

# NATIONAL BOVINE TB PLAN REVIEW CONSULTATION

FULL CONSULTATION DOCUMENT | JUNE 2015

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National Bovine TB Plan Governance Group (PGG)  
Wellington, New Zealand

This paper is also available on the PGG webpage [www.tbplanreview.co.nz](http://www.tbplanreview.co.nz).

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## FOREWORD

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The control of bovine tuberculosis (TB) in New Zealand is at a turning point. After more than 50 years of management and ups and downs, we are at a point where we can see the end. Progress in the last few years has shown that it is possible to eradicate TB from New Zealand - forever - and be rid of the negative impacts of the disease and the costs of control on both industry and the economy.

I have been working with representatives of the TB Plan investors, stakeholders and TBfree NZ (OSPRI) to shape the future of TB control in New Zealand as part of a Plan Governance Group. We have undertaken a stocktake of the gains made to date - which are significant - and discussed where to for management of TB from here. All these discussions have been undertaken in the context of limited funding available from all parties and the acute awareness of affordability, both for the farming sector and the Crown.

When looking at the recent gains made under the TB Plan, it is clear that eradication of TB from New Zealand is possible. This is largely because of the significant investment by farmers and the Crown over the past two decades, and by the cooperation of farmers with TB Plan management agency efforts. My colleagues on the Governance Group and I are of the same view - that eradication is the end game, and that we want it to happen as fast as it can within funding constraints.

Therefore, the proposal presented here is a pragmatic approach to balancing the desire for eradication with affordability. It is a compromise that will ultimately achieve the outcome that everyone desires – eradication of TB from New Zealand.

We are proposing to amend the current TB Plan to be focussed on eradication of TB from New Zealand by 2055, with progress being reviewed by 2026 when livestock are expected to be mostly free of TB. There are some important operational changes required that would enable TBfree NZ (OSPRI) to achieve the objectives with lower programme costs and shorter eradication timeframes. The Plan Governance Group is confident that the changes will improve the outcomes of the TB Plan and get us to the end game faster, within affordable funding limits.

It is an exciting time as we are faced with a great opportunity to eradicate a damaging disease. I invite you to make a submission and would welcome your feedback on the proposal.

**Chris Kelly**

*Chair of the TB Plan Review Project Governance Group*

## PURPOSE OF THE DOCUMENT

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The purpose of this document is to set out, justify and discuss a proposal to amend the bovine tuberculosis National Pest Management Plan (the TB Plan). The TB Plan itself is a significant document, affecting the interests of a number of parties and generating wide-ranging benefits for New Zealand.

The consultation process is a very important one, as it ensures that the proposal is well-tested by interested parties and underpins the best possible amended Plan being put in place. We are seeking the views from all stakeholders on the proposal – be it cattle and deer farmers, local communities, iwi, industry representatives, local authorities, or just an individual who has an interest in the management of TB in New Zealand.

### BASIS FOR REVIEW OF THE TB PLAN

Control of TB in New Zealand is currently carried out under the National Pest Management Plan (TB Plan) reflected in the Biosecurity Act 1993 (the Biosecurity Act). Part 5 of the Biosecurity Act sets out the detailed provisions relating to the development, review and funding of national pest management plans (in this case the TB Plan)<sup>1</sup>. Accordingly, that part of the Act provides the framework for the proposal.

The implementation and operation of the current plan is managed by OSPRI through its TBfree New Zealand subsidiary. The TBfree programme is well-known to stakeholders with an interest in the Plan.

The current TB Plan was last reviewed in 2009. An Order in Council amending the Plan came into effect on 1 July 2011. The Biosecurity (Bovine Tuberculosis National Pest Management Plan) Order 1998 – as amended to reflect changes in Plans over time – provides the specific detail relating to the exercising of legal powers and the setting of rules in order to achieve the objectives of the Plan.

In accordance with the Act (section 100D<sup>2</sup>), the Minister for Primary Industries is required to complete a statutory review of the Plan by 1 July 2016. The review must be on the basis of a proposal; this proposal can be prepared by the Minister or any other Party and must identify whether the proposal is to amend, revoke, revoke and replace, or leave unchanged the plan or part of the Plan.

The funding parties are reviewing the current Plan, in recognition of the rapid progress made towards its objectives, and in order to resolve funding shares. The proposal outlined in this document results from that review, and recommends amendments to the Plan to be applied from 1 July 2016.

### OVERVIEW OF INFORMATION IN THIS DOCUMENT

This document contains a large amount of information, as there are a number of requirements in the Biosecurity Act for the Plan review to satisfy. These requirements broadly related to ensuring high-quality work, fairness and efficiency in funding arrangements, and use of an open consultation process to test the proposal and the analysis and rationale supporting it.

In considering the document, it is important to note the following key aspects of the information provided:

- *the proposal* – the proposal itself is the collection of proposed changes to the Plan and other regulatory changes to give effect to a new Plan. The Plan is set by regulation by the Minister for Primary Industries. The following section – Summary of the Proposal – sets out the proposal in terms of
  - i. proposed amendments to the TB Plan (including identification of the overall contents of the Plan even if not proposed to change); and
  - ii. other proposed regulatory changes to give effect to the proposal.

The Plan sets the overall framework, and the rules and requirements, to be met during implementation. The Plan does not, however, prescribe the wide range of operational detail that is left to the Management Agency to address;

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1 <http://www.legislation.govt.nz/act/public/1993/0095/latest/DLM314623.html?src=qs>

2 The amendments to the Act in 2012 extended out the review period of National Pest Management Plans to ten years. However the transitional provisions require the next review of any Plans in force at the time the amendments came into force to be subject to the requirements of the earlier legislation (i.e. within 5 years). Subsequent reviews will then only be required every 10 years.



- *analysis and rationale supporting proposal* – the document includes analysis used to inform the Plan expenditure level; estimated timeframe for objectives to be met; and setting of funding shares. Other options, besides the proposed Plan, were also identified and carefully considered by the PGG as part of this analysis; and
- *implementation of the Plan* – this proposal discussed how the Plan would be implemented. It is important to recognise, however, that implementation of the Plan is the responsibility of the Management Agency (OSPRI through its TBfree programme). TBfree NZ (OSPRI) is responsible for setting operational policies and processes and making operational decisions. The Plan Governance Group, which includes representation from OSPRI, is confident that TBfree NZ (OSPRI) can effectively implement the proposed Plan via its operational policies and procedures.

TBfree NZ (OSPRI) is required to produce a National Operational Plan within three months of the new Plan coming into effect. When developing the National Operational Plan, TBfree NZ (OSPRI) would draw heavily on the analysis and rationale supporting the proposed new Plan. The National Operational Plan is a standard annual feature of implementing the Plan and must be made publicly available.

### **WHAT WE WOULD LIKE FROM YOU**

This is your opportunity – given an interest in the management of TB in New Zealand – to review and debate the proposal and, through a submission, influence decisions about the final Plan implemented to apply from 1 July 2016.

All views on the proposal and supporting analysis and rationale are welcome. To help submitters, a number of key questions have been posed to guide review and responses, but these questions should not be seen as a limitation on what views can be shared.

Further information on how you can provide feedback is provided in Appendix A.

## SUMMARY OF THE PROPOSAL

### PROPOSED AMENDMENTS TO THE TB PLAN ORDER

Clause	Proposal	Page
1	Title and commencement	No change
2	Interpretation	No change
3	National Bovine Tuberculosis Pest Management Plan	No change
4	Pest	No change
5	Objectives of plan	Proposed new objectives 31
5A	Principal measures to implement plan	No change
6	Management agency	No change
7	Term of plan	Propose to extend the term of the Plan to 30 June 2055 18
8	Powers used to implement the plan	No change
9	Plan rules	No change
10	Obligation to notify TBfree NZ (OSPRI) of place where herd is kept	No change
11	Obligation to provide facilities and assistance for restraint of animals	No change
12	Identification of animals with bovine tuberculosis	No change
12A	Identification of cattle and deer for testing	No change
12B	Declarations	No change
12C	Form and content of declarations	No change
12D	Retention of declarations	No change
12E	Sales	No change
12F	Meaning of movement	No change
13	Restrictions on testing and treatment of animals	No change
14A	Obligation of persons performing ante- and post-mortem examinations to submit specimens for investigation	No change
14B	Obligation of persons in charge of verifying compliance with ante- and post-mortem examination procedures	No change
15	Obligation of laboratories to provide results	No change
16	Obligation of operator of commercial slaughter premises	No change
17	Obligation to report suspected presence of bovine tuberculosis to TBfree NZ (OSPRI)	No change
17A	Release of pigs into wild state	No change
18	Compensation	Amend the compensation entitlements to allow payment from 0% up to 100% compensation 51
19	Funding of plans	Update funding arrangements to reflect new shares and funding parties 40-45
20	Application of funds	Revoke targeted funding requirements 43
21	Actions that may be taken by local authorities	No change

The following are other regulatory changes proposed to give effect to the Proposal:

- amendments are proposed to the Biosecurity (Bovine Tuberculosis—Cattle Levy) Order 1998 to provide for a differential levy for beef and dairy animals;
- a new Biosecurity Act levy to collect funding for the TB Plan from live cattle and deer exporters; and
- introduction of infringements for some minor breaches of the rules in clauses 10, 11, 12 & 16, and other operational policy changes that would change the way the programme will run.

## DEFINITION OF TERMS

<b>Biological eradication</b>	The complete absence of TB in wildlife and livestock (but not humans) from a particular management unit, such as a Vector Control Zone, with a near zero chance of disease reinvasion. A declaration of biological eradication follows a declaration of TB freedom.
<b>Breakdown</b>	Refers to TB being diagnosed in a Clear or Suspended status cattle or deer herd.
<b>Infected herd annual period prevalence (also herd infection rate)</b>	Is the number of cattle and deer herds classified as infected at the start of the financial year, together with the number of cattle and deer herds found infected during the financial year, divided by total cattle and deer herds, expressed as a percentage.
<b>False positive reactor</b>	Is an animal that subsequently is negative to one of the diagnostic tests for TB. This means that one of the tests it had (usually the skin TB test) was a false positive.
<b>Livestock TB freedom</b>	A TB Plan milestone where cattle and deer herds are largely free of TB infection, with the exception of a very small number of isolated breakdowns which would require mopping up.
<b>Management agency</b>	Is defined in the Biosecurity Act as “a management agency responsible for implementing a national pest management plan”. The management agency for the TB Plan is TBfree NZ (OSPRI), a subsidiary of OSPRI New Zealand (TBfree NZ, OSPRI).
<b>Movement Control Areas (MCA)</b>	Defined geographical areas used under the current Plan to control the risk of TB transmission through cattle or deer movements from areas with the highest wildlife infection risk, being those areas where infected herd annual period prevalence (as a proxy for wildlife infection risk) is greater than one per cent.
<b>National Animal Identification and Tracing Scheme (NAIT).</b>	The National Animal Identification and Tracing scheme (NAIT) is a mandatory New Zealand scheme which has been established to create an electronic identification system for animal identification and lifetime traceability. The scheme requires all cattle and deer to be identified with an approved permanent NAIT device within 180 days of birth or prior to movement.
<b>National Operational Plan (NOP)</b>	The set of operational measures and polices developed by the management agency to give effect to the Minister’s decision and the TB Plan Order. The NOP is required under s100B of the Biosecurity Act 1993 to be produced by the management agency within 3 months of the TB Plan Order (or amended Order) coming into effect. It must be reviewed by the management agency annually, with a report on performance and any amendments provided to the Minister. The NOP cannot place any statutory obligations on farmers or other stakeholders.
<b>Passive surveillance</b>	The use of data from different sources to provide inference about the likelihood of presence or absence of TB. These data may come from unplanned incidental observations (such as the detection of TB in pigs or deer by recreational and commercial hunters or possum fur trappers) or from information collected for other primary purposes (such as the use of slaughterhouse inspection of cattle and deer for TB, and the use of livestock testing data collected to determine TB presence in livestock, not wildlife <i>per se</i> ).
<b>Plan Governance Group (PGG)</b>	Established by funding parties to lead the TB Plan Review. Is responsible for preparing and submitting the Proposal to the Minister.
<b>Proof of concept</b>	Proof of concept is a realisation of a certain method or idea to demonstrate its feasibility.
<b>Probability of freedom</b>	The probability that TB has been eradicated from the possum population in a defined area.
<b>Proposal</b>	Means a proposal to create, amend, revoke, replace, or leave unchanged a National Pest Management Plan under the Biosecurity Act 1993. The contents and other requirements of a proposal on review of a national pest management plan are outlined in sections 105D and 59-67 of the Biosecurity Act 1993.
<b>Residual Trap Catch Index</b>	A measure used to determine the density of possum populations in a given area based on the number of possums captured per 100 traps laid (according to a specific design), expressed as a percentage.
<b>Reactor</b>	Means an animal that is positive to an approved TB test or tests and which is directed to slaughter. Such animals are to be identified with official Reactor ear tags up to the time of slaughter.
<b>Spillover host</b>	A spillover host cannot independently and indefinitely maintain TB within a population solely by transmission within the species concerned. Spillover hosts typically (in New Zealand) become infected by interacting with infected possums or some other host, but only very occasionally pass on the disease to another animal of the same species as itself. Some species can be true maintenance hosts at very high density (when there is lots of opportunity for transmission between individuals) but not at the low densities at which they usually occur in the wild. That is believed to be the case for wild deer, feral pigs, and ferrets, the three main spillover hosts in New Zealand.
<b>Stopping rule</b>	Means the level at which possum control stops in an area because the possum population is considered to be TB free. The level is currently set at a probability of TB freedom of 0.95. At that level, it is expected that one in 20 areas declared TB free will still contain TB possums and herds in such areas would be vulnerable

	to becoming infected. These areas would receive additional possum control to eradicate the identified infection.
<b>Surveillance</b>	The process of conducting formal field surveys to try to detect the continued presence of TB in possums. It includes direct necropsy surveys of possums (usually by trapping) and/or necropsy of sentinel species such as pigs, ferrets, and deer, which are known to largely be spillover hosts in which the presence of TB indicates the probable presence of TB in possums.
<b>TB</b>	Used as an abbreviation for bovine tuberculosis. <i>Mycobacterium bovis</i> , is the bacterium that causes the disease of bovine tuberculosis (and is the 'pest' managed by the proposed TB Plan).
<b>TB Plan</b>	The set of objectives, measures and operational policies established to manage bovine TB in New Zealand. It is given effect to through the TB Plan Order and operationalised through the National Operational Plan (a requirement under s100B of the Biosecurity Act. References to the 'current Plan' mean the TB Plan as currently enacted and implemented through the TB Plan Order and the National Operational Plan. References to the 'proposed Plan' mean the TB Plan as amended if the changes set out in this proposal were to be approved.
<b>TB Plan order</b>	Is the Biosecurity (National Bovine Tuberculosis Pest Management Plan) Order 1998 that gives effect to the regulatory elements of the TB Plan.
<b>TB freedom</b>	A defined geographic area (e.g. a Vector Risk Area or New Zealand) is considered to become free of bovine TB when it becomes free of unacceptable risk of infection in wildlife. The level of acceptable risk is specified by the calculated probability that TB is no longer present – the 'Stopping rule' set by the Board of TBfree on the advice of technical and scientific experts (currently 0.95). At that level, one in 20 Vector Risk Areas could potentially be declared free but still contain TB. There would therefore be some residual outbreaks in areas declared free that would require a low level of 'mop up' activity after the declaration of freedom and revocation of Vector Risk Area status. Can also be known as 'statistical freedom' of TB in possums.
<b>Vector Control Zone (VCZ)</b>	A defined geographical area in which activities are undertaken to control the populations of wild animals that are known vectors for bovine tuberculosis.
<b>Vector Free Area (VFA)</b>	A defined geographical area where bovine tuberculosis is not maintained in the wildlife populations.
<b>Vector Risk Area (VRA)</b>	A defined geographical area where bovine tuberculosis is being maintained in the wildlife population as indicated by either epidemiological information from infected cattle and deer herds, or the finding of tuberculosis in wildlife animals that are classed as bovine tuberculosis maintenance hosts.
<b>Works surveillance</b>	Refers to inspection of carcasses for TB at cattle and deer slaughter premises.

## MAKE A SUBMISSION

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Managing bovine tuberculosis is very important to the pastoral sector and to New Zealand as a whole. The National TB Plan has already delivered a great deal in terms of its eradication goals and industry, Government and farmers need to be sure that it continues to be fit-for-purpose.

The proposal outlined in this discussion document is intended to be fair, sustainable, affordable, based on sound science and consistent with the requirements of the Biosecurity Act. However, the PGG wishes, in keeping with the requirements of the Biosecurity Act, that funders and other interested parties, including the wider public, are adequately consulted, are able to have their views heard and have an opportunity to influence decisions on the best approach to managing TB in New Zealand.

The PGG invites you to send us your feedback on the proposals using the form in Appendix A. Please provide feedback through the submission form, by sending your submission to the Review Secretariat by 31 July 2015.

### HOW TO MAKE A SUBMISSION

You can email, post or complete your submission online. Submissions need to be submitted to the National Bovine TB Plan Review Secretariat by **31 July 2015**.

**Email** [submissions@tbplanreview.co.nz](mailto:submissions@tbplanreview.co.nz)

**Post** National Bovine TB Plan Review Secretariat  
PO Box 3412  
Wellington 6140

**Online** [www.tbplanreview.co.nz](http://www.tbplanreview.co.nz)

Electronic versions of the submission form, this discussion document and further supporting information are available at [www.tbplanreview.co.nz](http://www.tbplanreview.co.nz).

As well as the opportunity to make written submissions, you can put questions to representatives of the review group at several industry events and at workshop meetings around New Zealand.

For details of the confirmed workshop venues please check [tbplanreview.nz](http://tbplanreview.nz) the week before you attend.

To request further information you can call 0800 482 463 and someone from the TB Plan Review Secretariat will get back to you.

### WHAT HAPPENS NEXT?

After consultation closes, all feedback received will be reviewed and the proposal updated as appropriate. It is expected the final proposal will be submitted to the Minister for Primary Industries by the end of September 2015.

The Minister will assess the proposal presented to be satisfied that the proposal meets the requirements of the Biosecurity Act for national pest management plans and consultation, and that issues raised in the consultation have been considered.

The Minister will consider advice on the proposal from the Ministry for Primary Industries. This advice will include analysis of submissions. The Minister may also require further consultation should he believe that widespread agreement on the best approach has not been achieved through the current process.

Once satisfied with the proposal, the Minister would approve the preparation of the Plan consistent with the proposal. This would include a decision on TBfree NZ (OSPRI)<sup>3</sup> being the management agency, who would work with MPI, to develop the Plan. Once satisfied with the new Plan, the Minister would seek Cabinet approval before recommending to the Governor-General that an Order in Council be made to formally make the Plan.

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<sup>3</sup> As indicated elsewhere in this document, it is proposed that TBfree New Zealand Limited, a fully-owned subsidiary of OSPRI New Zealand Limited, will continue to be the management agency responsible for implementing the proposed national plan.

***Indicative timeline***

Consultation on TB Plan Proposal begins	22 June 2015
Roadshows	24 June – 10 July 2015
Consultation on TB Plan Proposal ends	31 July 2015
Final proposal submitted to Minister for Primary Industries	30 September 2015
Amended TB Plan Review in force / updated and new levies in place	1 July 2016
Updated TB National Operational Plan submitted to Minister for Primary Industries by TBfree NZ (OSPRI)	30 September 2016

## EXECUTIVE SUMMARY

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Bovine tuberculosis (TB) is a disease of farmed cattle and deer in New Zealand which, if left to spread, would lead to serious production losses and animal health issues. This disease can also affect humans. Managing TB effectively supports New Zealand's pastoral industries to increase productivity and access foreign markets – key elements of Government and industry strategies. A healthy farming sector is a vital component of New Zealand's economic wellbeing.

### SIGNIFICANT PROGRESS HAS BEEN MADE TO DATE

TB has been under varied levels of management intensity in New Zealand since the 1950s. Significant investment has been made by both farmers and government since the resurgence of TB in the 1990s – approximately \$1.2 billion since 2000. Infected herds numbered 1,694 in June 1994, and are now estimated to be down to just 46 (June 2015).

The land area harbouring TB-infected possums has also reduced substantially, with 1.1 million hectares being declared TB free over the past three years alone, with 1.1 million of the 2.5 million targeted by 2025, being declared free over the last three years alone.

Two independent science reviews were commissioned to assist with this TB Plan Proposal. These reviews concluded that the biological eradication of TB is technically feasible with current levels of funding, and can be achieved under existing timeframes. The TB research to date has successfully delivered on broad objectives, and the time has come to take a more targeted approach. Relaxation of operational or research intensity is likely to reverse the progress to date and result in substantial TB outbreaks in the future.<sup>4</sup>

The current plan set the challenge of “proof of concept” for eradicating TB in the most challenging areas (e.g. remoteness, difficult terrain, etc.). Progress on these areas has been ahead of schedule, with freedom from TB in possums nearing completion in both the Hauhungaroa and Rangitoto Ranges in the North Island and the Hokonui Hills in Southland.

The performance outcomes for TB infected herds also remain ahead of the target set in the plan – national annual TB infected herd period prevalence at no greater than 0.4 per cent – with the infected herd infection rate now at an all-time low of 0.15% (less than 50 herds).

### WHY ARE WE REVIEWING NOW?

Periodic review of the TB plan is important for ensuring it continues to be fit for purpose and is also required under law.

This proposal is the outcome of the most recent review of the TB Plan by a Plan Governance Group set up by the current TB Plan funding organisations to represent funding party and wider stakeholder interests in the Plan. Subject to the feedback from this consultation, the proposal will be submitted to the Minister for Primary Industries in late September for his consideration as part of his obligations under the Biosecurity Act to notify a proposal to revoke, amend, replace or leave unchanged the TB Plan by 1 July 2016.

The current review is particularly timely as it provides an opportunity to leverage the improved knowledge and valuable gains made in controlling TB over the last four years. These can now underpin a more tailored approach for the programme, both related to disease testing and wildlife control.

### WHAT IS THE PROPOSAL?

When the current TB Plan was developed in 2009, it was intended that it would provide a large scale proof of concept that TB can be eradicated from both farmed cattle and deer and from the wildlife species (principally possums) which act as a reservoir and vector of the disease, and that the demonstration of this in conjunction with new scientific research would inform subsequent Plan reviews. In light of the progress to date, and expected further technical and management developments to come, eradication is now considered both feasible and economically justifiable.

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<sup>4</sup> Ferguson, I and Hellström, J (2015). Review of the science undertaken for the purpose of managing Bovine Tuberculosis in New Zealand, and Caley, P (2015). A review of science underpinning eradication of TB from New Zealand.



It is therefore proposed to amend the Biosecurity (National Bovine Tuberculosis Pest Management Plan) Order 1998 so that the amended TB Plan will:

- set new objectives (clause 5);
- extend the term of the Plan to 30 June 2055 (with key milestones achieved over time through a staged approach) (clause 7)
- alter the compensation entitlements (clause 18); and
- update the sources and application of funding for implementation of the TB Plan (clauses 19 & 20).

It is also proposed to introduce infringements for some minor breaches of the rules in clauses 10, 11, 12 & 16, and other operational policy changes that would change the way the programme will run.

It is proposed the amendments come into force on 1 July 2016.

### ***New objectives***

The proposed new objectives of the TB Plan are:

- Biological eradication of bovine TB from New Zealand by 2055 with the key milestones of:
  - TB freedom in livestock by 2026
  - TB freedom in possums by 2040
- Ensuring the infected herd annual period prevalence stays at or below 0.2% on average throughout the term of the Plan.

