



Environmental
Protection Authority
Te Mana Rauhi Taiao

APP201363 Submissions

Submissions to application APP201363

The proposed importation and release of two weevils, *Berberidicola exaratus* and *Anthonomus kuscheli*, as biological control agents for Darwin's barberry (*Berberis darwinii*)



Under section 34 of the Hazardous Substances and New Organisms Act 1996

Printed: 7 August 2012

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Te Mana Rauhi Taiao

SUBMISSION FORM

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Submission on application number:	APP201363
Name of submitter or contact for joint submission:	Rob Simons Biosecurity Officer (plants)
Organisation name (if on behalf of an organisation):	Marlborough District Council
Postal address:	
Telephone number:	
Email:	

I wish to keep my contact details confidential

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The reasons for making my submission are¹: I support the application I oppose the application I neither support or oppose the application

In Marlborough *Berberis darwinii* is known to exist as scattered infestations in the Marlborough Sounds and Rai Valley areas. *B. darwinii* is not officially included in the Marlborough RPMS but surveillance information is collated. Our concern is, this species may have an adverse impact on the region's ecology and pastoral production. *B. glaucocarpa* (common Barberry) is fully naturalised in Marlborough and already a problem to the farming community.

With reference to the last sentence page 2 of Environment Southland's Application Summary (APP201363).

Berberidicola exaratus attacked the fruits of common barberry (*Berberis glaucocarpa*) in tests. Any damaging impact of *Berberidicola exaratus* on *B. glaucocarpa* would be beneficial to slowing the spread of this pest plant in Marlborough.

 I wish to be heard in support of my submission
(this means that you can speak at the hearing) **I do not wish to be heard in support of my submission**
(this means that you cannot speak at the hearing)**I wish for the EPA to make the following decision:**

To approve the importation and release of biocontrol agents (*Berberidicola exaratus* and *Anthonomus kuscheli*) to minimise the adverse impacts of *Berberis darwinii* and other introduced Barberry species.

¹ Further information can be appended to your submission, if you are sending this submission electronically and attaching a file we accept the following formats – Microsoft Word, Text, PDF, ZIP, JPEG and JPG. The file must be not more than 8Mb.

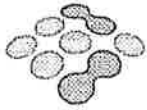
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SUBMISSION: 102575

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Submission on application number:	AP201363
Name of submitter or contact for joint submission:	Mary Trayes
Organisation name (if on behalf of an organisation):	West Coast Regional Council
Postal address:	PO Box 66
	Greymouth 7840
	Westland
Telephone number:	03 768 0466
Email:	mt@wrc.govt.nz

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The EPA is likely to post your submission on its website at www.epa.govt.nz. We also may make your submission available in response to a request under the Official Information Act 1982.

The reasons for making my submission are¹:

- | | | |
|---|---|--|
| <input checked="" type="checkbox"/> I support the application | <input type="checkbox"/> I oppose the application | <input type="checkbox"/> I neither support or oppose the application |
|---|---|--|

The West Coast Regional Council supports the introduction of the two weevils, *Berberidicola exaratus* and *Anthonomus kuscheli* as biocontrols for Darwins Barberry.

Darwins Barberry already has presence on the West Coast and is listed here as a Progressive Control pest plant.

Any mechanism which can reduce the spread of this pest plant is to be commended.

I wish to be heard in support of my submission
(this means that you can speak at the hearing)

I do not wish to be heard in support of my submission
(this means that you cannot speak at the hearing)

I wish for the EPA to make the following decision:

On behalf of the West Coast Regional Council, I wish the EPA to approve the introduction of the aforementioned two weevils.

[Handwritten signature]
wike,
16/7/2012

¹ Further information can be appended to your submission, if you are sending this submission electronically and attaching a file we accept the following formats – Microsoft Word, Text, PDF, ZIP, JPEG and JPG. The file must be not more than 8Mb.

Your Ref:
Our Ref: 7.00360

26 July 2012



Environmental Protection Authority
PO Box 131
Wellington 6140

Telephone: 0800 884 880
Facsimile: 0800 884 882
Email: info@boprc.govt.nz
Website: www.boprc.govt.nz
Pollution Hotline: 0800 884 883
International: +64 7 922 3390

Dear Sir/Madam

Bay of Plenty Regional Council's submission to the application for the import and release of two weevils as biological control agents for Darwin's barberry.

Thank you for the opportunity to comment on the application from Environment Southland for the import and release of two weevils; *Berberidicola exaratus* and *Anthonomus kuscheli*, as a biological control agents for the Darwin's barberry.

We do not wish to be heard on this matter. For any further enquiries please contact Kataraina Belshaw at Kataraina.Belshaw@boprc.govt.nz or 0800 884 881, extension 9323.

Our Organisation

The Bay of Plenty Regional Council is responsible for the sustainable management of resources within the Bay of Plenty region. Our Council works to manage peoples' effects on freshwater, land, air and coastal water under the Resource Management Act (1991).

The Regional Council also undertakes a range of roles managing pests under the Biosecurity Act 1993.

In addition we have a broader responsibility working with district councils in the area, for the economic, social and cultural well-being of communities in the Bay of Plenty region.

