (04 474 5494).

## The application process

The application process is set out in the HSNO Act, including timeframes within which steps of the process must occur. The main steps are set out below.

| Stage of process | Date |
|---|---|
| Application formally submitted to EPA | 17 January 2019 |
| Public submission period | 31 January 2019 – 15 March 2019 |
| EPA Staff Assessment Report release | Expected 12 April 2019 |
| Public Hearing (open to the public, applicant and submitters can present) | Expected to take place on or before 1 May 2019 |
| Consideration of application (not open to the public) | Expected to take place on or before 1 May 2019 |
| Decision released | Prior to 12 June 2019 |

## Who considers the application?

The application is considered by a sub-committee of the EPA's HSNO Committee. The HSNO Committee consists of eight members, appointed by the EPA Board, with delegated decision-making powers to consider certain applications made under the HSNO Act.

The Decision-making Committee for this application has not yet been appointed.

## The role of EPA staff

EPA staff support the Decision-making Committee, and administer the consideration process including the submissions and hearing.

EPA staff also provide advice to the Decision-making Committee. Following the close of submissions, EPA staff will complete a full assessment of the matters to be considered, using the information in the application, from submitters, and other readily available sources. This Staff Assessment Report will be published on the EPA website and will assist the Decision-making Committee with the consideration of the application.

## Information the Decision-making Committee will take into account

Sources of information for the Decision-making Committee include, but are not limited to:

- the application form and supporting documents
- submissions
- EPA Staff Assessment Report
- information presented at a public hearing (if a hearing is held).

All written reports, submissions, the application, and decision will be available on the EPA website as they become available.

## The statutory criteria for considering this application

In considering the application, the Decision-making Committee must take into account a range of matters set out in the HSNO Act.

### Undesirable self-sustaining populations

The Decision-making Committee is required to consider the potential for *Freudeita cupripennis* to establish an undesirable self-sustaining population, and the potential for eradication of an undesirable population of the beetle.

The Decision-making Committee is interested in any information about a situation where a population of *F. cupripennis* might be considered undesirable.

### Minimum standards

The HSNO Act sets out minimum standards that must be met in order for a new organism to be released. This means that *F. cupripennis* cannot be approved for release if it is likely to:

- cause any significant displacement of any native species within its natural habitat
- cause any significant deterioration of natural habitats
- cause any significant adverse effects on human health and safety
- cause any significant adverse effect to New Zealand's inherent genetic diversity
- cause disease, be parasitic, or become a vector for human, animal, or plant disease, unless the purpose of that importation or release is to import or release an organism to cause disease, be parasitic, or a vector for disease.

The Decision-making Committee is interested in any information about whether *F. cupripennis* meets the minimum standards.

### Adverse and beneficial effects

The Decision-making Committee is required to weigh the potential beneficial (positive) effects against the potential adverse effects of releasing *F. cupripennis* into the New Zealand environment.

If the adverse effects outweigh the beneficial effects, the organism cannot be released.

The Decision-making Committee is interested in any information about benefits or adverse effects that could result from the release of *F. cupripennis*, in particular, any effects on the environment, human health and safety, the market economy, Māori culture and traditions, and society and communities.

## You can participate in the process

### Make a submission

Any person can make a submission on this application, provided it is submitted within the submission period (31 January 2019 – 15 March 2019). In a submission you can provide information, make comments and raise issues. In this way, you contribute to the EPA decision-making process on this application.

Further information on the purpose of submissions is available from the EPA website using the link below:
https://www.epa.govt.nz/public-consultations/

In your submission, you can also request a hearing if you would like to speak to your views in person before the Decision-making Committee. Further information on submissions for an application is available from the EPA website using the link below:
https://www.epa.govt.nz/public-consultations/what-to-expect-at-a-hearing/

The EPA website provides guidance and steps on how to make a submission. This is preferably done via the EPA submission form online, but may be sent as a letter or e-mail to the EPA. This information and the submission form can be accessed from the EPA website using the link below:
https://www.epa.govt.nz/public-consultations/how-to-make-a-submission/

### Participate in the public hearing

A hearing may be held to enable submitters to speak to the Decision-making Committee about their submissions.

You are entitled to bring witnesses who may speak to your submission at a hearing. If you choose this option, you should provide the EPA with a list of the witnesses, their areas of expertise, and the elements of the submission or application they will talk to.

If you choose to speak at a hearing, you are entitled to speak in one of the three official languages of New Zealand: English, Māori, or New Zealand Sign Language. Please advise the application lead **at least two weeks prior to the hearing start date if you wish to speak to your submission in Māori or New Zealand Sign Language** in order for the EPA to organise for an interpreter. The application lead, Aubanie Raynal, can be contacted by e-mail (Aubanie.Raynal@epa.govt.nz).