### ***A staged approach***

A staged approach is required to achieve eradication of TB:

1. Cattle and deer herds would be largely free of TB infection by 2026, with potentially a very small number of isolated breakdowns which will require mopping up. This stage is anticipated to cost on average \$60 million / year over the first 10 years of the programme (i.e. 2016/17 to 2025/26);
2. Ensuring the possum population is free of TB by 2040. This is the point of 'statistical freedom' of disease from possums, i.e. where we are confident to a level of acceptable risk that the disease is gone from possums and no longer able to infect livestock. This stage builds on the vector control in Stage 1 and would cost an average \$32 million per year for the next 15 years (i.e. from 2026/27 to 2040/41); and
3. Complete biological eradication of TB from New Zealand, where TB is considered eradicated from all wildlife. This would take a further 12 – 15 years after the declaration of TB freedom in possums and will involve low level monitoring and verification, and the very occasional mop-up of livestock infection. This is expected to cost on average \$0.7 million per year for the final 15 years (i.e. 2041/42 to 2055/56).

These stages are not 'either or' choices; they contribute to a coherent programme that demonstrates a specific and logical flow of operations to rid New Zealand of TB. This package requires the strong commitment and support of farmers and key stakeholders for the next 40 years.

Regular review of progress – both annual and relating to longer term milestone achievement – would be undertaken and reported on by TBfree NZ (OSPRI). A key purpose of the review is to ensure the Plan and its implementation remains fit for purpose.

### **WHAT'S CHANGING AND WHAT'S STAYING THE SAME?**

A key improvement to the Plan is that it allows a more targeted risk-based approach to disease management and vector control, on the basis that we have:

- more and better data and experience to assess and manage risk;
- better information, data and expertise in general on TB, disease management, and management of TB in wildlife populations; and
- better analytical and decision-making tools.

There is now improved information and data; deeper knowledge; better analytics and better decision-making tools – all of which improves the cost-effectiveness of work so that better outcomes are achieved for the investment made. This has enabled a number of key changes in the proposed scientific and operational approach defined in the new plan:

- an evolution of risk-based disease testing, from large coarse risk zones to a carefully-designed methodology to allow much more accurate determination of which herds need disease testing and how often. This will take time to fully implement but some changes would occur straight away;
- an evolution of risk-based vector control, moving from broadly-defined areas zoned for treatment to a more tailored approach to what work is done derived from improved understanding of specific control required to prove freedom (particularly around better data and knowledge, including surveillance techniques);
- changes to the compensation and enforcement regimes.

A description of the proposed key changes in provided in Table 1.

Table 1: Description of proposed key changes to the TB Plan

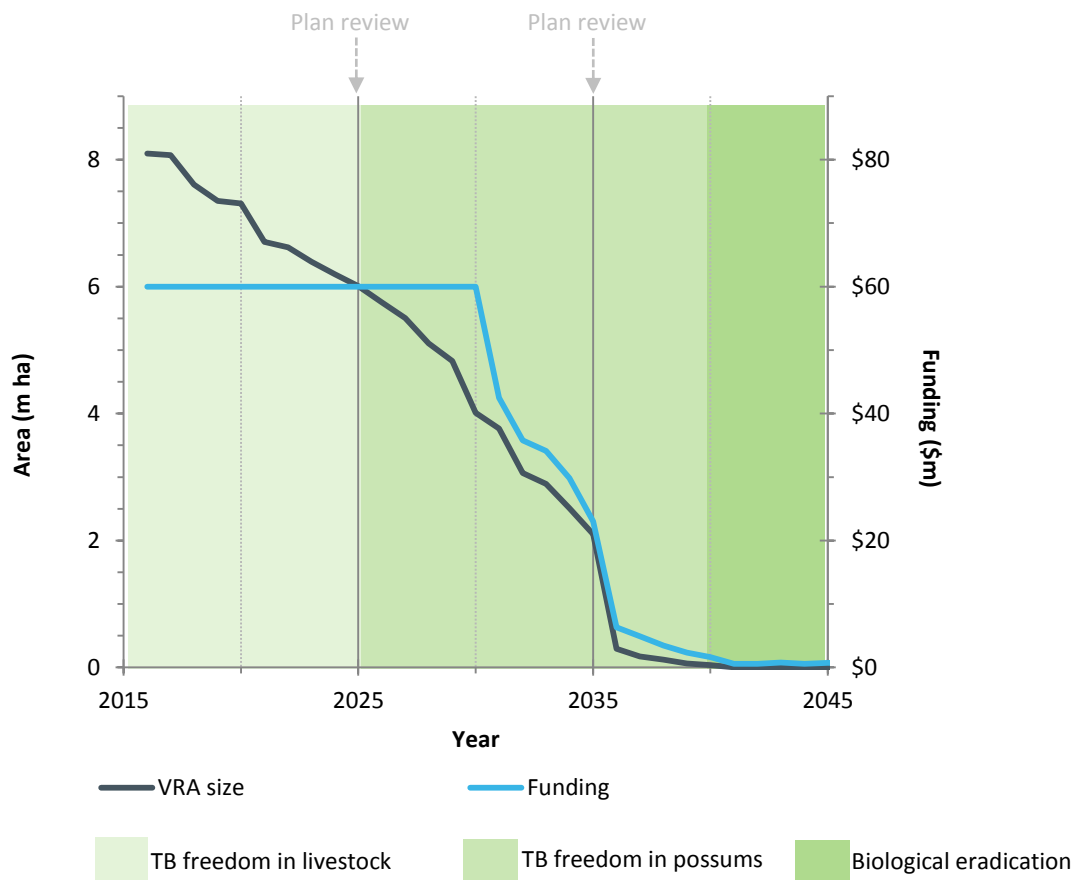
	From	To	Why
Objectives	Testing whether eradication is possible	Confirmed objective for TB eradication from NZ	“Proof of Concept” under current Plan has worked well Eradication is ahead of the test target Delivery of current plan has validated it is possible to go faster Further science review has underscored eradication is possible
	Infected herd prevalence less than 0.4	Infected herd prevalence less than 0.2	We can achieve the level recognised for international trade
Disease testing	Broad disease testing areas	Much more risk based tailored disease testing areas	TB Testing can now be focused on specific risk factors such as location, movement activity and Tb infection history Disease testing now an integrated activity to vector control choices (helping detect wildlife infection), not a stand-alone activity itself National Animal Identification & Tracing scheme (NAIT) data now in existence Changes will ultimately lead, through a phased implementation, to a significant reduction in testing overall New approach will strengthen behavioral incentives for farmers, including use of NAIT data
Vector control	Existing classification of Vector Risk Areas	New classification of Vector Risk Areas	Improved knowledge and surveillance work can inform an updated classification of Vector Risk Areas – significant areas of existing VRA will be removed
	Use of a standard phased approach to control	More emphasis on surveillance work to better inform control choices	Significant developments in wildlife surveillance, proven in pilot projects, can now be rolled out to the programme
	Prioritisation model based on eradication of land readily achievable	New prioritisation model based on full eradication from NZ	Improved knowledge can underpin a new methodology to optimise control decisions across a range of relevant factors Broadly speaking, a change of focus from areas easiest to eradicate – under current Plan’s objectives to trial eradication – to areas most urgently requiring work to eradicate TB from New Zealand by an end date (with a number of other factors influencing what is done when)
Funding matters	\$80M annually	\$60M average annually	Improved cost-effectiveness now possible with range of advancements in knowledge and tools Balance with other industry spending pressures Expected to achieve eradication in acceptable timeframe
	Old funding shares	New funding shares	Significant work on the benefits of the Plan has informed a change in funding shares The biodiversity benefits of the Plan are part of the Crown’s share The Beef share is significantly reduced; Dairy increased and Deer about the same An index is proposed for industry funding shares to ‘flex’ through time if circumstances change; the index to worked out during the rest of the review process
	Landowner funding via Regional Councils	No landowner funding via Councils	Regional Council funding on behalf of landowners has proven unpredictable and has high administration costs Landowners (pastoral farmers and others) receive benefits from the Plan which can be recognised in industry and Crown funding shares Avoids farmers unnecessarily paying through two separate channels (industry contribution and rates) Treating landowners as “exacerbators” is not favoured ahead for range of reasons, and benefits landowners receive are recognised

	No funding from live animal exporters	Funding from live animal exporters	Live animal exporters benefit from TB control but current funding arrangements do not collect a fair contribution – a levy is proposed
	Restrictions on what activities money can be spent on	No restrictions	Improved flexibility will improve cost effectiveness Focus on benefits of Plan overall, not particular sub-activities
	Restrictions on where money can be spent	No restrictions	Improved flexibility will improve cost effectiveness Regional Council funding restricted use of funding (including industry and Crown funds) to regional boundaries Focus proposed on best possible decisions and spending for New Zealand
Other matters	65% compensation for culled animals (with possibility of industry-funded top-up)	Between 0-100% for culled animals	Current approach and fixed level too simple to reflect different circumstances in practice Higher or lower compensation payments (than the 65%) may be a legitimate cost of the Plan, depending on farmer compliance with rules and recognising some 'false positives' in tests Compensation categories, rules and criteria would be worked through by OSPRI
	Compliance only using prosecution	Ability to have either infringements and/or prosecution	Previously under Biosecurity Act prosecution was the only avenue for management significant non-compliance. There is now an ability to utilize infringement as a means of management.

### WHAT'S IT GOING TO COST?

It is estimated that, against a baseline of no control of TB, the TB Plan would result in benefits of over \$6.69 billion (present value) at a total cost of \$1.093 billion (\$0.604 billion present value) over its 40 year life time. The majority of the costs (over 75%) will be in the first 15 years of the Plan's life before tailing off quite quickly over the following 25 years.

Figure 1: Projected decline in Vector Risk Area compared to average annual expenditure under the proposed plan



Significant operational cost savings have been identified which mean that an eradication programme is estimated to be delivered for a lower cost than the current Plan. For example, the current plan funding rules and arrangements have rigidities around where money can be spent and on what. Greater outcomes will be possible from greater flexibility under the proposed Plan to move expenditure to the activities and areas that will deliver the best value for the Plan.

Some changes may take time to implement, such as risk-based testing being dependent on the quality of NAIT data. It is acknowledged also via a staged approach that the management agency, TBfree NZ (OSPRI), will require time to integrate the new operational approaches in practice.

## FUNDING THE PLAN

New funding shares for the amended Plan, which reflect industry size, the benefits generated by the Plan, and affordability, are proposed for each industry sector, including live animal exporters as a new funding party, and the government.

Table 2: Proposed TB Plan funding shares

Funding party	Current Funding (\$80 million pa)		16/17	17/18	18/19	19/20	20/21
	By levy	Adjusted share <sup>5</sup>					
	Fixed	Proposed					
<b>Beef</b>	23.10%	24.54%	16.67%	15.75%	14.83%	13.91%	13.00%
<b>(\$ million)</b>	\$18.59	\$19.75	\$10.00	\$9.45	\$8.90	\$8.35	\$7.80
<b>Dairy</b>	29.91%	33.14%	40.83%	41.75%	42.67%	43.59%	44.50%
<b>(\$ million)</b>	\$24.07	\$26.67	\$24.50	\$25.05	\$25.60	\$26.15	\$26.70
<b>Deer</b>	1.68%	2.02%	1.67%	1.67%	1.67%	1.67%	1.67%
<b>(\$ million)</b>	\$1.35	\$1.62	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00
<b>Live animal exports (\$ million)</b>		N/A	\$0.50	\$0.50	\$0.50	\$0.50	\$0.50
<b>Crown</b>	37.78%	37.78%	40%	40%	40%	40%	40%
<b>(\$ million)</b>	\$30.40	\$30.40	24.00	24.00	24.00	24.00	24.00
<b>Regional Councils</b>	7.52%	2.51%	N/A	N/A	N/A	N/A	N/A
<b>(\$ million)</b>	\$6.05	\$2.02 <sup>6</sup>					

It is proposed that the industry parties monitor and review the indicative industry funding shares. The review will be informed by a funding share 'index', based on the relative size and value of each sector. The index would take effect once a steady state of funding is reached that reflects an agreed share of value. It will be developed by the PGG and agreed by the affected funding parties (excluding MPI) by September 2015. This would allow adjustments to relative shares to reflect medium term changes in the fiscal and economic environment for each sector.

Landowner shares (currently collected by regional councils on behalf of TBfree NZ (OSPRI)) would be incorporated into the industry and Crown funding shares (in effect reducing the need to invoice farmers twice – through levy and through rates).

<sup>5</sup> Current adjusted share incorporates the contribution to Plan funding that the Beef, Dairy and Deer industries make indirectly through Regional Council rates (or the Otago Land levy where relevant).

<sup>6</sup> This is the residual amount incurred by rural landowners other than cattle and deer (e.g. sheep, forestry horticulture). Actual collected by Regional councils is \$6.05 million (7.52% share).

The levy collection arrangements would remain largely the same with some changes to the levy amounts to reflect the change in quantum. As part of this it is proposed to introduce a differential cattle slaughter levy to more effectively collect funds from the beef and dairy sector.

Table 3: Proposed TB Plan funding arrangements for Biosecurity Act levies and direct contributions for beef dairy and deer industries

Funding arrangement	Current levy based share	16/17	17/18	18/19	19/20	20/21
	Fixed	Proposed				
Beef (\$million)	\$18.59m	\$10.00m	\$9.45m	\$8.90m	\$8.35m	\$7.80m
Cattle slaughter levy (per head)	\$11.50/head	\$6.25/head	\$5.90/head	\$ 5.55/head	\$5.20/head	\$4.90/head
Dairy share	\$24.07m	\$24.50m	\$25.05m	\$25.60m	\$26.15	\$26.70
Cattle slaughter levy (per head)	\$11.50/head	\$11.50/head	\$12.25/head	\$12.80/head	\$13.40/head	\$14.05/head
Direct contribution based on DairyNZ commodities levy (\$million)	\$14.07m <sup>7</sup>	\$14.50m	\$14.50m	\$14.50m	\$14.50m	\$14.50m
Deer share (\$million)	\$1.35m	\$1.00m	\$1.00m	\$1.00m	\$1.00m	\$1.00m
Direct contribution based on Deer Industry levy (\$million) <sup>8</sup>	\$1.35m	\$1.00m	\$1.00m	\$1.00m	\$1.00m	\$1.00m

It is proposed that the contribution of the live animal export sector is linked to the proposed dairy cattle slaughter levy head. In 2016/17 this is proposed to be \$11.50/head which gives rise to an estimated overall annual contribution of approximately \$500,000 per year (based on 44,000 animals – the average annual number of live cattle and deer exported over the last 5 years). The total annual contribution by the live animal export sector would vary annually according to the number of animals exported each year and any changes to the dairy cattle slaughter levy.

The Biosecurity Act TB levies will be reviewed annually, as currently, by TBfree NZ (OSPRI) to minimise over and under collection of funds (e.g. to respond to changing numbers going to slaughter).

### WHAT YOU CAN DO AND NEXT STEPS

The Plan Governance Group is confident that New Zealand can be rid of TB forever, and that the major impacts of TB infection in livestock can be removed in the near future. The eradication of TB from New Zealand will deliver real benefits to the pastoral farming sector by permanently removing the burden of both TB infection and control costs.

This consultation period provides an opportunity for all stakeholders to have their say, before the proposal to amend the TB Plan is provided to the Minister for Primary Industries in September for his final consideration.

This document provides the information that stakeholders will need to make a submission – including details found in the Appendices and supporting documents. The submissions and analysis of submissions, along with responses from the Plan Governance Group, will be publically available on the TB Plan Review website once complete.

<sup>7</sup> Approximately 0.7 cents per kg of milksolids on 2014 production figures (StatsNZ), excludes compensation top ups above 65% paid by programme.

<sup>8</sup> Currently set at \$0.05/kg venison & \$0.50/kg velvet.

## INTRODUCTION

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Control of bovine tuberculosis (TB) in New Zealand is carried out under a National Pest Management Plan under the Biosecurity Act 1993 (Biosecurity Act) managed by TBfree NZ (OSPRI). The Biosecurity (Bovine Tuberculosis National Pest Management Plan) Order 1998 provides for the exercise of legal powers and the setting of rules to achieve the objectives of the plan.

The TB Plan was last reviewed following notification of an amendment proposal by the Minister of Agriculture in September 2009. An Order in Council amending the Plan came into effect on 1 July 2011.

The Minister for Primary Industries is required under section 100D of the Biosecurity Act to start a review of the TB Plan by 1 July 2016<sup>9</sup>. There is no defined timeframe for conclusion of the review. The PGG led review brings forward this process so that the amendments in this proposal can be in place by 1 July 2016.

The review provides an opportunity for the TB Plan to be updated and improved to take into account progress, improved scientific knowledge, and technical developments. The review must be on the basis of a proposal; this proposal can be prepared by the Minister or any other Party and must identify whether the proposal is to amend, revoke, revoke and replace, or leave unchanged the plan or part of the plan.

This proposal has been prepared by the specially constituted Plan Governance Group comprising representatives of funding parties, TBfree NZ (OSPRI) and wider stakeholder interests. It has been initiated earlier than required in recognition of the rapid progress made over in the first three years of the current Plan, particularly the development of the improved scientific and technical knowledge from eradication proof of concept programme.

The consultation requirements of the statutory review process require that funders and other interested parties, including the wider public, can make their views known and influence decisions about the final determination of the proposed TB Plan.

### MYCOBACTERIUM BOVIS AND ITS ADVERSE EFFECTS

The subject organism of the proposed TB Plan, *Mycobacterium bovis*, is the bacterium that causes the disease of bovine tuberculosis (and is the 'pest' to be managed in accordance with the proposed TB Plan).

*Mycobacterium bovis* can infect humans as well as a range of domestic and wild animals. TB is particularly significant as a disease of farmed cattle and deer in New Zealand, and if left unchecked would cause unacceptable adverse animal welfare effects, result in significant production losses, and increase risk to market access for export animals and animal products. There are also considerable potential reputational knock on effects if New Zealand was not considered to have effective biosecurity arrangements in place for TB.

The adverse effects of TB and the wider social, economic, health and environmental benefits of managing TB are discussed in more detail in benefits analysis and discussion on wider effects of the proposed Plan.

No other organism will be controlled under the proposed Plan, except as described in the section on "Proposed measures to achieve proposed objectives" which notably include large scale possum control and a range of disease control and surveillance measures in livestock and other wildlife.

**Q1 Do you agree that a national plan to manage TB is still required?**

**Q2 Should the scope of the Plan be limited to focus on *M bovis*?**

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<sup>9</sup> The amendments to the Biosecurity Act in 2012 extended out the review period of National Pest Management Plans to ten years. However the transitional provisions require the next review of any Plans in force at the time the amendments came into force to be subject to the requirements of the earlier legislation (i.e. within 5 years). Subsequent reviews will then only be required every 10 years.

## THE PROPOSAL DEVELOPER

A 'Plan Governance Group' (PGG) was established by the existing TB Plan funding parties to oversee a joint programme of work to complete the review of the Plan and to develop a Plan proposal for submission to the Minister to consider whether it meets the requirements for national pest management plan under the Biosecurity Act.

The PGG has an independent Chair (Chris Kelly) and independent Member (Russ Ballard). Other members include the Chief Executives of DairyNZ (Tim Mackle), Beef+Lamb New Zealand (Scott Champion), and Deer Industry NZ (Dan Coup); the Chair of the OSPRI Stakeholders' Council (Anders Crofoot); a Ministry for Primary Industries representative (Julie Collins); and two representatives from the management agency, TBfree NZ (OSPRI), (Stu Hutchings and Peter Alsop).

## RATIONALE UNDERPINNING THE PROPOSAL

The TB Plan proposal described in this discussion document has been prepared to inform the statutory review of the Plan under section 100D of the Biosecurity Act (the Act), which requires the Minister to commence a review of the TB Plan before 1 July 2016.

This document outlines proposed amendments to the TB Plan and changes to the current approach which have been updated and improved to take into account progress, improved scientific knowledge, and technical developments. It has been developed with consideration of the wider biosecurity and animal welfare obligations and animal health issues that cattle and deer farmers must address and manage on a daily basis. If implemented, the changes are expected to provide for more cost-effective control of TB in cattle and deer herds, to:

- prevent, avoid and manage animal health implications relating to TB infection;
- prevent, avoid and manage livestock production losses and associated costs of TB infection to industry;
- deliver upon and satisfy market and consumer assurance requirements;
- maintain and build on the significant gains made in managing TB; and
- realise cost-savings and gains in overall effectiveness from a single national programme – without duplication in separate industry or regional programmes. This enables economies of scale in the design and delivery of operations. It also enables a skilled workforce and wide-ranging organisation capability to be build and maintained, in order to address the challenges posed by TB across New Zealand.

The proposal also outlines new funding arrangements for the Plan, to ensure the Plan is funded in an equitable, secure and sustainable manner, including for funding shares to change over time to reflect changes in circumstances or benefits received by funders.

There are a range of secondary benefits of the Plan including control of non-native pest animals responsible for the spread of TB (e.g. possums and ferrets) which also reduces adverse effects of these animals on biodiversity and environmental values.

## WHY A NATIONAL PLAN REMAINS THE MOST OPTIMUM APPROACH

The Biosecurity Act requires a proposal for a national pest management plan to describe why a national plan is more appropriate than a regional pest management plan.

The appropriateness of a national TB Plan has been established previously and is summarised in Appendix C. The current TB Plan is derived from the original Plan (then called a 'Strategy') which first came into force in 1998.

The Plan is appropriate because the organism *Mycobacterium bovis* affects more than one region and, as the cause of TB, the organism:

- has, or is likely to have, a significant effect on economic well-being;
- is unlikely to be successfully eradicated without significant use of central government (Crown) resources and significant industry resources managed on behalf of cattle and deer sectors by national organisations; and
- is relevant to New Zealand's international obligations<sup>10</sup>.

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<sup>10</sup> The OIE Terrestrial Animal Health Code.

Additional reasons why a national pest management plan for TB is appropriate are:

- a nationally coordinated approach is needed and eradication or management of the organism through a national plan is expected to be more cost-effective than other means, including the exercise of powers under Part 6 or Part 7 of the Biosecurity Act;
- it is essential to establish formal long-term funding arrangements, secure commitments from affected parties to act (eg, in a particular way or at a particular time) and, in doing so, to develop the management approach through the statutory process established by the Act;
- it is necessary to provide for compensation other than provided for by section 162A of the Biosecurity Act 1993 (in this case under section 100I of the Act);
- pest management plan rules are required and it is necessary for the rules to apply throughout New Zealand (or parts of New Zealand);
- funding by way of a levy under section 100L of the Biosecurity Act is required (ie, to at least maintain the current cattle slaughter levy); and
- where the management agency is a body other than a government department, the statutory Plan process means government and other stakeholders can be assured about the acceptability and accountability of the body to funders and those subject to management provisions under the Plan.<sup>11</sup>

A national plan offers advantages for the control and eradication of TB. As TB in New Zealand is a wildlife borne disease, control measures must extend well beyond individual farms and must be applied on a broad scale irrespective of land ownership, land use, or regional boundaries. Nationally consistent regulations on livestock testing and movement, herd registration and animal identification, along with nationally-collated disease control records and information systems, are essential for management of in-herd infection and to prevent herd-to-herd infection.

National planning and coordination of disease and vector control measures enables achievement of agreed national objectives. The affected livestock industries are nationally integrated, and any adverse trade effects associated with TB would impact on the industries at a national level. Therefore a national Plan shares industry costs and benefits in an appropriate manner, and funding can be applied from national, rather than regional, industry sources (although regional contributions can still be made on behalf of landowners in regions or to reflect regional benefits of TB control). Where regional or local variations are appropriate (as with herd testing policies) these can readily be applied within a national Plan framework.

