Environmental Protection Authority
Te Mana Rauhī Taiao

Decision

August 2018

Date	22 August 2018
Application code	APP203336
Application type	To import for release and/or release from containment any new organism with controls under section 38A of the Hazardous Substances and New Organisms Act 1996
Applicant	Brown Marmorated Stink Bug Council
Date application received	26 March 2018
Date of Hearing	11-12 July 2018
Date of Consideration	12 July 2018
Considered by	A decision-making committee of the Environmental Protection Authority (the Committee)[1]: • Dr Kerry Laing (Chair) • Dr Derek Belton • Dr John Taylor
Purpose of the application	To seek pre-approval to release *Trissolcus japonicus* (the Samurai wasp) as a biological control agent for brown marmorated stink bug (*Halyomorpha halys*) should it arrive in New Zealand
The new organism approved	*Trissolcus japonicus* Ashmead 1904 (Hymenoptera: Scelionidae)

[1] The Committee referred to in this decision is the subcommittee that has made the decision on the application under delegated authority in accordance with section 18A of the Act.

Summary of decision

1. Application APP203336 to release *Trissolcus japonicus* (Ashmead 1904) was lodged under section 34 of the Hazardous Substances and New Organisms (HSNO) Act 1996 (the Act). The aim of the application is to enable the conditional release of *T. japonicus* to support an eradication programme in the event of a brown marmorated stink bug (BMSB) incursion. The use of *T. japonicus* is subject to the arrival of BMSB, therefore, controls must be placed on an approval to allow conditional releases of the organism. The EPA's delegated decision maker, the General Manager HSNO, agreed that this application should be treated as an application made under section 38A of the HSNO Act. The applicant agreed to this.
2. The application was considered in accordance with the relevant provisions of the Act and of the HSNO (Methodology) Order 1998 (the Methodology).
3. The Committee has **approved** the application **with controls** in accordance with section 38C(1) of the Act.

Application process

Application receipt

4. The application was formally received for processing on 26 March 2018.

Purpose of the application

5. The applicant, the Brown Marmorated Stink Bug Council, sought approval to release *Trissolcus japonicus* as a biological control agent (BCA) for the brown marmorated stink bug (BMSB, *Halyomorpha halys*).

Public notification

6. Section 53(1)(ab) of the Act requires that an application under section 38A of the Act must be publicly notified by the Environmental Protection Authority (EPA) if the application has not been approved under section 38BA.
7. The application was publicly notified by placing a notice on the EPA website on 11 April 2018.
8. In accordance with section 53(4) of the Act, letters or emails were sent notifying the Minister for the Environment, the Ministry for Primary Industries (MPI), the Department of Conservation (DOC), and other government departments, crown entities, and local authorities who have expressed an interest in being notified about applications for non-genetically modified new organisms. Māori organisations, non-government organisations and stakeholders who have expressed an interest in being notified about applications for non-genetically modified new organisms were also directly notified. All these parties had an opportunity to comment on the application in accordance with section 58(1)(c) of the Act and clause 5 of the Methodology.
9. Section 59(1)(c) of the Act requires an application to be open for the receipt of submissions for 30 working days from the date of public notification. The submission period closed on 24 May 2018. The EPA extended the timeframe for public notification under section 59(4) of the Act for one week to allow a key party to the application to submit a response. The applicant agreed to the extension of the submission period.

Submissions from members of the public

10. The EPA received 69 submissions during the public notification period.

11. Sixty-five submitters supported the application. Two submitters, the Department of Conservation and Dr Imogen Bassett, neither supported nor opposed the application. Two submitters, Phil Karaitiana from Gisborne District Council and Arthur Flintoff from Nga Potiki Resource Management Unit, were against the application.

Comments from MPI and DOC

12. In accordance with section 58(1)(c) of the Act, the Ministry for Primary Industries (MPI) and the Department of Conservation (DOC) were advised of, and provided with the opportunity to comment on, the application.

13. MPI supported the application. MPI noted that there is sufficient evidence nationally and internationally to indicate the establishment of BMSB in New Zealand would have significant adverse environmental, economic and social effects with many horticulture industries being severely affected. MPI also noted that approval of the application would be consistent with its participation in the BMSB Operational Agreement as part of the Government Industry Agreement. MPI supported a control placed on an approval allowing the release of *T. japonicus* only when a BMSB incursion is detected. MPI requested that restrictions should be placed on who may use the approval and that populations of *T. japonicus* should be monitored following the release to determine the extent of non-target impacts.

14. DOC submitted that they do not wish to oppose the application based on the information from host specificity testing to-date that indicates that *T. japonicus* is not entirely host specific. DOC notes that the BMSB presents a degree of threat to biodiversity values and a significant threat to enjoyment of the New Zealand environment, as well as a serious threat to the horticulture industry and to lifestyle values. DOC, expressed concern for the endemic black alpine shield bug *Hypsithocus hudsonae* which is related to the BMSB. DOC requested that host testing be conducted on *H. hudsonae* or that the applicant, DOC and service providers negotiate a mitigation package that would allow for an insurance population of this endemic organism to be established.

15. The Committee is satisfied that the submissions from DOC and MPI have been considered in making this decision.

Reports providing advice to the Committee

16. The EPA Staff Assessment Report was provided under section 58(1)(a) of the Act. It was published on the EPA website and the applicant and submitters were informed of its availability on 26 June 2018.

17. Ngā Kaihautū Tikanga Taiao (NKTT) elected to prepare a report on the application.

Hearing

18. Section 60(c) of the Act requires that a hearing be held if a person who has made a submission stated in that submission that he or she wishes to be heard. Eighteen submitters requested the opportunity to speak to their submission at a hearing. Those submitters were Rod Hitchmough (DOC), Gerry Te Kapa Coates (Te Rūnanga o Ngāi Tahi), David Burt (Federated Farmers of New Zealand), Edwin Massey (New Zealand Winegrowers), Stu Hutchings (Kiwifruit Vine Health), Alan Pollard (New Zealand Apples & Pears), Arthur Flintoff (Nga Potiki Resource Management Unit), Mike Chapman (Horticulture New Zealand), Gordon McPhail (LeaderBrand), Vance Kerslake (Marlborough Winegrowers Association), Cath Wallace (Environment and Conservation Organisations of New Zealand Inc), Brad Siebert (New Zealand Avocado), Helen Barnes (Tomatoes New Zealand), Mauro Negri (Riversun Nursery), Brett Wotton (Wotton Trust), Duncan

Park (T&G Global), Jeremy Laurenson (Landfall Estate) and Rebecca Reider (Organic Winegrowers New Zealand).

19. Section 59(1)(d) of the Act requires that the hearing commence not more than 30 working days after the closing date for submissions. The hearing was held on 11 and 12 July 2018 at the Clifton Conference Centre, Majestic Centre, in Wellington.

20. Rod Hitchmough (DOC), Gerry Te Kapa Coates (Te Rūnanga o Ngāi Tahi), Chris Allen (Federated Farmers of New Zealand), Edwin Massey (New Zealand Winegrowers), Matt Dyck (Kiwifruit Vine Health), Alan Pollard and Roger Gilbertson (New Zealand Apples & Pears), Arthur Flintoff (Nga Potiki Resource Management Unit), Leanne Stewart (Horticulture New Zealand), Stuart Davis (LeaderBrand), Vance Kerslake (Marlborough Winegrowers), Cath Wallace (Environment and Conservation Organisations of New Zealand Inc), Brad Siebert (New Zealand Avocado), Alasdair MacLeod and Ben Smith (Tomatoes New Zealand) appeared at the hearing to speak to their individual submissions.

21. Jeremy Laurenson, Rebecca Reider, Mauro Negri, Brett Wotton and Duncan Park chose not to exercise their right to attend the hearing and speak to their submissions.

22. The applicant was represented by Alan Pollard (BMSB Council), Peter Clough (NZIER), Catherine Duthie (MPI), Gonzalo Avila (Plant and Food Research) and Anna Rathe (BMSB Council).

Information available for the consideration

23. The information available for the consideration comprised:

- the application
- the EPA Staff Assessment Report
- the NKTT report
- submissions
- comments received from DOC and MPI
- information obtained during the hearing.

24. The Committee considered that it had sufficient information to assess the application although it recognised some areas of uncertainty. The Committee waived any requirements where the application may not have met legislative information requirements.

Matters for consideration

25. The Committee considered the application in accordance with section 38C of the Act, taking into account the matters specified in section 36, relevant matters in Part 2 of the Act, and the Methodology.

26. Each point is addressed in the following sections of this decision.

27. Specific points raised by submitters (either in their submission or during the hearing) are addressed where appropriate throughout this decision.

Summary of appearances and information discussed at the hearing

Presentations from the applicant party at the hearing

28. Alan Pollard introduced the application to the Committee and noted that presentations from the applicant party, including grower organisations and expert witnesses, would elaborate on the drivers of, and benefits to, the horticulture industry that supports the release of *T. japonicus* as a biological control agent for any future BMSB incursions in New Zealand. Mr Pollard noted that the parties to the Government Industry Agreement (GIA) were unanimous in their view that it was necessary to submit this application due to the negative impacts of BMSB internationally and the potential risks of BMSB to New Zealand due to increasing trade and the ability of BMSB to hitchhike on goods.

29. Mr Pollard outlined that BMSB populations could increase exponentially and that this issue was both a rural and urban issue with a social imperative, BMSB was considered a public nuisance as it enters homes, clothing, and electronics, emits a foul odour, and a single home that was heavily infested with BMSB in the United States was estimated to have housed up to 26,000 individuals. He outlined that tools for controlling BMSB are limited.