Both the applicant and submitter(s) need to provide the EPA with copies of any information they intend to present at the hearing at least two weeks prior to the hearing.

# Appendix

We summarised the benefits, costs and risks in the application and made a preliminary assessment of the risks and costs, based on the information presented in the application form and by doing an initial literature survey. We will complete a comprehensive literature review and incorporate information obtained from the public, as well as a cultural risk assessment, in our full staff assessment report expected to be made available on or before 12 April 2019.

## Risks, costs and benefits in the application

The applicant claims that the introduction of *Freudeita* cf *cupripennis* (moth plant beetle) to control moth plant would benefit the environment, human health, market economy and people and communities in New Zealand by:

- reducing the rates of spread to and establishment of moth plant at new sites, especially in natural habitats
- reducing herbicide use to control the weed which would reduce costs to land managers and decrease collateral damage to native plants that grow in close proximity to moth plant infestations
- reducing incidences of adverse health effects from exposure to the caustic and toxic milky sap moth plant exudes when stems and fruit are damaged
- reducing infestations in natural habitats to enhance the experience of people visiting recreational areas.

The applicant notes the release of the moth plant beetle could adversely affect the New Zealand environment, market economy or people and communities. The moth plant beetle could be hazardous to the environment if it feeds on native plants, has adverse effects on ecological systems by displacing native species, for example, or if moth plant is replaced by worse weeds following the decline in weed populations from attack by the beetle.

## Preliminary assessment of risks and costs to the environment from the introduction of the moth plant beetle

We performed a preliminary analysis of the adverse effects to native or exotic beneficial plants from the introduction of the moth plant beetle and indirect adverse effects that the beetle could have on ecosystems and species interaction if it was approved for release in New Zealand.

### Could moth plant beetle damage native or valued exotic species in New Zealand?

Host range experiments were performed on the beetle in containment on native and exotic plant species that are closely related to moth plant to determine if adult beetles would feed on leaves or if the beetle larvae would feed on roots[1].

The testing protocol followed best practice phylogenetic centrifugal methodology based on the established premise that plants that are closely related to the target (moth plant) are most likely to be vulnerable to attack by the beetle. The Flora of New Zealand[2] compendium lists seven common genera in

[1] McGrath et al., 2018: https://www.landcareresearch.co.nz/__data/assets/pdf_file/0008/167696/host-range-of-Freudeita-cf-cupripennis.pdf

[2] Webb et al. (1988). Flora of New Zealand, Volume IV, Naturalised Pteridophytes, Gymnosperms, Dicotyledons. Botany Division, DSIR, Christchurch.

the same family moth plant belongs to (Apocynaceae) noting that there are other genera which are cultivated as ornamentals in New Zealand but are encountered casually only and are not naturalised. The New Zealand Plant Conservation Network lists 16 species of plants in the same family[3]. There are three native species in the family and all are *Parsonsia* (native jasmines). Swan plant (*Gomphocarpus* spp.), which is related to moth plant and the main host to monarch butterflies, has the most economic value of all exotic species in the family in New Zealand.

Ten species, including the target, were selected for host range testing. The test plants covered species that are progressively further related to moth plant representing species in the same or related subtribes and in related tribes in different sub-families.

The tested plants included:

- The exotic species *Oxypetalum caeruleum* (tweedia) sold as an ornamental by nursery and garden centres. Tweedia is phylogenetically very close to moth plant being in the same subtribe.
- A species of swan plant (*Gomphocarpus fruticosus*) and tropical milkweed (*Asclepias curassavica*), an uncommon casual exotic, were selected for testing. They represent species that are in a closely related subtribe to moth plant.
- A number of other exotic species were tested to represent tribes that are related to moth plant and cultivated in New Zealand, including *Hoya*, *Vinca* (periwinkle), *Nerium* and *Mandevilla* species.
- Two of the three native *Parsonsia* species were tested. *Parsonsia* are in a different sub-family to moth plant and thus more distantly related.

Two sets of experiments were performed. First, the feeding habits of the adult moth plant beetle on test plant foliage was observed in multiple replicates and, second, the survival rates of moth plant beetle larvae in the soil on potted test plants. The survival tests were conducted to determine if feeding on test plant roots enabled the larvae to emerge as adults to quantify development through to adult stage in multiple replicate experiments. Mated female beetles walk down a plant to lay eggs in the soil around the crown of the plant. Hatching larvae burrow down to feed in the root zone. The ability of the larvae to feed on the roots and successfully develop through to pupal and adult stages on some of the test plants would be a strong indication that the beetle could use other (non-target) plants as hosts in the environment.