### PROPOSED DURATION OF THE PLAN

The term of the current Plan is until 30 June 2026 (see clause 7 of the TB Plan). The proposal is extend the term of the current TB Plan until the 30th June 2055. That would require an amendment to clause 7 of the current Plan. The TB Plan would be subject to 10 yearly reviews under section 100D of the Biosecurity Act.

The first 10 year review is expected to coincide with the first major milestone of TB freedom in livestock, when the Plan activity is also expected to fall. At this point, provided the livestock freedom milestone has been achieved, the operational programme will change to reflect the new circumstances, with a focus on TB freedom in possums and less need for disease control.

**Q3 Do you agree that the term of the Plan should be extended out to 30 June 2055?**

### ENGAGEMENT WITH STAKEHOLDERS TO DATE

The TBfree Stakeholder Technical Advisory Group (STAG), made up of representatives of industry bodies, Federated Farmers, MPI, OSPRI and independent experts, was used throughout the proposal development process to provide strategic and technical advice to the PGG. A key function of the STAG is to ensure broader stakeholder issues and concerns are identified, canvassed within their organisations as appropriate, and addressed early in the options and Proposal development process.

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<sup>11</sup> As indicated elsewhere in this document, it is proposed that TBfree New Zealand Limited, a fully-owned subsidiary of OSPRI New Zealand Limited, will continue to be the management agency responsible for implementing the proposed national plan.



Other stakeholders, such as the DCANZ and Landcare have been kept informed of progress throughout the process and asked for specialist inputs or expertise as appropriate.

The PGG Chair met with the OSPRI Stakeholder Council and the chairs of the OSPRI TB free committees to discuss the review. He also attended to two OSPRI TBfree committee meetings.

Advice was sought from the Federation of Maori Authorities on the drafting of the section which discusses the effects of the TB Plan on Maori.

Appendix A provides information on the consultation process going forward.

## BACKGROUND

### BOVINE TUBERCULOSIS: THE DISEASE

Bovine TB is a serious disease. As a disease of farmed cattle and deer in New Zealand, TB would, if left unchecked, result in unacceptable animal health and welfare impacts, and significant production losses. TB usually affects the lymph nodes of infected cattle and deer, and ultimately will become generalised especially in the lungs, but may also spread to other organs, including the udder. In the early stages, affected animals may not show signs of clinical disease.

A number of other wildlife species (such as pigs and wild deer) have been shown to be spillover hosts of TB.

Figure 2: Image of TB lesions in animals



From left: significant lesion in axilla of possum; the majority of lesions in pigs are found in the lymph nodes of the jaw; generalised TB with multiple lesions attached to rib cage.

Bovine TB can also cause TB in humans most commonly affecting the lungs (pulmonary TB) causing chronic coughing, spitting of blood, fever, night sweats and weight loss. In some cases, infection may spread to other organs, including the central nervous system, lymph nodes, bones and joints. Many individuals may be infected without showing signs of disease, but the infection lies dormant and may be activated in later years when the immune system is weakened.

Transmission of TB to humans in New Zealand was most commonly by the consumption of TB infected raw milk, but also occurred on physical contact with infected animals, for example possum hunters would develop skin lesions after skinning infected possums.

### THE HISTORY OF TB AND CONTROL IN NEW ZEALAND

TB probably arrived in New Zealand in the middle of the nineteenth century through introduction of infected cattle. As with most developed nations, New Zealand progressively embarked on cattle TB control measures during the mid-to-late twentieth century. By 1970 all cattle herds were under regular TB testing or post-mortem inspection for the disease, along with compulsory slaughter of test-positive suspect TB cases and partial quarantine of infected herds.

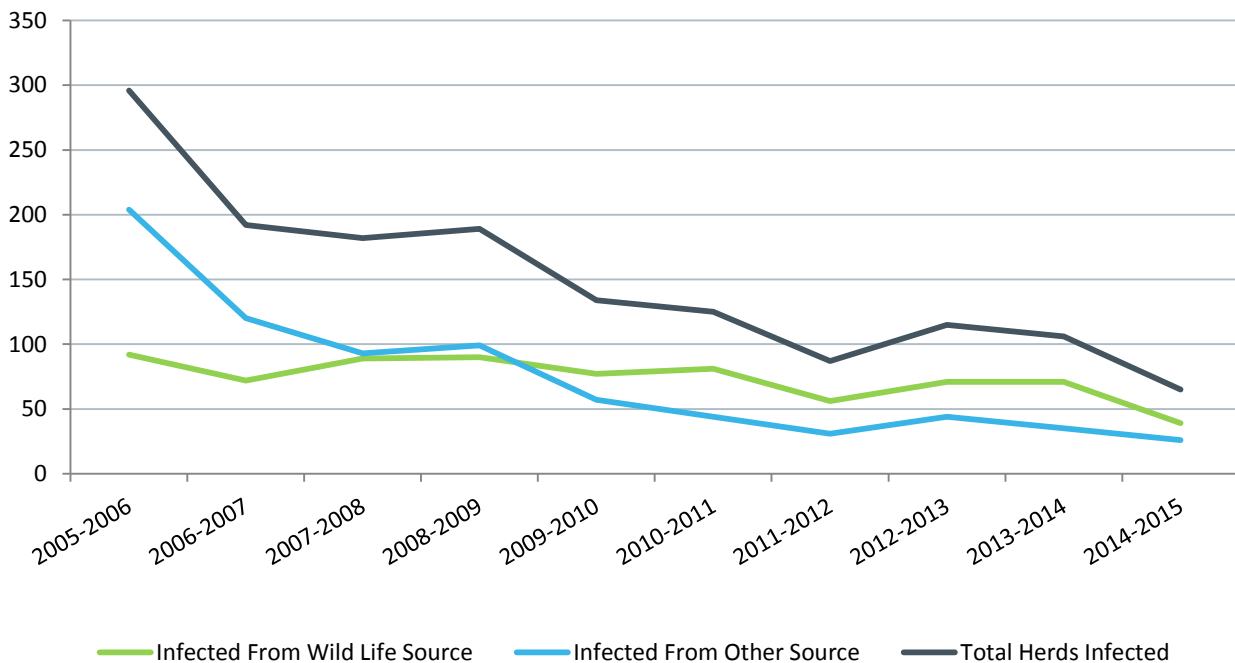
Although TB was effectively eradicated from cattle populations in regions such as Northland, Taranaki, and mid-Canterbury by the 1980s, unexplained failures in control became apparent in other areas from the late 1960s – most notably the West Coast of the South Island, the Wairarapa and central North Island. This problem was eventually linked to localised infection in populations of the Australian brush-tail possum (*Trichosurus vulpecula*) which had become established across most of New Zealand, following its introduction in the 1850s. The transmission of the disease from possums to farmed cattle and deer is by direct and close interaction between these animals in the field.

In the 1970s, Government-driven possum control resources were largely reallocated to areas with major TB problems. This led to sharp declines in livestock infection levels. However, taxpayer funding was mostly withdrawn in 1978, owing to a combination of complacency, public austerity and a spike in fur prices which encouraged belief that fur hunters would control the problem at no cost to the public purse.

The result of this was a gradual and then exponential increase in livestock TB infection through the 1980s, peaking at 1694 infected cattle and deer herds in June 1994. This represented a herd infection rate of 3.9%, far higher than in most other developed countries, creating a potential risk to the marketability of New Zealand beef, dairy and venison exports. The geographic range of infection in possums and other wildlife – in areas termed Vector Risk Areas – also continued to expand

to cover 39% of New Zealand’s land area by 2004. Figure 3 shows the number of vector and non-vector related livestock infections over the last 10 years.

Figure 3: Vector and non-vector origin infections over the last 10 years<sup>12</sup>



Incidences of human bovine TB remained at around 8.8 infections per year in the early 1990s. The number of cases has since fallen following introduction of the current TB Programme. Currently, the incidence of human bovine TB infection is at most 1-2 infections per year.

Since the 1990s, the TB control programme has focused on three important components:

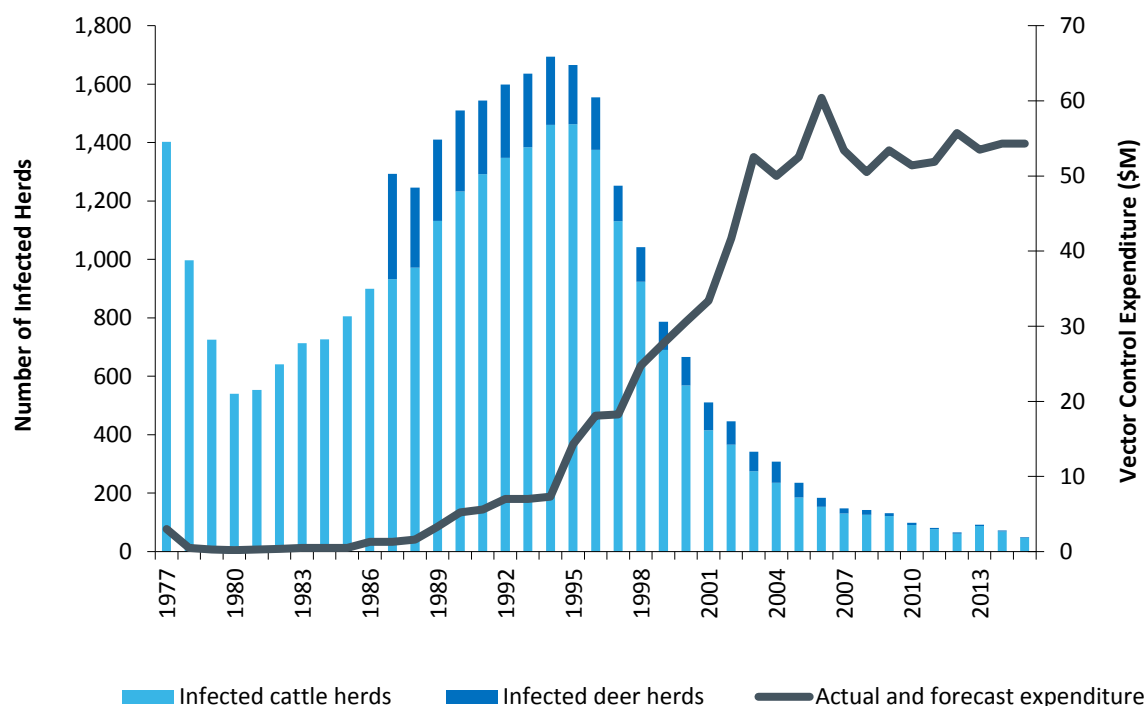
1. testing cattle and deer for TB and slaughtering infected animals;
2. minimising the between-herd spread of infection by quarantining infected herds and by requiring pre-movement testing of cattle and deer from areas where prevalence of infection is high; and
3. controlling possums in areas where they are found to be infected.

### PROGRESS TO DATE

Since the resurgence of TB in the 1980s, significant investment has been made by both farmers and government. Around \$1.2 billion has been invested in TB control since the year 2000. This investment, along with farmer cooperation, has seen great results, with the number of infected herds reducing from 1,694 in June 1994, to just 49 in June 2015.

<sup>12</sup> Please note there may be some small variations between infected herd numbers in this graph and those used elsewhere in the document. This is the result of how infected herds are recorded in the TBfree database which means that the count of infected herds for a given period represents the number of herds that had an infected status during that period, even if they also become clear during that same period. This in effect gives rise to some ‘double counting’.

Figure 4: The number of infected cattle and deer herds and expenditure on possum control from 1977 to 2015



### The current Plan

The current TB Plan, which has been running since 2011, is essentially a containment plan that tests the feasibility of eradication, with the following objectives:

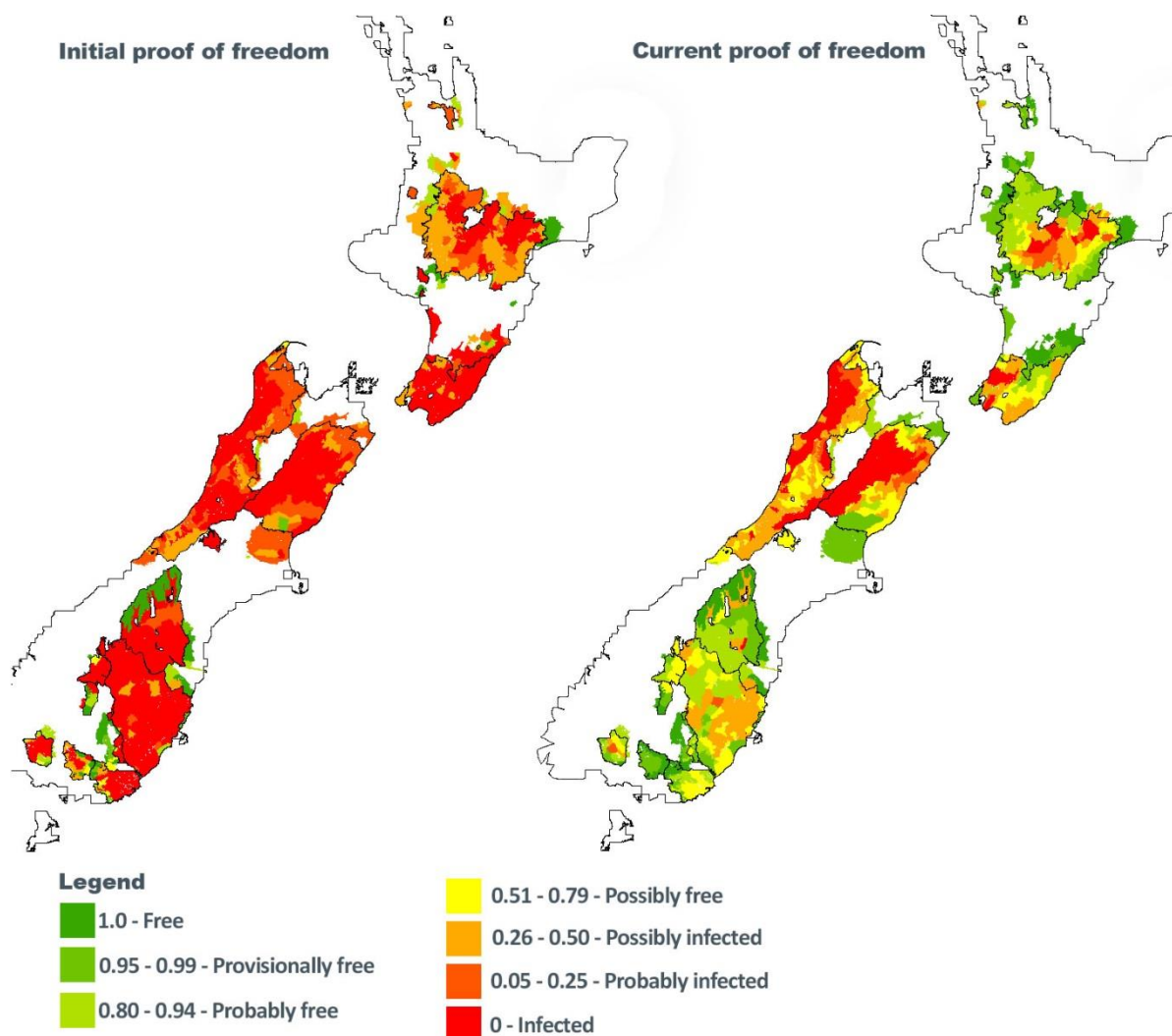
1. Establish the feasibility of eradication of endemic TB from wildlife populations across a representative range of New Zealand terrains, by achieving:
  - Eradication of TB from vector populations in two extensive forest areas representing relatively difficult operational terrain containing vector infection
  - Continued freedom from wildlife infection in areas where TB is considered to have been eradicated from wildlife populations.
2. By 30 June 2025, to have eradicated TB from wild animal populations from at least 2.5 million hectares of TB Vector Risk Area, with consequent reclassification of this land as TB Vector Free Area.
3. Prevent the establishment of TB in possum populations in Vector Free Areas during the term of the proposed strategy.
4. Maintain the national annual TB infected herd period prevalence at the lowest possible level while achieving the primary objectives, and at no greater than 0.4 per cent throughout the term of the proposed strategy<sup>13</sup>.

While there had been success in eradicating TB from many areas, these areas tended to be those that were readily accessible for comprehensive wildlife control. The current plan set the challenge of “proof of concept” for eradicating TB in the most challenging areas (e.g. remoteness, difficult terrain, etc.). Progress on these areas has been ahead of schedule, with 1.1 million of the 2.5 million hectares targeted for TB freedom by 2025, already free of TB (figure 5).

The implementation of the proof of concept programme, alongside dedicated research and operational analysis, has demonstrated that the eradication of TB from New Zealand is feasible. The current eradication performance outcomes for TB infected herds also remain ahead of target with infected herd infections now at an all-time low of 0.15%.

<sup>13</sup> This was the secondary objective.

Figure 5: TB infection across New Zealand from the 1990's (left) to now (right). Red indicates TB is present, dark green means a high probability that area is free of TB, white means the area was considered to be free of TB in 1990



Delivering the current Plan, with the focus on trialling eradication, has led to a number of learnings and significant improvements in data quality, and surveillance and control techniques. Those developments, along with the introduction of NAIT in 2012, can now underpin a more tailored approach to the programme, particularly relating to disease testing and vector control. The current Plan is tailored to some extent, but more can be achieved for better results at lower cost, a good news story for both farmers and the Crown.

### THE ROLE OF SCIENCE IN UNDERPINNING THE TB PROGRAMME

TBfree NZ's (OSPRI) TB eradication programme is based on knowledge gained from scientific research and operational findings. This is an ongoing process with investigation and evaluation of findings leading to new innovations and concepts to be evaluated, with the aim of identifying changes that will meet current and future programme objectives and milestones quicker and more cost-effectively.

The Plan Governance Group commissioned two independent science reviews to assist with the development of its TB Plan proposal. One review<sup>14</sup> focused on the science undertaken for the purpose of managing TB to date, and made recommendations for a future research programme. Key points of this review included:

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14 Ferguson, I and Hellström, J (2015). Review of the science undertaken for the purpose of managing Bovine Tuberculosis in New Zealand.

- It is time for more focus, fewer projects, and a more strategic approach to the science required. The research to date has successfully delivered on broad objectives, and the time has come to take a more targeted approach.
- The good progress to date has been grounded in science: a comprehensive programme of funded research and a pool of world-rated expertise has been critical to achieve this. Relaxation of operational or research intensity is likely to reverse this progress and result in substantial TB outbreaks in the future.
- Overall the TB research programme has delivered value for money and has been sufficiently nimble to respond to any emerging issues.
- In planning the research programme ahead, research into alternative toxins, vaccines and bio-control measures should be relegated to a lower level of activity: maintenance, a watching brief, or ceasing to fund.

Another review<sup>15</sup> focused on the science underpinning eradication of TB from New Zealand. Its key points included:

### ***TB testing***

With respect to TB diagnostics, New Zealand has been a world leader in investigating, evaluating and implementing changes. TBfree NZ (OSPRI) has been using the most cost-effective TB testing technologies designed to reduce false-positive reactors whilst minimising the risk of leaving TB behind in herds. This has been beneficial to farmers and the programme. This research is ongoing with the current evaluation of a more specific skin-test reagent. Research into *M. bovis* DNA typing has meant that since the 1980s we have been able to use this technique to assist veterinarians to determine the likely source of infection found in newly infected herds and enable directed trace-back investigations.

TBfree NZ (OSPRI) is currently evaluating whole genome sequencing as a better method for determining likely sources of infection. Culture of *M. bovis*, which used to take up to 60 days to determine if a herd was infected, now takes approximately half that time. In addition, PCR analysis can be used to determine whether *M. bovis* is present in a sample. The PCR provides a result within days, but is considerably more expensive than culture and is not appropriate for all samples. Thus this research has provided TBfree NZ (OSPRI) with a good basis for supporting a risk-based testing programme going forward.

### ***Vector control research***

Since TB possums were found to be a source of infection for cattle in 1971, most research effort has gone into a range of wildlife related projects. These have included investigating the epidemiology of TB in possums and other wildlife; understanding the ecology and behaviour of possums in various habitat types and at the low densities found following possum control; as well as identifying effective control, monitoring, detection and surveillance mechanisms for possums and other sentinel animal species.

Research had provided sufficient information in the early 2000s to develop a spatial TB possum model (SPM). The SPM could identify the probability of TB being able to establish in a defined area and also whether it could be eradicated following possum control. By 2006, researchers had used the SPM to identify that TB could be eradicated from an infected possum population if it was held at very low densities for 4 – 7 years and no TB possums immigrated into the area. This finding supported operational work that by 2006 had eradicated TB from possums in 10 small VRAs (115,000 ha), through maintaining low possum densities for more than five years.

However, the real value of the model was that it indicated TB could be eradicated from New Zealand using current control methodologies that kept possum densities low. This led to a change in programme emphasis, from one of reducing infected herds, to one of eradicating TB from the source infected possum population. This became the focus of the second amended NPMP, which started in July 2011. Several research projects were designed to provide support to this change and included:

- i. investigation of possum behaviour when at low densities, which indicated individuals had very large home ranges relative to uncontrolled possum populations and possums also tended to aggregate post control;
- ii. investigation of aerial prefeeding, which identified that possums learnt to search for baits, meaning that less toxic baits needed to be used and larger areas could receive aerial control at a lower cost;

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15 Caley, P (2015). A review of science underpinning eradication of TB from New Zealand. Commissioned by the TB Plan Review Plan Governance Group.

- iii. development and use of detection devices to determine presence and density of possums in defined areas which led to more cost-effective means of targeting possum control and carcass recovery in low density possum populations;
- iv. development and evaluation of new toxins, and possum detection devices to assist contractors and provide data for the Proof of Freedom; and
- v. development of a computer based Proof of Freedom utility that uses information from the SPM as well as findings from surveying possums and sentinel wildlife, to provide a probability that the possum population in an area was TB free.

The SPM and Proof of Freedom models have been improved through incorporating the findings from these projects. The Proof of Freedom utility has been used over the last four years to determine that TB has been eradicated from over 1.1 m ha of VRA.

### *Using the science in the field*

Consideration and collation of findings from various research projects has also led to the formulation and trialling of several concepts designed to provide more cost-effective ways to eradicate TB from possum populations. This has led to trialling the concept of undertaking wildlife surveillance prior to the final possum control relative to the current paradigm of surveillance following possum control. It relies on achieving a high possum kill (>90%), but it has been shown to significantly reduce the time and cost required to show that TB has been eradicated from the possum population.

Another important outcome of working with the SPM and Proof of Freedom utility is that TBfree NZ (OSPRI) staff have gained a greater appreciation of these tools and the important habitat and control factors that it relies on for proving TB freedom. This has enabled TBfree NZ (OSPRI) staff to evaluate each of the remaining possum control areas within VRAs and provide a probability of TB freedom for each one. They have thus identified areas that are close to TB freedom and areas that have a high probability that TB is still present in the possum population. Most of the later are associated with areas of extensive forest or mountainous backcountry within VRAs. Combining these areas with areas where known possum-related infection is still occurring in herds, means that less than 40 % of the current 9 m ha classified as VRA has a high probability that TB possums are still present. As a consequence of this evaluation, there is logic in now targeting these areas as a high priority, and leaving areas with a low probability of TB possum presence.