30. Mr Pollard described how BMSB can negatively impact the economy as it bores into crops with its stylet and causes physical damage with up to 90% crop losses in certain regions of the United States. He continued that increasing the frequency of pesticide usage from twice a year to twice a week did not eradicate BMSB nor completely remove damage caused by these insects overseas. Mr Pollard noted that BMSB could also have a negative impact on indigenous culture as it would undermine kaitiakitanga. The BMSB's potential impacts on native species are unknown.

31. Mr Pollard concluded that the introduction of *T. japonicus,* as the BCA for BMSB, presented significant benefits. Overseas research suggested *T. japonicus* was the best solution for controlling BMSB populations with up to 70% parasitism rates of BMSB eggs in studies from China. Mr Pollard noted that *T. japonicus* was internationally recognised as the preferred BCA for BMSB and provided New Zealand with a tool that was environmentally friendly. It would reduce the need for agrichemical and pesticide usage which would allow New Zealand exporters to continue trading internationally and avoid surpassing the Maximum Residue Limits (MRLs) for their respective markets.

32. Peter Clough from the NZIER presented the economic analyses that compared different options to minimise the impacts of a BMSB incursion. He noted that NZIER were requested to provide cost-benefit analyses on the following scenarios:

    - Do minimum
    - Precautionary chemical response to BMSB
    - A response using the BCA.

    Mr Clough noted that while the analyses were robust given the information provided to the NZIER, there were limitations with respect to the lack of data for the principal impacts, specifically the nuisance impact of BMSB and the loss of biodiversity from the incursion and establishment of BMSB populations. He noted that the NZIER used an S-shaped curve which was common for biological invaders such as BMSB as there would be an initial large increase in the population which eases off towards the end of the 20-year modelled period e.g. an initial incursion in 2018 would peak around 2026 before flattening out by 2038 .

33. Mr Clough noted that there were three choices that New Zealand had in response to a potential BMSB incursion:

    - Do minimum (growers respond as and when BMSB turns up): achieves highest benefit per dollar expended (highest benefit-cost ratio (BCR)). Absolute losses are still substantial.
    - Release *T. japonicus*: achieves reduction in absolute losses over four times the amount of that of the minimum response option. The net present value gained from the avoidance of

losses is also much larger in this case even though the BCR is a bit lower than the "do minimum" option.

- Heavy pesticide response: BCR lowest of the three and the net present value gain is smaller than BCA.

34. Mr Clough mentioned that if BMSB arrived in the near future and New Zealand were to have no response to controlling, managing or eradicating this pest, the modelling indicated that New Zealand's gross domestic product (GDP) could fall by $127m by 2020. He noted that the introduction of *T. japonicus* would represent significant gains to the New Zealand economy by reducing this loss by $77m and reducing GDP losses to $50m by 2020 as opposed to $127m. He noted that GDP losses were only one aspect of the economic damage from BMSB with the primary sector heavily impacted due to loss of employment, wages and potentially enterprises attached to the sector.

35. Mr Clough noted that the BCR from the estimations and *T. japonicus* response was 7.8 which according to him was fairly high. He continued that the analysis conducted by the NZIER was robust given the uncertainty around some of the variables e.g. biodiversity loss and nuisance impact. Mr Clough concluded that in addition to the benefits of releasing *T. japonicus*, New Zealand's primary sector would not need as many 'top-up' releases of the BCA if this were a classical biological control situation as *T. japonicus* populations would follow populations of BMSB and would reduce the need for agrichemical usage and pesticides.

36. Dr Cath Duthie, MPI, noted that an 8 year-long project focusing on BMSB had been undertaken which focused on the incursion response to BMSB, import health standards (IHS), monitoring the increase in incursions of BMSB in the southern hemisphere and developing a comprehensive response plan in case of any incursion by BMSB. Dr Duthie noted that a single BMSB individual would constitute an incursion but that the release of *T. japonicus* would be dependent on enforcement officials locating a breeding population of BMSB otherwise *T. japonicus* would have minimal effect.

37. Dr Duthie proposed a combination of *T. japonicus* and pesticides to reduce BMSB and described several aspects to tackle future BMSB incursions, MPI has multiple options:

    - Pesticides such as bifenthrin
    - BCA, e.g. *T. japonicus*, which targets a life stage of the pest that is not targeted by chemical control
    - Lure traps e.g. a pheromone released by male BMSB when feeding which lures other BMSB insects to that area
    - Dogs that can detect BMSB.

    Dr Duthie noted that while chemical tools had been commonly used overseas, the residual effects were not effective and that re-spraying was needed in intervals of every 10 to 44 days which is costly in the long term. She also noted that BMSB was only killed when directly hit with chemicals and that bifenthrin was the only effective and approved chemical to reduce potential BMSB populations in New Zealand. Dr Duthie also noted that the approval to use bifenthrin was expiring in late 2018 but a renewal application was planned to allow future usage.

38. Dr Duthie mentioned that MPI fully supports the application to release *T. japonicus* because a variety of tools such as chemicals, BCA and lures are required to have a reasonable probability of eradicating or managing any future BMSB incursion. She concluded that chemicals are not effective as a long term strategy.

39. Dr Gonzalo Avila, Plant and Food Research, presented the pre-emptive risk assessment of releasing *T. japonicus* in New Zealand. Dr Avila discussed how Plant and Food Research received approval to import *T. japonicus* into their containment facility to experimentally assess and predict its environmental impact on New Zealand species (APP202587; 30 October 2015). Host testing conducted with New Zealand fauna showed that *T. japonicus* only parasitizes eggs from Pentatomidae and Scutelluridae genera. He noted that there are eight species from the Pentatomidae in New Zealand and none from the Scutelluridae.

40. Dr Avila discussed that they were unable to conduct choice testing because BMSB is not in New Zealand. No-choice testing was completed on three native and one endemic species. The four other Pentatomidae species are considered exotic.

41. Dr Avila noted that the species *Hypsithocus hudsonae* had yet to be tested against *T. japonicus* due to four previously unsuccessful expeditions to locate this rare species that lives only in central Otago. He noted that a successful expedition had been completed in December 2017 where 24 individuals of *H. hudsonae* had been collected from sub-alpine areas of Otago. Dr Avila noted that Plant and Food Research was attempting to rear this species in captivity so that future no-choice testing trials with *T. japonicus* could be completed.

42. Dr Avila stated that *T. japonicus* was effective at parasitizing egg masses in no-choice testing with 18 to 96% of egg rafts of other species including *C. nasalis, D. canosus, G. amyoti* and *M. humuralis* successfully parasitized.

43. Dr Avila summarised the conclusions from no-choice tests and climate matching research:
    - No parasitoids emerging from *Nezara viridula* which was the same result found in studies in California, USA.
    - All other species parasitized are physiological hosts for *T. japonicus.*
    - No-choice tests often overestimate impact.
    - Parasitoids make use of chemical cues to locate hosts.
    - Parasitism of native species in a laboratory setting may not translate to parasitism in the natural environment due to a myriad of climatic, biological and environmental factors.
    - *T. japonicus* is most active at temperatures between 20 and 30^0C.
    - Climatic modelling (CLIMEX) was used to predict climatic suitability of *T. japonicus* to New Zealand.
    - There is overlap in climatic suitable regions for endemic Pentatomidae species and *T. japonicus* but this overlap is unsuitable or marginal at best for the BCA.

44. Dr Anna Rathe, BMSB Council, led the discussion on issues and concerns that were raised during the submission period. She clarified that the applicants, if granted approval, would seek to eradicate BMSB and if this was unsuccessful, then management of BMSB would be prioritised. She continued that there were issues with the logistical supply of *T. japonicus* and that a BMSB Council-funded project was underway to address this deficiency such as where to source the wasp, the release protocols, import permits with MPI and the number of wasps that would be permitted for release. She mentioned that the applicants were keeping their options open about where to source (import) the wasps or whether to breed them in New Zealand. She concluded that the applicants have not finalised all of the details as progress is reliant on application approval.

45. Dr Rathe discussed the concerns around non-target host impacts of releasing *T. japonicus*, namely:

- Negative non-host impact which the applicant believed was restricted to Pentatomidae only and that the level of risk is dependent on host preference, potential overlap and habitat preferences. With this in mind, the applicants acknowledged that *T. japonicus* may parasitize native species if given no choice. The applicant considered host preferences through overseas studies and Dr Rathe re-iterated Dr Avila's point that in an outdoor setting, *T. japonicus* would have a choice unlike in a laboratory environment.
- Consideration was made for the habitat preference of *T. japonicus* using studies from the United States which showed a preference for woodland/forested areas. The applicant stated that endemic Pentatomidae species prefer alpine/tussock zone habitats.
- Other studies in New Zealand show that 60 years after the release of another BCA, *T. basalis*, potential native hosts still exist in the natural environment.
- Post-release monitoring may be complicated and expensive.

46. Dr Rathe noted that a few submitters wanted host testing completed for *H. hudsonae* as well as captive breeding as an 'insurance policy' to ensure that this species survived. She noted that despite the best efforts of the steering and science groups created from the BMSB Council, the advice was that captive breeding was not possible due to limited egg masses. Plant and Food Research managed to collect individuals of *H. hudsonae* in December 2017 but the sole intention was to carry out no-choice testing with *T. japonicus*. Any future expeditions to collect *H. hudsonae* would be to complete no-choice testing as the general feeling is that breeding this population will be very difficult and may be impossible due to limited occurrence and resources.

47. She noted that submitters had concerns about the negative impacts of the introduction of *T. japonicus,* specifically:
    - Impact across native food webs.
    - Human-mediated control would be ineffective.
    - Competition between *T. japonicus* and native wasps.
    - Crossbreeding (although this is considered unlikely).

