

Memorandum

28 June 2018

To: Environment and Community Committee

Subject: Environmental Protection Authority submission regarding brown marmorated stink bug biocontrol

From: Dr Imogen Bassett, Principal Biosecurity Advisor

Purpose

1. To note that a submission was provided by Auckland Council staff to the Environmental Protection Authority on 31 May 2018 regarding a proposed biocontrol agent to be used in the event of a brown marmorated stink bug incursion in New Zealand.

Summary

- Brown marmorated stink bug has been identified as one of the highest risk biosecurity threats currently facing New Zealand.
- The Samurai Wasp Steering Group sought pre-approval from the Environmental Protection Authority to release the Samurai wasp as a biocontrol agent to manage brown marmorated stink bug, if the stink bug were to arrive in New Zealand. Submissions on the application were sought from 11 April 2018 to 31 May 2018.
- A submission was provided by staff on behalf of Auckland Council and is shown in Attachment A for the Environment and Community Committee's information.
- The submission did not oppose the application for use of the biocontrol agent but did seek conditions to assure protection of native insect species.

Context/Background

2. Brown marmorated stink bug (*Halyomorpha halys*) has been identified as one of the most significant biosecurity threats currently facing New Zealand.
3. Interceptions of brown marmorated stink bug entering the country are frequent during summer months; approximately 2,000 individual bugs were intercepted at the border between December 2017 and February 2018. Stink bugs were intercepted through a variety of import pathways. Given the high interception rate, climatic suitability and availability of host plants, the chance of brown marmorated stink bug establishing in New Zealand is high.
4. Native to Asia, brown marmorated stink bug has recently invaded the USA and Europe causing severe economic damage to horticultural crops and proving to be a significant nuisance pest, with considerable infestations recorded inside homes during winter.
5. Based on overseas experience, if it becomes established in New Zealand, brown marmorated stink bug is predicted to have severe impacts on many commercial horticultural crops. Nuisance impacts are also highly likely and impacts on native plants are possible though less well understood.
6. Management of brown marmorated stink bug is exceptionally difficult and requires repeat high-dose application of broad spectrum insecticides. This is costly, has high environmental impact and can limit access to international markets. Biocontrol offers a more environmentally friendly management tool and has been the most successful approach to date for managing brown marmorated stink bug overseas.
7. Industry, science and government representatives have collaborated to form the Samurai Wasp Steering Group to advance biocontrol pre-emptively, prior to a brown marmorated stink bug incursion in New Zealand, because of the high risk that invasion will eventually happen.

8. All new biocontrol agents to be released in New Zealand must first be approved by the Environmental Protection Authority in a process that provides safeguards against potential adverse side effects.
9. The Samurai Wasp Steering Group recently applied to the Environmental Protection Agency to release the samurai wasp (*Trissolcus japonicus*) as a biocontrol agent for brown marmorated stink bug. Public submissions on the topic were open from 11 April 2018 to 31 May 2018, during which period council staff lodged a submission.

Discussion

10. The submission was of low significance in terms of the Significance and Engagement Policy and was technical in nature. The associated political risk with this submission is also low. Therefore, staff considered that the submission did not need to be approved by Environment and Community Committee before it was provided to the Environment Protection Authority.
11. The submission did not oppose the application for pre-approval to release the proposed biocontrol agent as the risks posed by brown marmorated stink bug are severe and the proposed biocontrol agent is the most effective and environmentally friendly control option available.
12. However, the submission did not fully support the application due to concerns regarding potential adverse impacts on native insects, and risks to social acceptability of biocontrol. These could adversely impact council's use of other biocontrol agents if the risk is not adequately managed.
13. Notwithstanding this, the submission stated that, given the potential economic, social and ecological impacts associated with brown marmorated stink bug establishing in New Zealand, the benefits of releasing the biocontrol agent would outweigh any risks of adverse effects.
14. Relief sought included monitoring to assist in identifying any adverse impacts which might occur on native insects. Relief sought also included further research in relation to a native stink bug species which is closely related to brown marmorated stink bug and thus may be particularly at risk of adverse impacts.

Māori Impact Statement

15. Working on behalf of the Samurai Wasp Steering Group, Te Tira Whakamātaki Māori Biosecurity Network have provided tailored packages on the stink bug and biocontrol agent to inform Māori about this issue.
16. The Environmental Protection Authority also sought a review of Māori perspectives through Ngā Kaihautū Tikanga Taiao (their Māori advisory committee). Ngā Kaihautū Tikanga Taiao noted that brown marmorated stink bug poses a substantial risk to Māori economic and cultural values, but also raised concerns about lack of information about potential biocontrol agent non-target impacts, especially in relation to native species.
17. In the future, if council is required to manage brown marmorated stink bug, council may undertake direct mana whenua engagement.