Changing the control priorities provides the prospect of a quicker and more cost-effective route to eradication of TB from infected possum populations in New Zealand. It carries a higher risk of some possum –related breakdowns occurring in herds in those areas where there is a lower probability that TB is still present in the possum population. However, research has identified that the cost of controlling possums associated with these breakdowns when they occur, is more cost-effective than continuing to undertake control until one is certain that the area is TB free.

# OVERVIEW OF OPTIONS AND KEY PROPOSALS

## OUR PROPOSAL FOR MANAGING BOVINE TB IN NEW ZEALAND

The proposed amended objectives of the TB Plan would be:

- Biological eradication of TB from New Zealand by 2055
- Ensuring the annual infected herd prevalence stays at or below 0.2% throughout the term of the plan

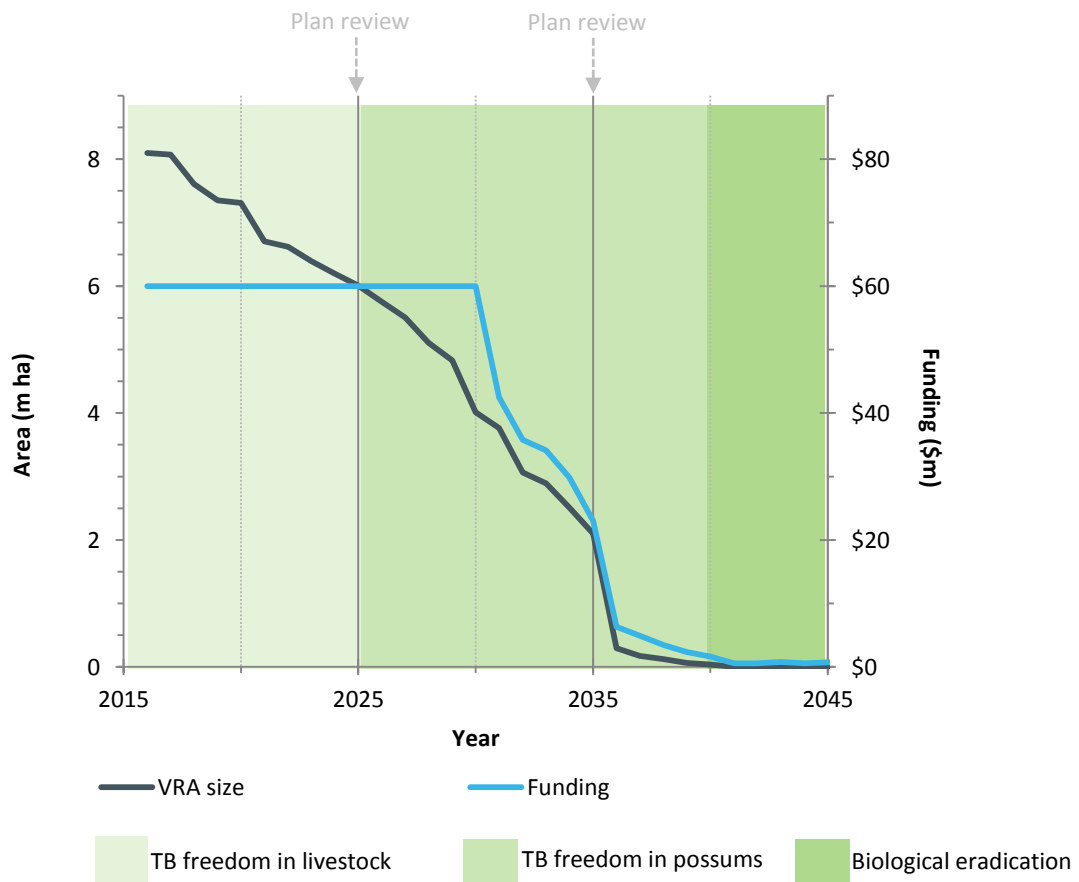
This will be achieved through adopting a more targeted risk based approach to disease management and eradication of the disease from wildlife. This would involve three distinct stages:

1. Cattle and deer herds largely free of TB infection by 2026, with the exception of very small number of isolated breakdowns which would require mopping up.  
This stage will cost on average \$60 million /year for the first 10 years of the programme (i.e. 2016/17 to 2025/26);
2. Ensuring the possum population is free of TB by 2040. This is the point of ‘statistical freedom’ of disease from possums, i.e. where we are 90-95% confident that the disease is gone from possums and no longer able to infect livestock.  
This stage builds on the vector control in Stage 1 and will cost an average \$32M/year for the following 15 years (i.e. from 2026/27 to 2040/41); and
3. Complete biological eradication of TB from New Zealand, where TB is considered eradicated from all wildlife. This is expected take a further 12 – 15 years after the declaration of TB freedom in possums and will involve low level monitoring and verification, with the very occasional mop-up of livestock infection.  
This is expected to cost on average \$0.7 million per year for up to 15 years (i.e. 2041/42 to 2055/56).

These stages are not “either or” choices; they are a combined flow of programmed operations to rid New Zealand of TB.

This will require the strong commitment and support of farmers and others for the next 40 years.

Figure 6: Projected decline in Vector Risk Area compared to average annual expenditure under the proposal





### *Achieving eradication*

The acceleration in eradicating TB would be achieved by reprioritising vector control activity to target first:

- all the Vector Control Zones with current or recent infection (since 2012) in livestock or ferrets, and
- all of the unmanaged or still infected areas where eradication will take the longest.

This would be supported by updated disease management and vector control operational policies, in particular:

- Introducing a more targeted risk based testing approach across the programme over the next 2-3 years;
- Restricting the movement of animals from infected herds to slaughter only;
- Using an adaptive approach to the use of high intensity control will provide TBfree NZ (OSPRI) with flexibility on how it uses the “Survey-then-Control” methods to ensure more appropriately targeted and cost effective interventions; and
- Providing greater flexibility to use a lower probability of freedom (Proof of Freedom) than the current 0.95 stopping rule for declaring a VRA free of TB when assessment of factors contributing to risk of re-emergence justify it.

The estimated cost of the plan is \$1.093 billion over 40 years. An average annual funding of \$60 million per annum will be required for the first 15 years of the Plan (a 25% drop from the current \$80 million p.a.), with the annual funding requirements quickly falling from 2031 onwards.

### *Why eradication now?*

The significant reduction in annual cost, while achieving improved outcomes, has only been made possible as a result of the accumulation of better understanding of eradication technology and improved science over the years. In particular, it would not have been possible without the results of the proof of concept work on eradication that has been implemented under the current plan over the past 3 ½ years.

Similarly the ability to move to a more risk based approach towards disease management in livestock is only possible because of the significant reduction in the number of infected livestock over the past five years. This improvement is directly the result of the current disease management settings which have been necessary up to now to achieve the results we have. It is also made possible by the improved understanding of animal location and movement as a result of the introduction of the National Animal Identification and Traceability scheme (NAIT).

It is therefore timely to introduce a more targeted testing and infected herd management approach which is more appropriately scaled to the size of the disease management problem in 2015 (i.e. to take advantage of the improvements of the last 5 years). This more targeted approach will deliver significant cost savings in the Plan (e.g. by ensuring only those animals at risk are tested) and to farmers (e.g. reducing the number of herds subject to management restrictions as a result of ‘false positive’ reactor tests and the direct and indirect costs of mustering animals for routine testing).

### **ALTERNATIVE OPTIONS**

Two alternative options were also considered by the PGG; these options and the proposal (option 1) were assessed against a baseline (the ‘counterfactual’)

**Option 2 Faster eradication** with a corresponding higher level of initial annual plan cost (\$70 million per annum for the first 10 years).

This option would use the same approach and tools as the preferred option, but with the additional funding dedicated to vector control activity. TB freedom in livestock would be expected to be achieved in a similar timeframe to the proposed option but TB freedom in possums could be declared by as early as 2035 (i.e. 5 years earlier than the proposed option) and biological eradication by 2050.

The total cost of implementing the TB Plan for this option was estimated as \$1.100 billion over 35 years.

**Option 3 Containment** of the disease at current 0.2% herd infection rate with initially some continued vector control to bank and protect the gains made to date. This would result in TB in wildlife being contained within five large areas (Central North Island, Southern North Island, West Coast/Tasman, North Canterbury and Central/Coastal Otago) and involve:

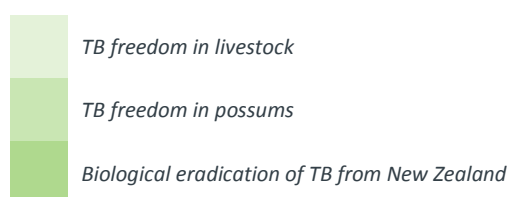
- management of the disease in livestock in accordance with the proposed new testing and movement policies;
- completing eradication and assurance activity for all Vector Risk Areas (VRA) where the current (2014/15) probability of freedom of TB in possums is at or above 0.8 (e.g. in the Hauhangaroa, Hokonui and Rangitoto Ranges); and

- eradication in isolated remnant VRA and any large-VRA outliers (to prevent localised reinfection of VFA).

The cost of the containment option was estimated at \$1.509 billion over the first 40 years (i.e. the same length of the proposal) with an ongoing annual cost of \$31 million from then on.

Table 4: Projected annual costs of different Plan options over their lifetime (\$ million)

Average annual costs per funding period							
Option	2016-25	2026-30	2031-35	2036-40	2041-45	2046-50	2051-55
Proposal (Option 1 )	60	60	33	4	0.9	0.9	0.3
Option 2 Faster eradication	70	64	13	2	1	0.7	
Option 3 Containment	51	38	37	32	31	\$31 million p.a. ongoing	



## WHY THE PROPOSED OPTION?

### Containment

The option of containing TB at its current levels, with some ongoing eradication activity in some areas for up to 5 years to secure the gains to date, was considered by the PGG. In particular it was recognised that a containment option would release scarce funds to farmers, industry bodies and government for other important biosecurity and animal health priorities, while still reserving the ability to upgrade to eradication in the future as funds and/or new technologies allowed.

However securing and maintaining the gains made in managing TB up to now is estimated to cost more than an eradication-focused Plan for the equivalent period of time, i.e. \$1.509 billion plus an ongoing annual funding requirement of \$31 million compared to \$1.093 billion required to eradicate completely. This is because considerable investment will continue to be required for vector control in the buffer and near forest areas after all VRA eradication activity is completed.

The cost of containment would be even greater if all eradication activity was halted from 1 July 2016 (i.e. were to move straight to containment), as a greater amount of area would need to be actively managed to prevent reinfection of VFAs. There would also be an increase in the number of infected herd breakdowns under either of the containment scenarios.

The containment option would also require ongoing funding (in effect in perpetuity) by farmers and the Crown.

### The case for eradication

The re-prioritisation of vector control focus (those areas which have not had control before) is a change to the current strategic approach (i.e. the progressive roll back of VRAs from the easiest area to access and manage) but will result in much faster achievement of the Plan objectives than the current Plan. For example, as the currently infected and high risk areas would be prioritised, the number of vector-induced breakdowns in livestock is expected to decline to near zero more or less linearly over the next 10 years (i.e. livestock will be almost completely TB free by 2026 irrespective of which eradication option is applied, which also will result in steady decline in funding required from that date).

This change in approach is the result of the significant progress that has been made in the understanding of what is needed, and whether it is technically feasible, to eradicate TB from New Zealand.

*What is readily accepted as achievable in 2015 was only thought of as a possibility seven years ago when the last review of the TB plan started. With considerable confidence, it can now be stated that TB can be eradicated and that eradication can*

be achieved cost effectively and deliver real economic benefits to farmers and the New Zealand economy (see previous discussion in section 5 and Caley 2015<sup>16</sup>).

The eradication will be achieved through more astute use of the knowledge, science and capability (inside and outside of TBfree NZ (OSPRI)) developed over the last 5-10 years, while continuing to develop and make the most of TBfree NZ (OSPRI)'s adaptive approach to planning and operational delivery (see previous discussion and Ferguson and Hellström 2015<sup>17</sup>).

In many ways this is not new ground that is being broken; New Zealand has a strong track record of successfully eradicating previously endemic diseases such as sheep scab, bovine brucellosis, and hydatids through a combination of surveillance and disease control strategies, similar to the TB Plan.

#### How fast should we go?

Both eradication options are predicted to result in livestock being almost completely TB free in 10 – 12 years, arguably the most significant and immediate impact that farmers are seeking from the TB Plan.

Increasing the funding by 10 million dollars per annum in the first 10 years of the new Plan is estimated to accelerate eradication of TB by 5 years and cost \$6 million less overall (over a forty year period) but it would not reduce the timeframe to achieve TB freedom in livestock.

It is therefore considered that although the cost of the Proposal (option 1) is slightly more than the faster eradication set out for Option 2, it is considered that this additional cost to farmers is outweighed by the benefits of:

- TB freedom in livestock being achieved in the same timeframe and at lower upfront cost
- lower annual cost to farmers, and
- likely material efficiency improvements over the lifetime of the Plan allowing later annual costs to be less than currently estimated.

#### SUMMARY OF THE COMPARATIVE ADVANTAGES OF EACH OPTION

Fuller analysis of the options is set out in the accompanying Options Analysis document. A key element of the analysis was an assessment of the options (illustrated in table 5) against a set of core criteria:

- How well does it meet the objectives of TB management in New Zealand?
- What is the ratio of benefits to costs of each option?
- Is the option affordable and are the necessary funding arrangements acceptable?
- Is the option feasible (technically, politically and considering compliance) and what is the likelihood of success?
- What are the resources and/or skills required to implement the option and are they available? Does the option impact resources in any other way?

Table 5: Summary of the comparative advantages of each option

	Strategic Fit	Benefit: Cost	Affordability and funding arrangements	Feasibility	Resources
Option 1 Eradication	•	•	•	•	•
Option 2 Faster Eradication	•	•		•	•
Option 3 Containment	•		•	•	•

• indicates the options meet the criterion more or less equally

16 Caley, P (2015). A review of science underpinning eradication of TB from New Zealand. Commissioned by the TB Plan Review Plan Governance Group.

17 Ferguson, I and Hellström, J (2015). Review of the science undertaken for the purpose of managing Bovine Tuberculosis in New Zealand. Commissioned by the TB Plan Review Plan Governance Group.

*Implications for the use of aerial 1080*

Eradication would see a significant increase in the area of aerial 1080 poisoning required in the next five years, with its use for TB control purposes then falling away very quickly to zero by 2030. The use of aerial 1080 would be almost entirely in the inaccessible deep forested areas where the alternative of using ground control is significantly less effective – this amounts to less than 10% of the total area of vector control.

There has been considerable improvement in baiting technology over the years which is expected to continue. For example, the amount of bait applied per hectare has been reduced from approximately 25kg/ha in the 1970s and 1980s to 2kg/ha (of which less than 3g of the 2kg/ha is 1080 – ¼ of the weight of an empty drink can) in 2015. Currently there are trials underway aimed at further reducing the application rate which are showing promising results.

There is currently research being undertaken into alternative toxins that could be approved for aerial application as well as improvements in technology for multi-species ground control. As further research and technology develops these changes would be incorporated as tools into any future work programme.

It is anticipated that there would be ongoing use of aerial 1080 poisoning under the containment option. Under containment it would be required at similar levels to the eradication option for the first five years of the Plan and then at a reduced, but ongoing, level to prevent TB spread out of some VRA and to minimise TB possum movement from deep forest to farmland.

## PROPOSED PLAN OBJECTIVES

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Eradicating TB from New Zealand requires the disease to be managed in both the livestock and the wildlife population. The proposed primary objective of the Plan is the biological eradication of bovine TB from New Zealand by 2055. Key milestones are:

- TB freedom in livestock by 2026; cattle and deer herds would be largely free of TB infection by 2026, with the exception of a very small number of isolated breakdowns which would require mopping up.
- TB freedom in possums by 2040; i.e. where we are confident to a level of acceptable risk that the disease is gone from possums and no longer able to infect livestock.

The proposed secondary objective of the Plan is to ensure that the national annual TB infected herd period prevalence does not exceed 0.2% throughout the term of the plan.

### Q5 Do you support the Plan objective and supporting milestones?

#### HOW THE PLAN OBJECTIVES WILL BE ACHIEVED

##### *Regulatory measures*

The principle measures to achieve the new Plan objectives are proposed to remain the same as for the current Plan (cl 5A), that is:

- a. Detection of TB infection through testing herds and vectors,
- b. Slaughter of TB-infected livestock,
- c. Vector management in VRAs and buffer zones, and
- d. Livestock movement controls.

No additional measures are proposed to be included in the TB Plan Order.

##### *Non regulatory measures*

TBfree NZ (OSPRI), and industry bodies, would also continue their information sharing and advocacy activities to encourage farming practice that positively contributes to achieving the Plan's objectives.

However, we now have more and better information and data; deeper knowledge; improved analytics and better decision-making tools – all of which contributes to the cost-effectiveness of operations to eradicate and manage TB so that better outcomes are achieved for the investment. This has enabled a number of significant changes in the proposed operational approach used to implement the current plan:

- the evolution of risk-based disease testing, from large coarse risk zones to a carefully-designed methodology to much more accurately determine which herds need disease testing and how often;
- the evolution of risk-based vector control, moving from broadly-defined areas zoned for treatment to a more tailored approach. This results from improved understanding of specific control measures required to prove freedom.
- changes to the compensation regime,
- the introduction of specific infringement offences for non-compliance with Plan rules.

These changes will help to ensure the benefits to farmers from the Plan are realised sooner rather than later. The proposed approach to disease management in livestock and in wildlife is described below. Further detail on these measures is provided in Appendix B. Full details and policies for the implementation of these measures will be set out in the TBfree National Operational Plan, to be prepared as required by Section 100B of the Biosecurity Act.

Appendix B also sets out a number of alternative measures to achieve the Plan objectives. These alternative measures are not considered reasonable alternatives at this stage as they are not publically acceptable, cost effective or effective enough, compared to current management methods.

##### *Disease management in livestock – managing TB on a herd TB risk basis*

The TB disease control measures in livestock are based on:

- Application of approved diagnostic tests to cattle and deer for disease surveillance and for the identification of infection within herds;
- Eradication of infection within herds, through mandatory slaughter of animals suspected of infection;
- Surveillance for disease in herds via post-mortem inspection at slaughter (ie at regular slaughter for food production); and
- Controls of cattle or deer movements from areas or herds with higher risk of infection.

It is proposed to modify the current approach of applying these control measures to more closely and accurately target the infection and management of the disease at herd level. This will involve:

- TB testing only being applied to herds where TB risk factors determine necessity (methodology explained below) – this will be phased in
- Increased frequency of TB testing for herds that receive animals originating from previously infected herds
- Gradual removal of Disease Control Area classifications (including Movement Control Areas)
- Reduction in overall number of TB tests undertaken nationally
- Requirement of high level of accuracy in NAIT movement data
- Animals from infected herds only allowed to move to slaughter
- Recovery of costs from farmers where extra testing is required due to non-compliance with the Plan rules
- Change to format of herd TB risk status (currently: I,S & C1-C10) to reflect key risk factors

It is expected that applying these measures, alongside minimising infection from wildlife, will allow infected herd rates to fall to close to zero by 2026.

#### ***A new approach to livestock testing***

The structure of the current testing programme in farmed cattle and deer herds is primarily based on the risk to domestic herds from wildlife TB infection (i.e. in the VRAs). Areas with the greatest wildlife infection within these, e.g. the Movement Control Areas, are subject to the most intensive TB testing regimes (i.e. greater testing frequency, more age-groups tested, test interpretation).

Testing requirements are progressively relaxed (lesser frequency, higher age-groups) the further the herd is away from the VRAs, i.e. from the special testing areas through to the surveillance areas. While surveillance areas have no TB vector risk, the current Plan rules still require breeding herds in these areas to test at a minimum frequency of three-yearly.

This TB testing regime has been effective through the various strategies/plans up to this point. However with current lower infection levels this testing approach is now considered to be more intensive than necessary. For example, TB testing in surveillance areas consumes over 30% of the cattle TB testing resource, yet there is no TB vector risk present in these areas. Maintaining this degree of herd TB testing has not prevented movement-related TB breakdowns from occurring in surveillance areas.

It is therefore expected that TBfree would look to introduce significant changes to the domestic herd TB surveillance requirements under the TB Plan. Specifically introduction of a more targeted risk based testing approach across the programme which will involve applying a risk rating classification in three categories:

- a. Area Risk – Local risk from wildlife (possums)
- b. Herd History Risk – History of TB infection within a herd
- c. Movement Risk – Movement of animals associated with area and herd history risk (above) and/or volume of animal movements (on an annual percentage basis)

A weighting multiplier will be applied to each category based on relative significance, e.g. Herd History risk is of greater importance.

#### **Implementing the proposed approach**

It is proposed that the new risk-based testing approach will be phased in over a period of two years commencing 1 July 2016, with the first step being to stop TB testing of low risk rating herds (based on location, herd history and trading behaviour). Full NAIT compliance will be essential to establish a low movement risk rating and will be a key determinant for the cost-effective implementation of the risk based testing approach.

A reassessment of the current Movement Control Areas will be phased in by March 2017, with removal of the Disease Control classifications (replaced with full TB risk based testing policy) by July 2018. This will require the new herd status structure and rating process to be agreed and implemented by 1 July 2018.

Animals from infected herds will only be allowed to move to slaughter to further reduce any opportunities for movement related infections. As the number of infected herds is expected to drop very quickly, this would only impact on a very small, and decreasing, number of herds.

It is proposed that non-compliance with Plan rules will result in a default test frequency which will be set out in the National Operational Plan, to be developed by TBfree NZ (OSPRI) within three months of the new Plan coming into effect.

It is recognised that it will take time for farmers and others to get used to the new approach and it is intended that TBfree NZ (OSPRI) will work closely with farmers, stock and station agents, MPI meat inspectors, etc as the new approach is rolled out.

#### **What will be the outcome of the new approach**

It is expected that the new approach will see a reduction in the number of cattle requiring TB testing from the current 4.2 million to less than 1.2 million and a reduction in the number of deer requiring testing from approximately 250,000 to less than 70,000 within 4 years of the amended Plan coming in. It is also dependent upon MPI continuing to notify TBfree NZ (OSPRI) of TB cases found in carcasses at routine slaughter.

It is also proposed to add functionality to NAIT to record TB risk status, and in time that the risk based testing TB risk status will be used by farmers as a market signal (i.e. animals that have a medium to high risk rating, which will require additional TB testing, would have a lower market value).

#### **Compensation levels and TB test payment policy**

It is proposed that compensation levels within the plan be set to allow compensation to be paid for reactors taken (animals deemed to be suspicious of having TB and requiring slaughter and further diagnostic testing), or potentially for other animals not deemed to be reactors under specific circumstances, of up to 100%.

This would allow TBfree NZ (OSPRI) to determine, in agreement with industry groups, what levels of compensation are appropriate to be paid dependent on criteria such as:

- Whether the reactor animal was subsequently test negative (a false positive test)
- Whether the reactor was diagnosed with TB (currently set at 65% fair market value compensation and recommended to remain at this level)
- The level of infection found within the herd if TB is diagnosed (currently herds classified as high risk receive 100% of fair market value as compensation)
- Whether the farmer was compliant with the regulations and policies within the Plan
- Whether there are other circumstances that result in further losses from the herd that could be eligible for wider compensation

It is also proposed that there be no change to the current TB testing funding methods, except for where cattle farmers, who knowingly purchase stock with a high risk rating, would be required to pay for the additional TB testing of the risk animals, as well as in-contacts, for a defined number of tests. There would be no change for deer farmers as they currently pay for TB testing.