Adult beetles fed on moth plant and tweedia leaves in the feeding tests. Feeding damage to the foliage of other plants, including native *Parsonsia*, was insignificant.

Beetle larvae fed and survived on the roots of moth plant and tweedia. Larvae placed in the soil around the roots of *Parsonsia* plants did not survive. Similarly, adults did not feed on swan plant foliage and larvae did not survive in the soil. No larvae or pupae were found on any other test plant, however, two surviving larvae were recorded in the soil of a *Hoya carnosa* plant at the conclusion of the tests (five replicates, each replicate plant was inoculated with 10 larvae). The researchers noted that the two larvae were a different colour compared to the larvae that fed on moth plant which was considered to be either as a result of feeding on a different plant or it is possible that the soil was contaminated with the larvae of another beetle.

The host range experiments provide evidence that the moth plant beetle would not attack plants outside of the family *Apocynaceae*. Furthermore, the beetle would not feed on the foliage or the roots of plants that are in a different subtribe to moth plant. Tweedia is a potential field host to the beetle and could

[3] New Zealand Plant Conservation Network: http://www.nzpcn.org.nz/

support populations. There are no other species in the same subtribe in New Zealand. We consider that it is highly improbable that moth plant beetle would pose adverse effects to native New Zealand plant species, in particular native jasmines. However, it is likely that the beetle would attack tweedia, however, such attacks would be incidental or spill-over effects where moth plant and tweedia grow in close proximity to each other. Tweedia is not a big earner for nurseries and garden centres and the potential risk posed to tweedia is acceptable when considered in the context of moth plant's adverse effects on natural environments and biodiversity values.

## Could moth plant beetle displace native species, cross-breed with endemic beetles, or cause adverse effects in ecosystems?

A survey of the invertebrates and pathogens that are associated with moth plant populations at 12 sites between Kerikeri in the north to Nelson in the south was performed between October 2002 and March 2004[4]. A range of native and introduced invertebrates was found to be associated with moth plant. There was no specialist moth plant feeding invertebrates found in the survey. Commonly to occasionally found native herbivorous insects include longhorn beetles, weevils and flower thrips. Native generalist species of spiders, ladybirds and ants were also recorded on moth plant foliage. None of these organisms feeds specifically on moth plant or would use moth plant as its preferred host to catch prey, groom or seek shelter on. Similarly, no moth plant-specific native or beneficial fungal pathogens were isolated from moth plant foliage as most fungi were ubiquitous secondary pathogens or fungi that live on decaying or dead plant material. There appears to be no native invertebrates or fungi associated with moth plant populations in New Zealand. We can conclude that, since moth plant is not a preferred niche for native organisms, the control of the weed by the beetle would not displace native species.

In New Zealand, the subfamily to which moth plant beetle belongs (the Eumolpinae) is represented by 19 species in four genera[5]. All but two species are endemic to New Zealand. However, none are *Freudeita* species. Therefore, if the moth plant beetle is approved for release, it won't be able to cross-breed successfully with endemic beetles in New Zealand and thus would not adversely affect our inherent genetic diversity.

Finally, we assessed whether the release of the beetle would generate increased pressures on native species from parasitism or predation. Populations of general or specific predators and parasitoids that are in our environment may increase substantially if they attack moth plant beetles which, in turn, could increase attack rates on native or exotic beneficial species. A literature survey suggests that there are no known specific parasitoids or predators that attack beetles in the same subfamily as the moth plant beetle in New Zealand. There are general predators however, e.g. ground beetles and robber flies, which attack leaf beetles but also other arthropods in our environment[6]. These predators do not depend on moth plant as a reservoir for prey.

We do not consider that the introduction of the moth plant beetle would cause increase rates of attack on valued species in New Zealand. Further, we expect the moth plant beetle would be limited to its host plant, moth plant, in New Zealand. Any effects on the ecosystem would occur in or close vicinity to moth plant infestations. Given the lack of moth plant-specific or unique fauna associated with moth plant in New

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[4] Winks et al. (2004). Invertebrates and fungi associated with moth plant, *Araujia sericifera*, in New Zealand. Landcare Research Contract Report LC0405/009.

[5] Nadein and Leschen (2017). A new genus of leaf beetle (Coleoptera: Chrysomelidae: Eumolpinae) from Three Kings Islands, New Zealand. Zootaxa 2: 271-280.

[6] Doddala (2012). Systematics of *Eucolaspis* (Coleoptera: Chrysomelidae) in New Zealand and ecology of Hawke's Bay lineage. PhD Thesis, Massey University, New Zealand.

Zealand, we do not expect that there would be significant adverse effects on ecosystems from the release of moth plant beetle.