48. She also mentioned that an element of uncertainty lingers over certain aspects of the application specifically because of information gaps that were identified in the EPA's cultural risk assessment, including whether or not *T. japonicus* would attack and parasitise native species and if populations of *T. japonicus* would naturally die out.

49. Dr Rathe concluded that the BMSB Council's approach was set around laboratory-based research, modelling, learning from case studies e.g. *T. basalis*, adopting a precautionary approach and acknowledging uncertainty which translated to weighing up the costs versus benefits with what the BMSB Council does know.

Presentation by EPA Staff

50. Dr Clark Ehlers (Senior Advisor, New Organisms) presented a summary of the EPA Staff Assessment Report focussing on the benefits, risks and costs of *T. japonicus*, and assessing the parasitoid against the minimum standards in the Act. The staff assessment discussed the information provided in the application, information readily available in scientific literature, and information submitted to the EPA via public submissions. The EPA staff assessed the potential benefits and positive effects of introducing *T. japonicus*, in particular the benefits to the market economy from the use of *T. japonicus* in an eradication response. The report also considered potential risks and costs (adverse effects) associated with the introduction of *T. japonicus*. The potential adverse effects assessed included the risk of the BCA parasitising and killing endemic pentatomid species which may jeopardise New Zealand's biodiversity and the potential adverse

indirect effects on the environment, including effects on native *Trissolcus* wasps. The EPA also assessed the effects of the BCA on the relationship Māori have to the environment. The staff assessment concluded that the benefits of conditionally releasing *T. japonicus* to control BMSB outweigh any identified risks and costs. The staff assessment also concluded that *T. japonicus* meets the minimum standards as stated in the HSNO Act. Dr Ehlers noted a set of controls the EPA proposes to manage the use of this BCA.

Record and summary of presentations from submitters at the hearing

Department of Conservation

51. Rod Hitchmough presented the submission from the Department of Conservation noting that, because of the severity of concerns about BMSB and the likely benefits of *T. japonicus*, DOC does not wish to oppose the release of *T. japonicus* if and when BMSB arrives. However, he expressed that DOC has very serious concerns about the poor understanding of the level of threats from *T. japonicus* to the endemic species, *Hypsithocus hudsonae*.

52. DOC suggested a risk management package to alleviate these concerns while allowing releases of *T. japonicus* to go ahead. If this approach was not accepted, DOC argued that permission to release *T. japonicus* should be delayed until positive information is obtained indicating that *H. hudsonae* is not at risk from the effects of *T. japonicus*. Mr Hitchmough explained that DOC recognises the likely severe impact of BMSB namely to biodiversity, visitor enjoyment of the New Zealand environment and the horticulture industry and that any tool to limit its spread and numbers is welcome.

53. DOC noted that *T. japonicus* attacks a broad range of pentatomid bug species and that New Zealand has nine pentatomid species/subspecies found on the mainland: four introduced species, three species believed to be native but also widespread overseas, one endemic species and one endemic subspecies.

54. DOC stated that some risks to native fauna have been adequately assessed, such as consideration for the endemic subspecies *Cermatulus nasalis hudsoni*. DOC expressed that even in a no-choice laboratory situation, parasitism rates by *T. japonicus* of this species were significantly lower than on BMSB and that field parasitism rates would be expected to be even lower. DOC concluded that this endemic subspecies are somewhat geographically separated from risk of parasitism (at very high altitudes) and the risks are therefore considered low and acceptable.

55. DOC stressed their serious concerns for the endemic species *Hypsithocus hudsonae* as it comes from a monotypic genus; its conservation status under New Zealand Threat Classification System was last assessed as “At Risk – Naturally Uncommon” in 2010 and has not been assessed since. Previous assessments were also based on information from specimens in collections, not field assessment. DOC highlighted the fact that in summer 2015-2016 attempts to collect specimens of *H. hudsonae* for host-specificity testing with *T. japonicus* were unsuccessful. DOC therefore suggested that conservation status assessment for *H. hudsonae* may have been over-optimistic or its status may have deteriorated (or both). DOC noted that further searches in summer 2016-2017 did find individuals of *H. hudsonae* at one locality. These results suggest that *H. hudsonae* is now likely to trigger listing in a “Threatened” rather than an “At Risk” category.

56. DOC acknowledged that efforts had been made in an attempt to carry out host specificity tests on *H. hudsonae* but that these tests failed because natural food plants for this species remain

unknown and building a healthy population in captivity to allow testing was largely unsuccessful. DOC however reiterated that no information exists on the susceptibility of this species to *T. japonicus*.

57. DOC noted that *T. japonicus* has a very wide natural host range among pentatomid bugs – reared from natural egg masses of most species it could encounter in its native range. It successfully attacks other members of the tribe Carpocorini in its native range (as well as members of several other tribes and another subfamily), therefore, there is a high likelihood that *H. hudsonae* will be attacked should BMSB and *T. japonicus* move into its range. DOC noted that the same parasitism rates which merely suppress abundance of pest species (e.g., *T. japonicus* is expected to only suppress, not eradicate BMSB) could be sufficient to tip an already threatened/at risk species into extinction. DOC stated that claims that *H. hudsonae* will be protected by habitat being only of marginal suitability for *T. japonicus* are highly questionable.

58. DOC expressed concerns about climate envelope matching as records of *T. japonicus* in its native range are from sites identified by the applicant's analysis as marginal. Mr Hitchmough stated that this draws into serious question the accuracy of the environmental niche modelling and means that "marginal" areas should be considered capable of maintaining *T. japonicus* populations. DOC noted that all *H. hudsonae* records are all from areas identified as "marginal"; all natural populations should therefore be regarded as at risk of egg parasitism. This is different to the situation for the endemic subspecies *C. n. hudsonae,* which has populations in very high altitude areas identified as unsuitable for *T. japonicus.*

59. DOC stated that other organisations such as Te Runanga O Ngai Tahu, Gisborne District Council, Environment and Conservational Organisations of New Zealand Inc. and Organic Winegrowers New Zealand shared DOC's concerns with respect to the uncertainty of pre-and-post release impacts from releasing *T. japonicus* into the environment on native species such as *H. hudsonae*. DOC further noted that the Environment and Conservation Organisations of New Zealand Inc. and Dr Imogen Bassett also requested for a self-sustaining captive insurance population of *H. hudsonae* be established and that greater research is needed on the potential effects of releasing *T. japonicus.*

60. DOC concluded that they understand that risk management and offsetting are not normal or common approaches for the EPA and are likely to fall outside standard processes. They are proposing this approach to allow a win/win outcome.

Te Rūnanga o Ngāi Tahu

61. Gerry Te Kapa Coates presented Ngāi Tahu's submission. Mr Coates outlined the Ngāi Tahu value system, which includes whanaungatanga (family), manaakitanga (looking after their people), kaitiakitanga (stewardship), tikanga (appropriate action), tohungatanga (expertise) and rangatiratanga (leadership). Mr Coates discussed the role the Ngāi Tahu HSNO Komiti plays in monitoring EPA applications and expressed that the EPA and MPI must be ever mindful of its task of 'active protection' under the Treaty of Waitangi. Mr Coates noted that Ngāi Tahu were in support of the application as they recognised that BMSB poses a serious risk to native species and has the potential to cause significant economic damage to New Zealand's agricultural industries. He noted that releasing *T. japonicus* seems to be a viable alternative to using broad-spectrum insecticides which only increase the overall chemical burden and have undesirable effects on the wider environment.

62. Mr Coates noted that BMSB could be disastrous for the horticultural sector which Māori have strong interests in and that BMSB can also attack native taonga which impacts mahinga kai. Mr Coates stated that a balancing act is needed between minimising the effects on the wider

environment at the risk of potential non-target species which are primarily the eight pentatomids in New Zealand. He noted that for any biological control agent, there was little to no option for later eradication and that monitoring the effectiveness, spread and parasitism rates of *T. japonicus* was necessary.

63. Mr Coates concluded that assuming the information gaps in the application can be remediated or augmented to provide greater assurances then Ngāi Tahu would remain in support of the application.

Chris Allen, Federated Farmers

64. Mr Allen noted that Federated Farmers were in support of the application and expressed his confidence in biological control agents given his experiences with the clover root weevil on his farm. Mr Allen noted that there is an increase in the likelihood of incursions of BMSB and that the mind-set of Federated Farmers is to keep it out and, if it arrives in New Zealand, we need to have adequate measures in place to respond quickly to eradicate or manage the pest as soon as possible. Mr Allen noted that BMSB affects a wide range of New Zealand's primary sector not just horticulture as maize, rapeseed and barley are all affected and that without the approval of a BCA such as *T. japonicus*, an undesirable amount of chemicals would then be required to eradicate BMSB. Mr Allen concluded that New Zealand must remain stringent pre-and-post border.

Edwin Massey, New Zealand Winegrowers

65. Dr Massey began by noting that the viticulture industry is comprised of 1,400 member organisations, 7,500 employees, has the export value of $1.7bn and is a major driver of tourism. The BMSB represents a significant threat to the viticulture industry with a dual impact on grape production but also wine quality. Fruit that are negatively impacted are further affected as they become more susceptible to viruses and bacteria. Dr Massey stated that given New Zealand's internationally reputable viticulture industry known for producing high quality wine to the premium end of the market, winegrowers and New Zealand cannot afford to have the BMSB arrive and establish. Dr Massey noted that since 2001, Sustainable Winegrowing New Zealand (SWNZ) members have reduced insecticide application on vineyards by over 50% and are creating a legacy of sustainable production. Dr Massey stated that internationally chemicals are used to manage and control BMSB but SWNZ does not permit the use of broad-spectrum insecticides with the exception of a single use that requires special permission.