**Q6 Do you agree the principal measures to achieve the objectives of the Plan should remain unchanged?**

**Q7 Do you agree with a more targeted risk based approach to disease management?**

**Q8 Do you agree with allowing for up to 100% compensation within the Plan based on agreed criteria?**

**Q9 Do you agree with allowing for user pays by farmers for TB testing in cattle in circumstances where they purchase high risk animals?**

### *Disease management in wildlife*

Overall, the general direction of vector control under the new Plan – subject to further modelling by TBfree NZ (OSPRI) in implementing the Plan – would be a focus on:

- areas that would take significant time to eradicate (as these must be started relatively early on);
- areas that have the highest likelihood and extent of TB infection in wildlife (given these are, in effect, the hottest spots that need to be controlled);
- areas that pose the most risk to herds (given the milestone goal to remove TB from herds by 2026 so farmers, as far as possible, get rid of direct impacts on-farm); and
- areas that can be eradicated quite quickly given work to date (rather than allowing such areas to regress and require further work later on).

There would be no vector control activity in areas where there is no TB to contain, but TB testing and works surveillance would continue as required by the risk based testing policy for disease management.

### **What does it mean on the ground?**

In practice, a number of factors need to be considered and weighed up to make the best possible decisions for vector control choices. In addition to updating the boundaries of Vector Risk Areas to reflect current knowledge, OSPRI is likely to consider the following key factors in operationalising the Plan (noting some would be more significant than others in the detail modelling that needs to be carried out):

#### *Vector considerations*

- Estimated population of TB-infected wildlife (particularly possums & ferrets).
- Likelihood of wildlife-to-herd infection given local circumstances and geography.
- Likelihood of infection spread to wildlife in other areas (and impact in those areas).

#### *Herd considerations*

- Recency and extent of wildlife-related herd infection (a predictor of re/new infection).
- Number of herds at risk in proximity of control area.
- Risk to herds elsewhere given the area's animal movement profile (supported by NAIT movement data as a predictor of future movement-related risk).

#### *Investment considerations*

- Urgency of starting to complete eradication by the Plan's end date, given a cycle of control over time is typically needed to achieve eradication.
- The role and interplay of testing, recognising that risk-based testing and vector control are complementary tools in working toward eradication.
- Expected cost to complete eradication, taking into account all control options and requirements for work through until eradication.

TBfree NZ (OSPRI) would also have greater flexibility in how it applies the high intensity control tools (i.e. potentially reduce their application) as informed by monitoring and assessment of possum population density. It would also have the option of using a lower probability of freedom stopping rule based on assessment of risk and consequences (plus associated cost) of dealing with residual infection if the disease is still present after stopping.

The appropriate use of these tools is expected to materially reduce vector control costs and lead to earlier declaration of TB freedom in VRA (with associated reductions in costs to farmers).

### **What will we see?**

The re-prioritisation of vector control focus is a change to the current strategic approach (i.e. the progressive roll back of VRAs from the easiest area to access and manage) but would result in much faster achievement of the Plan objectives than the current Plan's approach. For example, as the currently infected and high risk areas would be prioritised, the number of vector-induced breakdowns in livestock is expected to decline to near zero more or less linearly over the next 10 years (i.e.



livestock would be almost completely TB free by 2026 irrespective of which eradication option is applied, which also would result in steady decline in funding required from that date).

**Q10 Do you agree to the change in focus of vector control activity?**

## BENEFITS AND COSTS OF THE PROPOSAL

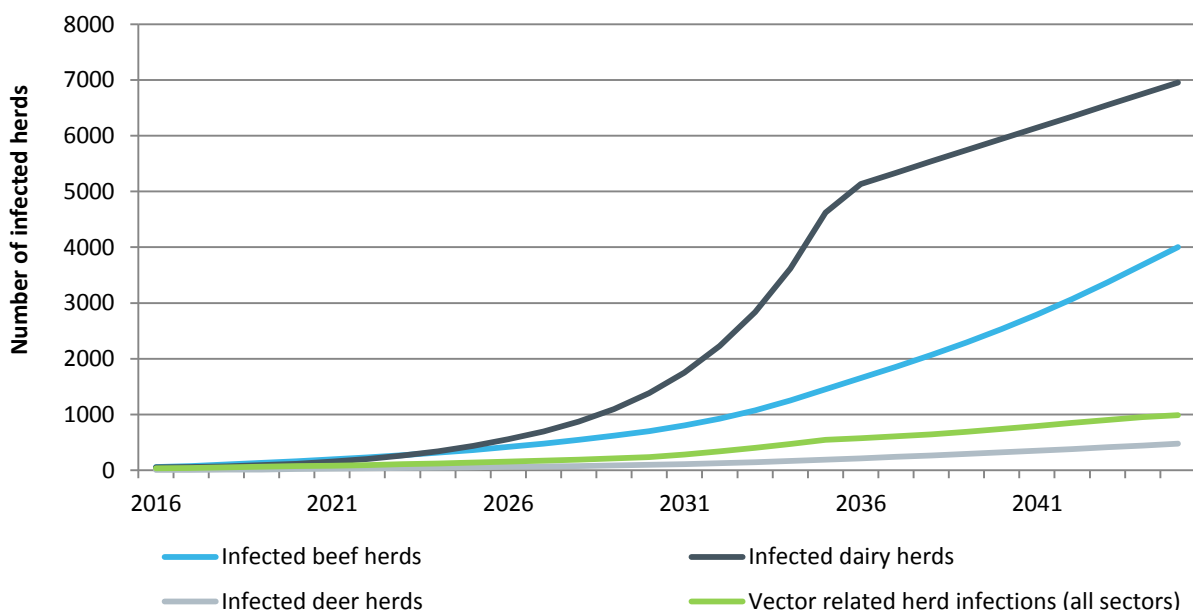
The cost benefit analysis (CBA) of the proposed plan was made against a baseline of 'no control'. This is consistent with recent Treasury guidance<sup>18</sup> which describes the counterfactual required for regulatory proposals as the...

*"situation that would exist if the project did not go ahead. It is sometimes described as the "do nothing" or as the "do minimum" scenario. It is not too critical as to what counterfactual is chosen, so long as it is a well-defined scenario and is applied consistently. The additional benefits and additional costs of the project are measured against the counterfactual".*

The analyses of the options were made against a baseline scenario of 'no control' where the only interventions are pasteurisation and works surveillance (i.e. requirements under food safety legislation). There would be no organised testing or vector control.

Under this baseline the number of infected herds would start to increase materially after 2020 (see figure x).

Figure 7: Increase in herd infection by sector under a no control scenario



The increase in number of infected herds rises more quickly in dairy animals than it does in beef and deer. This is a result of the significant amount of inter herd movement which occurs in this sector. The beef industry also sees a material, but less dramatic, rate of increase in number of infected herds which is largely result of movement of livestock between dairy and beef sectors.

Vector-related infections in all sectors steadily rises as the number and dispersal of possum infected with TB increases.

### METHODOLOGY

Although it is accepted that such a 'no control' scenario would never be allowed to occur, with industry acting to manage TB long before the disease gets out of control, using a 'no control' baseline does allow the full benefits and costs of each of the options to be calculated and attributed to beneficiaries. This analysis requires an understanding of the:

- a. impact and costs of
  - i. vector control on the spread of TB,
  - ii. disease management interventions on the spread of TB in livestock; and

<sup>18</sup> "Guide to Social Cost Benefit Analysis" (March 2015)  
<http://www.treasury.govt.nz/publications/guidance/planning/costbenefitanalysis/draftguide>

- b. the inter-relationship between vector infection and livestock infection.

#### ***Modelling eradication of TB in vectors***

Empirical projections for vector control and related costs were developed based on the predicted cost per hectare (ha) of achieving TB freedom for each of the vector control zones (the current management areas) in Vector Risk Areas VRAs, based on the current probability of TB freedom for each area.

#### ***Modelling impact of disease management interventions***

Historical analysis of disease data from the past 5 years and the results of the empirical vector control analysis were used to inform predictions of TB infection rate and spread under the proposed approach and alternative options.

The TB epidemiological model used in the 2009 review to predict the results of ad hoc control of TB was adapted to model the 'no control' base line.

The details of both approaches are summarised in Appendix C.

#### ***Outcome of the CBA***

Thirty benefits of the proposed Plan have been identified. Five cost-offsets were also identified; these recognise the costs some parties incur to participate in the Plan, such as presenting stock for disease testing.

Taking these benefits and costs into account the present value of the benefits arising from the Plan is estimated at \$6.69 billion over 30 years. The present value of costs of the Plan over this period is \$0.571 billion. This gives a Benefit Cost ratio of 12:1.

A more detailed discussion of these benefits and cost offsets is provided in the accompanying document (Beneficiaries, benefits and exacerbators of the Proposed TB Plan – Analysis).

Analyses were also carried out for the two alternative plan options.

The detail of the analyses is provided in the accompanying 'Options Analysis' document. These analyses indicate that the benefits of all the considered options significantly outweigh the costs of implementing the Plan.

### **ANTICIPATED BENEFITS**

The main benefits of the proposed Plan when compared to a baseline of no control, where the number of infected herds would quickly rise, are:

- protection of the industries from lost livestock production and value;
- reduced operational costs from having infected herds
- maintaining the quality image of New Zealand's beef dairy and deer products, and so protecting New Zealand's overseas trade
- enhanced environmental and ecosystem health.
- protection of human health
- improved social, financial and economic options for rural landowners

A number of broader benefits of the Plan were also identified (e.g. reduced pasture loss; improved genetics, reduced litigation)<sup>19</sup>.

#### ***Economic wellbeing***

##### **Protecting livestock and production value**

TB infection in cattle and deer herds incurs significant cost and impacts on farm management and profitability, mainly through reduced sale values and reduced opportunities for moving stock for grazing or herd relocation.

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<sup>19</sup> NZIER, Covac, Blaschke & Rutherford (2014). The broader benefits of TB vector control: Getting the measure of broader benefits of the National Pest Management Plan for bovine Tb.

More infected cows and hinds on farms would impact on productivity.

### **Trade benefits**

There is general agreement that in the absence of effective TB control, the number of infected herds and animals would escalate to unacceptable levels and may reach a point where there is some risk to New Zealand's overseas trade in beef, dairy and venison products, at least for some products in some markets.

Current food safety standards and requirements in New Zealand are not dependent on the TB Plan and are sufficient to meet international regulatory export standards (e.g. meat inspection and pasteurisation). This means it is unlikely that overseas countries would impose a regulatory trade barrier on New Zealand beef, dairy or deer due to bovine TB.

However, it is possible that overseas consumer demand may fall in some markets if disease levels in livestock increased to an unacceptable level (i.e. if there was to be a relatively high, and rising, incidence of herd TB). There is also an associated increased risk to the New Zealand clean and green brand in such circumstances. Even if the risk of such a scenario related to increased TB levels is very low, it should be considered in the light of New Zealand's high dependence on primary exports.

The potential damage to export trade resulting from reduced consumer preference for food products from a country with high TB prevalence rates is a significant economic factor. However, it is also the hardest to model, as the timing, quantity and duration of trade impact that might occur without a national Plan cannot be predicted. Therefore a cost benefit analysis has been carried out to examine the range of potential and predicted market loss scenarios.

These all indicate that the benefits of the Plan outweigh the costs, even if the risk to trade without a national Plan is assumed to be low.

However the analysis assumes that the trade risk is effectively nil at current herd infection rates and even in the absence of a national Plan it would be a number of years before the risk would be appreciable.

### **Environment**

The Plan generates significant environmental benefits as a result of the widespread and intensive pest control activities.

#### **Biodiversity benefits**

The value of the biodiversity benefits of the Plan has been estimated at \$53.62 million per year (or overall net present value of \$670.30 million) on the basis of the overlap between proposed possum control operations in VRAs and indigenous forests vulnerable to possum damage, over which the Department of Conservation and others may otherwise seek to control possum populations<sup>20</sup>. This estimate is consistent with research commissioned by OSPRI in 2014<sup>21</sup> which used a 'willingness-to-pay' non market valuation methodology to estimate the biodiversity benefits from the Plan of \$711.4 million, assuming the programme is on-going, or \$621.4 million, assuming the programme ceases immediately.

It should be noted these benefits come from the control of TB vectors for the purpose of managing TB, not as a specific objective of the TB Plan.

#### **Wider environmental benefits**

Reducing possum numbers also produces significant wider environmental benefits by reducing the impact of uncontrolled possum browsing on native flora and fauna as well as plantation and catchment protection forests, with a flow on effect of protecting endangered species and environmental wilderness and also enhancing people's (and native animal's habitat) experience of the natural environment. Together these environmental benefits of the TB Plan have been estimated to have a net present value of almost \$100 million.

There are also positive spill over effects on New Zealand's reputation and brand image as a result of reduced environmental damage by possums which has been captured in the reputational trade benefit of the TB Plan (e.g. tourism, sustaining the "clean green" branding).

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20 Saunders, Saunders and Nugent (2014). Assessing the avoided cost of the Bovine Tb NPMS to DoC. AERU Lincoln

21 Tait, Saunders, Nugent and Rutherford (2014). Management of bovine tuberculosis (TB): Investigation of the non-market biodiversity benefits to New Zealand residents of TB control.

## *Human health*

Surveys of farmers indicate that herd TB infection can be a very costly and stressful event. Low herd infection rates under an effective TB control therefore generates valuable mental health benefits for farmers and their families, and this has been factored into the cost benefit analysis.

Human physical health gains from eradication of TB would be minor. The number of reported cases of human bovine TB peaked in the early 1990s at around 8.8 infections per year. At that time the infection rates among herds and animals were significantly greater than it is at present. Currently, the incidence of human bovine TB infection is around 2 infections per year.

Even if TB was poorly controlled, pasteurisation of milk and existing high food safety standards for meat products would ensure minimal public exposure to the disease. There could, however, be greater exposure risk for farmers and hunters from handling infected livestock, possums or game animals. If TB infection rates increased among farmed animals then there would also be greater potential for TB to be contracted through drinking raw milk.

## *Landowners*

There are six landowner related benefits from the Plan: reduced possum control expenditure; erosion control; avoided possum damage; increased real option values for land; reduction in disputes; and reduced risks of liability to manage or eradicate possums. Two of these benefits apply across all of New Zealand – recognising the national benefits of the Plan – whereas, under the current plan, the sole focus on landowner funding has been in areas of active vector control.

## **ANTICIPATED COSTS**

The estimated cost of the plan is \$1.093 billion over 40 years. An average annual funding of \$60 million per annum would be required for the first 15 years of the Plan (a 25% drop from the current \$80 million p.a), with the annual funding requirements quickly falling from 2031 onwards. The costs for the proposed Plan are split into two categories

- Direct costs; and
- Indirect costs – the costs to farmers of having a Plan imposed.

Cost estimates are based on projections of current costs and include the impact of expected reductions to both TB prevalence and VRA size as well as efficiency savings. Ultimately, however, these would be constrained by available funding.

### *Direct costs*

The direct costs of the TB Plan consist of:

**Vector Control** – these costs are incurred as part of the possum control programme, and include wild animal surveillance and management costs and TBfree NZ's (OSPRI) costs of managing the programme. Under the proposed plan funding for vector control activity is expected to fall to just over \$40 million on average per year for the next 15 years.

**Disease control** – these costs include testing of cattle, administration costs associated with the database for allocation of testing, compensation for reactors and depopulation of non-reactors (where necessary) and infected herds. Under the proposed Plan the disease control costs is expected to reduce from around \$18 million in 2016 to potentially less than \$10 million by 2019 as the new risk based testing policy comes in, and continue to steadily decline thereafter as infection prevalence falls.

**Research** – these costs are incurred in researching and developing practical solutions to controlling and eradicating TB to continue to improve the Plan's cost-effectiveness and timely delivery. PGG consider that it is important that investment in research continues at similar levels as currently (between \$2 and 2.5 million per year) for at least the next 15 to support the drive for eradication of TB from livestock and cattle.

**Programme management** – these costs include communication, costs associated with levy collection, administration, TBfree committees, OSPRI corporate costs, TB Plan review and funding expenses. Initially approximately \$6 million per year, these costs are expected to gradually decline in proportion to the reduction in disease management costs.

### *Indirect costs*

The indirect costs of the Plan are those that arise for farmers from imposing the Plan are:

- Deer testing costs
- On-farm testing costs
- On-farm mustering costs

The indirect costs have been incorporated in the cost benefit analysis described below, the following table summarises indirect cost assumptions used.

Table 6

Item	Cost/unit
Labour costs per hour for on-farm mustering (deer and beef)	\$24.10
Hours per herd on-farm mustering test (deer)	14
Hours per herd on-farm mustering test (beef and dairy off platform)	10
Deer test costs	\$5.70/test
Beef herds tested	7570 in 2016 falling steadily to 0 by 2035
Dairy herds tested	1920 in 2016 falling steadily to 0 by 2035
Deer herds tested	1990 in 2016 falling steadily to 0 by 2035

These costs amount to approximately \$3million across all sectors in the first year of the amended plan, but subsequently dropping to under \$800,000 per year by year 3. The costs then gradually decline until testing ends around 2032.

#### *Transitioning in the amended Plan*

In the early stages of implementing the amended Plan, it would be necessary to incur proportionately higher disease management and overhead costs than currently as part of a transition path from the 'old' to the 'new'. Some changes would take time to implement, particularly risk-based testing, which hinges on the quality of NAIT data.

TBFree, NZ, under the auspices of OSPRI NZ, would commence analysis of a staged implementation plan that includes consideration of the risk based approach and its integration to operations.

### Q11 Do you agree with the assessment of benefits and costs arising from the Plan?

#### PROPOSED ALLOCATION AND FUNDING OF COSTS

The funding of the TB Plan is guided by the requirements of the Biosecurity Act. In particular, these require that a proposal for a national pest management plan should specify:

- The extent to which persons or classes of persons benefit from the strategy (beneficiaries);
- The extent to which persons or classes of persons create, continue or exacerbate the problems to be resolved by the strategy (exacerbators); and
- A rationale for allocation of costs.

#### *Current funding arrangements*

The current funding shares (table 7) resulted from negotiated agreement on the basis that:

- the dairy, beef and deer industries contribute funds for disease control and vector control as beneficiaries, because these industries benefit from TB control;
- the Crown contributes funds for vector control because Crown land is a major source of vector-borne TB, and the Crown recognises obligations to control possums on its land as a "good neighbour". The Crown also contributes as a beneficiary in light of the environmental benefits of vector control, and the wider (non-industry) economic benefits of TB control (from protection of export revenues); and
- regions primarily contribute funds for vector control on behalf of other (non-Crown) landowners, because their lands may be sources of vector-borne TB. Regions also contribute as beneficiaries in recognition of regional economic and environmental benefits from TB control.

The present funding agreements between the Crown, the regions and industry gave rise to the following strategy funding contributions in 2015/16.

Table 7

	Beef	Dairy	Deer	Crown	Regional Council
Current funding share (80 mill)	23.10%	29.91%	1.68%	37.78%	7.52%
(\$million)	\$18.59	\$24.07	\$1.35	\$30.40	\$6.05
Adjusted current funding share <sup>22</sup>	24.54%	33.14%	2.02%	37.78%	2.51%
\$million	\$19.75	\$26.67	\$1.62	\$30.40M	\$2.02 <sup>23</sup>

### **Beneficiaries of the TB Plan**

There are a number of parties that benefit from the Plan, including some that have not previously been identified as beneficiaries: live cattle and deer exporters; the forestry, sheep and horticultural industries; and non-commercial deer and cattle owners (e.g. lifestyle block owners).

A material new group of beneficiaries – livestock exporters – is proposed to be a new funder of the Plan. Access to foreign markets for the export of livestock is made possible through the effective management of TB under the Plan, demonstrated by the closure of Australian and North American markets during the 1990’s when TB was at higher levels.

### **Exacerbators**

The Biosecurity Act provides for funding to be sought from beneficiaries and/or exacerbators, i.e. those who cause or exacerbate the problem should pay. This is a key feature of the current Plan funding methodology and has particularly applied to landowners.

It is now proposed that landowners should be treated solely as beneficiaries of the Plan and *not* exacerbators. The rationale for this proposed change is important but detailed. Treating landowners as beneficiaries provides a more robust basis for ongoing funding.

Exacerbator charges should incentivise exacerbators to take desirable actions to avoid the charge (so that charges aren’t simply an unavoidable tax). Avoidable charges would not sit comfortably with the Plan’s implementation across large land areas. Given movement of possums, it would also be difficult for any single landowner to remain ‘clear’. It would also carry less legal risk; be a more positive footing for engagement with landowners about the Plan; and ensure a more coherent funding methodology focused on benefits and beneficiaries.

There are four other exacerbator categories, relating to situations where parties may break rules and work against the objectives of the Plan. While it is important these categories are identified, they are not well-suited to being used for funding of the plan, as the parties cannot be identified ahead of time. These are deliberate illegal acts, generally taken with little regard for the plan or consideration of others, and are more effectively addressed through compliance and enforcement measures.

Appendix D provides a description of beneficiaries, provides a breakdown of the benefits, cost offsets and exacerbators of the amended TB plan.

22 Current adjusted share incorporates the contribution to Plan funding that the Beef, Dairy and Deer industries make indirectly through Regional Council rates (or the Otago Land levy where relevant).

23 This is the residual amount incurred by rural landowners other than cattle and deer (e.g. sheep, forestry horticulture).

### ***Cost buckets***

The only purposes for which TBfree NZ (OSPRI) may spend levy money under the current TB Plan are disease control, vector control, or common programme costs (including research) as described in Section 8 of this document). These 'cost buckets' have been useful in ensuring that industry payments are directed as closely as possible to activities that benefit that industry or region e.g. for disease testing.

The use of cost buckets does, however, create inefficiencies as TBfree is not able to direct funds towards activities that are most beneficial for the overall programme. In addition, activities that were considered beneficial for specific industries are recognised to actually have wider benefits e.g. disease testing not only identifies infection within the industry, but also serves as a surveillance tool to hone vector control to the right locations, benefiting all industries.

It is therefore proposed that requirement to target sector through the use of the 'cost buckets' is removed from the TB Plan, by revoking clause 20 of the TB Plan Order, so that the management agency, TBfree NZ (OSPRI) has the flexibility to direct funding towards the areas of greatest programme benefit. This is expected to result in cost and operational efficiencies.

### ***Proposed new funding shares***

New funding shares for each sector are proposed which reflect industry size, the benefits generated by the plan, and affordability. This includes a new funder – live animal exporters – recognising the animal health and trade access benefits this group gets from the Plan.

### ***Landowners (through Regional Council contributions)***

Given the ongoing annual challenge of securing funding from some regional councils, it is proposed to incorporate landowner shares into the industry and Crown funding shares.

This approach would simplify the collection of funding and improve funding security for the management agency, TBfree NZ (OSPRI). It also reflects that some of the landowner benefits are diffuse and, for any individual landowner, very small. The benefits may also be difficult to explain to rural landowners, other than pastoral farmers, particularly in regions with low TB risk and minimal or infrequent Plan activity.

It is also important to recognise that, even with funding collected from landowners (via regional councils); farmers are still incurring a significant portion of that cost (supporting the rationalisation of two separate charges – levy and rates – into one).

In keeping with this approach, the levy on Otago landowners as provided for by the Biosecurity (Bovine Tuberculosis–Otago Land Levy) Order 1998 would also be revoked.

It is not proposed to amend or revoke clause 19(g) or (h) of the TB Plan order<sup>24</sup> at this time as clause 19(g) relates only to ability for councils to make discretionary contributions to the Plans implementation costs, which may still, be desirable for councils on a case by case basis, while any levy raised under clause 20(h) would still need to be subject to full consultation and regulatory approval (i.e. cannot be imposed unilaterally by the agency).