Next steps/implementation

18. The submission was submitted via an online submission form to the Environmental Protection Agency on 31 May 2018, as per Attachment A to this memo.
19. No further steps required by council.

Attachments

- a) Submission by Auckland Council to the Environmental Protection Authority on the release of the samurai wasp (*Trissolcus japonicus*) as a biocontrol agent for brown marmorated stink bug (*Halyomorpha halys*) should it arrive in New Zealand.



Once you have completed this form

Send by post to: Environmental Protection Authority, Private Bag 63002, Wellington 6140

OR email to: submissions@epa.govt.nz

Once your submission has been received the submission becomes a public document and may be made publicly available to anyone who requests it. You may request that your contact details be kept confidential, but your name, organisation and your submission itself will become a public document.

Submission on application number:	APP203336
Name of submitter or contact for joint submission:	Dr. Imogen Bassett (Principal Biosecurity Advisor)
Organisation name (if on behalf of an organisation):	Auckland Council
Postal address:	Level 2, Bledisloe House, Ground floor, 24 Wellesley Street, Auckland Central, 1010
Telephone number:	+64 21 807 563
Email:	imogen.bassett@aucklandcouncil.govt.nz

I wish to keep my contact details confidential

The EPA will deal with any personal information you supply in your submission in accordance with the Privacy Act 1993. We will use your contact details for the purposes of processing the application that it relates to (or in exceptional situations for other reasons permitted under the Privacy Act 1993). Where your submission is made publicly available, your contact details will be removed only if you have indicated this as your preference in the tick box above. We may also use your contact details for the purpose of requesting your participation in customer surveys.

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.

- I support the application
- I oppose the application
- I neither support or oppose the application

The reasons for making my submission are¹: (further information can be appended to your submission, see footnote).

Ka mihi ake ai ki ngā maunga here kōrero,
 ki ngā pari whakarongo tai,
 ki ngā awa tuku kiri o ōna manawhenua,
 ōna mana ā-iwi taketake mai, tauivi atu.

Tāmaki – makau a te rau, murau a te tini, wenerau a te mano.

Kāhore tō rite i te ao.

I greet the mountains, repository of all that has been said of this place,
 there I greet the cliffs that have heard the ebb and flow of the tides of time,
 and the rivers that cleansed the forebears of all who came those born of this land
 and the newcomers among us all.

Auckland – beloved of hundreds, famed among the multitude, envy of thousands.

You are unique in the world.

This is an officer only submission. Council officers do not wish to oppose the application for pre-approval to release the proposed biocontrol agent *Trissolcus japonicus*, for reasons detailed below, but would like to highlight a number of concerns around potential non-target host impacts, also detailed below.

Officers recognise the damaging economic, social and potential ecological impacts that the brown marmorated stink bug (BMSB), *Halyomorpha halys*, would cause if it were to establish in Aotearoa New Zealand, and are in favour of tools that will aid in limiting its spread. As documented in the supporting cost benefit analysis, economic impacts in its invaded range have been rapid and extensive, particularly in the horticultural sector, and are indicative of how BMSB would behave in Aotearoa New Zealand.

Officers believe the probability of BMSB establishing in Aotearoa New Zealand is extremely high, given the rapidly increasing number of source populations, import pathways and rate of propagule pressure; with 2000 individuals intercepted at the border between December 2017 and February 2018 (Ministry of Primary Industries 2018). Therefore the pre-emptive approach to sourcing a control tool is applauded, especially when considering the amount of resources associated with host-testing and getting biocontrol programmes off the ground. It is acknowledged that there are currently no preferable control tools available to effectively control BMSB, despite its extensive invasion history, and that *T. japonicus* is regarded in its native and invaded range as the primary candidate for biocontrol of BMSB. Officers agree that biological control can be a more effective, sustainable and socially acceptable means of invasive species management when compared to chemical control. Noting that while there may be some undesirable non-target impacts from the proposed biocontrol agent, as detailed below, these are likely to be less detrimental than the economic, social and ecological impacts associated with the increased use of broad spectrum insecticides required in the absence of an effective biological control programme.

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.