66. Dr Massey noted that due to the restrictions imposed by SWNZ on using broad-spectrum insecticides and the international expectations around premium quality New Zealand wine, the use or continuation of chemicals is not a sustainable nor long term solution. Furthermore, insecticides can only be applied post 'bud burst'.

67. Dr Massey concluded that new tools are required to combat BMSB due to the increasing number of detections. Incursions have a three-fold impact: wine quality, sustainability and grape production. The risk of BMSB would negatively affects international market access and he argued that releasing *T. japonicus* as a BCA is precautionary in its element.

Matt Dyck, Kiwifruit New Zealand

68. Mr Dyck noted that New Zealand's kiwifruit industry is made up of over 2,500 growers across New Zealand with heavy regional importance in the Bay of Plenty with over $300m investment by

Māori in this region alone. Mr Dyck noted that BMSB is a major pest of kiwifruit as it pierces the fruit resulting in fruit drop or rot; it impacts both the green and gold cultivars and losses can be up to 30% on heavily impacted blocks. Mr Dyck stated that chemical control such as broad-spectrum insecticides are unsuitable as they require regular and repeated application with limited results as BMSB has been shown to recover within a week. Mr Dyck concluded that there are no effective control products available to New Zealand kiwifruit growers and using chemicals results in high rates of residue levels that do not meet the local and international market maximum residue levels (MRLs) for kiwifruit.

Alan Pollard and Roger Gilbertson, New Zealand Apples & Pears

69. Mr Pollard began by stating that the horticulture industry forecasts ambitious economic growth. Mr Pollard noted that 6% of the industry is organic, it employs over 3,000 full-time staff including an additional 15,000 seasonal staff. The export returns are $800m in 2018 and there is huge financial and economic return to provincial New Zealand. If BMSB was to establish a self-sustaining population in New Zealand, Mr Pollard argued that it would be an economic catastrophe with losses in employment, loss of enterprises and a negatively impacted economy would lead to downscaling of businesses and flow-on effects such as social welfare issues. Mr Pollard concluded that due to the toxicity of insecticides, spraying in an urban environment is not possible.

70. Mr Gilbertson stated that New Zealand has the most competitive apple industry in the world with the largest range of premium apples. New Zealand's production practices are second to none. Mr Gilbertson noted that if broad-spectrum insecticides are used then New Zealand would most likely not be permitted to enter international markets due to MRLs. Therefore, New Zealand Apples & Pears is in support of the application as the BCA represents the most environmentally friendly alternative to pesticides and they believe in kaitiakitanga. He concluded that *T. japonicus* is a low-risk option and that broad-spectrum insecticides are socially, environmentally and economically not sustainable or acceptable.

Leanne Stewart, Horticulture New Zealand

71. Ms Stewart noted that New Zealand's horticultural industry is comprised of over 5,000 commercial fruit and vegetable growers that employs over 60,000 people. It is valued at over $6bn including $3.3bn in exports and provides critical regional developmental opportunities. Ms Stewart highlighted the lack of consideration for the social impacts of biological incursions such as BMSB since impacts are heavily interrelated. Many enterprises are family businesses that do not have 9 to 5 jobs and do not always have the resilience to bounce back from negative impacts. Ms Stewart elaborated on a case study from the country of Georgia where the presence of BMSB can be documented back to 2015 but formal identification only occurred in 2016. In a short space of time, people's livelihoods were severely impacted as the BMSB attacked Georgia's hazelnut industry which left many people without any source of income. Ms Stewart concluded that releasing *T. japonicus* is another tool that can be used for managing or eradicating BMSB and is a self-sustaining and targeted control of BMSB.

Stuart Davis, Leaderbrand New Zealand

72. Dr Davis noted that the potential damage from BMSB is large and highlighted a case study from sweet corn in Gisborne as an example. Dr Davis noted that in Gisborne over 300ha are hand harvested, >$5m per annum crop value, ~$3m crop value added, and employs over 120 staff for 12 to 14 weeks. In the context of New Zealand, these values are insignificant but for a region such as Gisborne, it is significant. Dr Davis noted just a few infected or damaged kernels are enough to

render an entire cob as unmarketable and subsequent negative flow-on effects include factory viability, post-harvest implications as well as logistics and marketing. Dr Davis noted that BMSB has similarities to the green vegetable bug (GVB) as it has wide-ranging impacts and can result in entire paddocks being lost. He concluded that insecticide control is unreliable, compromises market requirements, which will make New Zealand lose its competitive advantage and reputation, and that every tool will be needed to suppress populations to manageable levels.

Arthur Flintoff, Nga Potiki Resource Management Unit

73. Mr Flintoff noted the importance of kaitiaki and protecting New Zealand's biodiversity and environment. Mr Flintoff referred to his submission as the reference point to his concerns and highlighted that given *T. japonicus* inhabits forested areas, New Zealand's pohutukawa forests may provide the ideal environment for this species to form self-sustaining populations. Mr Flintoff highlighted that this has major implications for New Zealand as native pohutukawa and Myrtaceae trees in these forested areas are susceptible to the fungal pathogen, myrtle rust (*Austropuccinia psidii*). Given this susceptibility and the ideal conditions for *T. japonicus* to thrive, Mr Flintoff argued that *T. japonicus* may act as a vector for myrtle rust. Mr Flintoff expressed concern over our four native pentatomid species which he believed would be parasitized following the release of *T. japonicus*. Mr Flintoff requested greater understanding of *T. japonicus* and its potential relationship with native species as well as BMSB. Mr Flintoff noted that with the introduction of a BCA, it would change the biological balance of the New Zealand environment and he does not recognise the need for a BCA given that there is no real urgency as BMSB has not yet arrived nor established. Mr Flintoff concluded that a comprehensive longitudinal study should be investigated by the appropriate parties.

Vance Kerslake, Marlborough Winegrowers Association

74. Mr Kerslake stated that he was in support of the application and that there were three key points to his presentation: the importance of the wine industry to Marlborough, the concept of sustainability and the impact of BMSB to the viticulture industry. In terms of importance, Mr Kerslake stated that in the last five years, Marlborough had the largest increase in GDP anywhere in New Zealand and it was driven largely by Marlborough sauvignon blanc. He referred to economic statistics in his submission as further evidence and ended this note with the comment that the wine industry in Marlborough directly employs one person in every 10 in Marlborough and if all the people who are indirectly employed by the viticulture sector are included then it employs one in every five people in Marlborough. With regards to sustainability, Mr Kerslake notes that viticulture covers 27,000ha in Marlborough with 98% of vineyards run to Sustainable Winegrowing New Zealand certification and the remaining 2% being organic. Mr Kerslake noted that there are no insecticides that are effective in eradicating BMSB that are also compliant with New Zealand certification for MRLs and, therefore, international markets. Mr Kerslake concluded that New Zealand needs *T. japonicus* in case of a BMSB incursion as chemical responses are unsustainable and if the BMSB arrives, it would result in a loss of $600m in exports over 20 years. He noted that with the Marlborough region contributing about 80% of New Zealand's wine industry the bulk of losses would be experienced in Marlborough which would result in job losses and have detrimental effects on household incomes.

Cath Wallace, Environment and Conservation Organisations of New Zealand Incorporated (ECO)

75. Ms Wallace noted that ECO are comprised of 48 member organisations with a shared concern for environment, conservation and sustainability. ECO sought and received advice from external experts on the application. ECO welcomes and supports the control of any potential BMSB incursion and recognises the potential negative impact of the BMSB. ECO also expresses concerns about the potential impact of the BCA. ECO conditionally supports the application provided that it has appropriate conditions imposed and would like to see further research into the effects on native and endemic species with the findings of such research reported on and made publicly available. ECO considers that the cost of this research and monitoring is a small fraction of the costs associated with introducing the BCA and that if any BCA release is made following a BMSB incursion, monitoring and reporting should continue for 55 years as species can take several decades to take effect and make an impact. ECO supports imposing conditions that relate to greater research to examine potential impacts on endemic and native species as soon as possible, the establishment of a fund by EPA comprised of applicant and government funding that would allow effective environmental protection responses in the event of incursions and the continuation of long-term monitoring, examining and reporting for 55 years.

Brad Siebert, New Zealand Avocado

76. Mr Siebert stated that the New Zealand avocado industry has 60% of its industry in the Bay of Plenty, 20% in the mid-North Island, 9% in the far-North Island and 8% for the rest of New Zealand. The industry is comprised of 1,842 orchards, encompasses over 4,000ha, 11 exporters and has a value of $200m with the export season being August through to March of the following year. Mr Siebert stated that avocados hang on the tree for over a year which leaves the fruit exposed to pests with the industry having no ability to coolstore the produce. In addition, no chemical spraying can be applied during flowering or when the fruit is close to harvest. Mr Siebert stated that the New Zealand avocado industry faces challenges with spraying broad-spectrum insecticides such as bifenthrin as there are no label claims for avocados and there are always at least two generations of avocados on trees, meaning very few applications of insecticides can be applied. The New Zealand avocado industry has a highly valued and evolving pest management programme where any chemical spraying can only be undertaken if a pest has been positively identified. Any extraordinary agrichemical use that disrupts their valued IPM programmes can significantly undermine their main market advantage which is quality. Mr Siebert stated broad-spectrum agrichemicals are not effective, the challenges faced by the industry are compromised by the lack of effective monitoring to find or quantify BMSB populations, the re-infestation of crops, the lack of feasible control options due to the size of trees and the use of more aggressive broad-spectrum insecticides increase the risk of natural chemical resistance for secondary pests. Mr Siebert concluded that the New Zealand avocado industry supports the application as *T. japonicus* is internationally recognised as the most effective tool for controlling BMSB and remains the primary candidate for biocontrol overseas.