Comments

We support Environment Southland's application to import and release *Berberidicola exaratus* and *Anthonomus kuscheli*, as a biological control agents for the Darwin's barberry

- Within the Bay of Plenty Region known Darwin's barberry is currently confined to less than 100ha of scattered infestation within Whakarewarewa forest. Direct chemical control by stump treatment and spraying is carried out over this area at an annual cost of \$6,000.00. Darwin's barberry has the potential to be a major plant pest within the Bay of Plenty Region it has an estimated potential habitat of 414,607ha. The successful implementation of biological control would lessen the risk of *further* invasion of Darwin's Barberry into the region, with potential savings in costs of control and benefits resulting from the reduced use of herbicides within the region.

-
- From a national perspective the successful establishment of these two weevils will limit future invasion of pastoral land/plantation forestry and native plant communities, and in the long term, may reduce the financial investment currently made by DOC, regional councils and land occupiers to mitigate the effects of Darwin's barberry; restore productive values on infested pastoral/forestry land; and protect and eventually restore native vegetation and ecosystems

Our Council considers that *Berberidicola exaratus* and *Anthonomus kuscheli* are very suitable candidates for biological control of Darwin's barberry.

Yours faithfully



Fiona McTavish
Group Manager Strategic Development



Environmental
Protection Authority
Te Mana Rauhi Taiao

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Submission on application number:	APP201363
Name of submitter or contact for joint submission:	Dr John Liddle
Organisation name (if on behalf of an organisation):	Nursery and Garden Industry Association
Postal address:	PO Box 3443 Wellington 6140
Telephone number:	04 918 3511
Email:	john@ngia.co.nz

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The reasons for making my submission are¹: I support the application I oppose the application I neither support or oppose the application

The Nursery and Garden Industry Association (NGIA) believes that the release of the two proposed species should not proceed until exhaustive host specificity testing is completed.

NGIA believes that host testing is incomplete. Host testing must include all species and cultivars of the family Berberidaceae (including but not limited to Berberis, Epimedium and Mahonia) grown by the industry for the purpose of ornamental, amenity and shelter purposes.

Moreover the NGIA is concerned that the release of these species will, with the pending possible removal (in the context of an already limited range) of some of the pest control chemicals presently available, leave the industry and gardeners (both municipal and home) with another pest species.

NGIA notes that *Berberis darwinii* is a difficult pest plant to control. NGIA appreciates that control programmes are costly because of the woody nature of the plant and its small waxy leaves.

NGIA comments as follows:

Anthonomus kuscheli

In tests conducted in Chile *Anthonomus kuscheli* Adult weevils did not feed on foliage of *Nandina domestica* (sub-family Nandinoideae). Norambuena H.M., 2011 reported that a new generation of weevils was produced on *B. darwinii* and *B. thunbergii atropurpureum*therein lies the rub - a cause for concern for NGIA and gardeners.

NGIA is concerned about the statement (in the application) that "A new generation of weevils was produced on *B. darwinii* and *B. thunbergii atropurpureum* but not on the other nine *Berberis* species presented in those tests that were well-controlled". This statement coupled with careful spin in a supporting report that states "In fact, with the exception of *B. thunbergii*, no larvae were found in the buds of any plants other than the target weed, suggesting that adults only laid eggs on *B. darwinii*." The question of the effects on *B. thunbergii* (an important

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ornamental species) and its cultivars, along with *Epimedium* and *Mahonia* species, is in the view of NGIA dismissed without careful consideration.

The report also states "However, while it is possible that the foliage and buds of exotic species of *Berberis* may be damaged by transient adult weevils (see Section 6.4.1), these are not expected to support complete development (with the exception of *B. thunbergii atropurpureum*)." NGIA is emphatic that *B. thunbergii* is not an exception. This species and its cultivars are a component of the nursery industry offering which is widely grown in both public and private gardens.

Berberidicola exaratus

NGIA notes that Norambuena H.M., 2011 reported that the life cycle of this species was completed on seven of the eight *Berberis* species tested. There was no sign of larval development on *Nandina domestica*, (subfamily Nandinoideae), or on more distantly related plant species outside the family Berberidaceae.

Adults fed on the leaves and fruits of most *Berberis* spp. presented, but not on *Nandina domestica* (sub-family Nandinoideae) or on species from other families in the order Ranunculales.

No larvae were observed in native *Clematis paniculata* or in *Nandina domestica*.

NGIA is concerned that the statement: "As in Chile, adults did not feed significantly on the foliage of the seven species outside the sub-family Berberidoideae that were tested." What an entomologist seeking a biocontrol might describe a 'not feeding significantly' may in fact be considered as significant by an entomologist working in nursery crop plant production and amenity horticulture. Such damage albeit it 'not significant' can result in additional costs for the nursery industry impacting on product quality, control costs and gardeners perceptions of that particular plant.

Further concern

NGIA notes that:

- In the adverse effects section of the application the effects on ornamentals is, we believe, not given the weighting that it should have been
- While the applicant(s) state: "Neither *A. kuscheli* nor *B. exaratus* is expected to significantly affect the utility of barberry species as ornamentals for the following reasons." NGIA does not support this contention in the

absence of adequate information

- B. exaratus is not specific to Darwin's barberry, and is able to complete development on species within the genus Berberis and Mahonia
- "Similarly, adults fed on the leaves and particularly the fruits of most Berberis spp. presented,"
- "From these results we conclude that Berberidicola exaratus is able to complete development on several species within the genus Berberis and is not specific to Darwin's barberry."

