

Responses to public consultation on the proposed introduction of *Grypus equiseti* for the biological control of field horsetail

The scope of consultation

Field horsetail (*Equisetum arvense*) has a limited distribution in New Zealand. It is abundant in the Manawatu and Whanganui area, and in the northern west coast of the South island. There are sporadic known sites elsewhere in New Zealand. It has the potential to thrive throughout New Zealand. It has been declared an Unwanted Organism, and so is regulated in all regions

General consultation was undertaken before the application was written, to elicit subjects to be addressed in the applications (consultation with Iwi is reported elsewhere).

1. Meetings were held to discuss issues with EPA, and Department of Conservation staff were consulted.
2. Regional councils and Unitary Authorities from were consulted.
3. A range of organisations were contacted and asked to comment on the proposals including Federated Farmers of New Zealand, Nursery and Garden Industry NZ, Royal Forest and Bird Protection Society of New Zealand, Queen Elizabeth II National Trust, NZ Landcare Trust. The responses received are as follows.

Responses to general consultation on the current application (2015)

David Havell, Technical Advisor, Department of Conservation, Auckland.

Field Horsetail (*Equisetum arvense*), Distribution, Impacts and Control.

Distribution

Field Horsetail, *Equistem arvense* occurs within areas managed by the Department of Conservation, (DOC). Most infestations occur within the Manawatu Wanganui region, the West Coast, the Eastern Wairarapa, and Nelson Marlborough, figure 1. Infestations within affected areas are likely to be much more extensive than reported. For example in figure 3, (provided by Harvey Philips, Greater Wellington Regional Council), field horsetail occurs in over 70 sites compared to the 5 sites mapped in figure 1 and figure 2. Infestations are known to be more extensive in Nelson and Marlborough than shown. Examples of DOC protected areas known to contain field horsetail include Tawhirihoe Scientific Reserve, Pukepuke Lagoon Conservation Area, Waikanae Estuary Scientific Reserve, Whanganui National Park, Lower and Upper Buller Gorge Scenic Reserves, and Kahurangi National Park. Field Horsetail is regarded as a serious plant pest by at least four DOC pest control groups.

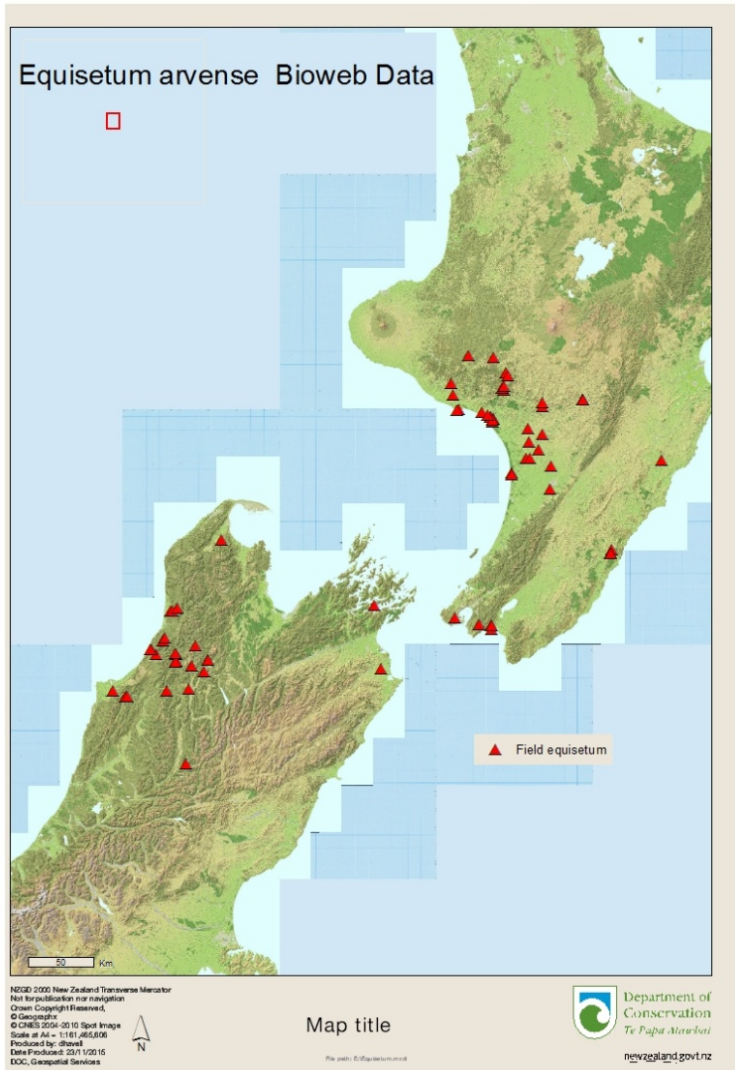


Figure 1. Infestations, DOC Bioweb Weed Data.