Alasdair MacLeod

77. Mr MacLeod stated that the New Zealand tomato industry is comprised of 130 growers, employs over 1,000 people, encompasses 120ha, and has a farm gate value of $131m with the canned crops industry worth approximately $295m. New Zealand exports all year round to Australia, Japan, North American and the Pacific Rim. The industry has aims of doubling the value of the sector by 2020 with the sustainability of pest control critical to future industry success. Mr MacLeod stated that the tomato industry does not know the complete impact of a potential BMSB

incursion but noted that any damage will cause loss of market access and will therefore have an economic impact on growers. He noted that the industry is experienced with using BCAs as an approach as they have been using BCAs for whitefly control for the past 25 years and have lodged other applications to release *Macrolophus* and *Tamarixia*. He concluded that the tomato industry were in support of the application.

Ben Smith, Turners & Growers (T&G)

78. Mr Smith stated that BMSB may arrive in New Zealand and that screens for the industry are not a viable option for managing any potential incursion. He referred to the industry's previous experiences with the tomato potato psyllid and that there are secondary consequences from over-usage of aggressive agrichemicals such as development of pesticide resistance by the invasive species. Mr Smith noted that if any potential BMSB incursion arises, there will be a loss of market which will hurt exporters, a loss of high value customers who have high standards for low MRLs, secondary resistance issues for any chemical spray programme for controlling BMSB with a multitude of crops being affected. He concluded that biocontrol is the preferred option as both consumers and growers prefer a non-chemical approach, the industry is experienced with biocontrols, using mesh is not practical or economical, resistance management requires multiple control options and that most countries have many greenhouse biocontrol options.

BMSB Council, Response to Submissions and Concerns

79. Dr Rathe opened by providing a summary of how the BMSB Council engaged with Māori. She stated that the BCA steering group attended a hui and met face to face with at least two Māori groups. The BMSB Council received written input from Ngāi Tahu HSNO Komiti and consulted Māori across Te Tira Whakamātaki (TTW) and Te Herenga networks. In February 2018, the BMSB Council sent additional communication to both Māori networks with more details of the application including climatic modelling, a summation of host testing, research of the BCA with chemical and economic modelling. The BMSB Council welcomed feedback from both TTW and Te Herenga networks.

80. Dr Rathe noted that from the Māori engagement, Māori expressed concerns of releasing the BCA in relation to endemic species, most notably, *H. hudsonae*. In response, the BMSB Council sharpened its focus on considering the risk to endemic species and mechanisms to reduce risk for example, geographic partitioning. The BMSB Council also dialled back assumptions and acknowledged the uncertainty that existed for numerous variables of the application e.g. impact of the BCA on endemic species. Dr Rathe noted that chemical use for Māori was considered highly undesirable and the BMSB Council noted to minimise chemical usage and opt for the use of the BCA in conjunction with any agrichemicals to eradicate or manage any potential BMSB incursion.

81. Dr Rathe stated that BMSB is being closely monitored overseas as incursions unfold and it spreads across infected areas. She noted that there has been a lack of preparedness in North America and considerable time has been taken for countries to begin research into effective BCAs for BMSB. She noted that there are considerable differences between New Zealand and other countries in this respect as other countries may have a slow process to develop a BCA tool due to complex legislation, greater research is required to ascertain the impacts of BCAs due to greater numbers of non-target species and that other countries do not have the same government-industry relationship that New Zealand has. Dr Rathe stated the BMSB Council is taking into consideration the information from other countries and are using this knowledge to get a head start.

82. Dr Avila stated that all studies from China showed that *T. japonicus* is the most effective BCA for controlling BMSB in its native range. He noted that out of all the BMSB parasitoids, the highest parasitism rates were observed from *T. japonicus* which was 70% with the next most effective BCA only parasitising at 12%. Dr Avila stated that there was generally low to no non-target attack by *T. japonicus* and that parasitism on non-target species by this BCA would not mean that it would seek out non-target species. He noted that there was no evidence to suggest non-target population decline or impact. Dr Avila stated that in the United States and Europe, they are seeking an effective BCA for BMSB and that *T. japonicus* is considered the most promising. He noted that this BCA was self-introduced in the United States in 2014 and that it is now found in eight states. In response to DOC, Dr Avila stated that significant work had been completed to try and locate the endemic species (*H. hudsonae*) with four of five expeditions into its native habitat being unsuccessful. He stated that a successful expedition was completed in December 2017 which collected 24 individuals of *H. hudsonae*. Dr Avila noted that *H. hudsonae* were challenging to rear in captivity and that if any future expeditions to capture this species are made, the researchers would conduct trials for host-specific testing straight away as it would be considered too risky to rear them in captivity. He concluded that they had received support from AgResearch and consultants.

83. Dr Duthie responded to the concerns raised by stating that there were significant environmental differences between *H. hudsonae* and the BCA. She noted that several key aspects of the application were in development such as the Response Readiness Plan for *T. japonicus* release and post-release monitoring (the current draft addresses insecticides which may be used and will require updating to include *T. japonicus*). She noted, however, that post-release monitoring may be unfeasible and possibly not useful as the BCA will be almost impossible to eradicate post-release. She stated that there are new tools on the horizon for managing and eradicating BMSB and that MPI, BMSB Council and Better Border Biosecurity (B3) have been working on options but consider *T. japonicus* as the most effective tool yet. She concluded by noting that these three agencies have been closely connected to international scientists with visits to external sites to learn more about the BCA, BMSB as well as any potential tools that may assist New Zealand. Dr Duthie stated that this BCA is considered the single most effective eradication tool for BMSB. Dr Duthie responded to comments made regarding the transport of myrtle rust by *T. japonicus*. She noted that while insects such as parasitic wasps are able to carry spores of myrtle rust on their body transferring it to susceptible host plants, the largest contributor to myrtle rust dispersal is the wind. Wasps may carry individual spores over short distances but not enough to have an appreciable impact on the spread of myrtle rust.

84. The hearing was adjourned on 11 July 2018, and closed on 12 July 2018.

85. The Committee would like to thank all people who submitted the information used in making this decision. Public submissions provide a focus for the Committee on points that need clarification, and the Committee found the submissions and the applicants' responses very helpful in its consideration of the application.

Organism description

86. The organism approved for conditional release is:

Taxonomic Unit	Classification
Class	Insecta
Order	Hymenoptera

Family	Scelionidae
Genus	*Trissolcus*
Species	*japonicus* (Ashmead 1904)
Common name	Samurai wasp

87. The Committee noted that *T. japonicus*, a solitary endoparasitoid in the eggs of BMSB, is identified as the best available option to initiate a biological control-based management option in the USA. It is recognised as the primary biological regulator of populations of BMSB in northern China. It has an annual average parasitism rate of 50% and parasitism rates up to 80% have been recorded in some field surveys in Northern China. Usually all eggs in an egg mass of BMSB were parasitized since an average female *T. japonicus* has 42 eggs which indicates it can parasitise all eggs in a single BMSB egg mass which is usually 28 eggs.
88. The Committee noted that *T. japonicus* has a short development time and can have multiple generations per year.

Host range of *T. japonicus*

89. The Committee noted that laboratory and field experiments to identify the host range of *T. japonicus* were performed in the USA, China and New Zealand.
90. The Committee noted that collectively, the laboratory trials showed that the parasitoid is oligophagous, therefore, it parasitizes the eggs of stink bugs within a defined taxa grouping. In New Zealand, eggs of all Pentatomidae fauna could be at risk of non-target attacks from *T. japonicus* females.
91. Host testing in the USA suggested that several non-target pentatomids can act as physiological hosts to *T. japonicus* although reductions in non-target stink bug populations are expected to be less than that of BMSB populations if choice scenarios tested in the laboratory play out in the environment.
92. In host experiments conducted in containment in China, test plants were selected according to phylogeny, accessibility and sympatry of target and non-target species. In no-choice tests, *T. japonicus* successfully parasitized seven out of eight species suggesting that the parasitoid may have a very broad host range within the family Pentatomidae. The Committee noted that within the same tribe, species were either not susceptible to parasitism or significantly less suitable than BMSB in terms of successful production of offspring. This suggests that there are factors other than phylogenetic relationship that influence suitability as a host, such as behaviour and chemical cues.
93. The Committee noted that in no-choice experiments conducted in New Zealand, seven out of eight tested pentatomid species were parasitized by *T. japonicus*, and at least three of the organisms had a mean percentage of egg masses parasitized similar to BMSB eggs. The Committee noted that host testing was not performed on *Cermatulus nasalis turbotii* and *Hypsithocus hudsonae* due to geographical isolation of *C. nasalis turbotii* and unsuccessful expeditions to collect *H. hudsonae* in its native habitat. The Committee noted that a population of *H. hudsonae* had been discovered since the completion of the host experiments and that the

applicant had opted to not proceed at this time with host testing experiments on this pentatomid. There is little information available about rearing colonies of this cryptic species in a laboratory and egg masses that were produced by this species in containment were limited.

94. The Committee noted the concerns by DOC that host testing was not performed on the endemic *H. hudsonae* and the non-targeted impact of the BCA on this organism could not be established.

95. The Committee concluded that all pentatomid species but one that are found in New Zealand, including untested *C. nasalis turbotii* and *H. hudsonae,* are considered physiological hosts to *T. japonicus*, based on the results of no-choice testing. Not all New Zealand origin species are equally acceptable to *T. japonicus* with three of the eight species tested showing significantly lower levels of parasitism.

