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Tiakitanga Pūtaiao Aotearoa

MPI 18607 Project Report

Building engagement and social licence: The lived experience of the 2017 myrtle rust biosecurity response: A Taranaki case study

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Prepared for the Ministry for Primary Industries
By Dean Stronge[1], Will Allen[2], Simon Wegner[3] and Andrea Grant[3]

[1]Manaaki Whenua, Landcare Research Limited
[2]Will Allen & Associates
[3]Scion, New Zealand Forest Research Institute Limited

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Publications Logistics Officer
Ministry for Primary Industries
PO Box 2526
WELLINGTON 6140

Email: brand@mpi.govt.nz
Telephone: 0800 00 83 33
Facsimile: 04-894 0300

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Executive summary

In 2017 the Ministry for Primary Industries' (MPI) commissioned research into myrtle rust (*Austropuccinia psidii*) to address critical knowledge gaps in social, cultural and scientific knowledge relating to the management of myrtle rust in NZ. A priority research theme identified as part of this process was 'building engagement and social licence'. The overall outcome of this theme is an improved understanding of the impacts of myrtle rust and response activities to help guide agencies and other decision makers involved in incursion response and long-term management of myrtle rust.

This report, which forms part of the Theme "Building engagement and social licence" research, investigates the effects on local communities and stakeholders of the response programme undertaken following the discovery of myrtle rust in Taranaki in 2017. It explores the impacts of the incursion response on residents and businesses, and the implications this has for biosecurity agencies in their bid to develop and maintain their social licence to operate.

This research largely takes a qualitative case study approach. Data was collected through semi-structured interviews and focus groups with local stakeholders and complemented with insights from the literature on social licence to operate.

Social licence to operate is about what affected communities and stakeholders see looking in, and not what agencies see looking out. Social licence to operate is granted by communities, so their perceptions, values, practices and expectations pertaining to biosecurity are important to understand if agencies wish to obtain the necessary public support to undertake their activities. Many of the participants still had detailed recollections of their experience with the myrtle rust response programme. Our research found people still held strong feelings about the response. While there were positive responses to the operation, particularly regarding its importance, a lot of the positive was from people who had little interaction with MPI and the response operations. As people were engaged repeatedly in the process their perceptions of the response deteriorated, and the process generated anger and frustration. It is from this perspective that we seek to highlight aspects of social licence to operate that can be improved upon, as well as aspects of the response engagement process that worked well in building or maintaining social licence. The personal stories that underpin this research provide important insight into how biosecurity response programmes are perceived by those on the receiving end of biosecurity management actions – an under-researched area in biosecurity management.

While many factors contribute to trust and the social licence process, the key criteria that emerged from this case study were relationships, response to community concerns, competency, communications, and procedural fairness. It was the perceived inconsistencies in the delivery of actions within these criteria that caused the most concern for participants and which influenced their granting or revoking of social licence.

Although most people interviewed had not fully withdrawn social license to operate, biosecurity agencies may have lost some trust and support among key potential partners. This report provides guidance on how to build and maintain social licence where applicable and to work effectively with communities impacted in the future.

It is recommended that biosecurity agencies;

- Use the rubrics developed by as part of the Theme "Building engagement and social licence" research project (see appendix 2) as a tool to help incursion response teams (at different operational levels) reflect on how the incursion response process can be adjusted to help foster improved SLO and partnership initiatives.
- Undertake further case studies on the myrtle rust and other incursion responses in other regions of the country to build on the understanding of what criteria influence SLO for biosecurity programs.
- Review how to incorporate participatory approaches into the incursion response process to take advantage of/build local relationships.
- In the need to manage a national event, don't forget the local context – SLO is issued by communities, so staying in tune with local perceptions, values, practices and expectations is critical in building and maintain SLO.

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1 Project background

To better understand myrtle rust and limit its impact in New Zealand, the Ministry for Primary Industries commissioned a comprehensive research programme in 2017 with more than 20 projects valued at over $3.7 million. Projects in this programme were completed by June 2019.

The projects covered research in the following themes:

- Theme 1 - Understanding the pathogen, hosts, and environmental influence.
- Theme 2 – Building engagement and social licence: Improved understanding of public perceptions and behaviours to allow better decisions about investment, improved design of pathway control strategies and maintain social license for use of management tools.
- Theme 3 – Te Ao Māori: Greater understanding of Te Ao Māori implications of myrtle rust in order to support more effective investments, and improved use of Mātauranga, specific Māori knowledge, and kaupapa Māori approaches in management regimes.
- Theme 4 – Improving management tools and approaches: Improved diagnostic and surveillance speed, accuracy and cost-effectiveness, supporting eradication efforts and enabling scaling up of surveillance efforts for a given resource. More effective treatment toolkits to avoid emergences of MR resistance to treatments and to enable disease control over increasingly large scales that will lead to reduced or avoided impacts.
- Theme 5 - Evaluating impacts and responses: Improved understanding of environmental, economic, social and cultural, impacts to inform risk assessment and management and to communicate implications to decision/makers and stakeholders.

This report is part of the MPI commissioned research under contract MPI18607 which addressed research questions within Theme 2, 4 and 5.

Text in the report may refer to other research programmes carried out under the respective theme titles.

2 Introduction

In 2017 the Ministry for Primary Industries' (MPI) commissioned research into myrtle rust (*Austropuccinia psidii*) to address critical knowledge gaps in social, cultural and scientific knowledge relating to the management of myrtle rust in NZ, as identified by the Strategic Science Advisory Group (SSAG) (MPI 2017a).

Four priority research themes were identified (Appendix 1):

- Theme Building engagement and social licence
- Theme Te Ao Māori
- Theme Improving management tools and approaches
- Theme Evaluating impacts and responses

This report forms part of the Theme "Building engagement and social licence" research (Appendix 2). This research seeks to understand stakeholder perceptions and behaviours to allow better decisions about investment, improve the design of pathway control strategies and maintain social license for the use of management tools[1]. A crucial part of achieving this aim is to understand public acceptance of management options to inform future decisions on research, management and communication.

How biosecurity response operations are experienced by stakeholders is an under-researched area internationally (Porth et al. 2015). Additionally, there is little documented about what engagement and social license processes have occurred in New Zealand in response to myrtle rust. This report seeks to address this by investigating the effects on local communities and stakeholders of the response programme undertaken following the discovery of myrtle rust in Taranaki in 2017. It explores the impacts of the incursion response on residents and businesses, and the implications this has for biosecurity agencies in their bid to develop and maintain their social licence to operate.

3 The New Zealand Biosecurity System - Big Picture vs Small Picture

The New Zealand biosecurity system seeks to prevent or manage risks from harmful pests and diseases from impacting on New Zealand's economic, environmental, social and cultural values (MPI, 2016, 2018b). The biosecurity system operates across three inter-related areas – internationally (pre-border), at the border, and within New Zealand (ibid.). Administered by MPI, the Biosecurity Act 1993 provides the legal framework for MPI and other agencies/actors to help keep harmful organisms out of the country, or if they do make it into the country, the powers to respond and manage the incursion (MPI, 2018a). New Zealand's biosecurity systems mission is to "[protect] New Zealanders, our way of life, our natural and production resources and our biodiversity from the harmful effects of pests and diseases" (MPI, 2016, p. 4). As outlined in Figure 1, pest and disease incursions have a direct impact on society and its quadruple bottom line (QBL; i.e. economic, environmental, social, cultural values) (Bourdieu, 1986; Dalziel et al, 2009). These QBL components underpin people's livelihood resilience; which is "…the capacity of all people across generations to sustain and improve their livelihood opportunities and well-being…" (Tanner et al., 2015). Pest and disease incursions can directly impact some or all of these QBL criteria, so the protection of these (and by extension, people's livelihoods and their livelihood resilience) is a key component of the biosecurity system (MPI, 2016).

Responses to incursions can be complex and fast-moving, requiring the co-ordination of government agencies, iwi, communities, industry and other stakeholders (MPI, 2018b). To manage this complexity MPI has guidelines and protocols in place to set up and run a co-ordinated response. These procedures reflect the need to act quickly to contain the spread of the threat; with the narrative emphasising the widespread national scale of the impacts (Porth, Dandy, & Marzano, 2015) – such as aiming to "minimise harm to the country" (MPI, 2018b, p. 13). As Porth et al. (2015, p. 669) note, "management success is consequently judged by the avoidance or minimisation of those large scale [big picture] impacts" on society. This approach often sees people in the abstract, reducing their lives to homogenised communities (Tanner et al., 2015) and a one-size-fits-all approach (Prno, 2013).

However, society is comprised of a heterogeneous collection of individuals, who endeavour to exercise agency (self-determination) in their lives and their livelihoods – managing everyday issues and concerns (small picture), which, while not of national importance, are nonetheless highly

[1] Tools in this sense is not just confined to the physical operational methods used to manage an incursion (i.e. spraying, mechanical removal etc.), but also includes the regulatory and operational processes and procedures that determine how they are used and what communication and engagement processes and approaches are associated with their use.

significant and substantive to them. Biosecurity issues do not sit outside these everyday concerns but form a part of people's locally constructed realities (Irwin, 2001).

Incursion responses also affect societies quadruple bottom line (Figure 1), impacting on people's livelihood opportunities and well-being (MPI, 2018b). This potentially compromises the very values the biosecurity system is intended to protect. Consequently, tensions exist between meeting national scale objectives and the needs and experiences of local communities and stakeholders affected by the response (Porth et al., 2015). These tensions can have important consequences for biosecurity agencies looking to develop and maintain widespread public acceptance of the approaches and tools used to manage biosecurity incursions and their social licence to operate.