Conclusion

NGIA believes that the research undertaken by Landcare on behalf of the applicant(s) has failed to adequately consider the effects on ornamental species of Berberis grown in New Zealand while focusing heavily on native species and native surrogates when doing host preference trials.

NGIA does not support the release of these bio-control agents until such time as it is satisfied that there will be no significant effects on the ornamental species grown in New Zealand.

I wish to be heard in support of my submission
 (this means that you can speak at the hearing)

I do not wish to be heard in support of my submission
 (this means that you cannot speak at the hearing)

I wish for the EPA to make the following decision:

NGIA believes that The EPA should not grant approval to release the two weevils proposed for controlling Berberis darwinii until such time as the research undertaken by Landcare on behalf of the applicant(s) adequately considers the effects on ornamental species of Berberis grown in New Zealand.

Submission Form

SUBMISSION ON APPLICATION APP201363, TO IMPORT AND RELEASE TWO WEEVILS AS BIOLOGICAL CONTROL AGENTS FOR DARWIN'S BARBERRY

Submitter: Dr Cliff Mason

Telephone:

e-mail: _____

This submission **opposes** the Application. The grounds for this opposition are as follows:

- 1) The introduction of any alien organism into New Zealand damages our environmental integrity.
- 2) There is very little evidence that the proposed introduction will yield any significant benefit.
- 3) The introduction of alien weevil species into New Zealand, which has a rich and varied indigenous weevil fauna, is intrinsically hazardous to that fauna.
- 4) The strategy of introducing multiple biological control agents against weedy plants is fundamentally flawed.

Expanding upon each of these points:

- 1) The complex of plants, animals and micro-organisms that exists in New Zealand has arisen over millennia of physical and biological isolation and constitutes a natural and cultural heritage. As guardians of this heritage, we are obliged to respect the integrity of this system and such responsibility is embedded in legislation, including the Hazardous Substances and New Organisms Act.
- 2) The proposed benefits from introduction of *Anthonomus kuscheli* and *Berberidicola exaratus* into New Zealand ecosystems are small and long term as described in the Application. The main benefit proposed is that a reduction in the volume of seed produced by extant Darwin's barberry plants will reduce the spread of the weed and reduce the amount of work and consequent expense of controlling new barberry populations. While there is abundant evidence for the ability of some biological control agents (BCAs) to reduce populations of weed species, I am unaware of any theoretical underpinning of the notion that BCAs can reduce spread. There is only the assumption that a reduction in seed production can be achieved that is sufficient to reduce colonisation of new sites to a significant degree. This assumption is groundless without information about the rates of colonisation achieved at varying

seed densities or total seed numbers and information about the total reduction in these values that empirical evidence suggests might be expected from introduction of the BCAs. More importantly, control of spread of a weed such as barberry could only be expected to have some chance of success if the BCAs are able to disperse over similar distances to weed seeds. Dispersal of barberry by birds occurs over a range of hundreds of metres to kilometres. There is no evidence that I have encountered to suggest that the BCAs can disperse over these distances. The targets in the context of spread are also isolated single plants. There is no evidence of the ability of the BCAs to successfully find such targets. As it is these isolated plants in difficult sites that incur the greatest difficulty in control and that are most important in conservation programmes, there will only be significant benefit from BCA introduction if these plants can be reached by the agents in sufficient numbers to reduce seed production. In the case of barberry, where visual cues allow bird vectors to locate such isolated plants, the efficiency of the BCAs in also locating these targets would need to be high. There is no evidence to suggest that this is the case and the proposed introduction seems very unlikely to achieve its main aim.

Added to this, there seems a possibility that *Anthonomus kuscheli* will interfere with the effectiveness of establishment of *Berberidicola exaratus* by reducing the volume of fruit available for colonisation by the latter. This important point is not covered in the Application.

The presence of an existing BCA, the parasitoid *Microctonus aethioides*, that targets weevil species, also may reduce establishment and/or efficacy of the BCAs proposed for introduction.

- 3) It is particularly disturbing that new weevil species are proposed for introduction when, as the Application states, there is virtually no knowledge of natural enemies and other ecological factors relevant to indigenous weevil populations. As the weevil fauna of New Zealand includes some rare and spectacular species and that our country is distinguished by this element of our fauna, it is unconscionable that introductions that might have an impact on this taonga could be approved. The previous approval for the introduction of *M aethioides* remains one of the most egregious errors of judgement of the Environmental Risk Management Authority.
- 4) The continuous introduction of new BCAs against weed species is a process that does not seem to be part of any overarching strategy. The independent assessment of each Application by the Authority also precludes a strategic approach and overlooks cumulative and synergistic effects of introductions. There has been very little consideration given to alternatives to the proposed introductions. At previous Application hearings I have suggested that targeting vectors in weed establishment and spread would be a better strategy than a piecemeal weed-by-weed approach. In the present case, the Applicants have provided references that strongly support the

case for targeting a vector. These references illustrate the major role that blackbirds play in dispersal of Darwin's barberry and several other weed species. While such an effective vector remains active, each and every BCA will be facing an uphill battle to achieve control of their target. It may be supposed that, should control of one weed be achieved, dispersal of remaining weeds will be intensified. It is curious that the Department of Conservation, as a member of the Biological Control Collective, does not seem to have raised blackbird control as an alternative strategy. I urge the Authority to specifically question DOC as a member of the Application team regarding the practicability of blackbird control as an alternative to the introduction of yet more foreign organisms.

