

## Transcript of Nga Potiki submission to hearing concerning the introduction of the Samurai wasp as a pre-emptive biocontrol against the Brown Marmorated Stink Bug

### Introduction

The Nga Potiki Resource Management Unit has a long history of performing our kaitiaki responsibilities in relation to Nga Potiki rohe. Our rohe covers the Rangataua, Waitao and Papamoa in the Bay of Plenty but our area of interest lay between the mountains and the sea. Since 1840 we have seen three quarters of our native vegetation destroyed and only half of what remains is legally protected. Introduced “pests” threaten many of our remaining plants and animals. The Waitangi Tribunal recommendation on Wai 262 is that new partnerships, advisory bodies and laws are formed relating to resource management, wildlife conservation and environmental protection. Māori identity and culture which include decisions about fauna and flora, is now a vital aspect of New Zealand identity and culture.

Our Resource Management Unit objectives include: protecting and managing the cultural and natural resources of Nga Potiki for the present and future generations; protecting and enhancing the habitats and natural values of indigenous flora and fauna, and; raising awareness of kaitiakitanga and environmental tikanga. These values are also covered in our environmental management plan and reflect our responsibilities as kaitiaki.

We appreciate and acknowledge the extensive information about the potential devastation the Brown Marmorated Stink Bug may have on the horticultural and agricultural industries if it were to become established. However, before the Samurai wasp can be introduced as a biological control we have concerns about the wasps impact on our ecosystems, in particular the impact on our native fauna and flora.

### Myrtle Rust

In our submission we expressed concern that given the high reproductive rate of this minute insect that it will increase the spread of fungal diseases affecting our native trees. Myrtle rust is one such fungal disease of serious concern in our area. Myrtle

Rust affects plants in the myrtle family: pōhutukawa, manuka, rātā and some common garden plants such as feijoa, ramarama and lilly pilly. Myrtle rust spores are microscopic and *Biosecurity New Zealand* report they are easily spread across large distances via insects, birds as well as people and machinery. Insects as carriers of fungi infection is a well-known fact. It is concerning then that on the proposal to introduce the Samurai wasp, there were no submissions from Ministry of Primary Industries or the Department of Conservation whom I might add, inform us that had they known of this proposal they would have had firm objections on the grounds of its potential to decimate our native species.

### Habitat Preference

Research has proven the Samurai wasps' preference is for wooded habitat. In comparison to legume fields or abandoned apple orchard, our pohutukawa forests would make ideal habitat for the Samurai wasp making the management of Myrtle rust more challenging. The Samurai wasp is highly transient (Hedstrom et al 2017) and our natural and urban park habitats where a diversity of host plants and Pentatomidae species are present will become most at risk.

### Climatic Preferences

The Samurai Wasp has a minimum threshold temperature of 12.2 degrees Celsius. A potential climatic mismatch can result in low effectiveness of the Samurai wasp to control the Brown Marmorated Stink Bug. The CLIMEX model maps the potential geographic distribution of the Samurai Wasp and the Brown Marmorated Stink Bug (Avila & Charles 2018). This model predicts that the north of the North Island would be considered high to moderately suitable areas for these specie. Coincidentally, these are areas our native stink bug is also prevalent. The central and southern areas of the North Island are considered moderate to marginally suitable while the South Island is considered generally unsuitable. To help the Samurai wasp to climatize to its new environment a strategy employed is rearing the wasp in the laboratory, infesting stink bug eggs and introducing them into nursery-type targeted areas. It is believed wild Samurai wasp that have been discovered through Europe and North America arrived through infested Brown Marmorated Stink Bug eggs on cargo ships importing plants from Asia.

## Species Preferences

Much of the research evaluating the efficacy of the Samurai Wasp as a biocontrol has only been conducted since 2007. Testing is critical to ensure that a biological control agent (the Samurai wasp) will parasitize its target host in the field and to reduce risk of unintended ecological consequences that could result from parasitizing of native fauna. There are well documented examples of unintended consequences on ecological food webs after the release of exotic organisms for biological control (Hedstrom et al 2017). Identifying the behavioural responses of the Samurai wasp to multiple stink bug species to detect potential host associations is important because it is inevitable that the Samurai wasp will encounter our native species.