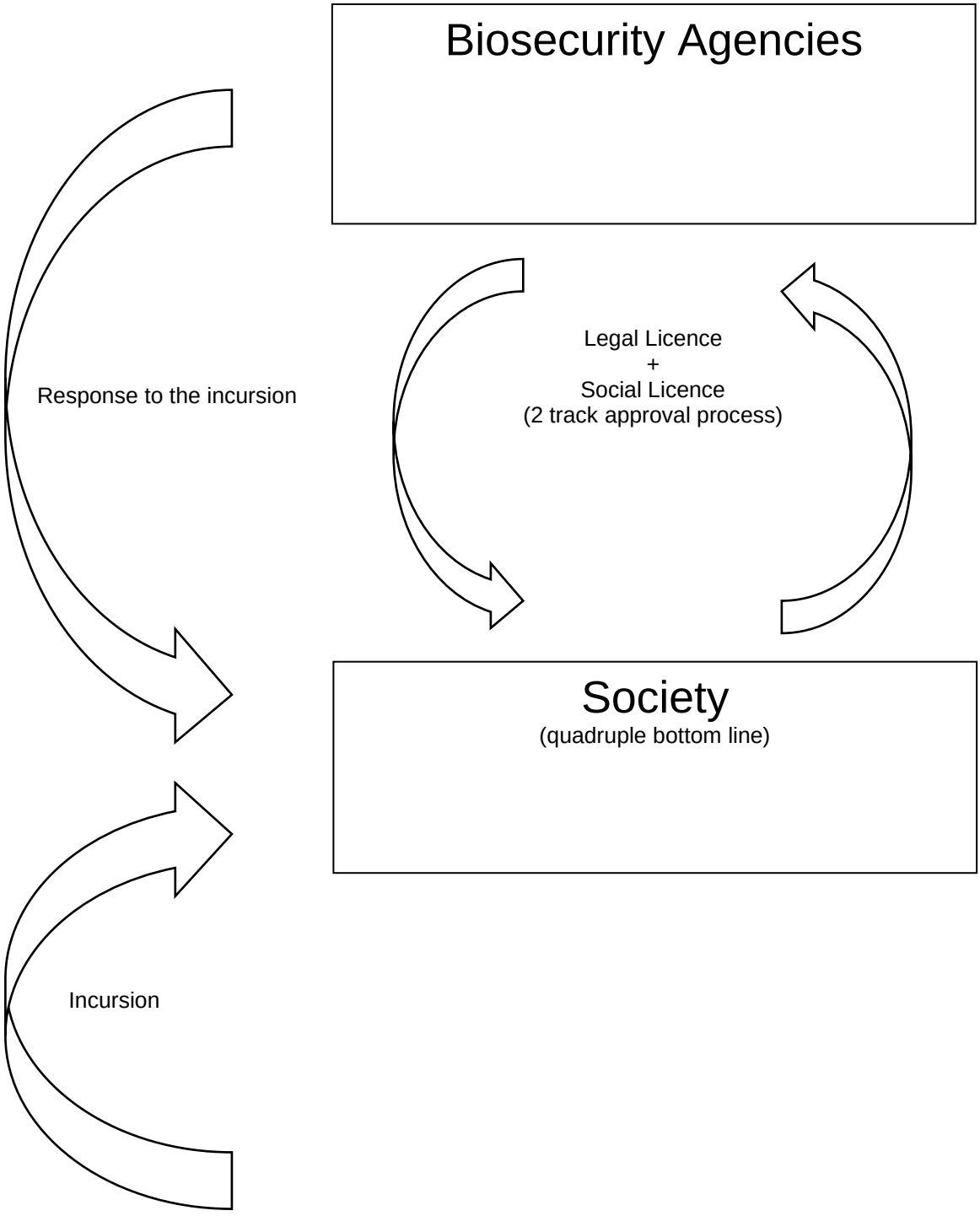

Figure 1: Biosecurity Incursion and Response Framework.

4 Social Licence to Operate

Social licence to operate (SLO) is broadly defined as the "…ongoing acceptance or approval of an operation by those community stakeholders who are affected by it" (Moffat, Lacey, Zhang, & Leipold, 2016, p. 4), both directly and indirectly. Originating in the extractive industries (particularly mining – see Boutilier, 2014 for a history of the concept), SLO is now being widely applied to many sectors (Boutilier, 2014; Edwards & Trafford, 2016; Mercer-Mapstone, Rifkin, Louis, & Moffat, 2018; Moffat et al., 2016; Quigley & Baines, 2014), including biosecurity (Jenkins, 2018; MPI, 2016).

Edwards and Trafford (2016) note, that due to the increasingly widespread use of the term, confusion exists around its meaning. They argue that in New Zealand there is a better articulation of what it isn't, rather than what it is (ibid). This is a major barrier to overcome for the development of SLO. The way a party sees SLO influences the way they approach it. Critically, organisations often see SLO as something to be gained through a transactional, 'make a deal' approach. This approach largely sees SLO as a risk management exercise where stakeholders need to be managed so that disruptions are minimised (Mercer-Mapstone, Rifkin, Moffat, & Louis, 2018), and so the tools and processes being utilised can continue to be employed by agencies to achieve their ends. Communities, on the other hand, generally grant a SLO on the basis of organisations showing "genuine respect and concern for [their] values and well-being" (ibid.) and the perceived quality of their relationships (Thomson & Joyce, 2008). While the transactional, 'make a deal' approach has achieved some limited success, it is apparent from the international SLO literature that more attention needs to be focused on the quality of the relationships between those undertaking an operation and the communities of interest affected by the work, if SLO is to be truly achieved. Another challenge of the transactional risk-management approach is that it encourages a view of SLO which is static, uniform and binary; whereas SLO is naturally influenced by cumulative past experiences and broader social, economic and environmental contexts (Prno & Slocombe, 2012).

Social licence to operate is foremost about trust (Mercer-Mapstone, Rifkin, Louis, et al., 2018; Moffat & Zhang, 2014; Prno, 2013). As Mercer-Mapstone et al (2018, p. 673) note, trust is "at the heart of the social licence process". Communities will develop trust in organisations that "do not take advantage of their vulnerabilities, demonstrate integrity and competence in the way they manage the risks their operation represents, work collaboratively with them, and meet community expectations regarding company behaviour" (Moffat & Zhang, 2014, p. 62). Many factors contribute to trust and the social licence process. Figure 2 outlines some of the key criteria as derived from the literature.

Figure 2: Key SLO Criteria dervied from a review of literature

As highlighted by Figure 2, different studies emphasise the importance of different criteria that contribute to trust and SLO. While not every criterion will be relevant in every situation, each has an important role to play in the development of trust and should be considered when investigating SLO.

Prno and Slocombe (2012, p. 348) argue that "the granting of a SLO often implies that [local stakeholders] have been meaningfully involved in decision making…" and meaningful engagement/participation is increasingly seen as significant in the SLO literature (Baines & Edwards, 2018; Mercer-Mapstone, Rifkin, Louis, et al., 2018; Mercer-Mapstone, Rifkin, Moffat, et al., 2017, 2018). Importantly, social licence is not a single licence granted by communities, but a "…continuum of multiple licences achieved across various groups within society" (Dare et al., 2014, p. 189). This implies that different levels of engagement will be required with different stakeholders, and that some will be more important than others (Boutilier, 2014; Quigley & Baines, 2014).

SLO within the context of a biosecurity incursion response brings specific challenges. The need for rapid response means that there is little time to form new relationships, build trust or ensure meaningful public participation (Mackenzie & Larson, 2010). Yet the need for trust is especially high as the public often must accept a certain degree of risk or actual harm to their property, income or other valued assets from the response. People form their judgements of what is a fair and acceptable

response based on their perceptions about the relative risks and impacts of the threat and the various control measures (García-Llorente, Martín-López, González, Alcorlo, & Montes, 2008; Gobster, 2010; Shackleton et al., 2018). This is complicated by a typically high degree of scientific uncertainty surrounding the potential impacts of the threat and the effectiveness or possible unintended consequences of different response options. Because these judgements are context dependent (Niemiec, Pech, Norbury, & Byrom, 2017; Qin & Flint, 2017), they are likely to evolve as more evidence arises about the spread and impacts of the incursion, or the effectiveness of control efforts. The perceived costs and benefits of a response are key: people may be willing to tolerate actions they consider extreme in the short term or make significant sacrifices if they believe the ends will justify the means but may grow frustrated if they do not see results (Gobster, 2010).

5 Context: Taranaki Myrtle Rust Incursion

Myrtle rust (*Austropuccinia psidii*) is a fungal disease that affects plants of the Myrtaceae or myrtle family. Of South American origin, myrtle rust is highly invasive and is recognised internationally as a biosecurity problem (Makinson, 2018). Myrtle rust has been found in South-east Asia, New Caledonia and all along Australia's eastern seaboard (Makinson, 2018; MPI, 2018b; Carnegie et al., 2016). Its microscopic spores can easily spread across large distances by wind, or via insects, birds, people, or machinery (MPI, 2018b).

The disease attacks the new growth of susceptible host species, damaging or killing new shoots and leaves, which can lead to progressive defoliation and plant stress or death as older leaves die naturally. (Makinson, 2018). Myrtle rust has the potential to affect iconic New Zealand plants including pōhutukawa, mānuka, rātā, kānuka, swamp maire and ramarama, as well as commercially-grown exotic species such as eucalyptus, feijoa and guava (MPI, 2018b; Black et al, 2019). To date varieties of ramarama and pōhutukawa have been the most vulnerable species (MPI, 2018b) and Bartlets rātā (Teulon et al, 2015). Overseas the impacts of myrtle rust have varied widely from country to country and plant species to species including between individual specimens (MPI, 2018b; Berthon et al., 2018; Freeman et al., 2019) so the long-term effects of the disease on ramarama, pōhutukawa and other myrtle species in NZ is unknown (Galbraith & Large, 2017; Teulon et al., 2015).

First detected on Kermadec pōhutukawa trees on Raoul Island, myrtle rust was subsequently found on the mainland of New Zealand at Kerikeri in early May 2017 (NZ Government, 2017). On the 16th May 2017 myrtle rust was reported in Taranaki and an incursion response process was set up in the region. Restricted place (RP) notices were put on properties directly affected by the disease and in June 2017 a Controlled Area Notice (CAN) was introduced – extending 10km out from known infected properties (MPI, 2017b) (Figure 3).

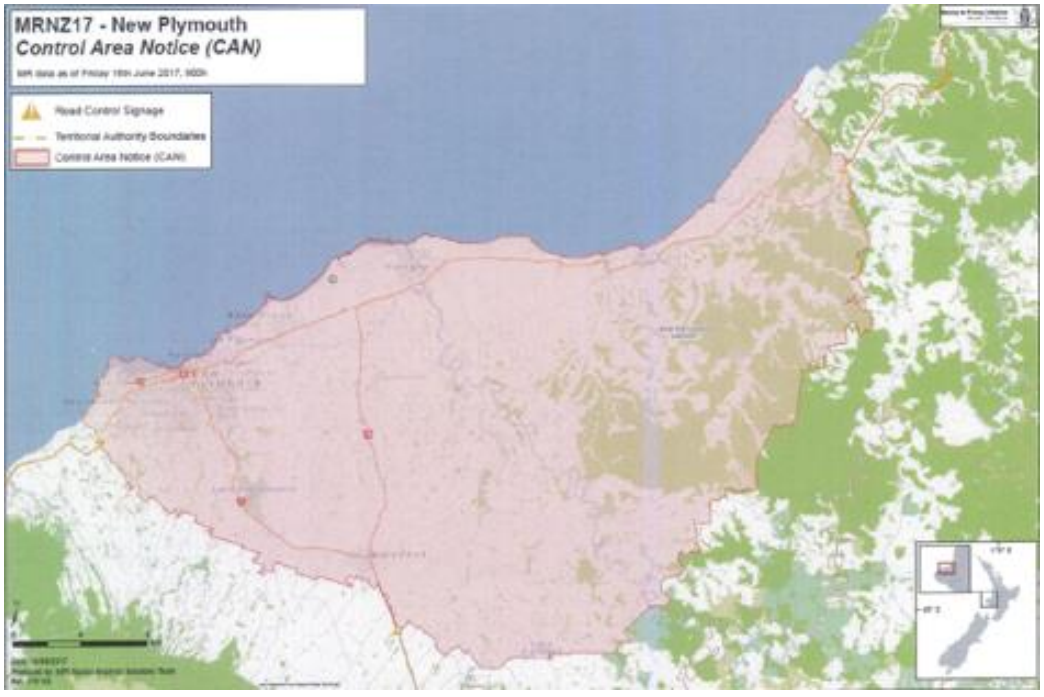

Figure 3: Myrtle rust controlled area map in North Taranaki (source MPI).

