Consultation over the proposed introduction for two biocontrol agents for *Arundo donax*

Richard Hill

Regional and District Councils

Joseph Camuso, River and Natural Hazards Manager, Northland Regional Council

In Taupo Bay a small 50 m^2 spot we have had 2 goes at about $400 dollars per go and will require another follow up spray. On the Awapokonui we spent $2,443 in 13/14 for spraying, $3,880 in 14/15 for follow-up and 15/16 we spent $330 follow spraying this was about a 300 s.m. section. …. AD can severely restrict flow and cross sectional area especially on our smaller streams in Northland. Also, if dislodged from the bank it can cause debris damming. So from a River Manager's perspective it is a headache.

Doug Foster, Land management Manager, Northland Regional Council

There are many of examples of Arundo donax plantings along road sides near stream in Northland as in the past County Council engineers and others promoted it as a cheap and easily established (using stem cuttings) erosion control species. It is reasonably good at that job but the negatives far outweigh its benefits. Currently many of these sites are locally problematic with some blocking of small streams and movement of live vegetative material from those sites being a problem when dug out during earthworks and dumped in a non-weedy site. The biggest problem is with bits of live material breaking off and re-establishing further downstream and it is only a matter of time till this plant is established down long stretches of many of Northlands rivers. Arundo donax currently flowers prolifically but doesn't seem to set much if any viable seed. The spread down rivers is expected to be rapid if seeding commences.

Conventional control using mechanical means is impractical and chemicals is very difficult as extremely good coverage of high rates of glyphosate is needed or recovery of sprayed stems and further regrowth of new stems is guaranteed. The common location beside streams makes the inevitable over spray and spray drift highly undesirable. Northland Regional Council and other Authorities are strongly advocating or requiring the fencing off of waterways and these riparian areas that have stock excluded will be an ideal habitat for river borne Arundo fragments to establish. Currently where stock can access newly-arrived fragments they kill many of them by browsing.

Away from waterways arundo has been mistakenly planted as shelter species or more commonly as ornamental plants and these sites are steadily getting bigger by vegetative reproduction via rhizomes or spread by ill-considered control efforts by landowners. These sites are a real nuisance but generally less problematic as they are generally more accessible with machinery and over spray or spray drift is not such an issue. It still is very difficult to kill and I don't see many successful efforts.

Sara Brill, Biosecurity Officer, Northland Regional Council.

I am aware of the first sighting of this species found at Lake Ngatu (dune lake) in 2014. This is one of our high value lakes and will be compromised if this gets established in this environment.

This is common on many streams, coastlines and rivers in Northland. It was recommended and planted by soil conservation staff from 1960s-80s so is widely distributed across the landscape. I

would be hard pushed to find a site that did not have arundo within 10km apart from the dense forested areas, although many of these may have arundo in their streams also.

There are no streams flowing through Whangarei without arundo – in some very dense patches in places.

Estuarine areas are common sites for this plant - Ngunguru, Hokianga are two I know of. In Omapere (photo attached) the residents are attempting to control it in the dune areas adjacent to the harbour. However the recent installation of a number of rock walls will assist the sea to do this for them in time as areas adjacent to the rock walls are eroded.

Stuart Jackson, Technical Officer, Parks and Recreation, Whangarei District Council.

In the sites that I manage in the northern part of the District, I have very few problems. Lake Waro had some big clumps but my contractors have been treating these and slowly, we have got on top of them – but not eradicated. As this was part of a wider maintenance cost, I can't give you a figure for this. It's invasive and dominant nature is clearly an issue and we were concerned about losing the open water at Waro should it have got more established. I'm still wary of it returning.

Steve Ellis, Environment Services Manager, Taranaki Regional Council

What is the current status of giant reed in your region? E.g. how many sites are there and how big are they?

In Taranaki under the RPMS, *Arundo donax* is an eradication pest plant. It was put into that category because of the limited (known) distribution at the time of the last RPMS review (2007) and the fact that there is vast suitable land it could infest in Taranaki. At 2007 there was total estimated 35 square metres of infestations known. At February 2016 TRC was actively attempting control at 23 sites (17 New Plymouth; 2 Waitara; 1 Oakura; 1 Hawera; 1 Manaia; 1 Pihama). Average size of the sites 5 square metres.

How do you see it affecting environmental or economic values in your region the future?