I wish to appear at any hearing into this Application in order to explain and expand upon the points made in this Submission.

Yours sincerely,

Cliff Mason



Environmental
Protection Authority
Te Mana Rauhi Taiao

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Submission on application number:	APP201363
Name of submitter or contact for joint submission:	Davor Bejakovich, Manager, Biosecurity
Organisation name (if on behalf of an organisation):	Greater Wellington Regional Council
Postal address:	Greater Wellington Regional Council, PO Box 41 Masterton 5840
Telephone number:	06 826 1518
Email:	davor.bejakovich@gw.govt.nz

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The reasons for making my submission are¹: I support the application I oppose the application I neither support or oppose
the application

The Greater Wellington Regional Council (GW) has statutory obligations for the management of pest plants within the 813,000 hectares of the Wellington Region. These obligations include the maintenance of regional indigenous biodiversity, management of regional economic threats and the implementation of the Regional Pest Management Strategy 2002-2022 (RPMS) under the Biosecurity Act 1993. As part of the implementation of the RPMS, GW is a contributor to and participant in the National Biological Control Collective, and supports the establishment of proven biocontrol species.

Darwin's barberry is a common pest plant species in the Wellington region, threatening both biodiversity and agriculture. It is particularly prevalent in the western hills of the Wellington suburbs, but is also present in the Hutt Valley, Kapiti Coast and Wairarapa. Seeds are spread by birds, and with both exotic and native bird populations increasing from extensive possum and rat control in the Wellington region, the spread is becoming worse. Under the RPMS, Darwin's Barberry is listed as a Site-Led Key Native Ecosystems species, meaning that it is controlled in sites of high biodiversity where possible. Darwin's barberry is a difficult and expensive species to control with traditional methods, meaning many of our worst infestations are left without any management.

GW has been involved in the National Biological Control Collective since its inception, and has been involved in the successful release of a number of biocontrol agents. Biocontrol is particularly desirable for wide-spread species such as Darwin's barberry, dispersing naturally to scattered infestations and slowing the further spread of the plant. Because of the invasive nature of Darwin's barberry and the steep terrain of the Wellington region, biocontrol is the only realistic control method in many of the invaded sites. With an ever increasing range of pest plant species, finite resources and growing opposition to the use of chemical control, biocontrol is a welcome alternative to traditional methods.

The only potential negative impact GW has identified is the unintended impact of the biocontrol agents to ornamental garden plants of the Berberis species. Given the widespread existence of Darwin's barberry in the region and the expensive current control methods, GW considers the potential benefits of biocontrol release outweigh the costs. The limited number of gardeners potentially impacted through damage to ornamental species will be out-weighed by the numerous landowners currently meeting the costs associated with Darwin's barberry infestation and control.

It is well recognised that following release there is no further control over any biocontrol species, meaning that testing and management needs to be thorough prior to release. GW supports the processes of the Environmental Protection Authority, Landcare Research and the Ministry for Primary Industries for the

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importation and release of new organisms, and trusts that due diligence will be followed in the assessment of risk by these agencies. As with any introduction, once the organism is successfully introduced, there is little or no ability to control or manage the organism in its wild state.

Darwin's barberry is a prevalent ecological and agricultural pest species in the Wellington region, which is expanding under the current management regime. The successful establishment of the biocontrol agents will greatly assist with the management of this problematic plant species.

I wish to be heard in support of my submission
(this means that you can speak at the hearing)

I do not wish to be heard in support of my submission
(this means that you cannot speak at the hearing)

I wish for the EPA to make the following decision:

GW supports the proposal to release *Berberidicola exaratus* and *Anthonomus kuscheli* as a biological control agent for Darwin's barberry. The establishment of this species as an effective biological control agent will greatly assist with the long-term, national management of Darwin's barberry.

SUBMISSION

TELEPHONE 0800 327 646 | WEBSITE WWW.FEDFARM.ORG.NZ



To: Environmental Protection Authority

Submission on: Release of two weevils *Anthonomus kuscheli* and *Berberidicola exaratus*

From: Federated Farmers of New Zealand

Date: 3 August 2012

Contact:

ANN THOMPSON
DAIRY POLICY ADVISOR

Federated Farmers of New Zealand
Box 715, Wellington, New Zealand

P 04 494 9191

F 04 473 1081

* athompson@fedfarm.org.nz

SUBMISSION

RELEASE OF TWO WEEVILS *ANTHONOMUS KUSCHEL* AND *BERBERIDICOLA EXARATUS*, REFERENCE NUMBER APP201363

1. FEDERATED FARMERS SUBMISSION

- 1.1. Federated Farmers welcomes the opportunity to submit to the Environmental Protection Authority on the proposal to the release of both *Anthonomus kuscheli* and *Berberidicola exaratus*, which are to be used to attempt biological control of the weed Darwin's barberry (*Berberis darwinii*).
- 1.2. In previous communication with Landcare Research we gave our support for the investigation to go ahead. Since that time, Landcare Research and Dr Hernán Norambuena have carried out research on behalf of the National Biocontrol Collective.
- 1.3. Federated Farmers is supportive of the release of both these weevils, based on the conclusions found.
- 1.4. While it is thought to impact on bee foraging, the Federated Farmers Bee Industry Group considers the effect on honeybees to be acceptable considering the invasive nature of the plant.
- 1.5. We note the use of these weevils will make no difference to established Darwin's barberry plants, which means that physical destruction of them will still have to be done in order to render an area free of the weed.
- 1.6. It is essential that the life cycles of both weevils need to be completed successfully in New Zealand in order for any success to occur.
- 1.7. We note that it appears the dependence of the weevils on the host plant will lead to self limitation, which is useful as it appears that not many predators are able to extract the larvae from the plant structures.

2. ABOUT FEDERATED FARMERS

- 2.1. Federated Farmers of New Zealand is a primary sector organisation that represents farming and other rural businesses. Federated Farmers has a long and proud history of representing the needs and interests of New Zealand farmers.
- 2.2. The Federation aims to add value to its members' farming business. Our key strategic outcomes include the need for New Zealand to provide an economic and social environment within which:
 - Our members may operate their business in a fair and flexible commercial environment;
 - Our members' families and their staff have access to services essential to the needs of the rural community; and
 - Our members adopt responsible management and environmental practices.

He tono nā



Te Rūnanga o NGĀI TAHU

ki te
ENVIRONMENTAL PROTECTION AGENCY

e pā ana ki te
APPLICATION NUMBER APP201363

12 Whā / August 2012

contents

1. EXECUTIVE SUMMARY
2. TE RŪNANGA O NGĀI TAHU
3. RECOMMENDATIONS

contact person

Richard Ball | Manager, Toitū Te Whenua | Te Rūnanga o Ngāi Tahu

request to be heard

Te Rūnanga o Ngāi Tahu does NOT wish to appear to speak to this response.

1. EXECUTIVE SUMMARY

1.1 Te Rūnanga o Ngāi Tahu (Te Rūnanga) is supportive of the application (APP201363). This support is provided in consultation with and on the advice of the HSNO Komiti (the Komiti) of Te Rūnanga.

1.2 Te Rūnanga recognises the significant adverse effects of Darwin's barberry, and is satisfied that this application – as one of a suite of methods to contain or eradicate Darwin's barberry – will have positive results.

1.3 Te Rūnanga, therefore, presents the following specific recommendations:

- (a) That the Environmental Protection Authority (EPA) approve the release of *Anthonomus kuscheli* and *Berberidicola exaratus* as biological control agents for the weed Darwin's barberry (*Berberis darwinii*);
- (b) The EPA ensures the scientific analysis supporting the application is sufficiently robust to support this conclusion; and
- (c) the application must be seen as one of a suite of methods to contain or eradicate Darwin's barberry.

2. TE RŪNANGA O NGĀI TAHU

2.1 This response is made on behalf of Te Rūnanga o Ngāi Tahu (Te Rūnanga). Te Rūnanga is statutorily recognised as the representative tribal body of Ngāi Tahu Whānui and was established as a body corporate on 24th April 1996 under section 6 of Te Rūnanga o Ngāi Tahu Act 1996 (the Act). We note the following relevant provisions of our constitutional documents:

(a) Section 3 of the Act States:

This Act binds the Crown and every person (including any body politic or corporate) whose rights are affected by any provisions of this Act.

(b) Section 15(1) of the Act states:

Te Rūnanga o Ngāi Tahu shall be recognised for all purposes as the representative of Ngāi Tahu Whānui.

(c) The Charter of Te Rūnanga o Ngāi Tahu (1993, as amended) constitutes Te Rūnanga as the kaitiaki of the tribal interest.

2.2 Te Rūnanga respectfully requests that this response is accorded the status and weight due to the tribal collective, Ngāi Tahu Whānui, currently comprising over 49,000 members registered in accordance with section 8 of the Act .

3. RECOMMENDATIONS

3.1 *Anthonomus kuscheli* and *Berberidicola exaratus*

- (a) Te Rūnanga recognises the significant adverse effects of Darwin's barberry. Te Rūnanga considers that there appears to be minimal risk to indigenous flora and fauna from the introduction of the two weevils *Anthonomus kuscheli* and *Berberidicola exaratus* as biological control agents for the weed Darwin's barberry (*Berberis darwinii*).

- (b) As such, Te Rūnanga recommends:
 - (i) That the Environmental Protection Authority (EPA) approve the release of *Anthonomus kuscheli* and *Berberidicola exaratus* as biological control agents for the weed Darwin's barberry (*Berberis darwinii*).

3.2 Scientific Information

- (a) Te Rūnanga relies on the information that these weevils will only attack plants of the same or closely-related families and will not adapt to other plant families, even in areas where barberry plants are not plentiful.
- (b) In order to maintain confidence in the information supplied, Te Rūnanga recommends that:
 - (i) The EPA ensures the scientific analysis supporting the application is sufficiently robust to support this conclusion.