Properties declared a restricted place had strict controls placed on them in regards the movement of risk goods such as plants and machinery. MPI's initial approach was to destroy all infected plants. Treatment included applying a sealant to the infected plant prior to its removal, the use of a fungicide to inhibit spread, and cleaning equipment and fixtures including soil – although not all these steps were necessarily taken in all cases (MPI, 2017c). It was also illegal for anybody to move myrtle species plants, fruit of green waste out of the controlled area (CAN) (MPI, 2017b).

Table 1 outlines the development of the incursion in Taranaki and the rapid increase in affected properties as the incursion response progressed (Figure 4). Due to the long-running nature of the incursion staff were regularly rotated in and out of the response process. Confounding this was the discovery of myrtle rust in the Waikato (May 2017), Bay of Plenty (June 2017), Auckland (November 2017), Wellington (December 2017), Manawatu (March 2018), the discovery of *Mycoplasma bovis* in South Canterbury (July 2017) and its subsequent discovery throughout the country, and the discovery of *Bonamia ostreae* in Stewart Island oyster farms (May 2017). These additional concurrent response programmes stretched available resources. Together with past incursion responses and ongoing management of established invasive pests, they also provided context for how people perceived the myrtle rust response and the agencies involved.

Table 1: Taranaki myrtle rust incursion timeline

Date	Description	Restricted Place Running Total
16 May 2017	Suspected myrtle rust reported to 0800 number	0
17 May 2017	Myrtle rust confirmed in Taranaki (Waitara nursery). Movement controls placed on property. 500m radius to be inspected.	1
19 May 2017	2 further properties confirmed positive in Taranaki (nursery + garden centre). Restricted Place Notices put in place. Locations treated with fungicide.	3
20 May 2017	3 further locations confirmed positive in Taranaki (2 (residential gardens + TRC nursery)	6
22 May 2017	4 further locations confirmed positive in Taranaki	10
23 May 2017	3 further locations confirmed positive in Taranaki	13
25 May 2017	3 further locations confirmed positive in Taranaki	16
26 May 2017	1 further location confirmed positive in Taranaki	17
29 May 2017	3 further locations confirmed positive in Taranaki	20
30 May 2017	1 further location confirmed positive in Taranaki	21
31 May 2017	3 further locations confirmed positive in Taranaki	24
May/June 2017	Intensive public notifications	
2 June 2017	5 further locations confirmed positive in Taranaki	29
6 June 2017	4 further locations confirmed positive in Taranaki	33
9 June 2017	2 further locations confirmed positive in Taranaki	35
13 June 2017	4 further locations confirmed positive in Taranaki	39
June 2017	Stopped destroying non-infected myrtles	
28 June 2017	Legal restrictions on movement of myrtle spp. plants and green waste out of an area in Taranaki introduced – Controlled Area Notice (CAN)	58
July 2017	Stopped fungicide on all non-infected myrtles	
Mid-July 2017	First myrtle rust discovered in Central Taranaki	
28 July 2017	Further locations confirmed positive in Taranaki	70
31 Aug 2017	Further locations confirmed positive in Taranaki	80
Oct/Nov/Dec 2017	Intensive Public Notifications	102
January 2018	Stopped removing infected trees in North Taranaki	112
Mid-February 2018	First myrtle rust discovered in South Taranaki	
27 February 2018	Restrictions on movement of myrtle spp. plants and green waste out of an area in Taranaki (Controlled Area Notice (CAN)) lifted. Restricted place notices for individual properties remain in force. Myrtle rust discovered on conservation land (Mt Messenger)	157
March 2018	Stopped removing infected trees in South Taranaki	
29 March 2018	Further locations confirmed positive in Taranaki	239

March/April 2018	Intensive public notifications	
30 April 2018	Further locations confirmed positive in Taranaki	263
April 2018 – June 2018	Interim long-term management emplaced	
May 2018	Public notifications slowed down significantly	
31 May 2018	Further locations confirmed positive in Taranaki	284
June 2018	Disposal of waste moved to self-management	
July 2018 – August 2018	Long-term management emplaced	286+

Source: AsureQuality; MPI media releases (https://www.biosecurity.govt.nz/protection-and-response/responding/alerts/myrtle-rust/myrtle-rust-media-releases/)

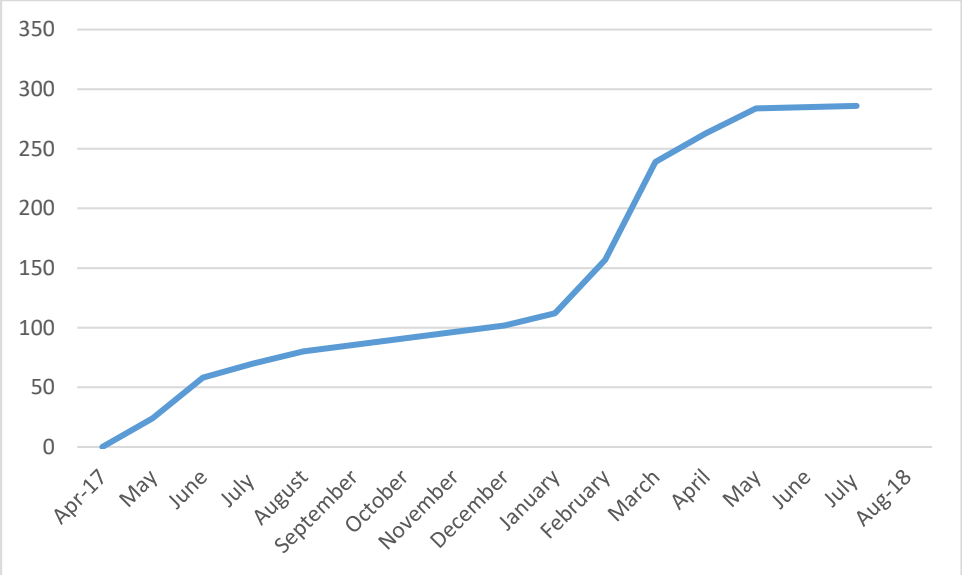

Figure 4: Running Total of Restricted Place Notices for Taranaki

6 Methods

This research takes an applied approach, in that it is concerned with understanding the nature of an issue of concern to society (Patton, 2015). To develop this understanding the study primarily used qualitative case study methods to explore the recipients experience of the myrtle rust incursion and response in Taranaki. The responses of the participants are used in this report to help capture and communicate the actual experiences of what they faced. As Patton (2015, p.54) argues, "Qualitative data tell a story" and narratives have at least as important a role in raising the profile and disseminating scientific information about the issue as do quantitative technical reports (Browne et al., 2009).

We used a combination of purposive and snowballing (asking people to identify others) techniques (Patton, 2015) to select participants for the case study. The aim of this was to identify information-rich participants who have detailed knowledge or experience of the issue under investigation (Curry, Nembhard, & Bradley, 2009).

Initial participant categories were identified through discussions with key stakeholders and the review of secondary documents. Identified participants included;

- Iwi
- The nursery industry
- Individual households that received a restricted place notice
- Public amenities (parks, golf courses)
- Community interest groups (environmental groups and garden groups)

While we acknowledge the relevance and importance of iwi to this research, this report does not include an iwi perspective. This is due to concerns raised by the Theme 2 Te Ao Māori research leads around duplicating enquires with iwi and over-burdening their limited resources. Instead, we have left this perspective to be captured by the Theme 2 research.

Contact with the nursery industry and community interest groups were initially made via overarching bodies (the NZPPI, Wild for Taranaki, NZ Gardens Trust). An information sheet and invitation to participate in the research was supplied to these bodies by the research team, who then disseminated them through their networks. Replies were followed up directly by the research team.

Initial contact with a random sub-sample (20 out of 200) of private households that received a restricted place notice was carried out by AsureQuality on behalf of the research team. Those households that consented to the research team contacting them (16) were then called to discuss the research and invited to participate. Of these, nine participated in a focus group or individual interview.

Public amenity managers were contacted directly by the research team and invited to participate.

Data for this report was collected through semi-structured interviews and focus groups with local stakeholders. Interviews for the case study were conducted over a two-week period during October and November 2018. Table 2 provides a summary of the number of interviews conducted during this research. With qualitative enquires there are no rules as to the sample size (Patton 2002). Rather, the aim is to reach a point where collecting additional data does not provide any new information or concepts (Collins 2010; Patton 2002). As Porth et al. (2015, p. 671) note, “Significant data can be generated through in-depth interviews with small samples of key informants because they occupy significant positions of expertise or have had particular experiences”. This knowledge they argue, allows for the provision of high quality, information-rich data (ibid.).

Table 2: Summary of Interviews

Recipient categories	Individual Interview	# Focus Group	# Focus Group Participants
Nursery	2	1	6
Household	6	1	4
Public amenities	2	0	-
Community groups	1	0	-
Other	2	0	-
Total # participants	**13**	**-**	**10**

Interviews were conducted at private homes, places of work, a New Plymouth pub, a church hall and by phone. Participants were asked questions about Taranaki and the QBL values that were important to them, questions about the myrtle rust incursion and response in Taranaki, and questions about the SLO criteria outlined in Figure 2, and their relevant importance. The interviews followed a semi-structured approach, meaning the interviewers drew from a list of pre-determined questions (appendix 3) to ensure key topics were addressed. Secondary questions were asked as needed to follow where participants directed the conversation and to investigate unanticipated themes.

An information sheet was provided to all individual and focus group interviewees prior to each interview/focus group. All agreed to have their interview recorded on a digital recorder. The audio files were transcribed by a professional transcription service and the transcriptions were sent back to each respective interviewee for verification prior to the transcript being used in the research. We also drew on earlier agency interviews conducted with people involved in the response by the research team for other aspects of this research project.

In addition to the interview data we collected secondary data throughout the case study process, drawing on both published and unpublished government and stakeholder reports, newspaper/media articles, website databases and academic publications, for example. As with the other data sources described above, this secondary data not only provided information but was also used to triangulate (Patton, 2002) or cross-check our primary research data.

Interview and focus group data were thematically analysed using the computer software NVIVO. A combined inductive/deductive process was used to code the data. Analysis was deductive in that some predetermined categories were looked for while exploring the data (i.e. impacts and implications

of myrtle rust on the quadruple bottom line; success factors, barriers and challenges to the incursion response; SLO criteria). It was inductive in that these categories are broad and overlapping, so the specific themes which emerged within them allowed for alternative explanations to be considered.