Inseparable organisms

96. No inseparable organisms associated with *T. japonicus* were identified.

Assumptions for risk assessment

97. The Committee noted that there are several uncertainties with regards to the application, specifically about whether or not *T. japonicus* will successfully establish in New Zealand, if and when the BMSB will arrive in New Zealand, the protocols around the release of *T. japonicus* given that the logistical work of rearing or importing *T. japonicus* is contingent on a potential approval and also the effects on non-target native species such as *H. hudsonae*. The Committee considered that if a BMSB incursion does not occur there would be no release of the BCA or, if it does and *T. japonicus* does not establish, there will not be any significant effects (adverse or beneficial) from the release. Conversely, if *T. japonicus* establishes successfully and develops self-sustaining populations, any potential effects will be at their greatest. Therefore, the Committee considered the minimum standards and assessed the risks, costs, and benefits of conditionally releasing *T. japonicus*, working on the assumptions that a BMSB incursion will occur and *T. japonicus* will establish and develop self-sustaining populations.

Minimum Standards

98. The Committee considered whether *T. japonicus* meets the minimum standards as specified in section 36 of the Act; specifically whether *T. japonicus* could:

    (a) cause any significant displacement of any native species within its natural habitat; or

    (b) cause any significant deterioration of natural habitats; or

    (c) cause any significant adverse effects on human health and safety; or

    (d) cause any significant adverse effects to New Zealand's inherent genetic diversity; or

    (e) cause disease, be parasitic, or become a vector for human, animal, or plant disease, unless the purpose is to import or release an organism to cause disease, be a parasite, or a vector for disease.

Potential to cause significant displacement of any native species within its natural habitat

99. The Committee considered the potential for *T. japonicus* to cause significant displacement of any native species within its natural habitat if conditionally released.

100. The Committee considered that displacement of native species could occur through competition with a native species in its natural habitat, or through parasitism of endemic pentatomid species such as *H. hudsonae* in its natural habitat.

101. The Committee noted that risk from parasitism by *T. japonicus* is mitigated by a lack in overlap in locations where populations of endemic pentatomids live and where the BCA is expected to be released. Endemic stink bugs are likely to be protected from exposure by the climatic and altitudinal range they inhabit and the creation of refuges in large habitats. The endemic stink bug *H. hudsonae* is ground dwelling and prefers cushion plants which are different from recognised BMSB preferred habitats and BMSB is the preferred host of *T. japonicus.*

102. The Committee noted that whilst native pentatomids are present in environments where BMSB would live and where *T. japonicus* might be released they are widespread in New Zealand and their range extends to Australia and other countries in Oceania.

103. The Committee considered that although encounters with endemic pentatomids could occur, those encounters were likely to be incidental and not significantly affect populations of endemic pentatomids in their natural habitats.

104. The Committee noted that *T. japonicus* is also expected to be attracted to BMSB as its primary host since they have co-evolved in their native range.

105. The Committee further considered any indirect effects on native parasitoids and found that the introduction of *T. japonicus* could lead to elevated populations of hyperparasitoids or predators especially given that the release of large numbers of the BCA in response to a BMSB incursion could lead to elevated numbers of predators. The Committee considered that the effects would be transient and would not result in persistent pressures on populations of other parasitoids that may be found in the area.

106. The Committee concluded that *T. japonicus* is not likely to cause significant displacement of any native species within its natural habitats

Potential to cause significant deterioration of natural habitats

107. The Committee considered the potential for *T. japonicus* to cause significant deterioration of natural habitats.

108. The Committee noted that *T. japonicus* will be released in environments where a BMSB incursion has occurred. The expectation is that this is likely to be horticultural and other modified habitats such as gardens, parks or urban areas in the vicinity of a port.

109. The Committee noted that the elimination or reduction in BMSB numbers following an incursion due to the activity of *T. japonicus* is not expected to lead to a deterioration of the modified horticulture cropping environment, domestic gardens and public parks. The effects that the introduction of the BCA could have on unmodified natural environments are uncertain in the absence of relevant ecological studies. There may be ripple effects that accompany the release of large numbers of the BCA to populations of other stink bugs and food webs in the region where BMSB is detected. These effects may be compounded by the application of agrichemicals as part of a response. The Committee considered that these effects would be contained to the incursion location and surrounding environments.

110. The Committee noted that it is unlikely for *T. japonicus* to migrate into natural habitats where endemic stink bugs live because of geographic and climatic separation of specific habitats where they respectively live.

111. The Committee concluded that *T. japonicus* is unlikely to exert significant effects outside of managed or modified habitats where BMSB is likely to invade, therefore, the BCA is not likely to cause any significant deterioration of natural habitats.

Potential to cause significant adverse effects on human health and safety

112. The Committee considered the potential for *T. japonicus* to cause significant adverse effects on human health and safety noting that *T. japonicus* does not sting and is not known to pose any risks to people.

113. The Committee concluded that *T. japonicus* is not likely to cause any significant adverse effects on human health and safety.

Potential to cause significant adverse effects on New Zealand's inherent genetic diversity

114. The Committee considered the potential for *T. japonicus* to cause significant adverse effects on New Zealand's inherent genetic diversity through hybridisation with native *Trissolcus* species.

115. The Committee noted that the impact of this wasp on populations of *Trissolcus* wasps cannot be accurately determined as there is limited information available on their demography or population abundances. The introduction of *T. basalis* as a BCA for *Nezara viridula* almost 70 years ago has not had any visible adverse effects on populations of the native *T. oenone* or endemic *T. maori* by cross-breeding with them.

116. The habitats in which *T. maori* live are moderated by environments where its hosts live. This suggests that there will be refuges for *T. maori* away from the typical areas where BMSB and *T. japonicus* are expected to interact. *Trissolcus oenone* is found in parks, gardens and native habitats and parasitizes the eggs of native and exotic stink bugs. There is no information to suggest that this parasitoid is endangered or limited in numbers.

117. The Committee concluded that *T. japonicus* is not likely to cause any significant adverse effect to New Zealand's inherent genetic diversity.

Potential to cause disease, be parasitic, or become a vector for disease

118. The Committee considered the potential for *T. japonicus* to cause disease, be parasitic, or become a vector for human, animal, or plant disease, resulting in damage to species other than BMSB.

119. The Committee concluded that *T. japonicus* is not likely to cause disease, be parasitic, or become a vector for diseases, except where it is intended to control BMSB through parasitism.

Conclusion on the minimum standards

120. The Committee took the controls that are imposed on the approval into consideration in its assessment of the minimum standards in accordance with sections 38C(1)(a) and 38C(3) of the HSNO Act. The Committee found that the controls are likely to be effective in meeting the objectives of the controls. The Committee noted that the BCA could establish self-sustaining populations away from an incursion location of BMSB should it encounter pentatomids in the environment. The Committee noted that it would be expensive and challenging to achieve eradication of a population of *T. japonicus* once released in large numbers. The Committee noted that any attempt at eradication would involve multiple applications of insecticide and an active monitoring programme.

121. The Committee was satisfied that *T. japonicus* meets the minimum standards set out in section 36 of the HSNO Act.

Identification and assessment of potentially significant adverse effects

122. The Committee considered the potential risks and costs of the conditional release of *T. japonicus*, including any potentially significant adverse effects on the environment, human health and safety, society and communities, the market economy, and Māori culture, traditions, and the principles of the Treaty of Waitangi (Te Tiriti o Waitangi).

Adverse effects caused by non-target parasitism of endemic or beneficial stink bugs

123. The Committee considered the potential for *T. japonicus* to parasitise endemic stink bugs in New Zealand and the consequent risks to populations of rare or threatened stink bugs.

124. The Committee noted that the risk to endemic or beneficial stink bugs depends on a BMSB incursion event. If there is no incursion there is no risk to pentatomids in New Zealand since *T. japonicus* would not be released.

125. The Committee noted that *T. japonicus* could adversely affect biological control if it has population-level effects on beneficial pentatomids. There is a significant chance that two native pentatomids with biocontrol roles, *Cermatulus nasalis* and *Oechalia schellenbergii* could be parasitized by *T. japonicus*. These two beneficial stink bugs are commonly found pentatomids.

126. The Committee noted that parasitism rates of *O. schellenbergii* eggs were significantly lower than BMSB in no-choice tests. Further, the Committee expects that where *T. japonicus* is given a choice between BMSB and *O. schellenbergii* eggs it prefers BMSB. Parasitism rates of *C. nasalis nasalis* eggs were almost as high as BMSB in the trials undertaken. However, *C. nasalis nasalis* is a widespread generalist stink bug that feeds on a wide range of insects. The Committee noted that farmers and crop growers may experience a surge in pest populations locally as a result of *T. japonicus* parasitizing *C. nasalis nasalis* eggs in horticultural, urban and peri-urban habitats where BMSB and other pests could co-occur. The Committee considered that the potential risk BMSB poses to cropping, taonga and ornamental plants outweighs the risks of non-target attacks on these beneficial stink bugs.

127. The Committee noted that the risks to endemic stink bugs are mitigated by the limited overlap in biogeographic locations, climatic suitability and comparatively low levels of parasitism that was shown in no-choice host experiments on *C. nasalis hudsoni* egg masses. The Committee noted that the risk to these stink bugs and, accordingly, native biodiversity depends on whether or not BMSB will migrate into common habitats and whether or not *T. japonicus* will follow BMSB into those environments. *T. japonicus* may also migrate into their habitats because it may locate the eggs of other pentatomids it can successfully parasitise whilst out searching for BMSB or other attractive hosts as was shown in host experiments. The two endemic stink bugs are restricted to the South Island and to sub-alpine and alpine locations. *Hypsithocus hudsonae* is restricted to five populations in the central and western alpine regions. The Committee noted that of all non-endemic stink bugs it may only be *Dictyotus caenosus* that could attract the parasitoid to habitats where the two endemic pentatomids are found as *D. caenosus* uses tussock grasses as a host and can survive cool temperate and sub-alpine environments. The other pentatomids that may be hosts to *T. japonicus* do not use this type of plant host or do not live at higher altitudes. The Committee further noted that the environments the two endemic pentatomids inhabit are sufficiently large and distinct from the expected BMSB habitat that protective refuges from *T. japonicus* parasitism are likely to be maintained.