### ***Crown funding***

It is proposed that Crown share increase to 40% of the total Plan budget, with the remaining 60% would be collected directly from beef, dairy, deer and live animal export sectors. The percentage share increase (from 37.8% currently) incorporates the share of other pastoral industry beneficiaries that are not subject to cost recovery, a proportion of the landowner benefit share, and the benefits that the Crown would gain from the amended Plan.

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24 Clause 19 The implementation of the plan is to be funded by payments from the following sources:

(g) by a payment made at the discretion of each regional council:

(h) subject to section 100L(5) of the Act, by a levy under section 100L(1) of the Act on persons within a region.



### Industry funding shares

Industry funding shares make up 60% of the Plan funding and have been calculated on the basis of the benefits analysis above and the need to reflect the relative size and value of the sector. Other factors taken into account include:

- The proportion of the herds/industry in VRAs;
- trends in infected herd numbers in each sector and the proportion of herds in VRAs over the last 5 years;
- landowner benefit share; and
- affordability.

This analysis has informed the proposed funding shares for industry beef, dairy, deer and live animal export sectors. Table x sets proposed shares for the beef, dairy and deer industries for 2016/17 and indicative funding shares for the following four years. The proposed contribution of live animal exporters is discussed in more detail below.

Table 8: Proposed average annual contributions to the costs of TB Plan by the beef, dairy and deer industries

Sector (making up 60% of total Plan funding)	Current funding (\$80m p.a.)		16/17	17/18	18/19	19/20	20/21
	By levy	Adjusted share <sup>25</sup>					
	Fixed	Proposed					
<b>Beef share</b>	23.10%	24.54%	16.67%	15.75%	14.83%	13.91%	13.00%
<b>(\$ million)</b>	\$18.59	\$19.75	\$10.00	\$9.45	\$8.90	\$8.35	\$7.80
<b>Dairy share</b>	29.91%	33.14%	40.83%	41.75%	42.67%	43.59%	44.50%
<b>(\$ million)</b>	\$24.07	\$26.67	\$24.50	\$25.05	\$25.60	\$26.15	\$26.70
<b>Deer share</b>	1.68%	2.02%	1.67%	1.67%	1.67%	1.67%	1.67%
<b>(\$ million)</b>	\$1.35	\$1.62	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00

It is proposed that the industry parties monitor and review the indicative industry funding shares. The review will be informed by a funding share 'index', based on the relative size and value of each sector. The index would take effect once a steady state of funding is reached that reflects an agreed share of value. It will be developed by the PGG and agreed by the affected funding parties (excluding MPI) by September 2015. This would allow adjustments to relative shares to reflect medium term changes in the fiscal and economic environment for each sector.

TBfree NZ (OSPRI), with the support of the industry bodies, will need to consult with farmers and other stakeholders on any decision to amend the indicative funding shares. Any adjustments would be given effect through the Management agencies annual levy rate review process.

**Q12 Do you agree that live animal exporters should contribute to the funding of the TB Plan?**

**Q13 Do you agree with the proposed funding share for each sector in 2016/17?**

### Collection mechanisms

It is proposed that TB Plan would be funded, in part, by a continuation of the levy on cattle slaughtered as provided for by Clause 19(a) of the Biosecurity (National Bovine Tuberculosis Pest Management Plan) Order 1998. The Biosecurity (Bovine Tuberculosis - Cattle Levy) Order 1998 provides for the collection by meat processing companies of a levy on all adult cattle slaughtered ('cattle slaughter levy'), payable to the management agency, TBfree NZ (OSPRI).

Importantly, the change to the beef funding share would require a change in the cattle slaughter levy to reflect the changed funding contributions from each sector.

<sup>25</sup> Current adjusted share incorporates the contribution to Plan funding that the Beef, Dairy and Deer industries make indirectly through Regional Council rates (or the Otago Land levy where relevant).

Currently the levy is set at one rate that applies to both beef and dairy cattle. The levy is set to meet the total funding contribution of the beef sector. However the levy rate is insufficient to fund the agreed contribution from the dairy sector. The shortfall in funding is met by DairyNZ from the funds it raises through the dairy industry commodity levy (currently \$14 million per year).

Under the proposed funding arrangements the share of the beef contribution would fall and would require a significantly lower cattle levy to be set to avoid significant over recovery issues. If the current cattle slaughter levy arrangements remain in place, the lower cattle slaughter levy would result in a significant increase in the amount of funding required from DairyNZ (approximately an additional \$6.3 million/year on top of the current \$14 million per year).

It is proposed, therefore, to explore the feasibility of setting two different rates for the levy - the levy on beef cattle slaughtered would reduce to a maximum of \$8.50/head but initially be set at \$6.25, while the levy on dairy cattle slaughtered maximum rate would remain at \$15.00/head but initially be set at \$11.50. Table 9 sets out proposed TB Plan funding arrangements for Biosecurity Act levies and direct contributions.

Table 9: Proposed funding arrangements and contributions for the beef, dairy and deer industries (indicative only from 2017/18 onwards)

Funding arrangement	Current levy based share	16/17	17/18	18/19	19/20	20/21
	Fixed	Proposed				
Beef (\$million)	\$18.59m	\$10.00m	\$9.45m	\$8.90m	\$8.35m	\$7.80m
Cattle slaughter levy (per head)	\$11.50/head	\$6.25/head	\$5.90/head	\$ 5.55/head	\$5.20/head	\$4.90/head
Dairy share	\$24.07m	\$24.50m	\$25.05m	\$25.60m	\$26.15	\$26.70
Cattle slaughter levy (per head)	\$11.50/head	\$11.50/head	\$12.25/head	\$12.80/head	\$13.40/head	\$14.05/head
Direct contribution based on DairyNZ commodities levy (\$million)	\$14.07m <sup>26</sup>	\$14.50m	\$14.50m	\$14.50m	\$14.50m	\$14.50m
Deer share (\$million)	\$1.35m	\$1.00m	\$1.00m	\$1.00m	\$1.00m	\$1.00m
Direct contribution based on Deer Industry levy (\$million) <sup>27</sup>	\$1.35m	\$1.00m	\$1.00m	\$1.00m	\$1.00m	\$1.00m

#### **Proposed changes to the Biosecurity (Bovine Tuberculosis - Cattle Levy) Order 1998**

It is proposed, therefore, to explore the feasibility of setting two different rates for the levy – the levy on beef cattle slaughtered would reduce to a maximum of \$8.50/head but initially be set at \$6.25, while the levy on dairy cattle slaughtered would remain at the maximum rate of \$15.00/head but initially be set at \$11.50.

If considered technically feasible and appropriate, this would require the following amendments to the Biosecurity (Bovine Tuberculosis – Cattle Levy) Order 1998:

1. Clause 9 – which currently states that the levy is set at a single rate, would be changed to state that the levy would be set at two rates.
2. Clause 11 (2) b – which currently states “the share of costs to be funded from the levy as established by the funding formula set out in Chapter 12.5 of the Animal Health Board (Incorporated)’s proposal for a national pest management strategy for bovine tuberculosis notified in the Gazette on 16 November 1995”, would be changed to reflect that future levy values would be set on the basis of the TB Plan funding shares proposed by funding parties and agreed to by the Minister.

<sup>26</sup> Approximately 0.7 cents per kg of milksolids on 2014 production figures (StatsNZ), excludes compensation top ups above 65% paid by programme.

<sup>27</sup> Currently set at \$0.05/kg venison & \$0.50/kg velvet.

3. Clause 16 – which states how the levy money must be spent and reflects the current system of ‘cost buckets’, would be amended to reflect the removal of cost buckets and would state that the only purposes for which TBfree NZ (OSPRI) may spend levy money are disease control, vector control, research, and programme management.

**Q14 Do you agree with the proposal to introduce a differentiated cattle slaughter levy for beef and dairy animals if it can be made to work fairly and effectively?**

**Q15 Do you agree with the funding arrangements for dairy sector?**

**Q16 Do you agree with the funding arrangements for the deer industry?**

#### ***A new levy on livestock exports***

It is proposed that a new levy on live cattle and deer exporters is introduced to part fund the TB Plan – the livestock exports TB levy. Livestock exporters were identified as beneficiaries (see accompanying options analysis document) as they benefit from access to foreign markets afforded by New Zealand’s low TB prevalence – a direct result of the TB Plan. TB infected animals are not accepted by importing countries and a resurgence in TB prevalence would result in market closures, as was the case when TB infection increased during the 1990’s.

In the interests of equity and affordability it is proposed to align the livestock exports TB levy with the cattle slaughter levy on dairy cattle. The levy would be set at a single rate, at the current maximum of \$15.00/animal, and initially set at \$11.50 (exclusive of GST). With an average export of 44,000 animals over the last 5 years, this levy is expected to contribute \$506,000 per year to the TB Plan. The total annual contribution by the live animal export sector would vary according to the number of animals exported each year and any changes to the dairy cattle slaughter levy.

The new levy would be enacted under the Biosecurity Act 1993 and collected by the Ministry for Primary Industries alongside other charges<sup>28</sup> at the point of export certification. The levy proceeds would then be passed on to TBfree NZ (OSPRI) as the management agency. The proposed payers of the levy are exporters registered by the Ministry for Primary Industries, who export live cattle or deer.

A levy on exported livestock is considered the most appropriate means to target this group of new beneficiaries of the Plan because the levy is specific to exported livestock only, is specific to those exporting the livestock (rather than domestic producers) and because it is clear that livestock exporters receive benefits from the TB Plan and that they do not currently contribute towards Plan funding.

Further particulars of the levy, as required for the levy order, are set out in Appendix D.

**Q17 Do you agree with the proposed levy on live cattle and deer exports?**

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<sup>28</sup> Existing charges by the Ministry for Primary Industries on exported livestock cover the costs of export certification and the unit fee charged under the Animal Products Act.

## WIDER EFFECTS OF IMPLEMENTING

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### TB PLAN EFFECTS ON MAORI

As a group Maori are over-represented in rural land ownership, and in general, Maori farming would benefit from the control of TB to the extent that all farming does. However, it is recognised that some of the benefits for individual farms and Maori farmers collectively may vary from farming in general because of variations in the mix of farm operations and locations.

The effects of the proposed Plan on the relationship of Maori and their culture and traditions with their ancestral lands, waters, sites, waahi tapu and taonga would most likely be manifest through local and regional vector control programmes, particularly where these programmes are carried out on Crown or Maori-owned land.

Maori concerns and interests may include:

- the impact of vector control methods on non-target species (particularly species valued for food or medicinal purposes), water quality or human health and safety;
- the possible disturbance of waahi tapu or other sites of spiritual or cultural significance during the course of vector control work;
- the secondary benefits of possum control, which may enhance the well-being of forests, native wildlife and taonga species;
- whether and how the concept of 'mauri' is accounted for in programme planning and implementation; and
- access by tangata whenua to valued items associated with vector control (eg, feathers and bones from any birds affected by toxins).

Maori concerns and interests would continue to be addressed at a local level in relation to individual operations. TBfree NZ (OSPRI) would develop protocols for consultation with tangata whenua at a local level to ensure any adverse effects of vector control operations on the relationship between Maori and their ancestral lands, waters, sites, waahi tapu and taonga are avoided or minimised and to determine how best to account for the concept of mauri in programme planning and implementation.

These protocols would reflect the then Environmental Risk Management Authority<sup>29</sup>'s August 2007 decision and recommendations on the Reassessment of 1080, which made a number of recommendations for improved engagement with Maori in planning and decision-making around pest control generally. Research work undertaken by TBfree NZ (OSPRI) has involved and would continue to involve, collaboration with Maori researchers and tangata whenua.

### CONTROL TECHNOLOGIES

As outlined below, the TB vector control programme does have significant environmental effects. Even though the management of pest animals is not an explicit objective of the proposed plan, the implementation programme would, as is currently the case, involve the destruction of possums on a wide scale, in both farm and forest environments. It may also involve the destruction of ferrets, wild deer and wild pigs in selected locations.

TBfree NZ's (OSPRI) investment in research and development builds tools, knowledge and understanding about the role of pests in the New Zealand environment and partnerships in research have benefited New Zealand's wider science and conservation community in their biodiversity protection activities.

#### *Effects of possum control technologies on the environment*

One of the major tools for possum control would continue to be 1080 poison (sodium fluoroacetate). Aerial baiting is the current preferred option for controlling possum populations over large areas of rugged terrain where ground methods become physically and logistically difficult to deploy. This amounts to 10% of the total area of vector control with ground-based methods, using 1080 and other toxins, or traps, used on the remaining 90% of vector control areas.

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<sup>29</sup> ERMA, now Environment Protection Agency.

## **Assessments of environmental and economic effects of 1080**

Because 1080 can affect a number of other animal species there have been public concerns at possible adverse environmental effects from its use, particularly in large scale aerial operations. A considerable body of research has been carried out to meet these concerns and baiting technology has been refined over the years as a result.

Research and monitoring carried out indicate that the risks of using 1080 provides for an acceptable outcome when measured against the benefits that result from reducing possum numbers. This research is thoroughly documented in the scientific literature and was also reflected in the findings of the ERMA decision.

ERMA's reassessment found that economic and environmental benefits of the use of 1080 for possum control outweighed any adverse effects. ERMA made a number of rulings and recommendations for improvements in operational standards, mandatory public reporting of operational information, research and better processes for communications and consultation on 1080 operations. These rulings and recommendations have been followed.

The use of 1080 was also more recently reviewed by the Parliamentary Commissioner for Environment. The Commissioner's report (2011) notably emphasised significant benefits from aerial 1080 baiting for indigenous biodiversity, through providing simultaneous multi-species predator control (of possums, rats and stoat). Greater use of 1080 in aerial application, and reduced regulatory constraint on this use, were recommended.

The Department of Conservation has identified significant conservation benefits from TB Plan possum control operations.

### **Continued use of 1080 within TB Plan**

The use of aerial 1080 is expected to come to an end (for the purposes of TB control) by the early 2030's under the eradication proposal.

Up to then, the safeguards for the use of 1080 and other toxins in possum control, mostly under the Hazardous Substances and New Organisms Act 1993, would continue to be applied. These include requirements to obtain approval for most 1080 operations from the local Medical Officer of Health. Other safeguards may also be applied through consent processes under the Resource Management Act and TBfree NZ (OSPRI) would continue to ensure there is:

- Strict application of standard operating procedures to all operations to ensure full regulatory compliance, effective consultation with affected parties and communities of interest, and minimisation of any adverse effects
- Continued focus on technical improvements in bait quality and application methods, with further reduced application rates
- Cooperation with DOC and other parties to maximise biodiversity benefits from TB control operations
- Carefully planned and managed communications to the public, stakeholders and communities of interest about the need for and benefits of targeted 1080 application for TB control and biodiversity management.

### **Ongoing Research into wildlife control**

While the proposed eradication plan is currently reliant on the use of aerial 1080 as a component of a suite of wildlife control tools, there is ongoing research being undertaken into alternative technologies to be applied at both aerial and ground level.

Allowing for innovation and the outcomes of research will mean that there remains the potential for the introduction of any new proven technologies in both the toxin and application area into the future.

These research activities will be undertaken in cooperation with other agencies in order to maximize any research efficiencies and enhance the potential for improved understanding of methods of wildlife control from both a TB management and biodiversity perspective.

### ***Use of surveillance animals***

#### **Effects of wild deer control on the environment**

Under certain circumstances, wild deer populations may be targeted for control where they may be acting as TB disseminators, and populations may be lethally sampled for TB surveillance purposes. Deer are unlikely to be targeted on a large scale.

Current deer control technology includes helicopter or ground shooting. Adverse environmental impacts are expected to be negligible, and certainly less than any adverse impacts arising from possum control operations. Standard 1080 poisoning operations for possums cause some mortality of deer. In situations where wild deer are highly valued for hunting, and where deer are not considered to be important in the epidemiology of bovine TB, consideration may be given to the use of deer repellent in 1080 baiting operations.

#### **Effects of wild pig control on the environment**

Wild pigs can be useful indicators of the presence of TB in possums because of their scavenging habit. They would be targeted on a limited scale, through shooting, with minimal environmental effect. However, as with the control of any pest animal, there may be some consequential environmental benefits.

#### **Effects of ferret control on the environment**

In some VRAs, ferret populations are also infected with TB and ferret control is required on a significant scale in some locations to prevent infection of cattle and deer herds. However, scientific and observational evidence indicates that in most parts of New Zealand ferrets are not a maintenance host and therefore do not require the same level of control as possums over wide areas.

Because they are scavengers, ferrets are useful indicators of TB infection in possums at prevalence levels lower than can be found by other methods. For this reason, ferrets are likely to be targeted in surveys designed to look for evidence of TB in wildlife, either for the purpose of optimal targeting of possum control, or to assist in determining proof of freedom of TB in wildlife.

Ferret control involves targeted baiting or trapping strategies, which in themselves are likely to have little environmental effect, but the ecological impact of reducing ferret numbers is another matter. Ferret populations may interact with populations of stoats, feral cats, rats and prey species in a complex and unpredictable fashion.

### **EFFECTS ON HUMAN HEALTH**

Bovine TB can cause TB in humans most commonly affecting the lungs (pulmonary TB) causing chronic coughing, spitting of blood, fever, night sweats and weight loss. In some cases, infection may spread to other organs, including the central nervous system, lymph nodes, bones and joints. Individuals may be infected without showing signs of disease, but the infection lies dormant and may be activated in later years when the immune system is weakened.

Transmission of TB to humans in New Zealand was most commonly through the consumption of TB infected raw milk, but also occurred on physical contact with infected animals, for example meat workers and possum hunters would develop skin lesions after processing or skinning infected animals.

The reported incidence of human infections dropped markedly with the introduction of milk pasteurisation and effective TB control programmes in the 1950s and 60s. The organism is destroyed by heat and therefore there is no risk from pasteurised milk. The risk of contracting bovine TB from meat is extremely small, particularly as the organism is killed on cooking.

Incidences of human bovine TB remained at around 8.8 infections per year in the early 1990s. The number of cases has since fallen following introduction of the current TB Programme. Currently, the incidence of human bovine TB infection is at most 1-2 infections per year.

In the absence of a Plan, it can be expected that there would be a gradual increase in incidents of infection in farmers and meat workers as they increasingly come into contact with clinically infected animals on the farm and at the meat processors. There would also be an increase in infection in possum hunters as the infection levels increased in possum population.

**Q18 Do you agree with the assessment of the wider effects of the Plan?**

## PROPOSED USE OF POWERS TO SUPPORT IMPLEMENTATION

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It is proposed that clause 8 of the TB Plan, which specifies the Biosecurity Act powers available to implement the TB Plan remain unchanged, namely:

- The powers conferred on an authorised person:
  - section 106 – Power to require assistance
  - section 109 – Power of inspection
  - section 111 – Entry in respect of offences
  - section 113 – Power to record information
  - section 114 – General powers
  - section 118 – Power to seize evidence
  - section 119 – Power to seize abandoned goods
  - section 121 – Power to examine organisms
  - section 121A – Power to apply article or substance to place
  - section 122 – Power to give directions
  - section 123 – Power to vaccinate, etc
  - section 130 – Declaration of restricted place
- The powers conferred on a management agency:
  - section 128 – Power to act on default
  - section 131 – Declaration of controlled area

**Q19 Do you agree that the powers available to implement the TB Plan remain unchanged?**

## PROPOSED RULES AND OFFENCES

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It is proposed that all of the rules in the current TB Plan remain unchanged as they are still necessary and fit for purpose to support the achievement of the Plan's proposed new eradication objective.

However, it is also proposed that infringement offences be introduced for breaches of Plan rules.

### COMPLIANCE

TBfree NZ (OSPRI) and authorised persons from other agencies work with farmers to achieve voluntary compliance with the TB Plan rules. Where non-compliance occurs, the current Plan only allows for prosecution, where a breach of Plan rules is proven, with a maximum penalty of \$5000. As it is resource intensive to collect evidence that proves non-compliance and to prosecute for offending against Plan rules, prosecution for relatively minor non-compliance is not in the public interest. This means that minor offending is often left unaddressed, and some farmers face no consequence for non-compliance with Plan rules.

It is proposed to introduce infringement offences for non-compliance with the TB Plan under the Biosecurity Act.

Infringement offence schemes are suitable for addressing comparatively minor breaches of the law, which warrant more than a warning but less than the full sanctions of the criminal law, and do not require the prosecution to prove intent.

### INFRINGEMENTS UNDER THE BIOSECURITY ACT

The Biosecurity Act includes an infringements scheme, whereby offences provided in the Act may be specified as infringement offences in regulations. The maximum infringement fee that may be set is \$1000, with the fees going to the issuer of the infringement notice.

The relevant offence in the Biosecurity Act is s 154N(18) which states that it is an offence not to comply with the rules in a National Pest Management Plan, where those rules specify that a contravention of the rule creates an offence against the Act. Each of the rules in the TB Plan (clauses 10-17A) already specify that failure to comply with the rule is an offence against this section of the Act.

The Biosecurity (Infringement offences) Regulations 2010 (Biosecurity Regulations), however, do not currently include s154N(18) offences as infringement offences. TBfree NZ (OSPRI) will work with the Ministry for Primary Industries on the possible inclusion of s154N(18) offences in the Biosecurity Regulations.

It is proposed that infringement offences be created for failing to comply with the following rules in the TB Plan:

- Clause 10: Obligation to notify TBfree NZ (OSPRI) of place where herd is kept
- Clause 11: Obligation to provide facilities and assistance for restraint of animals
- Clause 12: Identification of animals with bovine tuberculosis
- Clause 16: Obligation to supply information

These clauses have been chosen because they are the subject of the majority of minor non-compliance issues.

Infringements for non-compliance would only be issued when there is clear evidence that a farmer had information, support and assistance to allow for an informed and correct decision to be made, but chose a path of non-compliance. A "notice to remedy" would be issued to the farmer when the problem is identified, and the infringement would only be issued if corrective action has not been taken. Infringements do not result in a criminal conviction.

Further detail on the setting of infringement fees and administration of the infringements scheme will be worked through over the next year or so, while the new TB Plan is transitioned in. TBfree NZ (OSPRI) will work with the Ministries for Primary Industries and Justice on the details of the infringements, and may need to undertake further public consultation.

**Q20 Do you agree with the proposed introduction of infringements for cases of deliberate non-compliance with the Plan?**



## PROPOSED COMPENSATION FOR LOSSES

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It is proposed to amend clause 18 of the TB Plan Order so that compensation levels within the plan can be set to allow compensation to be paid for reactors taken (animals deemed to be suspicious of having TB and requiring slaughter and further diagnostic testing), or potentially for other animals not deemed to be reactors under specific circumstances, from 0% up to 100% fair market value.

This would allow TBfree NZ (OSPRI) to determine, in agreement with industry groups, what levels of compensation are appropriate to be paid dependent on criteria such as:

- Whether the reactor animal was subsequently test negative (a false positive test)
- Whether the reactor was diagnosed with TB (currently set at 65% fair market value compensation and recommended to remain at this level)
- The level of infection found within the herd if TB is diagnosed (currently herds classified as high risk receive 100% of fair market value as compensation)
- Whether the farmer was compliant with the regulations and policies within the Plan
- Whether there are other circumstances that result in further losses from the herd that could be eligible for wider compensation

It is proposed that there be no change to the current TB testing funding methods, except for where cattle farmers, who knowingly purchase stock with a high risk rating, would be required to pay for the additional TB testing of the risk animals, as well as in-contacts, for a defined number of tests. There would be no change for deer farmers as they currently pay for TB testing.