7 Results

Many of the participants still had detailed recollections of their experience with the myrtle rust response programme. Their personal stories provide important insight into how biosecurity response programmes are perceived by those on the receiving end of biosecurity management actions and are valuable for agencies in designing their engagement practices. These perceptions are also important in understanding social licence to operate and which SLO criteria play the most active role in stakeholders either granting or revoking their SLO.

The key insights that emerged from these stories were 1) the range of values that people identified as being important to their livelihoods and well-being, 2) the perceived impact of myrtle rust on these values and the effect that had on people, 3) the impacts of the response programme and the key criteria that influenced people's perceptions of the agencies' social licence to operate, and 4) insights around our understanding of welfare and well-being.

While many of the interviewees focused on areas where problems were identified, it is important to stress that the majority of people interviewed remained generally supportive of the response efforts. While most had not fully withdrawn social license to operate and some may be less willing to cooperate in future responses, biosecurity agencies may have lost the trust and support of some key stakeholders and potential partners in future response operations.

7.1 What Taranaki People Value

The New Zealand biosecurity system emphasises the importance of New Zealanders way of life (MPI, 2016) and understanding the values that comprise our 'way of life' is a critical part in its protection. Interviewees from this case study expressed the importance of all the quadruple bottom line values (environmental, economic, social, cultural) when describing what they appreciate about living in Taranaki. A key aspect of this was the diversity of interests and perspectives within the different values and relevant importance placed on the different values by different people.

> *Taranaki's such a diverse place, …people think of Taranaki as being milk and oil and gas. But it's way more than that (transcript #2).*

Environmental – Taranaki's indigenous biodiversity, ecosystems and landscapes were highly valued by those interviewed, with people connecting with the natural landscape and its features.

> *We're conservationists, environmentalists. We …came here because we found a place …that had …a QEII reserve bush area on it. We love the coast and the sea as well so finding the property in New Plymouth, we originally thought it was, like, unique having a house and small amount of land with access to the stream and access to the bush and four kilometres to town. After we've been here a few years we realised that's because of the topography. There's lots of streams, lots of remnant bush and there's many people in Taranaki who are privileged to have those things (transcript #16).*

But just as important to other people was the urban and novel ecosystems (Davis et al., 2011), with their mix of exotic and indigenous species.

> *People of the New Plymouth district value their parks and their reserves, and their trees are a huge aspect of it (transcript #12).*

People expressed pride when talking about these created landscapes, especially the regions gardens.

> *We're on the outskirts of Waitara with a lot of gardens and things like that around us, which we like…. We try to have a nice garden, but it doesn't always happen with, you know, when you spend so much time at work. So, we just admire the other peoples. [Our neighbours] garden is just, you know, absolute, you know, beautiful. Like, he won the best garden of the year (transcript #11).*

> *We do have a lot of gardens in the area and we're well known for the garden festival… Plants are very important to this town, this district… (transcript #12).*

When people come through, like we can get a thousand people through in ten days, gardening from all over the place (transcript #1).

A significant indicator of the value placed on these novel urban ecosystems is the extensive planting of pōhutukawa. Being outside its natural range[2], planted pōhutukawa are a dominant feature of the urban/peri-urban landscape (Photos 1 and 2).

New Plymouth has one of the highest tree coverage of a city in the area, in New Zealand... We have very high tree coverage within the town. Pōhutukawa make up a huge chunk of that (transcript #12).

Photo 1 and 2: Pōhutukawa in the Taranaki landscape

This is highlighted by the New Plymouth District Council's district plan. Of the around 1700 notable trees listed and identifiable to species, almost 50% are pōhutukawa.

We do have a lot of Pōhutukawa in this town, just in New Plymouth itself before we stretch out to the rest of the district. It's going to look quite bare if we lose all these trees. Long term it's going to look quite bare (transcript #12).

Economic – Interviewees undertook and valued a wide range of economic activities.

What's important economically? I think the diversity of things, basically (transcript #5).

While activities such as agriculture (especially dairy), horticulture, oil and gas, and tourism were all raised as important industries that contribute to the regions prosperity, everyone emphasised the importance of economic capital for their livelihoods.

Social – Many of the interviewees valued the lifestyle Taranaki afforded.

It's a pretty nice place to live actually. I really can't think of anywhere else I'd want to be (transcript #4).

The proximity of the mountain to the sea provided a diverse range of recreational activities that was frequently commented on by people. The sense of community, time spent with family and friends, the variety of cafes and other venues, walkways, festivals, and events were all raised by interviewees as positive aspects of living in Taranaki. All these aspects contributed to people's sense of well-being and were essential components in building and maintaining their lifestyle capital.

Cultural – Cultural values raised by interviewees centred largely around pōhutukawa and its iconic role in New Zealand national identity.

People were talking about no more pōhutukawa, no more Christmas tree flowers (transcript #1).

[2] The southernmost stand of naturally occurring pohutukawa occurs in North Taranaki. This stand is geographically isolated, being some distance from the closest confirmed naturally occurring population to the north, at Kawhia. The stand is of cultural significance to Ngati Mutanga (Simpson, 1997).

Pōhutukawa, those iconic New Zealand species. It was to me quite devastating to think that we could lose that. Especially around the coast here where those big old trees are and just feeling quite anxious and sad about that I guess (transcript #16).

One aspect that arose was that while there was some attempt made to recognise the cultural values important to Maori, particularly the protection of taonga trees, there was a lack of recognition by biosecurity agencies that this also extended to non-Maori.

If there were any taonga trees affected they would propagate from them, but that's the only concession that they had for anything that had a case of myrtle rust. Unique material in nurseries didn't get that chance. And you've got to, everybody's got to have that choice (transcript #1).

7.2 Impacts of Myrtle Rust

Because of its relatively recent arrival and because all known infected Myrtaceae were being removed up until January 2018 (see Table 1), few people reported seeing any negative impacts from myrtle rust. Most were aware of the potential impacts from the communications they had received. However, the removal of infected trees and the limited time for impacts to start to show due its recent arrival, left some in doubt as to the seriousness of the risk.

I don't think it's attacked a lot of the trees that they thought it was going to attack too like your feijoas and things like that. …Specific trees like mānuka and things like that, they were thinking that was going to be a problem, but I don't think it's bothered them too much, or pōhutukawa; and a lot of our native trees it doesn't like (transcript #4).

Is it going to devastate our pōhutukawa or our myrtle species? By the look of it I don't think it's going to do much at all. …That's what I'm hearing and it's what I'm thinking (transcript #6).

I don't know if there's too many - two, maybe one case where it's been found on Leptospermum. That's about it. So the sky's not falling. … It's like the Italian rust that came in, in the Lombardi poplars, in the '70s. That was going to nail all our Lombardi's. They did look sick for a little while, but they're still there (transcript #9).

Others also commented on international experience of the issue or referenced past biosecurity scares which turned out not to be as severe as predicted.

I've just been over to a plant propagator's conference in Hawaii and we walked through a nursery there, they have a native Metrosideros over there, and we were looking through their tunnel house and it was like shit, it's got myrtle rust on it, and a few other Kiwis flocked over to have a look, the ones that hadn't seen it, and the guy said, "We've had it for years. Doesn't really worry them, we're not worried about it." Some of the Australians I've talked to that were on the same tour, they basically said the same thing, "We just manage it. It's just another bug to look after but nah, it hasn't done much damage. There's one or two things we might not grow anymore, but it's fine" (transcript #15).

Despite this apparent scepticism by some, several of these people also believed the response was appropriate given the uncertainty (see section 6.3).

Some indirect impacts of myrtle rust were reported. One nursery owner reported that, due to the susceptibility of ramarama, they have ceased commercially growing that product which has resulted in lost turnover from clients. Another cost to them was the implementation and maintenance of all the procedures and protocols needed to retain and assure their clients that it was safe to buy goods off them.

Not all affected trees were identified and removed during the initial management process. This meant a few interviewees reported seeing the negative effects of myrtle rust on ramarama and pōhutukawa.

Some of those are stands, …stands of a couple of 100 trees [each] …are showing a lot of myrtle rust issues. …Pōhutukawa in particular. The ones that where we are seeing the effect of, it's quite interesting, you can look down - there's a very good example at Koru where you can look down the row of trees where there's a lot of leaf loss and they just don't look healthy…. (transcript #12)

On reflection, interviewees noted that trees with myrtle rust had been showing signs of ill health for a couple of years.

…some of these trees we look at we've been seeing that for 12 months, and we're going, 'I wonder if it's just dry conditions, or it's just the tree failing?' Well, now we've found myrtle rust on them (transcript #12).

The effects, …would indicate to me that it's been here a lot longer than when it was first noted (transcript #12).

Interviewees also observed some areas of hope. They noted that while they had come across stands of myrtle rust infected trees, amongst them they would find a;

…really bushy, lush tree that obviously hasn't been affected. …We've identified a lot of trees that don't have it with trees that do (transcript #12).

7.3 The Incursion Response

Biosecurity Acceptance - Across the board, interviewees were supportive of the need for biosecurity, from the national level perspective.

I think most Kiwis are concerned about the country and its biosecurity (transcript #8).

…our whole economy's based on biosecurity, …whether it's pastoral farming, orcharding or whatever (transcript # 1).

Many expressed an initial trust (or confidence) in the biosecurity system and that the biosecurity agencies would do the right thing. This meant that virtually everyone spoken to were supportive of the initial attempt to manage myrtle rust when it was discovered in Taranaki.

I didn't have a problem with what they did. Like I said, I'm all for keeping those sorts of things out of the country, and if I can do anything to help I will (transcript # 4).

I think there was generally really good support to try and achieve [eradication] in Taranaki (transcript # 15).

Yep, they had to try. It was becoming a futile battle towards the end, but [laughs] they had to try (transcript #6).

This support was evidenced by the initial self-reporting of the discovery of myrtle rust in Taranaki by the nursery industry - despite being aware of the potentially serious implications the response might have - and subsequently by the number of people self-reporting potential infection to the 0800 hotline.

The nursery that first pointed out they had an issue, they put their livelihoods on the line by saying they had something there (transcript #12).

People were also aware of the immensity of the task faced by the biosecurity agencies and the resource limitations they work under.

…it covered a wide area pretty quick, so they had a lot of people to deal with (transcript #7).

We're always getting incursions. There're incursions that we never hear about. …I've been and talked with people and how many times do fire ants get into New Zealand? Regularly. And they don't actually become established or whatever. Because [MPI] get onto stuff pretty well. I think they do a pretty good job. But they're on a hiding to nothing. Whenever something comes in its MPI's fault. Poor buggers (transcript #2).

There's a lot of yachts coming in bringing fruit fly etc. and the measures they're taking up there is just extraordinary. Must be costing a huge amount so, you know, you can't write the MPI off and say they failed because they are doing the best they can in the circumstances… (transcript #16).

However, once the response process interconnected with the day to day concerns of people's lives, their trust in the biosecurity system and the biosecurity agencies became more mixed, particularly the more they interacted with the system.