The only "environmental" impact likely is upsetting human habitat. The streams we have it on are big enough for it not to impact on them adversely. The economic impact would only be from cost of control. BUT the stated impacts in the RPMS are "The plant represents a potential threat to indigenous biodiversity values, particularly along riparian and forest margins. Dense clumps of the plant quickly form to suppress the regeneration of indigenous flora and may eventually eliminate indigenous seed sources" The obstruction or infestation of drainage channels or natural and recreational areas by Giant Reed may also be a problem on occasion."

What control or containment measures are undertaken by the council, and how much do these cost?

This council undertakes control of known sites. $2,000 last year and could expect this to increase as we find more infestations $2 – 4K annually.

Who else in your region is already affected by, or could be affected by giant reed? Are they taking control measures?

As far as we know no one is affected apart from those whose sites TRC. As far as we know no one else is under taking control measures. All control being done is by TRC.

Does giant reed have any beneficial attributes in your region? No.

Holly Cox, Auckland Council

Sorry a couple of weeks is not enough time to give you a good answer given our work schedule. If possible can you give us more of a heads up for the next one so I can then work with our Local and Sports Parks, Stormwater, Auckland Transport, Watercare and community groups etc to give you much better information.

I have gone out to our Biosecurity team for an update of their sites in the region. We wouldn't control this on private property as it is a designated "Surveillance" pest plant where we offer advice. We do control on Regional Parks where it is rare- mainly it is found in the Waitakere Ranges. I cannot answer for other teams in Council as I simply haven't had time and we currently don't have a database to be able investigate weed management undertaken by other groups- this is something that has been earmarked for the future. I would say that Stormwater do control this plant if it impedes water flow in stormwater drains. So in terms of a dollar value as we don't usually control it- more priority species to spend money on (such as moth plant, climbing asparagus, wild ginger, evergreen buckthorn etc) but if we did have budget we would control it.

Also as our Biodiversity team is in the process of completing an Regional Ecosystem prioritisation programme where the majority of wetlands have come through as a priority I would imagine that if Arundo is found in these sites it will be earmarked for control.

I have also directly answered your questions below.

What is the current status of giant reed in your region? E.g. how many sites are there and how big are they?

We have numerous sites of giant reed in the region (recorded around 45 sites just from Biosecurity Advisor's memory), mostly on marginal land near streams, rivers, wetlands, stormwater drains. It isn't the most common weed in the region however it is frequently found in urban waste sites and is likely to increase with dumping- it is commonly planted in gardens of a certain era. The sites can be from 10m2 (where they have been previously controlled) to over half a hectare.

How do you see it affecting environmental or economic values in your region the future?

As wetlands are threatened ecosystems in Auckland any plant that has the potential to invade these ecosystems will be treated. There are several infestations near Te Henga that are of concern, we are controlling giant reed on the Waitakere River.

What control or containment measures are undertaken by the council, and how much do these cost?

We are controlling Arundo on Regional Parks (up to $2000 pa but this has reduced as the infestations have reduced), some large infestations that received numerous complaints in Waitakere on private land have received control and stormwater have controlled some infestations that block stormwater drains and impedes water flow that can cause flooding in low lying properties.

Who else in your region is already affected by, or could be affected by giant reed? Are they taking control measures?

I would imagine that Community Groups may undertake control on this plant.

Does giant reed have any beneficial attributes in your region?

No. Although one site controlled slipped after removal of the plant.

Craig Davey, Environmental Co-ordinator, Horizons Regional Council

What is the current status of giant reed in your region? E.g. how many sites are there and how big are they?

A large number of at least 29 known sites, please see attached map for recent survey, both phragmites and arundo as id is very difficult so this is really giant reed in the wider sense of the term sorry.

How do you see it affecting environmental or economic values in your region the future?

Potentially both as it displaces native vegetation and may change habitats and make flooding more severe, though it appears to be eaten by stock. (Images) Our Operations team note it of concern as it traps silt, is beginning to invade stopbank assets and take up accretion land displacing easier managed plants. Our Rangitikei problem may be more phragmites kaka rather than arundo so this project may not help us.

What control or containment measures are undertaken by the council, and how much do these cost?
None, investigation only. Control is very difficult given size, and plant resilience and habitat of aquatic. Riparian nature.

Who else in your region is already affected by, or could be affected by giant reed? Are they taking control measures?
Not that I am aware.