In addition to the payment of compensation for cattle reactors, it is proposed that TBfree NZ (OSPRI) may also continue to pay compensation for cattle and deer when slaughter is:

- the only practical or permitted option for an animal following the imposition of restrictions on the movement from that herd (in such cases compensation would be at a rate of 65 percent of fair market value); or
- required, to either protect the TB status of an officially TB free area or to achieve eradication of TB from a herd within an acceptable time frame, so as to enhance the achievement of the TB Plan objectives.

**Q21 Do you agree with the proposed changes to the compensation provisions?**

## PROPOSED MANAGEMENT AGENCY

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It is proposed that TBfree New Zealand Limited, a fully-owned subsidiary of OSPRI New Zealand Limited, would continue to be the management agency responsible for implementing the proposed national Plan. Organisations representing the Plan funders – Beef+Lamb NZ, DairyNZ, Deer Industry NZ, and Ministry for Primary Industries – continue to support TBfree NZ (OSPRI) in this role as they have the necessary competence and expertise in their employees and contractors to deliver on the TB Plan.

All groups that are directly affected by the proposed Plan, and/or contribute funding to it, are stakeholders. Stakeholders' interests would be represented through the company Directors, shareholdings, membership of the OSPRI Stakeholders' Council or by the Government.

### ACCOUNTABILITIES

TBfree NZ (OSPRI) would be accountable to the responsible Minister for the management of the TB Plan and to the Ministry of Primary Industries for the prudent expenditure of Crown funds.

The directors of TBfree NZ (OSPRI) are also accountable to the company shareholders and, through them, to farming and other stakeholders for the conduct of the TB Plan and the prudent use of the funds they contribute.

### IMPLEMENTATION OF THE PLAN

In the course of implementing the current Plan, TBfree NZ (OSPRI) has developed effective capacity and systems for disease and vector control planning, databases and information systems, contract management, research management, financial planning and management of contributors' funds, communications and stakeholder relations. TBfree NZ's (OSPRI) skills, knowledge and capability to deliver a national Plan are maintained at a very high level.

The major tasks for the management agency would include but not be restricted to:

- preparation and implementation of a National Operational Plan (as required by section 100B of the Act);
- managing contracts for delivery of necessary services and monitoring the performance of contractors;
- maintaining a system for regulatory management and enforcement of the Plan rules and accompanying regulations under the Act in collaboration with MPI;
- providing farmer support, continuing education and communications;
- maintaining and managing systems and databases to support operational delivery and performance monitoring and reporting;
- providing information and reports to the Minister, the OSPRI Board of Directors, shareholders, funders, strategic partners, other interested parties and the public;
- ensuring that there are sufficient numbers of suitably trained people for appointment under the Act as authorised or accredited persons by the relevant Chief Technical Officer;
- ongoing review of policies and procedures consistent with the evolution of TB disease and its control (noting that operational disease and vector control work in the field is implemented mainly by external service providers under contestable, performance-based contracts); and
- ensuring compliance with relevant health, safety and environmental standards and regulations.

## PROPOSED MONITORING AND MEASUREMENT OF PROGRESS

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### DISEASE CONTROL MEASUREMENTS

The principal disease control measurements under the current Plan are:

- numbers of infected herds
- numbers of reactor animals and their status at post-mortem
- non-reactor animals found to be tuberculous at post-mortem
- rate of breakdown of herds
- rate of clearance of infection from herds that have broken down.

Milestones for annual period prevalence, number of infected herds, breakdown and clearance rates by year are calculated and actual numbers reported against these targets.

Under the Proposed TB Plan, these measurements, apart from annual period prevalence and the number of infected herds, will assume secondary importance as the Plan progresses and TB freedom in possums is pursued.

### VECTOR CONTROL MEASUREMENTS

To achieve TB freedom in possums, vector control operations are required to meet specified possum density performance targets. This will include not only meeting the overall target set but also within-operation targets where the operational area has been stratified on the basis of differences in risk.

A technical priority under the proposed Plan will be development of improved tools and metrics to assess the degree of risk of vector infection in given areas and to obtain accurate estimates of the probability that TB has been eradicated from vector populations.

### VECTOR CONTROL PROGRAMME PROGRESS MEASURES

Progress towards the primary objective of the proposed Plan will be assessed by having regard to the duration and measured effectiveness of vector control in meeting forecast phases of control across all Vector Control Zones at five-yearly intervals.

Measured effectiveness of vector control is currently underpinned by the use of the Residual Trap Catch Index (RTCI) which provides a relative estimate of possum densities based on standardised deployment of leg-hold traps in the area of interest, with the result reported as the percentage of traps capturing possums over a set period.

During the proposed Plan, the measure of effectiveness of possum control will shift to assessments of probability of freedom from TB in the resident possum populations in the areas of interest. Other possum density measures may be introduced in the term of the proposed Plan.

## OTHER STATUTORY CONSIDERATIONS

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### UNUSUAL ADMINISTRATIVE PROBLEMS OR COSTS

No unusual administrative problems or costs are expected in recovering the costs allocated to any of the persons whom the plan would require to pay the costs.

### COORDINATION WITH OTHER PLANS

It is not envisaged that other pest management plans for TB will be proposed. However, TBfree NZ (OSPRI) would continue to consider opportunities to coordinate implementation of the proposed national TB Plan with regional pest management plans – particularly plans related to TB vector species.

At a national level, coordination would be achieved through the National Pest Control Agencies.<sup>30</sup> At a regional level opportunities would include:

- operational and management synergies with possum or other pest management plans carried out by regional councils; and
- effective transitions to regionally-led programmes in areas where TB is considered to have been eradicated from wildlife; and possum control or other wildlife control is no longer a TB control requirement.

TBfree NZ (OSPRI) would also continue to work cooperatively with the Department of Conservation around pest control operations carried out under other legislation (eg, the Wild Animal Control Act 1977 and Conservation Act 1987).

### PROPOSED LOCAL AUTHORITY ACTIONS AND CONTRIBUTIONS

No direct contribution to the Plan's funding is required from local authorities. TBfree NZ (OSPRI) would however work proactively with local authorities to coordinate vector control activities with local pest management programmes to maximise the value and efficiencies for both parties.

This would include potentially providing support for vector control operations other than priority eradication operations where additional contributions of funding or resources are made by other parties. Such support would usually be conditional upon evidence that the operations are epidemiologically and ecologically sound and are mutually beneficial – or at least would not detract from TBfree NZ's (OSPRI) priority operations.

TBfree NZ (OSPRI) would also work closely with local authorities to ensure the appropriate consents are obtained and observed.

### PROPOSED DISPOSAL OF RECEIPTS

Subject to the provisions of the Biosecurity Act, any receipts arising in the course of implementing the plan would be fed back into the programme funds.

### APPLICATION TO THE EXCLUSIVE ECONOMIC ZONE

The proposed Plan would not apply to the Exclusive Economic Zone as defined by the *Territorial Sea, Contiguous Zone, and Exclusive Economic Zone Act 1977*.

### APPLICATION TO ROADS

Ground and aerial vector control activities may on occasion affect roads and land adjoining to roads. Where this occurs, land owner and local authority permissions are obtained, along with any required consents and approvals as required under the Resource Management Act and the Hazardous Substances and New Organisms Act 1993.

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<sup>30</sup> The National Pest Control Agencies (NPCA), formerly the National Possum Control Agencies, established in the early 1990s to help co-ordinate possum control in New Zealand. In 2011, NPCA changed its name to reflect the wider need to control all vertebrate pest populations in New Zealand and became an incorporated society. TBfree New Zealand, regional councils, the Department of Conservation and the Ministry for Primary Industries participate in NPCA activities.

## **NATIONAL POLICY DIRECTION**

At the time this document was prepared no national policy direction had been made under the Biosecurity Act. However, a direction was under development. Accordingly, in preparing the proposals, we took account of advice from the Ministry of Primary Industries about the likely content and requirements of the future direction and have attempted to ensure close alignment with the anticipated requirements.

## SUPPORTING INFORMATION AVAILABLE TO SUBMITTERS

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Beneficiaries, Benefits and Exacerbators of the Proposed TB Plan – Analysis (2015).

TB Plan Options – Analysis (2015).

Caley, P (2015). A review of science underpinning eradication of TB from New Zealand. Commissioned by the TB Plan Review Plan Governance Group.

Ferguson, I and Hellström, J (2015). Review of the science undertaken for the purpose of managing Bovine Tuberculosis in New Zealand. Commissioned by the TB Plan Review Plan Governance Group.

Tait, Saunders, Nugent and Rutherford (2014). Management of bovine tuberculosis (TB): Investigation of the non-market biodiversity benefits to New Zealand residents of TB control. AERU Lincoln and Landcare Research.

Mackereth (2015) Descriptive analysis of Tb disease and surveillance data: July 2009 – June 2014,

Mackereth (2015) Estimating disease statistics for the economic modelling of eradication and containment strategic options.

Mackereth (2015) Estimating testing statistics for the economic modelling of eradication and containment strategic options.

Mackereth (2015) Estimating disease and testing statistics for the economic modelling of counterfactual options.

Nugent, G. (2015). Cost projections for eradication and containment options for the National Pest Management Plan for bovine tuberculosis (NPMP TB)

Nugent and Mackereth (2014). Interdependence of disease management and vector control aimed at simultaneous control of bovine TB in livestock and wildlife. Landcare Research and MacsIntel Ltd.

NZIER, Covec, Blaschke & Rutherford (2014). The broader benefits of Tb vector control: Getting the measure of broader benefits of the National Pest Management Plan for bovine Tb.

NZIER (2014). Economic effects of a Bovine Tuberculosis outbreak: A dynamic CGE analysis

Saunders, Saunders and Nugent (2014). Assessing the avoided cost of the Bovine Tb NPMS to DoC. AERU Lincoln

UMR (2014). Survey of Bovine TB infected farmers.

This information is available on our website or on request from the TB Plan Secretariat.

## APPENDIX A: SUBMISSION AND CONSULTATION INFORMATION

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We welcome your feedback!

Your submission may become publicly available information. For this reason, you should indicate clearly if your comments are commercially sensitive or if, for some other reason, you do not consider that they should be disclosed. Any request for non-disclosure would be considered under the Official Information Act 1982 and the Privacy Act 1993.

Once consultation closes, the Plan Review Secretariat will analyse the submissions and respond to all the points raised by submitters. The analysis and responses will be available on the plan review website once complete (September). Submissions will be used to inform the final proposal to the Minister for Primary Industries.

To request further information you can call 0800 482 463 and someone from the TB Plan Review Secretariat will get back to you.

### HOW TO MAKE A SUBMISSION

You can email, post or complete your submission online. Submissions need to be submitted to the National Bovine TB Plan Review Secretariat by **31 July 2015**.

**Email** <mailto:submissions@tbplanreview.co.nz>

**Post** National Bovine TB Plan Review Secretariat  
PO Box 3412  
Wellington 6140

**Online** [www.tbplanreview.co.nz](http://www.tbplanreview.co.nz)

### WHAT TO INCLUDE IN YOUR SUBMISSION

Name	
Position and organisation	
Type of farmer (beef, dairy, deer, other)	
Phone	
Email	
Postal address	

Please answer the questions relevant to you and explain the reasons for your answer. Make sure you include the question number with your response.

<b>Question 1</b>	Do you agree that a national plan to manage TB is still required?	Page 16
<b>Question 2</b>	Should the scope of the Plan be limited to focus on <i>M bovis</i> ?	Page 16
<b>Question 3</b>	Do you agree that the term of the Plan should be extended out to 30 June 2055?	Page 18
<b>Question 4</b>	Do you support the proposal as option 1 to eradicate bovine TB?	Page 30
<b>Question 5</b>	Do you support the Plan objective and supporting milestones?	Page 31
<b>Question 6</b>	Do you agree the principal measures to achieve the objectives of the Plan should remain unchanged?	Page 33
<b>Question 7</b>	Do you agree with a more targeted risk based approach to disease management?	Page 33
<b>Question 8</b>	Do you agree with allowing for up to 100% compensation within the Plan based on agreed criteria?	Page 33
<b>Question 9</b>	Do you agree with allowing for user pays by farmers for TB testing in cattle in circumstances where they purchase high risk animals?	Page 33

<b>Question 10</b>	Do you agree to the change in focus of vector control activities?	Page 35
<b>Question 11</b>	Do you agree with the assessment of benefits and costs arising from the Plan?	Page 40
<b>Question 12</b>	Do you agree that live animal exporters should contribute to the funding of the TB Plan?	Page 43
<b>Question 13</b>	Do you agree with the proposed funding share for each sector in 2016/17?	Page 43
<b>Question 14</b>	Do you agree with the proposal to introduce a differentiated cattle slaughter levy for beef and dairy animals if it can be made to work fairly and effectively?	Page 45
<b>Question 15</b>	Do you agree with the funding arrangements for the dairy sector?	Page 45
<b>Question 16</b>	Do you agree with the funding arrangements for the deer sector?	Page 45
<b>Question 17</b>	Do you agree with the proposed levy on live cattle and deer exports?	Page 45
<b>Question 18</b>	Do you agree with the assessment of the wider effects of the Plan?	Page 48
<b>Question 19</b>	Do you agree with the powers available to implement the TB Plan remain unchanged?	Page 49
<b>Question 20</b>	Do you agree with the proposed introduction of infringements for cases of deliberate non-compliance with the Plan?	Page 50
<b>Question 21</b>	Do you agree with the proposed changes to the compensation provisions?	Page 51

## OTHER CONSULTATION ACTIVITIES AND INFORMATION

Online and telephone farmer surveys will be carried out to ensure that a broad and representative range of farming views are captured and considered alongside written submissions. In addition, consultation activities that have been or will be undertaken during the review include:

- regular liaison with PGG, technical advisors, key funders, strategic partner organisations and others in the course of developing the proposals and the consultation approach;
- engagement with organisations representing the interests of the tangata whenua (Maori Trustee and Federation of Maori Authorities);
- meetings/hui with sector leaders and others to discuss their particular interests and concerns;
- engagement with the Ministry of Primary Industries, Treasury and other relevant government departments;
- attendance at some sector-organised events; and
- keeping TBfree Committees informed so they can support and encourage participation in the consultation process at regional and local levels.

A considerable amount of effort has been made to ensure that the responsible Minister can be satisfied that:

- other Ministers and any local authorities whose responsibilities may be affected by the plan have been consulted;
- consultation with tangata whenua or other persons is appropriate; and
- sufficient consultation has occurred having regard to:
  - the scale of the impacts on persons who are likely to be affected by the plan; and
  - whether the persons likely to be affected by the plan or their representatives have already been consulted and, if so, the nature of the consultation; and
  - the level of support for, or opposition to, the proposal from persons who are likely to be affected by it.

If the Minister is not satisfied, the Minister may require further consultation to be undertaken on the proposal. Under section 64 of the Act, before approving the preparation of a plan, the Minister must also be satisfied that the issues raised in all the consultation undertaken on the proposal have been considered.



## APPENDIX B: PROPOSED MEASURES TO ACHIEVE PROPOSED PLAN OBJECTIVES

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### DISEASE CONTROL

Full details and policies for the implementation of these measures will be set out in the TBfree NZ (OSPRI)'s National Operational Plan, to be prepared as required by Section 100B of the Biosecurity Act.

Disease control measures are based on:

- Application of approved diagnostic tests to cattle and deer for disease surveillance based on risk of infection, and for the identification and eradication of infection within herds, through slaughter of animals suspected of infection, based on test results
- Further surveillance for disease in herds via post-mortem inspection at slaughter
- Controls on the movements of cattle or deer from areas or herds with higher risk of infection.

A general outline of disease control policies for the proposed Plan is as follows.

#### *Classification of animals*

No changes to the current classification of animals viz. in-contact animal, reactor, test-positive animal, test-negative animal and tuberculous animal are proposed.

#### *Animal identification*

Animal identification is achieved through the use of NAIT scheme data.

#### *Herd classification*

Herds would be classified to reflect the nature of farming operation they are managed under, to enable the most appropriate testing and disease surveillance regimes to be applied. Changes to current classifications would be introduced gradually over the the first two years of the proposed Plan. With the move to a risk-based approach to TB surveillance testing after that, it is likely that changes would be made to the herd classification system to better reflect risk. Such changes would be subject to consultation.

#### *Herd TB status*

The present method of describing the TB status of herds (Clear, Infected, Suspended, with an index number to indicate the length of time a herd has been tested with or without infection being identified) is well established in the farming community.

It is proposed to retain this for at least the first two years of the proposed Plan. With the move to a risk-based approach to TB surveillance testing after that, it is likely that changes would be made to the herd TB status system to better reflect the components of TB risk, i.e. geographic risk from wildlife, previous infection risk in both herds and animals, and movement risk. As this would represent a fundamental and significant change to the herd TB status system that has been in place for over a decade, any changes would be subject to full consultation with affected parties.

#### *TB disease management areas*

To allow the orderly management of disease risks, and risk-based variations in herd testing and movement control requirements, New Zealand is currently divided into the following disease management areas under the Plan:

- Movement control areas (MCAs)
- Special testing areas (STAs)
- Surveillance Areas.

**Movement control areas:** Under the current Plan, TBfree NZ (OSPRI) creates Movement Control Areas via a Declaration pursuant to Section 131 of the Biosecurity Act. The purpose of these areas is to control the risk of transmission of TB through cattle or deer movements from areas with higher wildlife infection risk as manifested by higher annual herd infection prevalence (greater than one per cent).

It is proposed to retain the current Movement Control Area concept and procedures for the first two years of the proposed Plan. With the move to a risk-based approach to TB surveillance testing after that, the Movement Control Area concept may be retained to manage the geographic risk from wildlife but with a more refined methodology for defining area boundaries. This would be based on a more objective calculation of wildlife TB risk than the broader annual herd infection prevalence applied under the existing Plan. Such a move would lead to a substantial reduction in the existing Movement Control Areas and keep area TB risk better aligned with VRA eradication. Ultimately the need to use section 131 of the Biosecurity Act to manage area risk may be able to be dispensed with as the risk based TB surveillance framework may adequately deal with this.

**Special testing areas (STAs) and surveillance areas:** It is proposed to retain the current STA and Surveillance area concept for the first two years of the proposed Plan. With the move to a risk-based approach to TB surveillance testing after that, it is proposed that the STA and Surveillance area concept be dispensed with as TB risk in those areas would be defined by herd, animal and movement risk, not geography.

#### *Herd movement control*

Specific controls on the movement of stock would continue be applied to infected herds, and suspended status herds, irrespective of their location.

Given that the proposed Plan would likely commence with less than 50 TB infected herds, it is proposed that all infected herds are considered high risk. Movements from infected herds would be permitted direct to slaughter, only until infection is cleared. The existing separate Plan definition of Infected-High Risk herd, which specific policies, would be dispensed with.

**Declarations:** Current requirements for declarations of herd TB control information to accompany movements of cattle and deer via Animal Status Declarations would be retained in the interim. The specific requirements for declarations may change with the implementation of electronic ASDs (E-ASD) if enabled.

#### *Surveillance*

The principal surveillance tools in domestic animals are intended to be the:

- testing of farmed cattle and deer
- post-mortem examination at slaughter of all cattle and deer including reactors

The structure of the testing programme in farmed cattle and deer herds under the current Plan is primarily based on the risk to domestic herds from wildlife TB infection, i.e. TB VRAs (VRAs). Areas with the greatest wildlife infection are subject to the most intensive TB testing specifications (frequency, age-groups tested, test interpretation), e.g. the Movement Control Areas. Testing specifications are relaxed (lesser frequency, higher age-groups) progressively the further one moves away from the VRAs, i.e. from the Special testing areas through to the Surveillance areas. While the latter areas have no TB vector risk, current Plan rules still require breeding herds in these areas to test at a minimum frequency of three-yearly.

While this TB testing paradigm has been effective through the various Plans up to this point, the efficiency and effectiveness of continuing this approach is highly debatable. For example TB testing in Surveillance areas consumes over 30% of the cattle TB testing resource yet there is no TB vector risk present in these areas. Conversely, maintaining this degree of herd TB testing in Surveillance areas has not prevented movement-related TB breakdowns from occurring.

It is proposed to introduce fundamental and significant changes to domestic herd TB surveillance within the Plan. The proposal is to introduce a more targeted risk based testing approach across the programme which would involve applying a risk rating classification to three categories:

1. Area Risk – Local risk from wildlife (possums)
2. Herd History Risk – History of TB infection within a herd
3. Movement Risk – Movement of animals associated with area and herd history risk (above) and/or volume of animal movements (on an annual percentage basis)

A weighting multiplier would be applied to each category based on relative significance, e.g. Herd History risk of greater importance.

Risk based testing would be phased in over a period of two years commencing 1 July 2016. The plan would be to discontinue TB testing of low risk rating herds (based on location, herd history and trading behaviour). Full NAIT compliance is essential

to establish risk rating and would be a key determinant for the effective implementation of risk based testing. Reassessment of current Movement Control Areas is to be phased in by March 2017. Removal of DCA/MCA classification (replaced with TB risk based testing policy) by July 2018. The new herd status structure to be agreed and to be implemented by 1 July 2018.

It is further proposed that non-compliance with Plan policy would result in a default test frequency, possibly at the farmers' expense.

### **Vector control and surveillance**

While the vector control/surveillance paradigm has been effective through the various Plans up to this point, it is proposed to amend both the design and implementation of TB vector control and surveillance activities to gain further efficiencies. This would be based on reaching the two key milestone objectives of the proposed Plan.

### **TB freedom in wildlife**

Vector control activity would be prioritised to target:

- all the Vector Control Zones with current or recent infection (since 2012) in livestock or ferrets, and
- all of the unmanaged or still infected areas where eradication would take the longest.

This prioritisation is a change from the current strategic approach (progressive roll back from the easiest areas). As the currently infected and high risk areas are prioritised the number of vector-induced breakdowns in livestock is expected to decline to near zero more or less linearly over the next 10 years (i.e. livestock would be almost completely TB free by 2026)

The core **TB freedom in wildlife policies** relate to survey then control and threshold for declaration of freedom.

An adaptive approach to high intensity control in VRAs using current baseline approach of "Survey-then-Control" policy of two controls, surveillance, final control would continue. This involves:

- Ground control every 1-3 years
- Aerial Control every 4-7 years
- Control stops when probability of freedom (pF) reaches 0.8

TBfree NZ (OSPRI) planners and management would also be able to change how they apply the surveillance then control approach as informed by monitoring and assessment of possum population density.

Lower intensity surveillance and control activity would continue until pF reaches 0.95 at which point a VRA is declared TB Free.

TBfree NZ (OSPRI) planners and management would have the option of using a lower pF stopping rule based on assessment of risk and consequences (plus associated cost) of dealing with residual infection if disease still present post-stopping.

### **Proof of freedom framework**

TBfree NZ (OSPRI) uses a quantitative and qualitative approach to determine whether TB has been eradicated from possum populations in defined areas. The quantitative approach involves the use of two possum models. Firstly, the Spatial Possum Model (SPM) provides an initial probability as to whether TB would persist in a possum population in a defined area given the type of habitat and history of possum control undertaken. The results of the SPM model are then used in a Proof of Freedom utility, which takes account of spatial surveillance data from possum and other wildlife surveys undertaken to detect TB within the defined area.

The data from possum and other wild animal surveys provides an indication of the landscape coverage achieved and the intensity of surveillance that has been used to detect TB possums, either directly or indirectly in the landscape of the defined area. Overlaying the sentinel wild animal locations together with locations of possum detection devices or traps on a map of possum habitat provides a good visual means of assessing the intensity of wild animal surveillance undertaken in the Vector Control Zones. This is supported by an objective measure of the sensitivity of wildlife surveillance from the Proof of Freedom model.