I basically trusted what they do, but they do need to make improvements… (transcript #8)

I think there was a lot of goodwill to begin with – Not now. To begin with, but I think it has been seriously hurt and harmed (transcript #15).

Perceptions of the myrtle rust response and relevant agencies were also influenced by perceptions related to other eradication or management efforts. Participants frequently made references to other past, current or future biosecurity threats.

> *I've seen probably half a dozen weeds, new weeds species come into the system and over the years I can remember when poplar rust first came in the 70's. Guava moth, Dutch elm disease, PSA, the fruit fly incursions there's all these things that I can remember coming in, and they haven't been able to nail a lot of them. They weren't even interested in the guava moth, but that goes back to, I think it was MAF at that stage. But it's a company culture and they change, might change the labels on the department, but it doesn't actually change the company culture (transcript #1).*

The Response Process – While every situation was unique, participants recollections of the response process were generally consistent. For many of those interviewed their first experience of the incursion response was when the 'white suits' arrived to inspect their properties.

> *They just turned up unannounced, there's just these guys walking up the driveway… In their white suits…. It might scare some people, I'm not sure, because there was no clear way to identify who they were (transcript #5).*

> *The first thing we seen is these guys in white overalls. We thought drug house up the road. You know what I mean? That's what you instantly think: murder, drug house, you know (transcript #11).*

> *…the other thing that came out of it was when you get guys in space suits wondering around terrorising neighbourhoods, they didn't go to the front door and knock to see if somebody's home. They just wandered in, and I've heard of cases of kids look out their window and see these people in white suits and start howling. You don't do that, if you've got to approach, or got to enter onto a section you don't just bowl on in, you've got to make some approach to the household and check if anybody's home. Sure, they have the right to do that but it's not necessarily just go in because you have that right. You don't want to upset the locals. …you go to the door, knock on the door and that's when it starts. And if you don't knock on the door you're already on the back foot (transcript #1).*

On the discovery of myrtle rust during the inspection, owners were informed of the need to undertake treatment. This involved the property being declared a restricted place, with strict controls being applied in regards the movement of risk goods (i.e. plants and machinery), and in some instances people (i.e. staff). Treatment of infected plants occurred later to the inspection, with teams returning to the property to either spray and/or remove infected plants. Depending on the property, this involved either a single or multiple visits. Follow-up monitoring visits were conducted and once satisfied the risk of myrtle rust spread was mitigated as far as practicable, property restrictions were eased. This process went relatively well for some.

> *I think once the myrtle rust was discovered on the property I think the sequence of events followed up very quickly and then the resurveying of the property was consistent with a follow up pattern that eventually led through to the fact we had a clearance of movement of stuff on our property (transcript #10).*

In some cases, participants were not particularly concerned by the removal or possible removal of plants from their properties or considered their losses an acceptable sacrifice for the eradication effort. Although these people raised many of the same complaints as others, they saw their sacrifice as minor and were generally willing to accept this as part of the eradication effort.

> *That's what I say, we're lucky. It just didn't affect us at all. The only thing we lost was a couple of trees, you know (transcript #11).*

> *To me something has to be done. I was quite happy that they did what they had to do. They had to dig out a few bushes, well okay. This is the response that was necessary and they were probably in a situation where something had to be tried. I don't think it is something that it's a regular thing to find such as a myrtle rust problem anywhere and I think the initial tackling of it to identify how much and where it was a good response (transcript #10).*

> *But that just goes with the territory, I suppose; it's just one of those things that we accept and move on with, yeah (transcript #8).*

Others, however, expressed concerns to varying degrees, particularly where the response process impacted on their lives or businesses more severely.

> *There was nothing well about it really, it was a bloody huge inconvenience (transcript #6).*

I think it was a muck up from start to finish actually (transcript #15).

These people also accepted the need for some sacrifices, but there were limits to the sacrifices they were willing to make.

[T]hey were looking at taking 40 metres of trees around the infected tree. That basically devastated [my colleague here], so we had to sit down with them and said 'okay, where's the compensation coming from in relation to the 40 metres of trees around that infected tree?' and they told us that they do not compensate for the infected tree, but they do for the other trees. So I asked a question as 'how are you going to put a dollar value on a fully grown pōhutukawa tree?' They didn't have the answer for that, they went back to Wellington, they came back to say 'we're going to take the affected tree, not the ones around it'. That changed the whole concept of what we originally were looking at, at the devastation that we were looking at, as far as today (transcript #6).

Frustrations grew over time, particularly as more rust was discovered and it became clear that eradication was unlikely.

…once it was becoming evident to me that chopping down all these tress isn't actually going to help – you know, it's like hold on, have we really still got this policy that we're going to chop everything down? They chopped down this big long row of Pohutukawa hedging that somebody had put in. That thing must have been 25 years old. And they chopped it down. And I'm like – "Do we really need to chop it down? They're finding it all over the place now. How about we just wait a couple of days?" "No, no, no. We've got to get in there and chop it down." So chainsaws come out and they chop it all down. I don't know how – it wasn't very long after that they changed their policy and said we're not going to chop things down any more. And I was annoyed for that person, that he'd lost – it was down his driveway but they'd lost this – and I know there's got to be times around decisions. But when you're starting to think you're going to make the decision to not cut things down any more, maybe slow down your cutting (transcript #2).

Actions like these, which were seen as overly harmful or unfair, had serious implications for agencies pursuing social licence to operate and support for future incursion responses.

…There was a lot of duplication and silly things happened that didn't really need to happen. And that's not good for MPI either, is it? It doesn't sit in a good light as far as any future things happening (transcript #8).

If they want help from [locals] they'd better sort their ideas out though because the next one that comes in, I'll be very reluctant to report (transcript #15).

Biosecurity is a national challenge and it should affect everybody, and they say they've got, what is it four million people on board, but they're dreaming when they say that. Because they've rubbed too many up the wrong way (transcript #1).

So the upshot of the whole thing is if you found myrtle rust again or some other thing… MPI would be the last person that would find out. It would be burnt, destroyed, whatever because they've got no credibility really… (transcript #15).

None of the interviewees lived in isolation. They all had neighbourhood, community, industry networks. They shared information and observed what was happening with their neighbours and networks in relation to themselves. For those that aired concerns with the response process, it was the inconsistencies that raised questions of trust, credibility and procedural fairness; all of which affected their view of the response. Several people who reported positive experiences personally were still upset over the treatment of neighbours or friends and this influenced their perceptions.

Relationships – The quality of relationships was a central theme in many discussions. Overall the experience was not positive in most cases. A big issue for participants was the constant change in personnel. This affected their ability to build any long-term relationships and trust with those they were dealing with.

We never were able to get a good relationship with one or two people where we could just call and say, 'This is what we've got going on. What do we do now, or where do we go now?' it changed quite a lot (transcript #12).

This was frustrating for many as they felt they were constantly dealing with someone new and had to re-explain the situation to each new person.

The trouble was, they kept changing people all the time, so you had no continuity. So, when you turn up, it's like 'Who am I talking to today?' (transcript #9).

But the staff or the different amount of people that we had to deal with, that was just awful…. One time you'd have a meat inspector, so you'd explain to him the situation, then the grain inspector and you'd explain to him the situation. We didn't have just one person dealing with, and every time different people would turn up you'd have to… catch them up on the situation (transcript #15).

Importantly, participants often were unsure which agency the people they interacted with represented, did not always understand the separate roles played by the agencies and contractors involved, and did not necessarily distinguish between different government agencies. This was further compounded by a perceived lack of communication between different parts within the response and frequently changing instructions.

…the strategies changing behind the scenes all the time but the people at the front don't know so to give you understanding. It would help me to understand better why the delays were or what was happening if I knew some of that other background information I guess (transcript #16).

Because they were very siloed as well. They knew exactly what they were there for but they couldn't tell you anything about anything else (transcript #15).

Thus, poor experiences with one person or organisation reflected poorly on the whole response operation and all agencies involved.

Response to community concerns

Several participants noted positive interactions with individual response staff, who they felt listened to and attempted to address their concerns.

When they came and said about the tree by the aviaries [which was to be sprayed], …we explained about our parrots and so they got someone else to come and … he was just awesome. Just so helpful, you know? Just explaining what they were going to do and they were getting these big shipment container tarpaulins in and just made sure that it was done properly (transcript #11).

You asked what could [they] deal with, so yes there were areas that [they] couldn't give you an answer but [they] would facilitate, [they were] a great facilitator. If [they] couldn't give you the answer [they'd] get back to you that afternoon with the answer (transcript #15).

I was at home a couple of times when they came in and set it up and checked the property, and the people that were checking the property were quite friendly and let me know, "We're just going to spray these trees over there, keep an eye out yourself, this is what you're looking for." They were quite informative, so they were very good (transcript #4).

Others felt that their concerns were not listened to and that there was a lack of any real opportunity to input into the process.

And to be fair from their point of view I can see they didn't want to manage the incursion by committee, but I do think there should've been some cross-party meeting where they could've involved [people] and then come to a joint decision via MPI rather than their decree of what was happening. … there should've been some sort of, "Hey guys, we've got this problem – … "What do you recommend?", … "Let's work out a process to handle it in the best least impact way that we can actually manage the issue" instead of just coming onboard, "This is what we're doing." … "We do this best." … "This is our job, this is what we do, stand back" (transcript #15).

Some felt this requirement to stand aside and not interfere was being highhanded. It was particularly frustrating for those who had a working knowledge of the biosecurity and health and safety legislation.

…it was a highhanded attitude, 'we're in here. You're the property owner but step aside, we're managing this…' [They didn't come with the MSD sheets]. Not until a week or so after they'd sprayed. …They just seemed to be above the law as far as their own health and safety act and HSNO act. They just didn't seem to recognise – even though they were another government department there was just no acknowledgement of those other bits of legislation and requirements (transcript #15).

I got pulled aside by the MPI guy and [he] said, "Can you talk to [him]? He's being difficult." And I went, "I don't think he's being difficult. He just wants to know some – he's just a scared landowner that wants to know what [you have] put on his land…" So, I said, "Bear in mind, he knows The Biosecurity Act. So, he knows when you're doing it wrong. And he'll pull you up on it

because he's that kind of guy." But not in a bad way. I think he's just really trying to make sure that if they're doing it properly for him then they're doing it properly for others (transcript #2).

Those from the nursery industry were particularly aggrieved at not being able to input into the process. Their initial offers of assistance of staff, expertise and equipment were declined, which made them feel untrusted.

We had enough trust and openness for MPI to offer them all our machinery at the time – And our expertise. And so, they messed the trust thing up right at the beginning, [being] not even interested (transcript #15).

This was compounded when contaminated equipment was brought in to spray their properties as part of the control process.

Before we re-opened, we had to have two sprays done on the nursery. It was actually brought up at one of the meetings that we had with them about the use of sprayer brushes, and this guy got up and said that the tanks and that have all been cleaned according to protocols. But unfortunately, some of the tanks had been used for, I believe, a hormone spray, so we got damage from basically a herbicide tank being used for putting on fungicides… (transcript #8).