Does giant reed have any beneficial attributes in your region?
None that I am aware, apart from amenity value when in a controlled planting.

Shane Grayling, BOPRC

What is the current status of giant reed in your region? E.g. how many sites are there and how big are they?

There are sites of *Arundo donax* around our region but it is not widespread. It is found across the region at isolated sites, most are less than 100m^2. The majority of the infestations we know of are in the Western Bay of Plenty. Few in Rotorua and not many in the Eastern Bay of Plenty. We do not actively undertake surveillance for it or record infestations in our database so could not give an exact figure. Answer based on my and other staffs observations.

How do you see it affecting environmental or economic values in your region the future?

Do not see it affecting environmental or economic values significantly compared to the plethora of other species we face. Issues would likely be quite localised and in the grand scheme of things not dissimilar to issues caused by bamboo.

What control or containment measures are undertaken by the council, and how much do these cost?

Very little at this stage apart from some small-scale control at biodiversity sites, less than $1000 per year as an estimate.

Who else in your region is already affected by, or could be affected by giant reed? Are they taking control measures?

Imagine roading managers would be most affected, could create issues with sight and maintenance along roadsides. Hard to know as not common.

Does giant reed have any beneficial attributes in your region?
Not that I am aware of.

Darin Underhill, HBRC

We haven't done any formalised surveillance for Giant reed but I estimate there is at least 200 sites in Hawke's Bay. They are all small, less than 20 square metres

I don't see it affecting either economical or environmental values in the next 20 years. However after this it may affect environmental values to a small extent

No control measures are undertaken so no cost

Nobody else has mentioned it in Hawke's Bay so probably similar to above

Not really (I suppose some people may like the look of it in a garden setting)

Other organisations

Alistair Cole, Landcare Trust

I am familiar with *Arundo donax* – certainly it is having an ecological impact throughout the lower end of the Rangitikei Catchment, where it is causing significant competition and becoming a monoculture throughout the estuary at Tangimoana. I know that community members in Tangimoana were trying to make attempts to remove it by hand from areas – but with limited success. (contact details removed)

This estuary is host to a large number of sensitive and threatened plant species. Great to see a bio control being prepared to combat this weed. The Rangitikei River estuary will be thanking you for it!

(the weed referred to in this submission was wrongly identified and proved to be *Phragmites australis*)

Philippa Rawlinson, Federated Farmers

I've not personally heard of the giant reed, but I can put a notice in our Friday Flash calling for feedback on the issue. I will forward any responses I get onto you if we receive any.

Paul Champion, Aquatic Weed Scientist, NIWA

I am fully in support of this application and have previously replied to queries relating to this from:

Horizons and Waikato Regions (May 2015):

"Hi Darion

Had the same query from Craig D this morning. Here's what I sent to him (also he's got to deal with the new Phragmites in his region):

Hi Craig

It is an NPPA plant and although it hasn't really shown its teeth in wetland habitats like it does in the western USA, I'd be supportive of a release like this. It is becoming more widespread and patches getting much bigger. Even though Phragmites is in the same subfamily I doubt if the bugs would jump onto the P. karka. It is something to make Lynley and co aware of though, could be a bonus if it would damage it.

It is slowly spreading in the Waikato in waste areas and escapes from cultivation, but is much worse in Auckland/Northland."

NZ Wetland Trust (Feb 2016):

"Hi Karen

It is found through much of lowland NZ, I've seen it south of Haast, but it is more common the further north you go. As yet, I haven't seen it growing in wetlands. It can be very weedy in riparian margins and waste places generally. I guess it is being touted as a biofuel species, but it is an

Unwanted Organism and listed on the National Plant Pest Accord so could only be used for this purpose if an exemption is granted under the Biosecurity Act.

I was asked about the project in May last year. Certainly I'd support it."

John Dyer, Northern Wildlife Manager,Auckland Waikato Fish & Game Council.

Is giant reed known as an issue for wildlife and waterways management in your region at present?

Not at present, to my knowledge. I am aware of its' reputation overseas. There are small but dense clumps of it growing at defined locations beside state highways where I drive past it, (several locations in West Auckland near SH16 and also SH1 just north of Moerewa). There is some on Lake Waikare in the lake, again only in small isolated clumps, but they have shown no great tendency to spread. I had considered spraying them. I'll look out for them next time I'm at the Waikato River delta where I think some discrete clumps may have also established on islands there.