3.3 Alternative Methods

- (a) Te Rūnanga notes that the application has little supporting information which quantifies the costs of infestation by Darwin's barberry or the costs of alternative methods to contain or eradicate infestations. This is particularly important information in this case, as the weevils, if successful, will only slow the spread of the plant, but will not fully contain its spread or eradicate current areas of infestation.
- (b) In this context, Te Rūnanga recommends that:
 - (i) the application must be seen as one of a suite of methods to contain or eradicate Darwin's barberry.

3.4 Timing and Location of Release

- (a) Te Rūnanga request that information is provided to both Te Rūnanga and Papatipu Rūnanga on the proposed timing and location of the release of this new biological control agent.
- (b) Information on the effectiveness is also requested once it is available.



**Otago Regional Council Submission
on the
Southland Regional Council Application to the Environmental Protection
Authority to Import and Release Weevils as Biological Control Agents for
Darwin's Barberry**

This is a submission to the Environmental Protection Authority on the application by Southland Regional Council (APP201363) to import and release two weevils (*Berberidicola exaratus* and *Anthonomus kuscheli*) as biological control agents for the weed Darwin's barberry (*Berberis darwinii*).

The Otago Regional Council does not wish be heard in support of this submission.

Signature of submitter (or person authorised to sign on behalf of submitter):

Fraser McRae
Director of Policy and Resource Planning

3 August 2012

Address for service:	Otago Regional Council Private Bag 1954 DUNEDIN 9054
Telephone:	03 474 0827
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Contact person:	Fraser McRae, Director Policy and Resource Planning

This submission is:

The Otago Regional Council (ORC) supports the Southland Regional Council application to import and release two weevils (*Berberidicola exaratus* and *Anthonomus kuscheli*) as biological control agents for the weed Darwin's barberry (*Berberis darwinii*).

Darwin's Barberry has been well established for many decades in parts of Otago. It is commonly found in South Otago where, while it may be localised, the infestations can range from individual plants or small patches, through to dense infestations. It can be found in pastoral, forestry and native bush locations.

Darwin's Barberry is also present in varying degrees in coastal areas of Dunedin City including the Otago Peninsula and in Glenorchy in the Queenstown Lakes District. In North, East and Central Otago it is believed that in large, it has not yet established to any extent. It may be established in other areas of Otago which ORC has no record of.

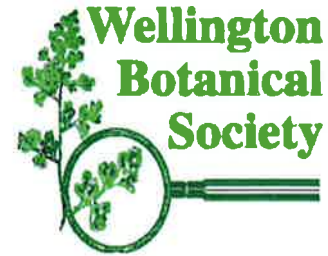
Although Darwin's Barberry is not included in the ORC's Regional Pest Management Strategy, it is recognized as a widespread pest plant in Otago. Any control work undertaken is at the discretion of the landowner. Aside from one community group in South Otago, there are no special interest groups in Otago that actively control Darwin's Barberry or generate any publicity.

There are no known specific benefits that Darwin's Barberry has to Otago. The Environment Southland proposal will have positive effects on the control of Darwin's Barberry in Otago and as such, the proposal is supported by ORC.

The Otago Regional Council seeks the following decision from the Environmental Protection Agency:

That the application be granted.

PO Box 10-412
Wellington
6143
New Zealand



Charities Commission Registration CC10518

6 August July 2012

New Organisms Division
Environmental Protection Authority
PO Box 131
Wellington 6140

submissions@epa.govt.nz

cc: Kate.Bromfield@epa.govt.nz

Submission to the Environmental Protection Authority on application to release two weevils as biocontrol agents for Darwin's barberry (*Berberis darwinii*)

Submitter: Wellington Botanical Society

Contact details Bev Abbott, 0274 481 100

Phone 0447 481 100

1. The Wellington Botanical Society welcomes this opportunity to comment on the application to release two weevils as biocontrol agents for Darwin's barberry.
2. As a general principle, the Society promotes a precautionary approach to biological control given the risks that introduced control agents may impose on non-target indigenous species. In the case of Darwin's barberry, however, we consider that the time has come to test biological approaches to its control. We share the concern of the applicants about the effects of Darwin's barberry on native vegetation and ecosystems. From our own observations, Darwin's barberry is a vigorous, persistent and invasive weed that quickly out-competes native plants and is difficult to control.
3. We hope that in the long-term the release of the two weevil species will:
 - reduce the impact of Darwin's barberry on indigenous vegetation and contribute to the restoration of ecosystems and productive pastoral land
 - reduce costs to DOC, regional councils and land occupiers of mitigating the effects of Darwin's barberry.
4. We were disappointed to learn that neither weevil is expected to have any impact on the growth rate or survival of **Berberis** plants already growing in New Zealand because the weevil larvae only feed on reproductive parts of the plant, and adults do little eating.

Conclusion and recommendation

5. The Society has no particular concerns about the release of the two species of weevils and sees advantages in the way that their modes of attack are complementary (additive).

6. Consistent with a precautionary approach, however, we would propose gradual release from containment. One option would be to start with Rakiuara/Stewart Island. If, after a specific period, there are no indications of any adverse effects, release could be managed in other parts of Southland. After that, releases in new locations and settings could be considered.