This only added to their sense of frustration and questions around the expertise of those undertaking the work.

…it's just standard practice. If you're using hormone in spray tank that doesn't get used for insecticide fungicide on plants. We have a separate knapsack if we want to do anything with that type of gear… Any home gardener worth their salt will have two sprayers in their chemical shed, one for weeds and one for fungicides (transcript #15).

Credibility of Response Staff – While not all the work required skilled staff, some of it was skilled work and it was obvious to participants when those undertaking it were not competent to do the job. This affected people's trust and confidence in the ability of the response agencies to do the job.

I know they had no idea what a myrtle actually looked like. We had small leaf Coprosmas and all sorts that they were busy looking at and it's like wasting your time. [Laughter] (transcript # 15).

…it was the same situation with the people that were looking for the myrtle rust. There was an inspection as time went on to see how widespread it went, and a lot of them had no idea what they were looking at. You know, you've got a guy walking around a Macrocarpa tree for nearly an hour, then wanders over to a puriri tree. They're not even myrtle species. And [he] even said to them 'have you guys got any idea what you're doing?' They said 'I haven't got a frickin clue' [laughter] (transcript #6).

I had to try and show them the plants, and they just went for a little wander around the garden and didn't pick up any others, and I can go for a walk and find them easily myself, so I don't know how well trained they are from that point of view. They certainly identified it once they saw it here, but other than that they didn't pick up any other Lophomyrtus plants around the garden (transcript #5).

Although it was acknowledged that finding enough skilled staff was an issue as the incursion mushroomed, incidences such as these eroded the initial trust and support people had in the agencies and their procedures.

Communication – Communications was another mixed issue with participants. While some were happy with the process, others were far from satisfied.

…they'd just turn up without giving you notice… No notice and, "Here we are to spray" but we're standing here working. Or you'd look out and there'd be a few people walking round your [property] and it's like who the hell are these guys, they hadn't even introduced themselves. Just let us know that you're on our property! (transcript #15).

We had spray crews turn up with staff onsite which caused a major health and safety risk for us to manage. There were inspection crews turned up unannounced. There were inspection crews turn up the day after the other inspection crew had just turned up (transcript #15).

While some participants felt they received clear and consistent messages, perceived inconsistency and changing instructions were common frustrations which undermined public support. This was often related to the changes in personnel noted above but also to some inconsistencies in operational protocols from one property to the next.

…you'd have someone here for two weeks and then they'd have to go on leave, so they'd be replaced by someone else, and the communication between them was just non-existent, because the next person would come along and just have completely different ideas and knew nothing about what was discussed with the previous person. That was the frustrating part about it. Everyone had their own ideas; it was crazy, some of their actions (transcript #6).

Like I said every time we followed a step and got into that process it got changed. So every time it changes you lose a little bit more of your faith in what's happening and is it right? (transcript #7)

They didn't really know what they were doing, they weren't told the right information, they had some people spraying wheels and feet, other people just wandered in and out, there was really no continuity of the information that needed to be handed down; it was pretty inadequate (transcript #6).

[W]e had to dress up, we had the white zoot suits on till we got clearance again, you see? We were wearing those every day. Staff had to have boots that they left here. Whereas the golf course was allowed to carry on playing golf and being open. ….they said their protocols were evolving all the time and that was why – but to my mind, I thought, well, with people just wandering in and out, a few spores on the ground or whatever, like with here, there could've been – it was being stopped here but it wasn't there. (transcript #8)

Several people were not provided with basic practical information about what was happening on their properties or what they were expected to do.

[T]here wasn't a step by step thing that we were sent out of how much we needed to get rid of, whether we needed to get rid of it all. So we were a bit lost in that respect (transcript #7).

Left us with booties and gloves and things like that, and overalls, which I don't know what they were really for, to be honest, because it's not like you could wear them to the supermarket and stuff, you know what I mean? I wasn't too sure what they were for. (transcript #11)

If you come into somebody's house, farm or nursery and you're spraying crap all over, they're going, "What is that? I want to know. Yes sure, I can't stop you. But I want to know what it is. What impact's that going to have on me in the future?" (transcript #2).

Procedural Fairness - Because the response process had a direct impact on people's homes and businesses, it was important that it was perceived as fair and proportionate to the threat.

People did not always understand why protocols changed or were applied differently, so differences were sometimes seen as arbitrary and unfair.

See that's what I can't understand about the changing the protocols. These guys less than a k and a half down the road, they just levelled anything that looked like a feijoa, it was just scorched earth policy. We were a positive site and probably no more than from here to the front door is our household orchard with two feijoas in it. They looked at them but no one said, "You have to cut them down." [My neighbour] was gobsmacked when I said, "They haven't touched our feijoas." (transcript #15).

Nurseries lost customers or suffered reputational damage due to the destruction of their stock and the ongoing effects of the spray contamination.

We've now been off the market for two years. That market's been filled now. [We've lost customers because] … we haven't got the product still. Yeah, we don't have product for them. And when we do they're now used to buying from other [sources] – we've got to try and break back into a market we've had for years, because two years is a long time to be off the market. It took us seven years to build up to that point and every year our crop had increased, and we had more plans for the future, but all of a sudden, we're back to zero again. All of a sudden, you're stalled for two years. …Add that to hormone damage so the cuttings aren't coming away and you're right back at where we were five odd years ago… (transcript #15).

We shipped some plants out to some customers, they went to the South Island, and then I got some phone calls, "Hey these plants aren't coming into growth like they should. They're all twisted looking. They look like they've got hormone damage" and then I started to click oh shit, and I had to do some explaining. It's our good name. You explain what's happened and they're okay with that, but you have to give credits for it. But it's still our name (transcript #15).

All of which resulted in financial hardship for some.

…a lot of us people that were affected are quite small businesses, so you take that [into] the equation and – so we had to fund by overdraft and whatnot, if you got a bit short, and there's a few of us that had to do that… (transcript #8).

They took half our income last year and half of it from this year… Which didn't help us with the bank (transcript #15).

Although the Biosecurity Act 1993 "…provides for compensation to be paid when the use of powers to manage or eradicate and organism causes financial losses to people, specifically from the damage to or destruction of property and losses arising from movement controls" (MPI, 2018c, pg 27), many felt the process was overly complicated, drawn out and unfair. Some interviewees, almost two years on, were still waiting for their compensation claims to be settled.

There's no other customer that can come onboard and take 70% of your stock and not pay for it for nine months, and not pay interest or anything like that. That's crazy. It's as good as ringing up and saying, "The cheque's in the mail", well it's not (transcript #15).

[It] took forever, and it was me sending emails of probably six A4 pages in relation to backwards and forwards 'this is what's happening, we need an update, I haven't heard from anybody' and finally it all happened last week, so we got that. And the comment kept coming back 'we didn't know where [you] fitted in a non-commercial claim'. Well, I didn't think it was that hard [laughter] (transcript #6).

Participants also felt that they were not respected during the process.

We documented everything and had signed signatures of everything that was taken, and we were still made to feel like we were claiming for things that we had no right to. We were kind of made to feel like we're criminals, like we're trying to, I don't know, get away with something - Rip them off for stuff they've destroyed – and we were only wanting what we actually had taken (transcript #15).

Adding to this was the observations by participants that resources appeared to be readily available throughout the response process but were not being used appropriately.

I think that was part of the frustration too is the way they demonstrated right through the whole process that money was not an issue. They had money to throw around. You'd have three truckloads turn up with perhaps one person in each just to pick up a few leaves. …heaps of money for resources and nothing to help out us actual people that were affected (transcript #15).

It seemed to take a long, long time to do what they needed to do, and I think that was basically the contractors bled your system of time wasting. They just took forever. Even MPI, when they first moved in with the trees on the affected ones - for example, we had four people turn up, had their white gear on, to stake out the 20 metres around the infected trees. That took them all day. It could have taken us five minutes. And they got here, there was no tape, there was no standards, there was no equipment, someone went off, came back; for a five-minute job it was just a total waste of time, as far as money basically spent (transcript # 6).

[They] had five staff, two days and they put on in excess of 800 litres. On our second spray round after our insistence we used our local contractor, he put on 600 litres, did exactly the same amount in 32 minutes. Now to me the economies of that, it beggars belief… (transcript #15).

I was actually approached to help, a lady from Wellington rang up and said, "You guys have found it, you know what you're looking for, we need people who know plants, can help train other people" and I said, "Oh yeah, well we're shut off the property for the time being" and she said, "Well we're paying $17.50 an hour" and I said, "Well I pay my staff more than that" and she's, "Oh no, that's all there is" and I said, "Well they won't do it for that, sorry." Then I hear all of the Taranaki Regional Council staff, …being charged out at $150 an hour [for managers] and other staff were charged at $100 an hour…. They want to pay me $17.50? It was bloody laughable (transcript #15).

All of these incidents affected the perceptions of fairness in the eyes of those impacted.

7.4 Welfare

Both the incursion of myrtle rust and the response to it had an impact on the well-being and welfare of many of those interviewed. Some found the response approach rather intimidating and frightening.

> *I was quite shocked actually when I got the letter, if you do this and you're not allowed to take your rubbish away and you can be charged and there's big fines, it was a little bit scary to start with I suppose (transcript #4).*
>
> *That was definitely clear, you do as you're told. Do as you're told was very much threatening – yeah. The notice of direction was quite threatening… (transcript #15).*
>
> *[There] was a PORSE lady, she had young kids zero to five-year olds and then all of a sudden, these white [suited] people were in the backyard and they hadn't actually approached the owner of the property. …And it freaked these kids out (transcript #15).*
>
> *…there was one little old man that rang up – …I didn't talk to him, one of the guys did. And he was inside his house going, "There's people walking around my house in white overalls!" They hadn't even knocked on the door, you know? So, we're like, "Hold on. Where are you?" So, we had to calm him down (transcript #2).*

Others found the process took an emotional toll.

> *The impact I think for me was just like fear of the unknown and not knowing what was going to happen to the bush or what's going to happen to the swamp maire, are they going to be wiped out completely? I still have a little bit of anxiety about that not knowing how much is here, not knowing where it is in the bush (transcript # 16).*
>
> *…they had the nerve to say we would not be out of pocket. There is no way we can't be out of pocket. Just the lost sleep alone is enough to put you out of pocket (transcript #15).*
>
> *I didn't cope that well with what happened here, it was very emotional (transcript #8).*
>
> *He actually ended up going to the doctor because he felt so stressed because he was just such a mess really (transcript #16).*

Participants were mixed as to whether this aspect was accommodated for during the response process. While some reported that they were asked about their emotional health and offered information on where they could get assistance, many stated that this was never raised with them. Those that did receive the information stated that the onus was on them to implement any support and that they found the information of little use in practice.