How do you see it affecting environmental or economic values in the future?

If fragments were to break off and establish elsewhere in floods, that could prove troublesome on a localised basis. For instance, when it drifts down-current in a river or stream and enters a lake, then whatever wind is blowing on the day will take it to more or less randomised locations where it can establish. For instance, if it is thrown up onto the shore by high waves and is free to grow, (not noticed nor grazed nor sprayed).

It is certainly persistent and somewhat aggressive where it is established. Some of these clumps, beside state highways, have been around at least 30-40 years to my knowledge. Those beside Triangle Road, Massey, Auckland, seem to have spread along the waterway there and by forming a number of dense patches have excluded all other plants. The local council have recently removed what was probably the original source there, the plants highest in this catchment – but not their offshoots.

Would it have any positive attributes for F & G members?

I'm glad you asked this, as release of some biological controls in the past have been done without consulting with us and had the potential to greatly negatively affect the food resources for gamebirds that we manage. That in turn can affect recreational gamebird hunters and therefore our income and our ability to manage the legislative responsibilities we have. However the control of giant reed is not one of those. If anything, it's dense habit probably prevents bird nesting. It probably does have some value in stabilizing slopes, especially near road verges. The SH1 north of Moerewa plants are on a slip-prone very steep site right beside the road. Giant reed may have been originally deliberately planted to stabilize it. If insects destroy it, consideration will be needed to replace it with alternative slope stabilization. So that is a cost. If this road washed out in a flood, that would isolate Northland as recently happened in the past in similar circumstances.

Giant reed, where established, probably also provides wave baffling to shorelines and low islands and so protects them from wave encroachment. I'm thinking of one or two islands in a lake that are valuable waterfowl breeding locations. Without protection from wave encroachment, they will likely disappear. One of these islands is a difficult location to establish alternate stabilization plants, being hard clay with sulphur deposits from nearby springs. I'm fairly sure it is giant reed growing there now along with pampas grass and some stunted English oaks.

One of my associates makes hand-made musical instruments. I'm not sure what the demand is for pan flutes made from this plant, but its canes seem to have some limited alternate uses such as this.

Brian Cox, Executive Officer, Bioenergy Association of NZ

As I indicated New Zealand has a number of feedstock options for the production of liquid biofuels in the future. *Arundo donax* hasn't featured as a significant possible feedstock and considering the other crop options I think that there are many higher starch/higher sugar options that would be of more interest in the future. While *miscanthus gigantus* is a possible feedstock it is likely to be grown as a complementary crop to traditional farming operations.

The New Zealand biofuels sector is quite different from most other countries where the use of crops for production of a feedstock for the manufacture of liquid biofuels is common. In those countries the driver is generally the subsidies available rather than good economic thinking.

New Zealand liquid biofuels are likely to come from lignocellulosic feedstocks and municipal organic waste.

Feel free to quote me or come back to me for further information.

Dr John Liddle; Chief Executive, Nursery and Garden Industry New Zealand (NGINZ)

NGINZ does not anticipate any impacts on nursery production in New Zealand as a result of the proposed release of two biocontrol agents *Tetramesa romana* and *Rhizaspidiotus donacis* to control *Arundo donax* L.

We appreciate Giant reed (Arundo donax) is considered to be a serious future threat to wetlands, riparian areas and other habitats in New Zealand in the future and support the view that since its distribution is still limited early intervention through biological control is most likely to limit future adverse effects.

NGINZ understands that the New Zealand initiative to introduce the two proposed biological control agents *Tetramesa romana* Walker and *Rhizaspidiotus donacis* Leonardi can draw heavily on a biological control programme against giant reed that has been underway in USA and Mexico for over ten years where both agents have been released. As the biological control agents are host specific much of the risk assessment undertaken in the USA/Mexico (USDA 2009, 2010) is relevant to the New Zealand situation. NGINZ endorses situation such as this where robust peer reviewed research undertaken elsewhere is applied in New Zealand without repeating the entire piece of work.

We understand that *Tetramesa romana* has a unique relationship with giant reed as like most gall-formers it is host specific, and on a particular part of the plant.