128. The Committee also noted that research suggests that semiochemicals emitted by BMSB play a role in host location by *T. japonicus*.

129. The Committee acknowledged the conservation value the endemic stink bugs have to New Zealanders, especially *H. hudsonae* which are considered to be naturally uncommon in the environment. They noted the uncertainty regarding the potential adverse effect *T. japonicus* may have on *H. hudsonae.*

130. The Committee could not conclude that there would not be adverse effects from the use of *T. japonicus.* The Committee however noted that a series of hierarchical events would need to take place in order for an adverse effect to occur commencing with the BCA dispersing beyond the environment where it was released and ending with successful parasitism of *H. hudsonae* eggs, with a number of low probability intermediate events in between. Any attack on *H. hudsonae* eggs would be moderated by the landscape, preferred host vegetation, climatic and altitudinal ranges the endemic species occupies and that BMSB, if established, is unlikely to penetrate subalpine and alpine regions as there would be abundant food supplies in lowland areas. Any potential risks to endemic pentatomids are further moderated by the controls that are placed on the approval. The Committee concluded the probability of adverse effects occurring is unlikely.

Indirect adverse effects caused by interference with ecosystem functions

131. The Committee considered the potential for *T. japonicus* to cause non-target effects on ecosystem processes such as food webs and hyperparasitism rates where the parasitoid is expected to establish.

132. The Committee considered whether there are any other organisms that depend on the same resource as *T. japonicus.* The Committee noted that there are no parasitoids in New Zealand that are known to attack BMSB should it arrive. The Committee further noted that where *T. japonicus* encounters the eggs of other pentatomids that it could successfully parasitize, it could reduce availability of eggs for other *Trissolcus* wasp species to attack. The Committee considered that this may eventuate only in the case of *T. oenone* which parasitizes the eggs of several stink bugs and is not dependent on a single host for its survival.

133. The Committee considered the impact that hyperparasitism of *T. japonicus* might have on valued insects that are hosts to the same hyperparasitoids. The Committee noted that there are no known hyperparasites that exclusively attack *Trissolcus* species in New Zealand. If large numbers of *T. japonicus* are released to eradicate BMSB, there may be transient increases in populations of predatory insect species or birds. The Committee considered that this is unlikely to result in persistent pressures on other insect species that are found in the area.

134. The Committee also considered the potential of other *Trissolcus* species that are present in New Zealand to cross-breed with *T. japonicus*. The Committee noted that although there is little information available on *Trissolcus maori* population levels, its hosts are widespread. The other two *Trissolcus* species identified in New Zealand are also widespread here (and elsewhere). The Committee concluded that self-sustaining populations of all these New Zealand *Trissolcus* populations are likely to be maintained in the event of a conditional release of *T. japonicus*.

135. The Committee noted that any potential indirect risks from the use of *T. japonicus* are moderated by the controls that are placed on the approval.

136. The Committee concluded that, in the absence of specific information, any indirect effects on New Zealand's ecosystem functions resulting from the conditional release of *T. japonicus* be considered negligible.

Potential adverse effects on Māori culture, traditions, and Te Tiriti o Waitangi

137. The Committee took into account the possible effects on the relationship of Māori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, valued flora and fauna, and other taonga, and the principles of the Treaty of Waitangi (Te Tiriti o Waitangi).

138. The Committee noted that the applicant engaged with Māori via Te Tira Whakamātaki (the Māori Biosecurity Network), the Māori Kiwifruit Growers Forum and the EPA's Te Herenga[2] network

139. The Committee read and took into consideration the report prepared by Ngā Kaihautū Tikanga Taiao (NKTT) on the application.

140. The Committee noted that the Ngāi Tahu HSNO Komiti and Nga Potiki Resource Management Unit both voiced concerns about the introduction of *T. japonicus* and any potential detrimental impacts that it may have on native species and the environment. The Committee also noted that the Ngāi Tahu HSNO Komiti requested greater reassurance about the logistics of the applicant's approach to ensure it has the greatest chance of success and that possible effects on native pentatomid species from releasing *T. japonicus* to whole ecosystems are minimal.

141. The Committee noted that the application to release *T. japonicus* is broadly consistent with the principles of kaitiakitanga and manaakitanga since *T. japonicus* is expected to benefit people and the environment, and provides for a softer option than insecticides for managing BMSB.

142. The Committee noted that whilst uncertainties about the risks to taonga species and native ecosystems were identified in some submissions from Māori and in the NKTT report the information and evidence presented to the Committee demonstrated that those risks are low and are outweighed by the benefits of *T japonicus* as a biocontrol agent for BMSB, should it enter New Zealand.

Identification and assessment of potentially significant beneficial effects

143. The Committee considered the potential benefits of the conditional release of *T. japonicus*, including any potentially significant beneficial effects on the environment, human health and safety, society and communities, the market economy, and Māori culture, traditions, and the principles of the Treaty of Waitangi (Te Tiriti o Waitangi).

144. In doing so, the Committee noted that *T. japonicus*, is intended to be a biocontrol agent for BMSB and would be released as part of an eradication strategy only when an incursion of BMSB occurs. The BCA will act by parasitising BMSB eggs significantly limiting their reproductive potential.

Potential benefits from *T. japonicus* parasitising BMSB

145. The Committee noted that the applicant and several submitters considered the BCA to be a critical component of an eradication strategy that would maximise the probability of successful eradication attempt.

146. The Committee also noted that a significant number of submissions considered eradication of BMSB through the introduction of *T japonicus* impossible or very unlikely, but that *T japonicus*

[2] Te Herenga is made up of Māori resource and environmental managers, practitioners, or experts who represent their iwi, hapū, or Māori organisation on matters of relevance to the activities and decision making of the EPA.

would be an essential component of long term management and control of BMSB. The challenges and high costs of eradication of any newly introduced species were also noted. The Committee agreed with several submitters that the success of an eradication attempt that involves the release of this BCA relies on a Response Readiness Plan that stipulates the key requirements for effective introduction and use of *T. japonicus* as a biocontrol agent for BMSB. The Committee considered the requirement for such a response plan to be key to the activation of an eradication attempt and made it a control on this approval.

147. The Committee noted that the benefits to the economy would only eventuate when *T. japonicus* is released in an eradication strategy against BMSB. The Committee noted the economic impact assessment of BMSB and costs of a response prepared by NZIER, BMSB-related costs horticulture industries elsewhere had borne, and extrapolations of impact to New Zealand industries. The proposed economic impacts of BMSB include reduced yields across a range of crops, increased broad-spectrum agrichemical use, higher labour costs and lower export prices due to concerns about chemical residues. Further, the Committee noted the uncertainty regarding the potential economic effects of BMSB, in particular uncertainty regarding the spread rate of BMSB and actual economic costs on, for example, netting and how much time orchardists would require to mitigate the risk of spread.

148. The Committee heard from a number of grower organisations and individual growers about the potential impacts BMSB might have on their industries and livelihoods. The Committee noted that many horticulture industries rely on integrated pest management practice or the use of softer chemicals for pest control. The Committee further noted a BMSB incursion and subsequent establishment of BMSB would lead to widespread use of broad-spectrum agrichemicals which are likely to adversely affect sustainable practices and access to export markets.

149. The Committee considered the economic assessment revealed impacts across the economy from a BMSB incursion and establishment. The Committee noted that the economic analyses are based on conservative assessments of the impacts of BMSB and costs to control the pest as there is uncertainty of what effects it might have in New Zealand. They noted that under all scenarios tested in the cost benefits analysis in the NZIER report and from the expert witness presentation by Peter Clough that a biocontrol approach to manage BMSB yields the highest net benefit.

150. The Committee noted that a successful eradication strategy using *T. japonicus* in combination with other tools could protect horticulture environments from becoming infested with BMSB. This would minimise or eliminate the economic costs of BMSB to New Zealand.

151. The Committee concluded that the likely economic benefits from the use of *T. japonicus* to eradicate or control a BMSB incursion are significant (non-negligible).

Benefits to the environment from the conditional release of T. japonicus

152. The Committee noted that potential environmental benefits include reductions in the damage from broad-spectrum insecticide applications to other fauna in the vicinity of BMSB and reductions or elimination in the occurrence of feeding by BMSB on native plants following a conditional release of *T. japonicus.*

153. The benefits relate to the use of *T. japonicus* as part of an eradication strategy to eliminate or minimise the wide use of contact chemicals if BMSB establishes outside incursion locations. The Committee noted the uncertainty regarding the success of eradication strategies generally but believe that the use of the BCA could contribute significantly to an attempt to eradicate a BMSB incursion.

154. The Committee concluded that the likely benefits are significant (non-negligible).

Benefits to people and communities from the conditional release of T. japonicus

155. The Committee noted the potential significant nuisance factor BMSB could pose households in New Zealand. The use of *T. japonicus* may improve the probability of eradication success and, as a result, could reduce the likelihood that BMSB would become an issue to homeowners.

156. The Committee further noted the potential impacts BMSB could have on household incomes and the New Zealand economy as modelled by the NZIER. These effects are likely to impact people and their communities, especially communities engaged in horticulture in peri-urban and rural environments.

157. The Committee noted the uncertainty of the effects of BMSB on New Zealand's people and communities but considered that the conditional release of *T. japonicus* could have important benefits. They concluded that these benefits are potentially significant (non-negligible).

Potential beneficial effects on Māori culture, traditions, and Te Tiriti o Waitangi

158. The Committee noted that commercial Māori food growers, Māori food gardens, home gardens, Māori practitioners, users of public amenity areas and homeowners would benefit from the conditional release of *T. japonicus*.

