



APPLICATION SUMMARY

Organisms	<i>Berberidicola exaratus</i> and <i>Anthonomus kuscheli</i>
Purpose	To import and release two weevils, <i>Berberidicola exaratus</i> and <i>Anthonomus kuscheli</i>, as biological control agents for Darwin's barberry (<i>Berberis darwinii</i>)
Application number	APP201363
Application type	Notified, Non-GM release, Full Release
Applicant	Environment Southland Private Bag 90116 Invercargill 9840 New Zealand
Date formally received	19 June 2012

Application summary prepared by Environment Southland

The National Biocontrol Collective has determined that biological control is the most likely means of achieving environmentally acceptable and cost-effective management for the weed Darwin's barberry (*Berberis darwinii*) in New Zealand. Environment Southland (ES) makes this application on their behalf.

Darwin's barberry (*Berberis darwinii*) is a threat throughout New Zealand and features in the Regional Pest Management Strategy (RPMS) of 10 regions. It invades pasture, disturbed forest, shrub-land, tussock-land, along roadsides and other scarcely vegetated sites. The seeds are spread long distances by birds that eat the berries. It can grow more rapidly than native species when suitable conditions arise, dominating sites where it establishes. It can suppress existing vegetation and prevent the establishment of desirable plants. Darwin's barberry can persist under canopy in forest and shrub-land.

Environment Southland has prepared a Regional Pest Management Strategy (RPMS) designed to minimise the actual and potential effects of plant pests in the environment and the community. Under this strategy the land occupier is largely responsible for managing pests on that land. However, ES acts to maximise the effectiveness of individual actions through a regionally co-ordinated approach. Environment Southland has declared Darwin's barberry to be a 'containment pest' and defined a Containment Area in the eastern half of the region (Landcare Research, 2012). The aim is to:

1. Destroy Darwin's barberry wherever it is found outside the Containment Area; and

2. Implement policies that reduce its distribution and abundance within the area, particularly where it damages native habitats of high ecological value.

The key to success of Darwin's barberry management is to reduce the risk that Darwin's barberry will reinvade cleared sites or expand its distribution. To this end, we wish to limit the ability of the weed to disperse by introducing biological control agents that reduce seed production and dispersal. Its distribution in all regions is still limited, and it is important to reduce the ability of this weed to extend its range within those regions.

This application proposes the introduction of two weevils; *Anthonomus kuscheli* which destroys flower buds, reducing flowering and fruiting, and *Berberidicola exaratus* which feeds on seeds within the remaining fruits. Agents are self-dispersing and can locate host plants that are unknown to weed managers. This is the first biological control programme ever mounted against this weed.

The expected positive effects of biological control of Darwin's barberry using these two weevils include:

- Reduced invasion of un-infested land;
- Reduced damage to native ecosystems in the long-term;
- Reduced control costs to farms businesses and communities in the long-term; and
- Improved allocation of resources to maintain biodiversity values in the long-term.

Darwin's barberry is still of limited distribution in New Zealand, and this proposal is targeting the weed before it generates significant costs here. Estimates of the potential environmental and economic benefits of biological control based on existing effects are modest or long-term (Section 6.4.1).

Introduced natural enemies must be safe if this weed management tactic is to be environmentally acceptable. Significant adverse effects on the environment or on productive values would occur if either insect attacked valued non-target plants, but the application presents evidence that neither will cause significant damage to desirable plants in New Zealand. History shows that plants closely related to the target plant are the species most likely to be damaged by control agents. There are no native species in this family in New Zealand, and so none will be at risk from these weevils. Selected tests on native plants conducted in containment in New Zealand supported this conclusion. The results of all tests are summarised in Section 6.1.2, and the detail can be found on the [Landcare Research website](#) (Landcare Research, 2012). No significant harm to the aesthetic value of ornamental barberries is expected because adult weevils only nibbled foliage. However, the seed production of some species could be reduced. No other significant adverse environmental or economic effects are considered likely. *Berberidicola exaratus* attacked the fruits of common barberry (*Berberis glaucocarpa*) in tests, and could be a biological control agent for this emerging weed as well.