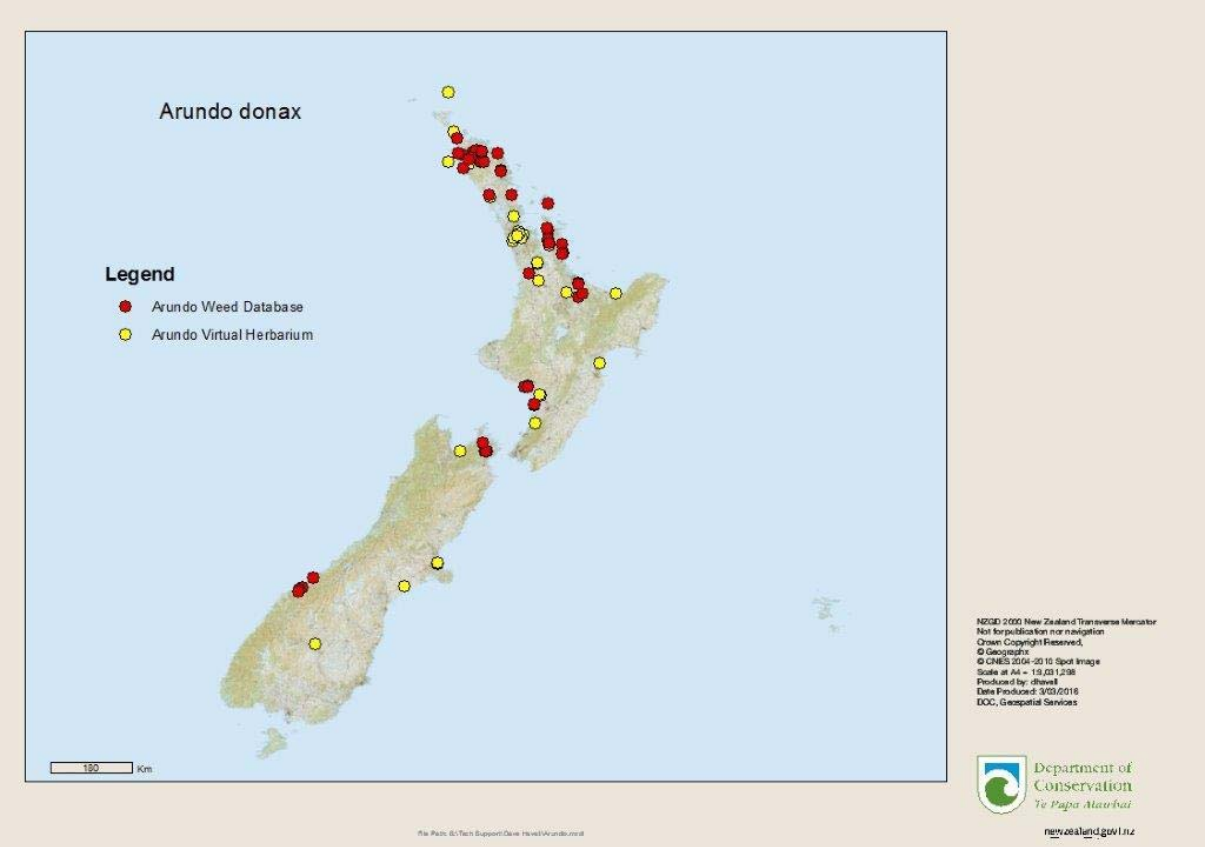
We note that Landcare has tested three native plant species as potential hosts for *Rhizaspidiotus donacis* reporting no sign of scales on *Isachne globosa* or *Spinifex sericeus.* A single very small scale, probably a male, was observed on *Zoysia minima* and lost.

NGINZ supports the Landcare Research view that it was not necessary to undertake additional tests regarding alternative hosts as investigation has shown that neither control agent species is considered to pose a threat to native plants or valued exotic plants in New Zealand.

Department of Conservation

Dave Havell, Threats, Department of Conservation

So far 10 sites where work is occurring, all small jobs. The west Coast sites really annoy some as they private land and we can't control them. About 20 sites all together but as usual under recorded as 3 work don't appear on the maps.



Contacts for Iwi Liaison officers

Sam.tamarapa@trc.govt.nz we sent this too him so he is aware that you may contact him

HRC iwi liaison role. Kara Dentice <Kara.Dentice@horizons.govt.nz>, 027403362

Senior Advisor on Treaty settlements, Matemoana McDonald (Matemoana.McDonald@boprc.govt.nz).

Not exactly sure who you should contact for the treaty obligations, my best suggestion is Esther Powell (phone no. 06 8338026) (HBRC)