From figure 2, there are or were outlying infestations in Dunedin, Christchurch and Canterbury, Hawkes Bay -Napier, New Plymouth, Auckland and Kawhia. While field horsetail is not currently thought to occur currently in Auckland, Otago, or Kawhia, a new population was recently discovered at Waikanae which possibly indicates the species is continuing to expand its range. Overseas information including Australian data indicates that field horsetail has a wide temperature tolerance, readily occupies wet areas and is tolerant of partial shade, (<https://www.environment.gov.au/biodiversity/invasive/weeds/publications/guidelines/alert/pubs/equisetum.pdf> , <http://www.fs.fed.us/database/feis/plants/fern/equarv/all.html#MANAGEMENT> CONSIDERATIONS). It is likely that Field Horsetail could occur in more areas of New Zealand than the current distribution data would indicate, including estuary areas which are potentially saline at high tides.

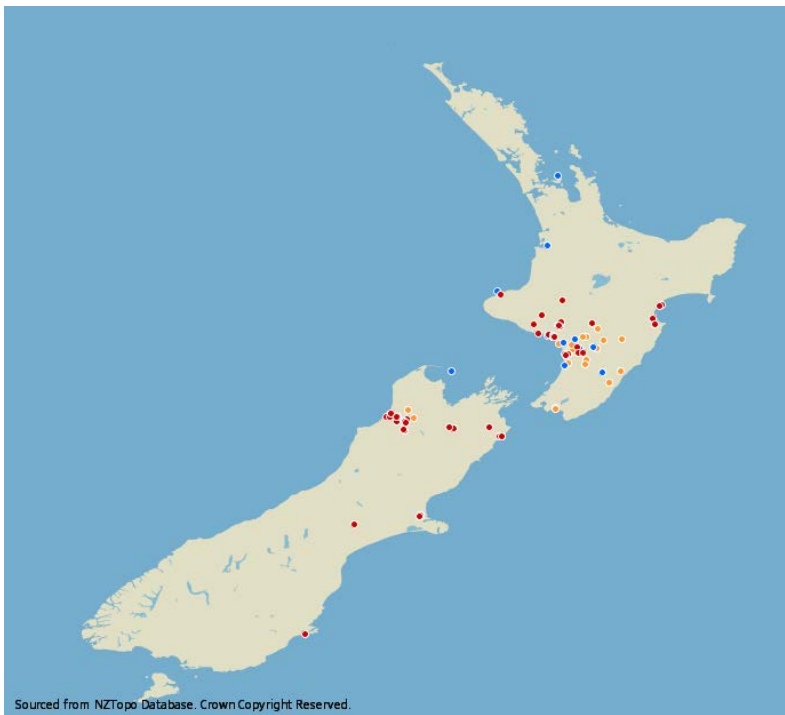


Figure 2. National Virtual Herbarium Data, <http://www.virtualherbarium.org.nz>



Known *Equisetum arvense* sites in the Wellington Region (survey incomplete)



Figure 3. Equisetum arvense Harvey Philips Greater Wellington regional council.

Current Department of Conservation Management of Field Horsetail .

The Department of Conservation currently lists metsulfuron, and Tordon Brush Killer as herbicides to control field horsetail. Other methods of control are detailed by James and Rahman, (http://www.nzpps.org/journal/63/nzpp_631020.pdf). Overseas plant pest managers have used amitrole, halosulfuran methyl, diclobenil, clorsulfuron, glufosinate, and imazpyr –glyphosate mixes. Research by James and Rahman (referenced above), and many others indicate that herbicide treatment of field horsetail has limited effect on field horsetail, and some such as glyphosate encourage field equisetum. DOC rarely manages field horsetail by herbicides except to create buffers and manage very small infestations. The recommended herbicides are too broad spectrum and may extensively damage non target plant species, infestations within affected areas are often too widespread to use herbicides efficiently even if they work.

Other methods of control include physical removal of rhizomes and tubers, repeated hoeing and deep ploughing where rhizomes and tubers are close to the surface, repeated mowing to remove shoots, very deep burial and shading out. Control which leaves the rhizomes and tubers intact, and which leaves small pieces of field horsetail behind is ineffective as field horsetail readily re grows from rhizomes and tubers. Field horsetail naturally grows as an under-storey plant in riparian forests and other forests in the northern hemisphere and is unlikely to be sufficiently controlled at site by shading without altering the natural values at the site. DOC staff and others consider field horsetail to be uncontrollable once it has established in a site, though early intervention when infestations have been small has been successful in at least one New Zealand Auckland site, (Ewen Cameron, personal communication).