> *They gave us a nice pamphlet on where you could seek assistance, both mental assistance and financial assistance. The financial I followed through on, it was the Ministry of Social Development…, which was WINZ. I ended up in Auckland and then I ended up getting put through to Wellington. Both contacts had no idea what myrtle rust was and what I was talking about. I finally got put through to a case manager in Hawera, I haven't got all the days [it took] but it was a period over about five weeks to finally get to talk to somebody only to be told that there was no financial assistance package available for the myrtle rust incursion, if you earned any more than $21,000 a year there was nothing we could do to help you. With that I just had to go out and get outside work, it was just crazy, and the emotional toll on that was huge. I didn't bother going down the mental assistance route if that's the way they treated tangible things that you could actually deal with.… [The mental assistance information] …was just an 0800 number for suicide help and there were three local agencies – like Lifeline (transcript #15).*

8 Discussion

This case study draws on the lived experiences of Taranaki residents to the 2017 incursion of myrtle rust into the region. As Porth et al. (2015, p. 677) note, "the lived experience of outbreak management is a very under-researched area". They argue that biosecurity management responses can have important and substantive local impacts on people which require serious consideration by policy makers and biosecurity incursion managers (ibid.). Our study supports this finding, particularly in relation to biosecurity agencies desire to build and maintain a social licence to operate. Understanding the local social, environmental, economic [and cultural] (QBL) factors that shape SLO outcomes is an important aspect in developing approaches to achieve SLO (Prno 2013). Participants from our study expressed the importance of all these values when describing what they appreciate about living in

Taranaki. These QBL factors underpin people's concerns and expectations and how they were addressed influenced whether they granted or withdrew SLO. While the QBL impacts of myrtle rust in Taranaki have been limited to date – largely due to its relatively recent arrival in the region – the impacts of the management response to myrtle rust have been significant for many of those interviewed. Impacts included livelihoods being placed at risk due to economic loss and hardship, a toll on emotional well-being and welfare, and a loss of valued environmental aesthetics. At a local or individual scale, these impacts from the response effort may be seen to outweigh the impacts of the pathogen, resulting in an undermining of SLO and trust in the biosecurity system within some sectors of the community.

How a biosecurity response is executed can influence the experience of those affected by the incursion, which in turn can influence people's perceptions of the biosecurity managers and their respective agencies. This has important implications considering the recent focus on Biosecurity 2025 – a national strategic direction to future-proof New Zealand's biosecurity system. Biosecurity 2025 (MPI, 2016, p. 11) has the goal of biosecurity being "a reflex action", where "thinking about and participating in biosecurity has become fundamental to what we do as New Zealanders". Biosecurity 2025 highlights that strengthening biosecurity in New Zealand requires a team of 4.7 million willing participants, who are motivated to act. A key outcome of which is that "all those involved in managing pests have the necessary social licence to use appropriate biosecurity risk management tools and undertake biosecurity activities (MPI, 2016, p. 11). It was clear from our study that all the participants were supportive of the need for biosecurity and were motivated to act, at least initially or to a certain extent. This is in line with other recent studies on New Zealanders perceptions of biosecurity (Colmar Brunton 2018). However, issues arose as the incursion grew ever larger and agencies focused on managing the national big picture, at the expense of local concerns and expectations - as was acknowledged by one agency representative (Agency interview 22 May 2018). As a result, the initial support biosecurity agencies had was eroded as participants felt excluded and ignored. Though individuals and businesses willingly accepted that some losses and impositions would occur and were necessary for the greater good, they expected these costs to be proportionate to the threat and to be fairly compensated. Frustration and anger arose where the impacts were greatest and where compensation was considered inadequate or slow. These concerns grew further over time, particularly as the likelihood of eradication diminished and a transition towards management was expected. That changing context shifted how people perceived the relative costs and benefits of control, so that the continued removal of valued trees or the cumulative burdens of compliance over time were no longer seen as necessary or worth the sacrifice.

While many factors contribute to trust and the social licence process (see Figure 2), the key criteria that emerged from this case study were relationships, response to community concerns, competency, communications and procedural fairness. While discussed individually below, it was clear from our study that they are all inter-related.

As noted above, many of the participants expressed an initial trust in the response process and the agencies tasked with its implementation. All understood the need for biosecurity and why it is important, which reflects positively on the high-level engagement and communication strategies around biosecurity issues generally by biosecurity agencies. However, those perceptions changed as people repeatedly engaged with the biosecurity processes on a more personal level. Because of the rapidly evolving nature of the incursion and the need to act quickly, biosecurity agencies had little time to develop **relationships** with local landowners. This was compounded by the drawn-out nature of the response as it escalated to other regions, and the occurrence of other major incursion response programmes running concurrently which may have contributed to the constant rotation of staff. This inability to build any long-term relationships with those they were dealing with was a central theme in many of the interviews and negatively influenced perceptions of the response programme.

Mercer-Mapstone et al (2018, p. 3) note that "trust and relationships [are] important for stable social licence" and that this is only achieved when agencies show "genuine respect and concern for local stakeholders' values and well-being" (ibid.). The importance of this **response to community concerns** was evident from the high praise expressed by numerous interviewees in our study for individuals who listened to their concerns and made attempts to find solutions to them; even by those who were still angered by the response process and had very negative views about the agencies. Participants expressed their continued trust in these people because of the respect and concern shown to them for their well-being and for the issues particular to their situation. However, because this approach was not consistent across the change in personnel, it resulted in an overall negative view by many stakeholders of the relationships and level of trust they had with the biosecurity agencies. Drawing on the engagement process utilised by these individuals could help agencies develop an improved model for community engagement which would help foster continued community and public support for biosecurity.

Another engagement issue that arose out of the case study included people's inability to input into the process. Several people with significant relevant expertise and local relationships felt that their insights and local knowledge were not valued, which left them feeling untrusted, not respected and excluded from the response process. This is linked also with feelings among some respondents that the response agencies were insensitive to their concerns. The need for better communication and increased participation and input from those affected by response programs is a common theme across several studies (Mackenzie & Larson, 2010; Porth et al., 2015). While challenging, "such activities are crucial, and must be included to whatever extent possible, even in rapid response programs" (Mackenzie & Larson, 2010, pp. 1019-1020). Taking a participatory approach to biosecurity incursions has worked well for MPI (Agency interview 31 May 2018). This approach was utilised by MPI staff during the *B. ostreae* response program in Stewart Island oyster farms, which ran concurrently to the Taranaki myrtle rust response. Local parties were involved from the outset in the operational planning and delivery, which resulted in stakeholder buy-in. While not issue free, the operation was regarded as a success by those involved (ibid.). Incorporating learnings from this operation into future response programs will facilitate the development of agencies SLO.

As the above *B. ostreae* example illustrates, it is the nature of the engagement that drives perceptions of trust, relationships and acceptance, and ultimately SLO (Mackenzie & Larson, 2010; Mercer-Mapstone, Rifkin, Louis, et al., 2018; Porth et al., 2015). As Porth el al (2015, p. 670) note, in an incursion response "there is often a significant distance between rapid emergency responses and established best-practice stakeholder engagement", which incorporates participatory processes that "emphasise empowerment, equity, trust, and learning (ibid.). The stringent time constraints of incursion responses and need for quick action, which do not allow for the development of trust, are a significant challenge in bringing the two together (Mackenzie & Larson, 2010; Porth et al., 2015). For engagement to be seen as authentic and non-tokenistic (i.e. going beyond the unidirectional dissemination of information), it needs to engender perceptions of fairness (Mercer-Mapstone, Rifkin, Louis, et al., 2017). Engagement processes need to be a two-way, inclusive process where stakeholders actively co-create solutions to problems (Mercer-Mapstone, Rifkin, Louis, et al., 2017). Biosecurity agencies need to consider how they incorporate participatory processes into their response approach to ensure they maintain the support of the public for their activities. A key element of this is for agencies to reflect on whether their organisational culture and processes supports or hinders a participatory approach (Mackenzie & Larson, 2010). Rubrics (as a performance and assessment guide) tested in other biosecurity settings (Allen et al, 2018) provide one method to help agencies plan and assess progress towards achieving this objective. In this context rubrics contribute to enhanced understanding of what can be done, what worked, what was less successful, and why

Trust also requires that an entity demonstrate it has the expertise and knowledge to manage the task it has been entrusted with effectively while protecting community interests (Moffat & Zhang, 2014). Negative comments about the response team members' knowledge about plants, improper or incompetent use of equipment, and apparently slow action indicate that agencies and their contracted representatives were not seen as acting with the **competency**, professionalism and efficiency that was expected of them. These perceptions eroded the initial trust and support people had in the agencies and their procedures. For those people who felt their own expertise was being ignored, it compounded their frustrations when they believed they could do better or more efficient work. Finding and retaining skilled staff was a challenge for agencies, particularly as the incursion escalated in size and because the drawn-out nature of the response meant staff had to be rotated in and out of the programme. Utilising local insights, knowledge and resources, as per the *B. ostreae* example above, would have been one way for agencies to address this issue. Doing so is likely to have nurtured and maintained greater trust with affected stakeholders.

Public support for the response programme was also undermined by the perceived inconsistency and changing instructions within **communications**. Partly this was attributed to the changes in personnel, but it was also the result of the rapidly changing nature and escalation of the response. As noted by Mackenzie and Larson (2010), clearly articulating the reasonings for rapid response approaches is a challenge for agencies in the face of uncertain and changing knowledge. Communicating these uncertainties more clearly and consistently is a key aspect in gaining stakeholder trust (ibid.), otherwise the changing messages undermines credibility. Having limited scientific knowledge and needing to alter messages as more is learnt is a reality of biosecurity response management. Communication strategies need to accommodate this reality and should be reviewed to see if practices and techniques need to be changed to address this fact.

9 Conclusion

This report presents an analysis of the 2017 myrtle rust response program in Taranaki and the influence this had on the provision of SLO amongst a number of those stakeholders most engaged – and impacted – by the response process.

It was clear that all those (or most of those) we engaged with clearly recognised the importance of biosecurity to their industry, region and to New Zealand. This shows that the many awareness and pre-incursion activities undertaken by MPI and other agencies with an involvement in the biosecurity space are contributing positively to a national and regional social licence. These can be seen to cluster under the 'Creating awareness and shared purpose' performance criteria in our accompanying SLO rubric (Allen et al. 2019).

Five key criteria emerged from this Taranaki case study analysis that had an influence (both positive and negative) on key SLO performance criteria: relationships, response to community concerns, competency, communications, and procedural fairness. For example, there were response staff involved who provided exemplary channels to hear people talk about their concerns and skills which increased positive perceptions around aspects of SLO, while examples were given of response staff exhibiting low technical awareness around the potential spread of the pathogen which lowered SLO perceptions.

Partnerships are increasingly seen as an important component of biosecurity management. The way we operate in partnerships at the local and sector level is a strong contributor to SLO. Key performance criteria at the partnerships level that this case study shines light on include relationships, communications and engagement, and joint activities and contributions. In turn, these lessons have contributed to the development of a partnership's rubric through this Theme "Building engagement and social licence" work (Allen et al. 2019).