Regionally, the potential for BMSB to establish in Tāmaki Makaurau Auckland is high due to climatic suitability, availability of plant hosts and rates of propagule pressure associated with high volumes of trade. Consequently, Auckland Council is ultimately likely to have a role in the long-term management of BMSB within the region. This may transpire directly and/or indirectly via community group assistance, requests for service and the provision of education and advice. A pre-existing and effective biological control programme would, therefore, be operationally advantageous as it would not only alleviate BMSB associated impacts within the region, but also reduce costs associated with implementing a biocontrol programme from scratch.

Although officers do not oppose this application, there are some concerns regarding the potential ecological impacts associated with the release of *T. japonicus*. While the difficulties associated with testing the endemic *Hypsithocus hudsonae* are appreciated, it is concerning that the degree to which this species is susceptible to *T. japonicus* is unknown, taking into consideration its close taxonomic association with BMSB. It is recommended that further research is undertaken to discern this relationship, ensure an effective monitoring programme is in place both pre- and post-release of the proposed biocontrol agent and that a self-sustaining captive insurance population is established.

Further, while the approach to utilise the proposed biocontrol agent as part of a multi-faceted biosecurity response is laudable, the positive results of parasitism in the 'no-choice' host test and overlaps in climate suitability suggest a level of risk posed by *T. japonicus* to native and endemic pentatomids in the event that eradication of BMSB is successful. The high rates of parasitism on the native species *Cermatulus nasalis nasalis* and *Glaucias amyoti* in the 'no-choice' host test indicate they would be suitable candidates to sustain a population of *T. japonicus*. Although these species are widespread and so the species themselves are not at risk, there may be undesirable impacts on trophic food web interactions in affected ecosystems. This may be evident in crop-systems, as both pentatomid species predate on insect crop pests, but also native ecosystems where both species occur and, given its habitat preference for wooded habitats in its invaded range in North America, so might *T. japonicus* (Herlihy et al. 2016).

Often ecological impacts are under explored where there is a perceived economic imperative for biocontrol, and council officers do not consider this to be a satisfactory balance of values. Furthermore, officers are concerned that non-target impacts to native species pose a risk to social licence for biocontrol more broadly, including for management of pest plants, and therefore caution and appropriate follow-up monitoring should be applied when considering release of polyphagous invertebrate agents, even when there is a compelling economic case for their use. Therefore it is again suggested that an effective monitoring programme on non-target hosts is imperative to determine what these impacts are and how to best manage them.

In summary, the application for pre-approval of the proposed biocontrol agent *T. japonicus* is not opposed as it will 1) reduce economic, ecological and social nuisance impacts of BMSB and 2) reduce the use of broad spectrum insecticides required to control BMSB in the absence of an effective biological control programme. However, officers wish to have on the record concerns regarding the unknown susceptibility of endemic *H. hudsonae* and non-target impacts in the event that BMSB is eradicated, given the proposed biocontrol agent is not entirely host-specific to BMSB.

References

Herlihy, M. V., Talamas, E. J., & Weber, D. C. (2016). Attack and success of native and exotic parasitoids on eggs of *Halyomorpha halys* in three Maryland habitats. *PLoS One*, 11(3), e0150275.

Ministry of Primary Industries (2018) Busy summer for frontline biosecurity officers [press release]. Retrieved from <https://www.mpi.govt.nz/news-and-resources/media-releases/busy-summer-for-frontline-biosecurity-officers/>

All submissions are taken into account by the decision makers. In addition, please indicate whether or not you also wish to speak at a hearing if one is held.

- 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)

If neither box is ticked, it will be assumed you do not wish to appear at a hearing.

I wish for the EPA to make the following decision:

Relief sought:

- An effective monitoring programme to determine impacts on native and endemic non-target pentatomid populations is implemented in conjunction with monitoring populations of the proposed biocontrol agent and BMSB. If the application to release the proposed biocontrol agent is successful, non-target population monitoring should be initiated as soon as possible to determine base level population characteristics prior to the arrival of BMSB and subsequent release of *T. japonicus*. This should be undertaken in a wide variety of habitats including native ecosystems.
 - Further research is undertaken to discern the degree to which the endemic pentatomid *H. hudsonae* species is susceptible to *T. japonicus*, and, if applicable, a self-sustaining captive insurance population is established.
 - In the event that BMSB is successfully eradicated following a biosecurity response, appropriate levels of surveillance and monitoring are undertaken to determine if a self-sustaining population of *T. japonicus* establishes and what the associated impacts are.
 - Steps to quantify direct and indirect ecological impacts of BMSB and the proposed biocontrol agent are undertaken to inform management and move towards improved quantification of ecological implications of biological control programmes for economic pests.
-