APPENDIX

7. This appendix emerged from the iterative process used by the Society to develop an informed position on the proposed release. The EPA is welcome to adopt or adapt any additional information or perceptions from the Appendix. See for example, paragraphs 24 and 25.
8. The Society also proposes to use information from the appendix in communications with agencies and stakeholders in the Wellington region who have responsibilities to manage Darwin's Barberry. Drivers for this additional activity include:
 - alerting key agencies and stakeholders that a new bio-control approach may be available within the next few years with the potential to limit the spread of Darwin's Barberry
 - reminding agencies of the long history of the current infestations and the ongoing threat that these impose to places such as Otari-Wilton's Bush
 - encouraging agencies to review the success of their current investments and approaches in tackling this pest.

Background

9. Environment Southland has applied to the Environmental Protection Authority (EPA) on behalf of the National Biocontrol Collective to release two weevils as biocontrol agents for Darwin's barberry (*Berberis darwinii*). The collective comprises 13 regional councils and the Department of Conservation (DOC).
10. Darwin's barberry is a vigorous, persistent, invasive and long-lived weed that quickly out-competes native plants.
11. The two weevils are:
 - *Anthonomus kuscheli*, or the flower bud weevil. This is tiny (3mm long) and brown in colour with a striking pale stripe along its thorax and either side of its abdomen. In its native range (Chile), it has multiple generations per year, with the first adults emerging in early spring. Adults mate during flowering and larvae feed on flower buds of Darwin's barberry, preventing flower formation. There is no reason to expect its biology or behaviour to be different in New Zealand.
 - *Berberidicola exaratus* or the seed weevil. This is also tiny (<3mm long) but is a uniform dark brown. Adult weevils lay eggs inside the fruit of Darwin's barberry and the resulting larvae feed on and damage developing seeds. In its native range (Chile), it has one generation per year and emerges later than the flower bud weevil to attack the developing fruit. Again, there is no reason to expect its biology or behaviour to be different in New Zealand.
12. In its application Environment Southland notes that:
 - Darwin's barberry invades pasture, disturbed forest, shrubland, tussockland, roadsides and other scarcely vegetated sites
 - the seeds are spread over long distances by birds that eat the berries
 - it grows more rapidly than native species when suitable conditions arise, and dominate sites where it becomes established
 - it can suppress existing vegetation and prevent the establishment of desirable plants. Darwin's barberry can persist under canopy in forest and shrubland.
13. According to the application, the two weevils feed on the reproductive structures of Darwin's barberry. The effects are additive because reduction in fruit production as a result of *A. kuscheli* activity is likely to reduce the resource available to *B. exaratus*, increasing the proportion of seeds attacked within each fruit.

14. Feeding on reproductive structures is expected to:
 - limit the rate at which satellite populations become established
 - limit the rate at which investment in Darwin's barberry must increase to maintain biodiversity and production values
 - increase the effectiveness of current investment by limiting reinvasion of cleared sites.
15. Release of the weevils, however, is unlikely to influence the survival of existing infestations.
16. As noted above, birds play a major role in the spread of Darwin's barberry. Allen & Wilson, 1992 have reported that approximately 50% of all Darwin's barberry flowers mature to form fruits, and production can exceed 4,000 fruits per square metre. These authors also reported that birds consumed 74% of Darwin's barberry fruits in one year and 77% in another year.

Support for application

17. The Wellington Botanical Society is supportive of this initiative by regional councils and the Department of Conservation to find new ways of limiting the future spread of Darwin's barberry.
18. Whilst the application states that "Darwin's barberry is still of limited distribution in New Zealand", it is certainly a problem in Wellington and is spreading at an alarming rate.
19. Members of the Society have a long history of urging local authorities to deal with Darwin's barberry in reserves such as Otari Wilton's Bush, Wellington. [Otari is New Zealand's national native plant museum. It has a priceless legacy of original forest as well as an internationally significant collection of New Zealand's indigenous species].
20. Specific references have included:
 - In the early 1930s, Stan Reid pointed out to Wellington City Council that there was some Barberry in the hilly area above the Karori Cemetery and suggested that it be dealt to before it spread
 - In 1996, Reid, J.S. published the results of a review of the botanical quadrats he established in Otari in 1934. The following quote showed that he drew attention to the serious nature of the invasion of Darwin's barberry from a long-standing invasion on nearby Johnson Hill.

Darwin's barberry requires similar strong action, immediately, to kill mature fruiting plants and to maintain a constant watch for seedlings. The most probably source for Darwin's barberry is an area on Johnson Hill where it has been for 60 years and is within easy flying distance of Otari for birds that find the fruit attractive. Recently a review of the 1934 quadrats in Otari has revealed the serious nature of the invasion which has been brought to the attention of the City Parks Manager." [Reid, J.S. 1996: Otari Vegetation. Wellington Botanical Society Bulletin 47: 34–53.]
 - In 2008, members of the Society participated in a Bioblitz at Otari to record the indigenous and other plant species present in Otari. Subsequent reports provide some additional context about the seriousness of Darwin's barberry in this unique reserve:

The number of native vascular plants found during the BioBlitz exceeds the number of exotic vascular plants by approximately 50. Two factors account for the balance favouring native species. Firstly, at least 25 of the native species recorded are known to have been planted, e.g., Agathis australis, Nothofagus fusca, Cortaderia fulvida. Secondly, some of the exotic species may have been

eradicated, e.g., *Euonymus japonicus*, *Elaeagnus ×reflexa*. Species such as Darwin's barberry (*Berberis darwinii*) and wandering willie (*Tradescantia fluminensis*) have been actively controlled although are still present. Both species were recorded by Stan Reid (1996) as being particularly aggressive and requiring control. Myers (1985) also noted the need for control of adventive plants, particularly Darwin's barberry. She listed just five adventive species: onion weed (*Allium triquetrum*), Darwin's barberry, *Selaginella kraussiana*, wandering willie and gorse (*Ulex europaeus*), all of which were recorded during the BioBlitz.