159. The Committee further noted that the conditional use of *T. japonicus* is broadly consistent with the principles of kaitiakitanga and that its release could address a potentially significant economic and environmental problem should BMSB arrive in New Zealand.

160. The Committee considered the benefits on Māori culture, traditions and the Treaty of Waitangi from the conditional release of *T. japonicus* to be non-negligible.

Weighing of beneficial and adverse effects

161. In accordance with section 38C(1)(c) of the Act the Committee considered whether the positive effects of *T. japonicus* outweighed the adverse effects.

162. The Committee found that the potential positive effects (benefits) of conditionally releasing *T. japonicus* primarily arise from eradicating BMSB from a location where an incursion has been detected. The Committee noted that the magnitude of the beneficial effects will depend on the efficacy of *T. japonicus* in parasitising BMSB eggs in conjunction with the use of chemical control. The Committee further noted that the efficacy of an eradication response that involves *T. japonicus* would depend on a Response Readiness Plan that details the key requirements for effective introduction and use of *T japonicus* as a biocontrol agent in the event of a BMSB incursion. The Committee considered the combined potential benefits of conditionally releasing *T. japonicus* are significant and non-negligible.

163. In its assessment of the benefits of conditionally releasing *T. japonicus*, the Committee considered the ability of the organism to establish self-sustaining populations and the ease with which *T. japonicus* could be eradicated if it is shown to have established an undesirable population. The Committee noted that a self-sustaining population could only develop when a BMSB incursion occurs and mated female *T. japonicus* individuals locate suitable pentatomids eggs or eggs of BMSB that escaped eradication. The Committee further noted that an undesirable population would establish if the BCA is shown to parasitise the eggs of two endemic pentatomids. This would only occur if *T. japonicus* migrates into sub-alpine or alpine regions in the

South Island and particularly in the Otago ranges. The eradication of such an undesirable population would be challenging and would entail application of insecticides in native habitats.

164. The Committee considered the primary concern relating to the conditional release of *T. japonicus* as its potential to parasitise the endemic *H. hudsonae*. They noted that although *H. hudsonae* could be considered to be a physiological host to *T. japonicus* and thus parasitism of its eggs could be expected, that multiple filters operate in the environment that would mitigate the risks the BCA would pose this species. These filters include the geographical separation between the most likely areas where BMSB would first be detected in New Zealand to action an eradication response and where *H. hudsonae* lives, the parasitoid-host relationship between BMSB and *T. japonicus*, the landscapes that BMSB is likely to infest if it is not eradicated coupled with climatic, altitudinal and host vegetation preferences of this endemic stink bug. The Committee considered that these filters in the environment in conjunction with the controls for conditional release give reasonable confidence that *H. hudsonae* is unlikely to be adversely affected by the conditional release of *T. japonicus*.

165. The Committee noted that there is uncertainty regarding the adverse effects on endemic pentatomids and gave consideration to clauses 29-32 of the Methodology. They recognised that there would be little value in seeking additional information on this matter from the applicant, and decided to proceed with the information available.

166. The Committee found that due to uncertainty regarding the level of adverse effect that *T. japonicus* could have on endemic pentatomids, they could not conclude that the risks were negligible (clause 26 of the Methodology). Therefore, the Committee gave consideration to clause 27 of the Methodology. In this instance the Committee confirmed their finding that *T. japonicus* will not cause any of the effects in the minimum standards (section 36 of the HSNO Act), and weighed the risks against the benefits.

167. The Committee found that the benefits of conditionally releasing *T. japonicus* outweighed the possible adverse effects.

Matters pertaining to conditional release

168. The Committee agreed with the proposed controls presented in the EPA staff assessment report with amendments but noted that an additional control is required. The Committee stipulates that MPI in conjunction with the applicant develop a Response Readiness Plan pertaining to the conditional use of *T. japonicus* wherein it outlines the person who determines and verifies when a BMSB incursion occurs and the boundaries of the eradication response zone in addition to addressing conditions of release and preparedness. A Response Readiness Plan must be prepared and submitted to the EPA before any conditional releases can be made.

169. With regards to 'requiring monitoring' in Section 38D(b) of the Act, a number of submitters requested the requirement for a monitoring control. The Committee did not consider setting such a control as justifiable as it would not mitigate any of the risks to endemic pentatomids discussed above. The Committee however noted the value of information that can be obtained from post-release monitoring and encourages the applicant to undertake monitoring and report findings to interested parties.

170. With regards to who may use the approval, the Committee noted that only MPI and MPI's appointed agents may use *T. japonicus* on the basis that MPI is the Government Ministry responsible for managing incursion responses and has sufficient expertise to ascertain the use of *T. japonicus*. If this responsibility changes in the future, the approval user must adjust the listing for the Government entity that is responsible for managing incursion responses.

Achieving the purpose of the Act

171. The purpose of the Act is to protect the environment, and the health and safety of people and communities, by preventing or managing the adverse effects of hazardous substances and new organisms (section 4 of the Act).

172. In order to achieve the purpose of the Act, when considering the application the Committee recognised and provided for the following principles (section 5) of the Act:

    a. the safeguarding of the life-supporting capacity of air, water, soil and ecosystems

    b. the maintenance and enhancement of the capacity of people and communities to provide for their own economic, social and cultural well-being and for the reasonably foreseeable needs of future generations.

173. The Committee took into account the following matters when considering the application in order to achieve the purpose of the Act (sections 6, 7 and 8 of the Act):

    a. the sustainability of all native and valued introduced flora and fauna

    b. the intrinsic value of ecosystems

    c. public health

    d. the relationship of Māori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, valued flora and fauna, and other taonga

    e. the economic and related benefits and costs of using a particular hazardous substance or new organism

    f. New Zealand's international obligations

    g. the need for caution in managing adverse effects where there is scientific and technical uncertainty about those effects

    h. the principles of the Treaty of Waitangi (Te Tiriti o Waitangi).

174. The Committee is satisfied that this decision is consistent with the purpose of the Act and the above principles and matters. Any substantive issues arising from the legislative criteria and issues raised by submitters have been discussed in the preceding sections of this decision.

Decision

175. After reviewing all of the information contained in the application, the Committee was satisfied that the application met the requirements of section 38A of the Act. In any event, in accordance with section 59(3)(a)(ii), the Committee waives any information requirement that has not been met.

176. The Committee considered that the threshold for approval under section 38C of the Act has been met. It is satisfied that the organism meets the minimum standards set out in section 36 of the Act, and that the beneficial effects of the organism outweigh the adverse effects of the organism, taking into account all of the following:

    a. all the effects of the organism and any inseparable organisms

    b. the relevant matters in Part 2 of the Act

    c. the Methodology.

177. The Committee decided to **approve** the release of *Trissolcus japonicus* under section 38C(1)(of the Act **with controls**.

178. The Committee noted that as it is an approval for conditional release, *T. japonicus* remains a new organism and can only be used in accordance with the controls (Appendix 1).

179. The Committee noted that the approval will lapse after 10 years from the date granted. However, any person may apply before the expiry of the time limit for an extension of that time limit or reduction of this time limit to allow for a full release approval to take effect (if applied for and granted).

180. The Committee would like to thank everyone who provided information that has been used in making this decision.

22 August 2018

Dr Kerry Laing **Chair, Decision Making Committee** **Environmental Protection Authority**	**Date**

Organism	Approval code
Trissolcus japonicus Ashmead 1904 (Hymenoptera: Scelionidae)	NOR100165

Appendix 1: Controls

1. *Trissolcus japonicus (T. japonicus)* may only be released when a brown marmorated stink bug (BMSB, *Halyomorpha halys*) incursion is detected and only at the location of the incursion in accordance with the provisions of the Response Readiness Plan. The approval can only be used by the approval user.
2. Control 1 may be reviewed if BMSB becomes established as specified in a Response Readiness Plan during the period of the approval. The potential consequence of such a review is that Control 1 may be amended to allow for a more widespread but still conditional release of *T. japonicus* in New Zealand.
3. Before any conditional release can be made, MPI in conjunction with the BMSB Council must submit a Response Readiness Plan that complies with Control 4 to the EPA, at the following email address: neworganisms@epa.govt.nz.
4. The Response Readiness Plan pertaining to the conditional use of *T. japonicus* must state:
    a) the person who determines and verifies when and where a BMSB incursion occurs;
    b) the person who determines and verifies when a BMSB population becomes established;
    c) how conditions of release are addressed; and
    d) specific operating procedures that may be required for any particular incursion.
5. The Response Readiness Plan must be reviewed and resubmitted to the EPA no later than the third anniversary of submission of the original Response Readiness Plan.
6. If MPI determines that BMSB is eliminated from the location of an incursion following release of *T. japonicus* no further releases of *T. japonicus* are allowed at that location unless there is a new incursion at that location.
7. The approval to release *T. japonicus* expires after 10 years from the date the approval is granted.
8. Control 7 may be reviewed in either of the following circumstances:
    a) in the last year of the approval. The potential consequence of such a review is that Control 7 may be amended to extend the expiry date; or
    b) if BMSB establishes in New Zealand during the period of the approval the approval user or another applicant can apply for a full release approval for *T. japonicus*. The potential consequence of such a review is that Control 7 may be amended to bring the expiry date forward, so that the full release approval can take effect earlier.
9. The approval user must notify the EPA of any proposed release of *T. japonicus* before release at the following email address: neworganisms@epa.govt.nz.

Definitions

Terms used in the controls have the same meaning as in the HSNO Act, or regulations made under the Act. In addition, the following definitions apply:

Term	Definition
approval user	MPI and MPI's appointed agents
MPI	Ministry for Primary Industries