Biosecurity management of equipment and clothing /footwear and careful sourcing of gravel /soil/ sand are the recommended control methods for limiting the impact and spread of field horsetail. Field horsetail is likely to have spread through transport of rhizomes and tubers in contaminated material from rivers, with garden plants (http://bts.nzpcn.org.nz/bts_pdf/Well_1971_37__51-53.pdf), as well as through spores on clothing, footwear and machinery, some spread may have occurred in association with mining, and herbal medicine. Natural dispersal may be significant within affected regions especially where cones are produced. Staff undertake ongoing surveillance to intercept infestations of field horsetail before they establish.

Impacts on natural values including conservation values.

Field Horsetail can form extensive swards in damp areas along rivers, in dune areas and along swamp margins and other wetlands, (personal experience DCH).

From experience, in areas where field horsetail occurs, naturally threatened and uncommon ecosystems occur. Threatened ecosystems include dune systems (Manawatu–Horowhenua–Rangitikei), lagoons, shingle beaches, braided rivers (Canterbury, Wairarapa and Marlborough), ephemeral wetlands, lake margins and estuaries. Threatened species at risk from field horsetail

include plants such as *Pimelea actea*, *Eleocharis neozelandica*, *Isolepis basilaris*, *Mazus novae zeelandiae* subsp *impolitus*, *Carex litorosa* and *Gunnera arenaria*. Threatened bird species such as double banded dotterel, (*Charadrius bicinctus*), and pied stilt, (*Himantopus himantopus*) occur in areas affected by field horsetail. There are also species and habitat at risk should field horsetail expand its range especially in Canterbury, Marlborough and Otago, these include species such as wrybil and black fronted tern. Biodiversity values potentially affected by field horsetail are referenced in the following Landcare Research web page, (<http://www.landcareresearch.co.nz/publications/factsheets/rare-ecosystems>).

Figures 1 and 3 show that field horsetail occurs throughout river systems in affected regions and is likely to affect native terrestrial riverbed communities in these areas by smothering smaller native species as *Raoulia australis* and by transforming mobile habitat into stable areas allowing additional weeds to establish. Habitat loss as mobile dune fields and riverbed etc are changed to other habitat by field horsetail is likely to impact on a range of species which utilise such habitat, including birds as well as plants.

Field Horsetail is likely to reduce native plant biodiversity in wetland margins by smothering smaller plants and by forming dense swards. An example of this can be seen in photographs taken by Colin Ogle, (http://www.nzpcn.org.nz/flora_details.aspx?ID=3891) where a dense sward is growing adjacent to flax near Marton. A range of native plants such as *Ranunculus amphitrichus* would be expected to grow in such areas.

Summary

In summary, field horsetail is difficult to manage by herbicides and other methods. It grows in areas where natural ecosystems and native species including threaten species are present, and poses a threat to many native species. A selective biocontrol agent which reduces the impact of field horsetail within natural ecosystems and reduces the potential of field horsetail to spread will have benefit for New Zealand conservation.

Tom Belton, Department of Conservation, West Coast

Horsetail is more than just appearing on the Coast- it is well established in some places and is fairly widespread in Buller catchments. So far though it hasn't been recorded south of the Buller/ Maruia catchment. It is common in the Karamea River catchment, Karamea Bluffs, Mokihinui catchment (abundant on flats at Mokihinui Forks), and the Buller gorge, with an outlier population at the Alfred River (near Lake Daniell).

Most of the habitat it appears to be impacting is grassy riverflats, river banks, and forest margins along waterways. Also some roadside sites (Karamea Bluffs). I'm not sure if it is impacting any farmland here yet.

We haven't done any significant control as horsetail is already so widespread and we don't have the resources, so would support the introduction of the weevil as anything that would reduce the species vigour would be a bonus.

I suspect in the absence of effective control horsetail will continue to extend its range in the West Coast Region, and will eventually start to have significant economic impacts as it begins to invade pasture.

[Genevieve Bannister, Senior Advisor Land Protection, Queen Elizabeth II National Trust](#)

We are very interested in your research and support the efforts made by Landcare Research to control and eradicate this weed and the other weed species you are currently working on.

I have spoken with our Manawatu/Rangitikei Regional Representative, John Williamson, about the prevalence of Field Horsetail in his region and he has says, although he often spots it along the road-side here and there, particularly at this time of year, it is patchy and not particularly widespread in the areas he visits. None of the covenants he monitors in this area have yet had this species recorded within them. Although it isn't an immediate problem for us, because it is in the area, it becomes a potential future problem for us. For this reason, the National Trust is supportive of this biocontrol application.