Another source of weeds is bird-carried from uncontrolled barberry on nearby reserves such as Johnson Hill. Within the Otari Reserve, kererū (NZ pigeon) have helped spread karaka. [http://bts.nzpcn.org.nz/bts_pdf/WBS51-2008-5-23-Otari-BioBl.pdf].

- Additional information is also available from recent research projects.
21. **Costs of other control methods:** Information in the application to release the two weevil species also provides an indication of the difficulty and cost of controlling Darwin's barberry.
- It requires high rates of herbicide and penetrant to successfully poison with spray, and is difficult to target because it is commonly found amongst regenerating native. Cutting and stump treating is very labour intensive, with hard stems, sharp vegetation and the plant growing in dense thickets
 - It took ten man days to cut and stump treat 800 sq m of barberry mixed in with regenerating native. Less than 2 kg of vigilant gel was used in the two days, indicating the difficulty of the vegetation and the task.
 - Another site of 3.3 ha was controlled by cutting and stump treating. This took 37 man days during which 5125 trees, saplings and seedlings were destroyed. Almost 11 kg of herbicide was applied, with some of the seedlings pulled by hand. (Davor Bejakovich, GWRC).
22. Overall the application presents a compelling case for releasing the two species of weevils.

Comments on assessment of adverse effects

23. **Ornamental Berberis:** The application notes the potential for adverse effects of the weevils on valued species of ornamental Berberis. These values are identified in Wikipedia as follows:

Several species of Berberis are popular garden shrubs, grown for such features as ornamental leaves, yellow flowers, or red or blue-black berries. Numerous cultivars and hybrids have been selected for garden use. Low-growing Berberis plants are also commonly planted as pedestrian barriers. Taller-growing species are valued for crime prevention; being very dense, viciously spiny shrubs, they make very effective barriers impenetrable to burglars. For this reason they are often planted below potentially vulnerable windows, and used as hedges. Species in cultivation include: [B. darwinii](#), [B. dictyophylla](#), [B. julianae](#), [B. thunbergii](#) and [B. verruculosa](#)

24. The Society considers that this potential adverse effect is of low significance, and can be managed through strategies such as:
- releasing the weevils in locations with high infestations of Darwin's barberry so that they are less likely to find/attack single plants in domestic/urban gardens
 - regular observation by landowners of valued plants and, where necessary, application of insecticides

- public awareness initiatives to highlight the economic, environmental and recreational effects of Darwin's barberry beyond the immediate garden environment
 - continuing with educational initiatives to persuade landowners not to plant *Berberis* in the first place and to remove existing plantings, (e.g. by continuing to fund the cost of printing and disseminating books such as *Plant Me Instead* (DOC 2005)
 - persuading garden centres not to stock ornamental *Berberis* species and to ensure their staff can advise customers on alternatives, e.g. non-invasive thorny plants that will keep dogs and burglars out of domestic gardens
 - banning the importation of new *Berberis* cultivars.
25. **Berberis a food source for birds:** The application also identifies reductions in food sources for some birds as a potential adverse effect. The Society considers that:
- the introduction of these weevils is unlikely to result in the rapid or complete removal of **Berberis** fruits
 - where the loss of this food source may have an unacceptable impact on indigenous birds, agencies and communities can reduce the risk by encouraging the regeneration and planting of indigenous fruit-bearing plants.

Testing methodology

26. The application included details of three years experimental and field survey work in Chile. Factors influencing the range of plants selected for testing in Chile included:
- there are no native species in the family Berberidaceae in New Zealand. The native flora is therefore not closely related to the target plant.
 - there are only four families in the order Ranunculales represented in the New Zealand naturalised flora.
 - the Ranunculaceae are an important part of the native flora, but no New Zealand species have fruits suitable for attack by *Berberidicola exaratus* (Webb et al., 1988).
 - all New Zealand native species that form fruits resembling those of Darwin's barberry are too distantly related to Darwin's barberry to warrant testing.
 - no New Zealand native species were available for testing in Chile.
27. Additional tests were conducted under containment within New Zealand on four New Zealand and four exotic species of Ranunculaceae (in the same order as the Berberidaceae). These tests were limited in scope because of the time of year, but are reported as reinforcing the findings from the tests in Chile.
28. We have no particular concerns about the testing methodology.

Conclusion

29. The Society has no particular concerns about the release of the two weevils and sees advantages in the way that their modes of attack are complementary (additive). We would, however, propose gradual release testing from containment, consistent with a precautionary approach. One option would be to start with Rakiuara/Stewart Island, following by other parts of Southland and then to other locations in New Zealand.