New Zealand has four native Pentatomidae species that would be potentially parasitized by Sumarai wasp, they are the:

- Brown soldier bug *Cermatulus nasalis*
- Australasian green shield bug *Glaucias amyoti*
- Black alpine shield bug *Hypsithocus hudsonae*
- Schellenberg's soldier bug *Oechalia schellenbergii*

There are five other exotic species present in New Zealand and they too will also be susceptible to becoming parasitized by the wasp.

US research revealed the Samurai wasp successfully parasitized other species and that the high parasitization of the Brown Marmorated Stink Bug does not indicate it is their preferred host (Hedstrom et al 2017 1176). The data suggest physiological suitability of several nontarget hosts indicate that the Samurai wasp tend to parasitize multiple hosts in an area in a short time.

Several questions bear reflection:

1. If the Samurai wasp is introduced in the absence of the brown marmorated stink bug would it then simply parasitize native and exotic species of Pentatomidae? The research certainly supports that.

2. If having eradicated existing populations of the brown marmorated stink bug, would the Samurai wasp then also cease to exist? Again, the evidence suggests that is highly unlikely. Given its ability to parasitize other species and its high reproduction rate, it will adapt.

### The issue

Key points arise from the facts:

1. Under laboratory and field conditions the Samurai wasp successfully develops on rare and beneficial Pentatomidae other than its intended target the Brown Marmorated Stink Bug;
2. The introduction of the Samurai wasp into New Zealand is potentially the eradication of native species;
3. Considering the negative impacts on native non-target species it must be determined at what point is such a trade-off justified;
4. There are other options for the control of brown marmorated stink bug and these could be explored before embarking on a course that cannot be undone.

The use of the Samurai wasp as a long-term low-cost strategy for pre-emptive biological control of the brown marmorated stink bug requires much more information. In Asia several species of *Trissolcus* are reported to attack eggs of the Brown Marmorated Stink Bug (Arakawa and Namura 2002), with high rates of parasitism (Yang et al. 2009). It has not yet been adequately explored if there are species existing in New Zealand that have the potential to also provide biocontrol.

The notions that the Samurai wasp infesting native species is “remote” or “very limited” is not responsible grounds for proposing or approving its release. The release of the wasp is not a long-term proposal, it is long-term cost.

The question is not: do the benefits outweigh the risks, it is: do the benefits outweigh the price we and our environment will pay? The introduction of the Samurai wasp will change the balance of our biosystem. Let me remind you that today there is no brown marmorated stink bug invasion existing in New Zealand and that to date the use of pesticides at our borders has been successful in curbing any threat. Kate

Maguire, Phd scientist and Operations Manager for Jenkins Freshpac Systems Ltd (and former Chief Scientist for RipeSense) stated that in her opinion and experience, fumigating containers as they arrive at port is an effective border defence against the stink bug. Her organisation reported dead bugs in only two of 30 containers over the period of a year. If the frequency were significantly more maybe there would be grounds for concern.

I conducted a week-long poll on the benefits and trade-offs of introducing the Samurai wasp to get sense of the public's opinion on this proposal and the results were overwhelmingly opposed.

### Our position

The Nga Potiki Resource Management Unit has a responsibility to protect and enhance our natural resources, habitat and natural values of indigenous flora and fauna for the present and future generations, and at this stage we strongly oppose the release of the Samurai wasp. We do not recognise the urgency or that it should be initiated because of fear based on economic scenarios. The proposal to introduce this biocontrol should be considered when evidence proves existing controls are failing. In the meantime, comprehensive and longitudinal studies should be invested in to find more options to address this potential threat. The following adage is appropriate in this instance: *where there are only two options there are in fact none*. That is not the position we want to be in.

In closing we would also like to express one further concern about the consultation process on matters such as this. As a Crown partner and a recognised authority we do not appreciate being consulted via a public notification mechanism. We request notification at the earliest stages of the proposal so we can do the due diligence that proposals such as this require. As a Crown partner we want to work with organisations to solve issues that confront our nation, especially of an environmental, social and economic nature, rather than to be yet again marginalised and placed in a reactive position. We ask that you shelve this proposal to allow us along with our peer's time to employ matakāwhiri (Maori knowledge) and fully explore the threat the brown marmorated stink bug poses.

*Nga mihi mo te whakarongo*

## References

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