[Darin Underhill, Hawkes Bay Regional Council](#)

The answers to your questions regarding Hawke's Bay:

1. What is the regulatory status of FHT in your area? It is just a plant we are noting regarding its location in Hawke's Bay.
2. What does FHT mean to your council? It is a weed of concern due to the fact it is spreading and can be an issue in pasture
3. what does it mean to other land managers in your region? Nothing really as due to the fact it isn't widespread it isn't causing problems YET!
4. What effects do you predict in the future? It will become an issue in pasture/cropping paddocks and possibly in peoples gardens
5. Do you have any comments about the proposal to introduce the weevil? It is really the only option we have due to the fact that it is impossible to control chemically. It is also present in a lot of hard to get to areas which the weevil can access. HBRC is all for it!

At present we are not committing any resources to control it, just ensuring that if machinery has been working where there is an infestation of it that they are cleaning before leaving the infestation site. This would only occur 1-2 times annually.

Field horsetail is a weed that is just establishing itself in Hawke's Bay and has mainly been found down our rivers. Due to having no present control methods, biological control is the only option to halt the spread of a weed that could cause major issues in Hawke's Bay cropping and pastoral industries.

[Richard Grimmatt, Greater Wellington Regional Council](#)

Greater Wellington Regional Council (GWRC) has targeted FHT as a species to communicate 'Biosecurity at the Farm Gate' and 'Machinery Hygiene' to landowners and contractors. FHT is ideally suited to wetland habitat and will compete with indigenous species.

GWRC has undertaken delimiting surveillance (2013-15) from known infestation sites to understand the extent of spread and potential response. The information will support consideration of FHT during review of the pest management strategy. We now recognise that this species is well established across eastern Wairarapa hill country river systems, northern Kapiti lower reach river banks and estuary areas, plus one infestation receiving active control in Karori Sanctuary (Wellington).

1. What is the regulatory status of FHT in your area?

This species is not currently listed as a species within our RPMS. It is monitored within the National Pest Plant Accord (NPPA) surveillance program of plant nurseries and sales outlets within the region.

2. What does FHT mean to your council?

FHT is a serious threat to the region's economy, biodiversity and flood risk. Surveillance showed that FHT is well established and widespread and increasing area of infestation. The infestations are widespread and located in areas that cannot realistically be contained. The high cost to control and very low probability of success will exclude this species from, 'Eradication' and 'Progressive Containment' management categories of our strategy. The likely management categories FHT will be allocated during review will be to resource 'Sustained Control' (Biocontrol control agent release and provide Information and Advice) and 'Protecting Values in Places' (Key Native Ecosystems).

3. What does it mean to other land managers in your region?

DoC have just commenced control operations in Waikanae estuary. Karori Sanctuary are currently controlling a small infestation. Pastoral and cropping landowners will either have reduced productivity or change management practices, with increased resource investment, to maintain productivity.

4. What effects do you predict in the future?

Field horsetail will;

- Increased requirement for machinery cleaning and inspection
- Restricted gravel extraction of gravel from rivers (NPPA)

- Have a negative impact on waterways and wetlands ecology and indigenous biodiversity
- Reduction in watercourse loose gravel and silt movement downstream increasing flood risk
- Have a negative impact on pastoral/cropping productivity and require increased management costs. The toxic attributes will affect grazing management. The foliage will reduce pasture availability and crop yields.
- Require investment to continue communicating the risk to land owners and support biocontrol research and introductions.
- Continued spread of infestation across the region.

5. Do you have any comments about the proposal to introduce the weevil?

GWRC is aware of the research project through membership of the National Biocontrol Collective. We have been informed of the research findings and the rationale for selecting only one of the 2 candidate species. We support the scientific assessment and application to introduce the field horsetail weevil, *Grypus equiseti* for horsetail control.

Rob Simons, Marlborough District Council

FHT is not recognised as an RPMP weed for Marlborough Region.

AS far as I know the pest is largely confined to an area at Wharanui south of Ward and also the Lower Wairau River Bed, and is not reported to be an agricultural pest in our region. However, this can change, not long ago I received a verbal report of field FHT establishing on the edge of a track/road laid down with river gravel from the lower Wairau.

I fully support the proposal for introducing the weevil, as herbicide control of this pest plant is expensive and often ineffective.

MDC/RDC have provided that rather large and loose figure of approximately \$25k per annum for horsetail related spraying. This will increase after the field days as RDCs offer of aligned or supported spray programmes with motivated land owners will see them spraying more area of roadside.

Craig Davey Environmental co-ordinator, Horizons Regional Council

I think we have tapped the barrel on concern/knowledge of horsetail **and** which can feedback with anything half decent. Your effort of contacting DoC was well worthwhile so thanks. It has raised awareness within DoC to the point where new infestations are being reported.

We have a quote from a land tillage contractor that he passed on a job where horsetail was present as he didn't want to a) have to clean his machine down, to b) not spread field horsetail around.