While these criteria materialised from this study, the literature on SLO indicates that other performance criteria also play an important role. These criteria are outlined in Figure 2 and expanded on in Allen et al. (2019)). Further case studies on the myrtle rust incursion response (or other response operations) in other regions of the country would likely highlight additional criteria that biosecurity agencies need to consider in their quest to acquire SLO for their activities.

Social licence to operate is not just about what agencies see looking out, but needs to include what affected communities and stakeholders see looking in. It is communities who issue a SLO (Prno, 2013), so their perceptions, values, practices and expectations pertaining to biosecurity are important to understand if agencies wish to obtain the necessary public support to undertake their activities. For biosecurity agencies to nurture a SLO from communities and achieve Biosecurity's 2025 objective of 4.7 million willing participants, then the biosecurity system needs to be seen to acknowledge and respond to society and not force society to reflect the system.

As Prno (2013) notes, context is key to SLO. Communities are heterogenous, so a one-size-fits-all approach will likely not address all the community-specific concerns. Understanding the social, economic, environmental and cultural variables and expectations that are specific to a community are important in generating SLO. Biosecurity agencies need to recognise this and match their management and communication practices and techniques to these diverse contexts and expectations (ibid.). The rubrics developed through this and other Theme 1 work provide a mechanism with which biosecurity agencies can reflect on how they represent themselves when they engage with communities of interest, and how their processes and procedures can be adapted to accommodate people's participation in the system in ways that are easy for them to do so and support their willingness to participate.

10 Recommendations

It is recommended that biosecurity agencies;

- Use the rubrics developed by as part of the Theme "Building engagement and social licence" research project as a tool to help incursion response teams (at different operational levels) reflect on how the incursion response process can be adjusted to help foster improved SLO and partnership initiatives.
- Undertake further case studies on the myrtle rust and other incursion responses in other regions of the country to build on the understanding of what criteria influence SLO for biosecurity programs.

- Review how to incorporate participatory approaches into the incursion response process to take advantage of/build local relationships. In particular, incorporate learnings from the *B. ostreae* operation into future response programs.
- In the need to manage a national event, don't forget the local context – SLO is issued by communities, so staying in tune with local perceptions, values, practices and expectations is critical in building and maintain SLO.'

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Appendix 1: Priority research topics identified by MPI (source MPI 2017a)

Theme and outcome	Priority Topics
Building engagement and social license *Outcome: Improved understanding of public perceptions and behaviours to allow better decisions about investment, improved design of pathway control strategies and maintain social license for use of management tools.*	Understanding public acceptance of management options (that are current or close to market) to inform future decisions on research, management and communications. This is a critical input to short and long term management.
Te Ao Māori *Outcome: Greater understanding of te ao Māori implications of myrtle rust in order to support more effective investments, and improved use of Mātauranga, specific Māori knowledge, and kaupapa Māori approaches in management regimes.*	Identify Māori values and species-specific aspirations for managing myrtle rust, to inform management options and identify opportunities for Māori involvement. This is a critical input to short and long term management.
Improving management tools and approaches *Outcome: Improved diagnostic and surveillance speed, accuracy and cost-effectiveness, supporting eradication efforts and enabling scaling up of surveillance efforts for a given resource. More effective treatment toolkits to avoid emergences of MR resistance to treatments and to enable disease control over increasingly large scales that will lead to reduced or avoided impacts.*	Improved myrtle rust surveillance and monitoring tools and approaches, including detection in the absence of confirmed myrtle rust observations, wide-scale surveillance effort to track spread of the disease, detecting the disease in remote areas, and statistical assessments of likelihood of presence of myrtle rust. Needs to inform and support the surveillance work of DOC, MPI and other parties.
	Mapping the distribution of high priority Myrtaceae species across NZ and identification of nationally important iconic/taonga individuals. This is likely to feed into Phase 2 for the next level of priority.
	Pilot trials of management tools for individual high priority trees and sites.
	Desktop review of potential disease control tools, including fungicides, biocontrol etc., to identify those most likely to be effective. This would be a critical input to Phase 2, which would further develop the tools.
	Scoping a resistance breeding programme approach, highlighting the likely requirements and constraints with respect to known biology of the hosts and informed by susceptibility research findings, as available.
Evaluating impacts and responses *Outcome: Improved understanding of environmental, economic, social and cultural, impacts to inform risk assessment and management and to communicate implications to decision/makers and stakeholders.*	Develop monitoring approaches (including establishing baselines) for assessing impacts of myrtle rust to environmental, economic, social and cultural values over time, and for understanding the impact of management interventions.

Appendix 2: Theme “Building engagement and social licence” Building engagement and social license - research approach and outputs

We took a systems-based and complexity-aware approach to helping MPI and other agencies improve the effectiveness of their approaches to developing and maintaining SLO and effective partnerships. This approach recognises that developing and maintaining SLO and partnerships are processes that need to be managed as complex systems through an adaptive management process.

The work of the research team could be usefully seen as comprising three interlinked phases. Phase 1 was a scoping and context phase. This involved reviewing international and New Zealand knowledge on incursion management, social licence and partnerships. A theme analysis of SLO and partnerships was undertaken, and this was later grounded with biosecurity response agencies during two workshops (SLO criteria in August 2018 – and Partnerships criteria in September 2018). Interviews were also conducted with response operations personnel (n = 8) and analysis of policy/response documents undertaken to understand and characterise the myrtle rust incursion response. Phase 1 informed and contributed to the outputs of the other Theme “Building engagement and social licence” phases.

Phase 2 explored myrtle rust experiences. This phase sought to understand in a NZ/myrtle rust context how the public found the experience of the incursion response. To provide both breadth and depth in the understanding we chose three audiences which provided different perspectives of stakeholder perceptions and behaviours in relation to the incursion response. These audiences were:

- Interested and impacted - An internet survey with people who called the ‘0800’ hotline to report or request information and those whose properties were restricted during response operations (see Bayne et al. 2019).
- Impacted - Interviews and focus groups with people who were impacted by the response in Taranaki (this report).
- Motivated - Interviews with people who expressed an interest in being more actively involved in biosecurity operations (see Grant et al. 2019).

Phase 3 developed an initial rubric as a tool for planning and assessing initiatives in each of the SLO and engagement areas (see Allen et al. 2019). The development of the rubrics builds on both the experience of the research team and a review of international and national literature around strengthening activities that support engagement and SLO, particularly focusing on experience in the natural resource management area. This work also incorporates and links with the other research initiatives in this theme.

A final report (Grant et al, *in prep*) consolidates each of the standalone reports outlined above and presents the high-level findings of our research strands and bring them together into a comprehensive picture of the myrtle rust short term response and the factors that influenced communities granting or revoking SLO. These findings, rubrics and recommendations set the groundwork for future iterations of systems change to support MPI, their partners and their stakeholders to implement better decisions about investment, improve the design of pathway control strategies and maintain social license for the use of management tools in short and long-term management of myrtle rust. The tools and lessons are also applicable to other contexts of biosecurity.

Appendix 3: Participant information sheet and interview schedule

Participant Information Sheet – Interviews

This Participant Information Sheet provides you with information that enables you to make an informed decision about whether or not you wish to participate in this research. It is recommended that you keep this document for future reference.

Project title: Building Engagement and Social License
Researchers: Co-Investigators: Dr. Andrea Grant, Dr. Dean Stronge, Dr. Will Allen
Researcher Contact: Andrea Grant - andrea.grant@scionresearch.com

THE WIDER RESEARCH CONTEXT: This research project is part of the Ministry of Primary Industries' (MPI) response to the arrival of myrtle rust in New Zealand in 2017. MPI have identified critical gaps in social, cultural and scientific knowledge relating to the management of myrtle rust in NZ. They commissioned Scion, Manaaki Whenua – Landcare Research, and Plant and Food Research to jointly undertake research to address those gaps.

THIS RESEARCH PROJECT: The interviews are designed under the social science component of this project and addresses the theme of 'Social licence and engagement'. This research seeks to understand stakeholder perceptions and experiences to allow better decisions about engagement and response investment, improved design of pathway control strategies and maintain social license for use of management tools.

THE OUTPUTS: The data collected during this research will contribute to a range of research and management outcomes, including conference and academic publications, public communications and outreach.

CONFIDENTIALITY AND ANONYMITY: We will endeavour to ensure information collected from interviews is presented in a way so that data are non-traceable to individuals. Your name and other personal information will not be identified or connected to the data; instead, generic descriptions will be used to identify individuals and groups. Our intention is to provide generalised rather than specific accounts.

THE RIGHT TO WITHDRAW: Participation in this research is voluntary and you have the right to refuse to participate. You have the right to withdraw from the research, and your consent to use any associated data, at any time without giving a reason.

DATA STORAGE: In accord with ethics protocol, data collected during this research project will be kept in storage in a locked cabinet at Scion for six years and will then be destroyed. In the case of electronic data such as audio recordings, data will initially be safeguarded by passwords on hard drives and/or cloud-based storage spaces and then deleted from all storage spaces after six years. Summaries and other hard copies of data will be shredded after six years.

SOCIAL RESEARCH ETHICS INFORMATION: The human ethics protocol and processes underpinning the research approach and methodology have been reviewed by two independent senior social science researchers. Our expectations are that ethical considerations discussed in the protocol are adequate to deal with any concerns that may arise during or as a result of the project. However, if any unanticipated ethical issues do arise the research team will meet as early as possible to discuss, and seek to resolve the issue. If you have any questions or concerns about this study, please feel free to contact the co-Investigators at any time.

Interview schedule

Taranaki Context

Tell me about Taranaki.

- In economic, environmental, social/cultural terms what aspects are important to you?
- What's less important?

Incursion effects

Tell me what you know about myrtle rust generally and what impact it is having?

- What threat does it pose?
  - *Prompt: Do you see any (economic, environmental, cultural, social) threats?*
- Which of these concerns you most? Why
- Do you think the threat justifies the level of response taken?

Management Effects - The incursion response

Take us through the incursion response process/situation (from your perspective). Starting from when you first became involved;

- What was the situation when you first experienced MR?
- When were you initially contacted?
- What action was taken
  - How often
  - By whom
  - How did you feel about the actions taken/methods used?
- How well were you informed about the process?
  - Did you get sufficient information?
  - Was it timely and easy to understand?
  - Did you know who to contact/have a specific contact person to approach
  - Did you think the process was fair?
- Were your concerns/interests taken into account?
- What opportunity did you have to discuss different/alternative approaches?
- Did having MR on your property cause any issues with your neighbours?
- What do you feel were the main impacts that the MR incursion and response had on you and the things you value?
  - And 1yr on, has that changed at all?
- Overall, what went well with the process?
  - What did you perceive as some of the barriers/challenges?
  - Where do you see room for improvements?

Face-to face interviews only

Social licence and engagement

The literature identifies some key criteria of social licence (use SL bubbles as prompts). Thinking back to the incursion response;

- Which of these do you think are important, and why? (talk me through as many as you want)
- Which ones were done well, and why?
- Which one could be improved on, and why?
- Are there any additional aspects that you think are important, and why?