The outcome of the Proof of Freedom analysis provides TBfree NZ (OSPRI) with a probability that the possum population in the defined area is TB free. TBfree NZ (OSPRI) then assess that result using qualitative information such as the cost associated with making the wrong decision and risk posed to the area by TB possums in adjacent areas. Provided TBfree NZ (OSPRI) are satisfied that there is a high probability ( $P \sim 0.95$ ) of TB freedom and a low risk and costs if a wrong decision is

made, then the defined area would be presented to the OSPRI Board to decide that TB has been eradicated and the Vector Risk Area status of the area can be revoked.

### **Biological eradication**

There would be no pest control activity in areas where there is nothing to contain, but TB testing and works surveillance would continue as per established policy above. Areas that are more difficult to eradicate would come increasingly into scope over time. The core **biological eradication policies** are

- Passive wildlife surveillance and livestock at slaughter from 10 years post TB freedom.
- Maintain vector population density in buffer zones VFA at 2 – 5% RTCI until eradication is achieved in the area behind the buffer

The required outcome of an eradication programme is biological freedom from the organism or pest – in this case the bovine TB bacterium *Mycobacterium bovis*.

Information from both disease modelling and real life experience support the proposition that bovine TB can be eradicated from both domestic livestock and wild animal populations in New Zealand. The methodology for eradication from livestock is well-established. The key to eradication from wildlife is to reduce and maintain populations of the major wild animal TB maintenance host (the possum) at very low, even densities within the VRA.

Research, strongly supported by field experience, has shown that if the possum density is held at or below two per cent Residual Trap Catch Index (RTCI) for five years, and in the absence of immigration, there is a 95 per cent probability that infection would be eradicated from the population. Immigration effects can be minimised by carrying out possum control over large continuous areas within short timeframes.

Uneven control can leave behind “patches” of possums, some of which may be infected. Modelling shows that the effect of these patches is to delay the time to eradicate TB from the associated possum population. Patchiness has been measured and shown to be a real risk under field conditions. This would be addressed through attention to control inputs and through improved methods of detecting surviving possums after control has been applied.

#### *Evidence of eradication success*

TBfree NZ (OSPRI) data strongly supports that TB has been successfully eradicated from wildlife and cattle and deer herds from eight defined locations totalling approximately 450,000 ha between 2000 and 2011. This has been achieved by holding possum densities in these areas at low even levels for at least five years. The largest of these areas was the Banks Peninsula VRA. Large aerial possum control operations in the Hokonui Hills (9,000 ha) in 2004 and 2014, and the Hauhungaroa Range (82,000 ha) in 2005 and 2011 - 13 have reduced possum populations to extremely low levels, demonstrating that optimum aerial baiting methods can achieve possum densities necessary for TB eradication over large areas of continuous heavy forest.

#### *Eradication Strategy*

The eradication strategy would depend upon the progress that has been made towards eradication for a defined area. It would include (i) aerial and ground control of possums as appropriate for the stage of eradication, (ii) monitoring and mapping of possum densities, (iii) surveys to detect TB in possums and other wildlife species as appropriate.

Once TB is considered to have been eradicated from the wild animal populations in a designated VRA or isolated part of a VRA, vector control would cease, though surveillance of domestic and wild animal populations would continue for some years to confirm eradication. Vector control funds would then be available for investment into extra vector control activities in remaining VRAs that had previously been under a containment programme.

#### *Measuring success*

TBfree NZ (OSPRI) uses a quantitative and qualitative approach to determine whether TB has been eradicated from possum populations in defined areas. The quantitative approach involves the use of two possum models. Firstly, the Spatial Possum Model (SPM) provides an initial probability as to whether TB would persist in a possum population in a defined area given the type of habitat and history of possum control undertaken. The results of the SPM model are then used in a Proof of Freedom utility, which takes account of spatial surveillance data from possum and other wildlife surveys undertaken to detect TB within the defined area.

The data from possum and other wild animal surveys provides an indication of the landscape coverage achieved and the intensity of surveillance that has been used to detect TB possums, either directly or indirectly in the landscape of the defined area. Overlaying the sentinel wild animal locations together with locations of possum detection devices or traps on a map of possum habitat provides a good visual means of assessing the intensity of wild animal surveillance undertaken in the Vector Control Zones. This is supported by an objective measure of the sensitivity of wildlife surveillance from the Proof of Freedom model.

The outcome of the Proof of Freedom analysis provides TBfree NZ (OSPRI) with a probability that the possum population in the defined area is TB free. TBfree NZ (OSPRI) then assesses that result using qualitative information such as the cost associated with making the wrong decision and the risk posed to the area by TB possums in adjacent areas. Provided TBfree NZ (OSPRI) are satisfied that there is a high probability ( $P \sim 0.95$ ) of TB freedom and a low risk and costs if a wrong decision is made, then the defined area would be presented to the OSPRI Board to decide that TB has been eradicated and the Vector Risk Area status of the area can be revoked

In all cases, once TB has been eradicated from the wild animal population in a VRA, testing of cattle and deer together with wild animal surveillance would continue biennially (every two years) for the next four years before changing to surveillance testing, or Risk-Based Testing. The purpose of undertaking biennial testing is to provide confirmation that TB has been eradicated from the possum population.

### ***Vector control technology***

Effective possum control tools are limited to a small number of vertebrate toxic agents (VTAs) approved for use in New Zealand, and a similarly small selection of leg-hold or kill traps.

The VTA sodium fluoroacetate (1080) is of singular strategic importance, as it is the only VTA able to be used in aerial application of toxic bait. Aerial application of bait enables rapid, uniform and highly effective possum control to be achieved in difficult environments where the hand application of baits or setting of traps would involve excessive labour costs, hazard to operators or sheer physical impracticality.

Landowners who object to the use of 1080 on their land are able to choose an alternative control approach, provided it is practicable and they pay any additional costs incurred as a consequence of that choice

A range of other toxins are available for ground-based application in a number of formulations. TBfree NZ (OSPRI) would seek to improve vector control technology during the course of the proposed Plan, through applied research and management enhancements in the following areas:

- improved cost-effectiveness of aerial 1080 and ground control operations through further reductions in bait application rates and better targeting of application;
- ongoing research in alternative toxins and control methodologies that may have a role in the future of the plan and
- development and registration of new and/or improved toxins and delivery methods.

### ***Monitoring***

#### ***Infection in possums***

Possoms, feral pigs, wild deer and ferrets are all used as either a direct or indirect means of determining whether TB is present in a defined possum population. Feral pigs and ferrets become infected by eating TB possum carcasses. Thus they provide effective indirect methods of assessing TB presence in the possum population.

To detect TB in the possum population, possums in a defined area are surveyed and all possums are necropsied and tissue samples cultured for TB. However, this is expensive and by its nature a survey may miss a foci of TB possums. Therefore these surveys are often supplemented by looking at feral pigs in particular, or ferrets.

In forest or bush areas where wild pigs are present, they provide the most effective means of detecting TB in possum populations and would be included in any surveillance programme. Wild deer may be surveyed in bush areas where feral pigs are uncommon, or to provide additional surveillance effort to support the other surveillance activities. In farmland areas where ferrets are present they provide another useful means of detecting TB possums and would be included in any surveillance programme.

### *Impact of possum control*

Monitoring is the means by which the relative abundance of possums in an area is measured using a standard protocol, to ensure comparability of results over time, and between different localities. Monitoring is used to determine the need for control, define the desired technical density outcome, measure the performance of contractors and provide data to inform TB freedom determinations.

Under the current Plan the Residual Trap Catch Index (RTCI) has been the standard measure of relative possum abundance. Monitoring systems using live animal detection devices (wax tag or chew card bite detection devices) detect the presence and relative abundance of vector species. These methods have contributed to reduced monitoring costs and improved targeting of further control requirements, especially at low population densities. They also provide data to inform TB freedom determinations.

### **Legislation**

Vector control operations under the proposed Plan require the employment of methods which are controlled by other legislation as follows.

- The Hazardous Substances and New Organisms Act 1996 (HSNO Act) is the primary legislation controlling the use of vertebrate toxic agents (VTAs). It is noteworthy that a major reassessment of 1080 was completed under the HSNO Act in 2007
- The Agricultural Compounds and Veterinary Medicines Act 1997 provides additional controls on the use of VTAs
- The Resource Management Act 1991 under which vector control operations, particularly the use of aerial 1080 poisoning, may require a resource consent or certificate of compliance, to be obtained from the relevant regional council.

TBfree NZ (OSPRI) would ensure all vector control operations have the required notifications, permissions, safeguards and consents in place before starting any operation.

### **ALTERNATIVE MEASURES**

Potential alternative methods to achieve the objectives of the Plan are:

- vaccination of cattle
- vaccination of possums
- fertility control of possums.

#### ***Vaccination of cattle***

In the event that vector control is no longer able to be so intensively applied in the future, it may be necessary to have other options to prevent livestock infection. In this context TBfree NZ (OSPRI) contracted Landcare Research to undertake a major five-year field trial in order to determine the efficacy of BCG vaccination in protecting cattle from TB infection from possums and other wildlife.

In cattle, vaccination with BCG was found to have an efficacy in excess of 70%, under natural challenge; ie 70% of vaccinated cattle were not infected after grazing in areas containing TB possums compared to non-vaccinated cattle. However, the effect of vaccination appears to wain after 24 months. Irrespective of this finding, up to 30% of BCG vaccinated animals would still get TB when challenged and therefore all cattle would still need to be TB tested to identify them. It is expected that up to 10% of vaccinated animals would react at TB tests within 12 months of being vaccinated with BCG. Nevertheless, vaccination is an alternative that could be used in a few situations such as in TB possum locations where the cost of possum control far exceeds the cost of keeping herds TB free. Vaccinating herds in such areas would enable possum control funding to be transferred to higher priority control areas in the meantime. Under current international agreements, products from vaccinated animals would not be able to be sold to EU countries.

This measure is not considered a viable alternative to current management measures due to not high enough efficacy and the trade barriers that animal products would face in EU markets.

### *Vaccination of possums*

TBfree NZ (OSPRI) has invested in the development and testing of an oral vaccine bait for possums. While there is growing confidence that the oral vaccine would provide significant protection for possums against bovine TB, there may be limited uses for the vaccine in New Zealand due to the fact that culling is effective and probably more cost-efficient than vaccination in reducing TB infection in wild possum populations. However, vaccination may be a useful additional tool in certain situations. When aerial dispersal of the oral BCG vaccine was trialled, there was a failure by possums to uptake the oral bait.

The cost of vaccination and its dispersal is considered to be very expensive relative to aerial 1080 control and vaccination would need to be repeated at least on a biennial basis. An alternative would be to vaccinate possums in a 500 m to 1 km wide buffer in bush adjacent to farmland. This would reduce the risk of TB possums migrating onto farmland, but not prevent it. Again this would be an expensive option compared with possum control and would not stop all TB possums from migrating onto farmland and infecting cattle and deer. Vaccination of possums would also have a negative impact on conservation values, as possum numbers would build up over time. Thus for the foreseeable future, vaccination of possums is unlikely to provide a viable means of controlling TB in infected possum populations.

### *Biocontrol of possums*

A large amount of research into biological control methods for possums was undertaken during the period 1993 – 2009. While a large amount of knowledge was gained on possum reproductive physiology and modelling, translating this into a viable form of possum control would have required some major genetic engineering of potential vector populations. It was considered that the New Zealand public would not support this level of genetic engineering and therefore the research was stopped. A non-genetic engineering method (the Trojan Female) of affecting possum reproduction is currently being researched by Otago University and Landcare Research. It would be a number of years before a viable option would result from this research. Therefore for the period of this Plan, having a means of biologically controlling the possum population to the density required to eradicate TB is considered very remote.

## APPENDIX C: MODELLING THE OPTIONS AND NO CONTROL SCENARIO

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### MODELLING THE VECTOR CONTROL OPTIONS

Empirical cost projections for the TB Plan were developed for each of the Plan options considered. The projections were based on the predicted cost per ha of achieving TB freedom for each of the current management areas with Vector Risk Areas (VRAs), based on the current probability of TB freedom (Proof of Freedom; values range from 0 = infected to 1.0 = free) for each area.

#### *Key assumptions*

The key assumptions were:

- Each year of active management increases Proof of Freedom by 0.05.
- Active management ceases at a 'stopping rule' (SR: currently Proof of Freedom = 0.95).
- Current strategic approaches and management techniques continue unchanged, except the prioritisation of areas is changed to fit each particular funding scenario.
- A vector control cost of \$9.16/ha/y is assumed for all areas, for both ground and aerial control, except that a multiplier of 1.5 is applied in ground control areas in which more than 50% of the area is good possum habitat. This includes contractor and internal TBfree NZ operational planning costs, but no 'Corporate Services/Head Office/livestock' costs. The cost is derived empirically from expenditure over the last four years in the areas targeted for eradication before 2026 under the current Plan in which further management is still required. Achieving of TB freedom at this cost is assumed to take 20 years. Achieving freedom in less time is assumed to incur a proportionately greater cost/ha/yr (i.e. the total cost stays the same).
- TB is assumed to re-emerge in a proportion  $[(1-SR)/2]$  of areas declared free and be detected at a random interval 1-20 years after TB freedom. The cost of 're-eradication' is proportionate to the time to detection (100% at 20 years).
- The level of vector control spending in any year is the minimum amount determined by either (1) the scheduled cost or (ii) subtraction from the funding available minus the cost of livestock testing and disease management and a 'Business Services' overhead proportionate to the total programme size.
- By 1 July 2016, only 8.5m ha of VRA would remain. It is conservatively assumed all of that would require management.

#### *Eradication projections*

Under the above assumptions, an immediate start in all areas from mid-2016 would have an initial 2016 vector control cost of \$78m, which compares with \$53m budgeted for 2015/16. As that exceeds funding potentially available, deferral of management is required for some areas. Prioritisation has been based on targeting first (i) all the Vector Control Zones with current or recent infection (since 2012) in livestock or ferrets, and (ii) all of the unmanaged or still infected areas where eradication would take the longest. The ~2m ha in the latter category ultimately determines how quickly national TB freedom can be declared. This prioritisation is a change from the current strategic approach (progressive roll back from the easiest areas). Under this prioritisation scheme, all of the almost 2m ha of currently unmanaged VRA is afforded an immediate start. This would see a large increase in the area of aerial 1080 poisoning required in the next five years.

As all the currently infected and high risk areas are afforded high priority it is assumed that numbers of vector-induced breakdowns in livestock would decline to near zero more or less linearly over the next 10 years (i.e. livestock would be almost completely TB free by 2026).

#### *Containment projections*

The containment option modelled assumed:

- TB in wildlife would be contained within the five large areas in which all or most Vector Control Zones has a Proof of Freedom of <0.8 in 2015.
- TB would be eradicated as soon as possible from the Vector Control Zones with Proof of Freedom  $\geq 0.8$  and from any isolated remnant VRA <400,000 ha and any large-VRA outliers <30km across.



- Within the five large contained areas, current Vector Control Zones were designated as 'Boundary', 'Farmland buffer', 'I-herd Suppression', and 'Unmanaged'. The costs of managing these were assumed to be 0.8, 0.4, 0.2, and 0.0 respectively of the \$9.16/ha/y eradication cost assumed above.
- Livestock and other non-vector costs were assumed to remain static, except the Corporate Services costs declined in proportion to total programme size.

Vector control costs begin to reduce immediately because there is little initiation of management in previously unmanaged areas. The decline plateaus at an in-perpetuity cost of \$21m p.a. Total vector control costs to 2046 (30 years) are similar to those for eradication (\$760m) but total funding costs increase to \$1,420m assuming static testing and disease costs. If testing costs are halved over the next five years, total funding cost is reduced to \$1,360m.

## MODELLING THE DISEASE CONTROL OPTIONS

Disease data from the last 5 years (2009/10 – 2013/14) was analysed to inform predictions of both disease under different scenario options.

The analysis revealed disease is clustered in the core of the VRAs and in particular the South Island VRAs. In particular:

- Large areas classified as vector risk had little or no herds infected by TB possums over the 5 year period.
- Detection of infected livestock was a rare event, where 3.6 animals with TB lesions were detected for every 100,000 animals tested, and 3 animals with lesions detected per 100,000 routinely slaughtered.
- There was a strong gradient of infection towards the core VRAs; meaning that detection rates were much lower (up to 33 times) in the vector free area.
- Half of all newly infected herds were considered to have been directly infected by vectors.
- Indirect infections resulting from movements comprised a third of infections, and the remainder from re-appearance of disease in previously infected herds, or from splitting of herds.

These findings were similar for both dairy and beef herds, although dairy herds showed more movement and recrudescence infection than beef.

### Discussion

The distribution of disease in the core of the VRA and the strong decline in gradient of infection as we move to the VFA supports the fundamental understanding of the epidemiology of bovine TB in New Zealand; that vectors maintain TB and are a reservoir of infection for livestock.

Indirect infection levels indicate that current surveillance in the vector risk core is keeping indirect infection in check. However triennial testing is unrewarding in vector free areas, and is estimated to only detect 6 cattle herds per annum at the cost of approximately 2.5 million tests.

The consequence of not testing in the VFA was considered to be minor in comparison to this investment. NAIT data for 2013-14 indicated that 2.1 million cattle were slaughtered from the VFA. This slaughter surveillance plus a focus on animals entering the VFA from the VRA (risk based testing) is proposed as an alternative. It was considered that this should provide enough protection for the VFA herds, particularly if the vector control strategy chosen targets the core VFA; rather than rolling back the VRA. In targeting the core VRA, vector control would remove the majority of infection from vectors and hence indirect infection from movements.

### Applying the analysis

The herd disease statistics and animal disease statistics in relation to the number of new vector infected herds was used to extrapolate these statistics under the different Plan options. The expected number of incident vector infected herds was predicted under various vector control options and the indirect herd and animal disease statistics were extrapolated from what we have seen in the last 5 years. This makes the assumption that the relationships between direct and indirect infections would remain much the same.

The vector control projections were used to estimate the reduction in TB possums on pasture and vector infected herds for each of the above options over time. The initial small number of I herds and TB animals were reduced to zero over 15 to

25 years in the eradication options or maintained at similar levels under the containment option. The number of primary tests under each option was calculated assuming that:

1. Triennial testing is phased out quickly in the VFA and is replaced by risk based testing.
2. Testing in the all but the core VRA is reduced to reflect risk (100,000 tests were allowed to manage the risk of a breakdown).
3. Testing in the core VRA continues.
4. Slaughter surveillance data for livestock from each area is taken into account.
5. All testing ceases in 4 years after no new vector infected herds are expected.
6. Once NAIT is providing good data on farm to farm movement, risk based testing would be easier to estimate.

## **APPENDIX D: ADDITIONAL DETAILS ON THE PROPOSED LIVE ANIMAL EXPORT TB BIOSECURITY ACT LEVY**

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The actual rate of the levy is proposed to be fixed by TBfree NZ (OSPRI) at any meeting of the directors of TBfree NZ (OSPRI). In fixing the rate of levy, TBfree NZ (OSPRI) must have regard to —

- a. the expected total costs of implementing the TB Plan for the current financial year; and
- b. the share of costs to be funded from the levy as established by agreement between the funding parties; and
- c. the expected number of cattle and deer that will be exported in that year.

As soon as practicable after fixing a rate of levy, TBfree NZ (OSPRI) must notify the rate of the levy—

- a. by notice in the Gazette; and
- b. by notice in the publication *Farmers Weekly* or, where that publication has ceased to be published, a publication for the time being specified for the purposes of this order by the Director-General by notice in the Gazette.

The Ministry for Primary Industries would charge any administration or collection costs directly related to the collection of the Livestock Exports TB Levy to TBfree NZ (OSPRI), and not to livestock exporters.

### **Records relating to levy to be kept**

1. The Ministry for Primary Industries must keep accurate records of the payment and full particulars of the transaction to which the payment related.
2. All such records must be preserved for a period of not less than 2 years from the date they are made.

### **Appointment of arbitrator in case of dispute**

1. If a dispute arises as to—
  - a. whether or not any person is required to pay the levy; or
  - b. the amount of the levy any person is required to pay,—the parties may agree to submit the dispute to arbitration and that agreement is an arbitration agreement for the purposes of the Arbitration Act 1996.
2. If the parties are unable to agree on the appointment of an arbitrator, the arbitrator must be appointed in accordance with Schedule 1 of the Arbitration Act 1996 and, whether by agreement or in accordance with the Arbitration Act 1996, the arbitrator is an arbitral tribunal for the purposes of the Arbitration Act 1996.

### **Procedures and other matters relating to resolution of disputes**

Unless an appeal to the District Court is made, the provisions of the Arbitration Act 1996, including the provisions for procedures to be followed by an arbitral tribunal, apply to the resolution of all disputes submitted to arbitration in accordance with this order.

### **Payment of arbitration costs**

The costs of the arbitration, including the arbitrator's remuneration, must, unless the parties agree otherwise, be determined in accordance with Schedule 2 of the Arbitration Act 1996.

### **Appeal to District Court**

1. Any party to a dispute who is dissatisfied with the decision made by an arbitrator may appeal to a District Court against the decision.
2. The appeal must be brought by the filing of a notice of appeal within 28 days of the making of the decision concerned, or within any longer time as a District Court Judge allows.
3. The Registrar of the court must—
  - a. fix the time and place for the hearing of the appeal, and notify the appellant and other parties to the dispute; and
  - b. serve a copy of the notice of appeal on every other party to the dispute.
4. Every party may appear and be heard at the hearing of the appeal.
5. On hearing the appeal, the District Court may confirm, vary, or reverse the decision appealed against.
6. The filing of a notice of appeal does not operate as a stay of any process for the enforcement of the decision appealed against.

**Remuneration of persons conducting compliance audit**

A person appointed as an auditor under section 100P of the Act must be remunerated by TBfree NZ (OSPRI) at a rate determined by the Minister after consultation with TBfree NZ (OSPRI).

## APPENDIX E: USE OF 1080 FOR POSSUM CONTROL

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Aerial application of 1080 (sodium fluoroacetate) bait for possum control is a key tool for achievement of TB Plan objectives, and also delivers significant biodiversity benefits through simultaneous control of possums, rats and stoats. It is the only possum control tool available to be delivered from the air, enabling rapid, effective and broad-scale control over environments where the terrain or vegetation cover prevent reasonable access for workers on the ground.

The use of 1080 for animal pest management within New Zealand is strictly regulated and controlled under the following legislation:

- Hazardous Substances and New Organisms Act 1996 (HSNO)
- Agricultural Compounds and Veterinary Medicines Act 1997 (ACVM)
- Resource Management Act 1991 (RMA).
- The Health Act 1956 (The Health Act).

HSNO provides the basis for approving the importation, manufacture and use of all vertebrate toxic agents (VTAs) in New Zealand, and is administered by the New Zealand Environmental Protection Authority (EPA). The Act sets out the overarching framework for the management of hazardous substances but the details that guide the management of VTAs are all contained in regulations. In addition to regulations, specific approvals for VTAs under HSNO also include a range of controls to manage the environmental effects and risks of substance use.

ACVM is administered by the New Zealand Food Safety Authority and Ministry for Primary Industries and VTAs such as 1080 need to be registered for use within the New Zealand under ACVM. Product labels, which include conditions to manage use of the products, are developed under ACVM.

Under the RMA a hazardous substance includes, but is not limited to, any substance defined in section 2 of HSNO. Pest control operations that use 1080 and other poisons must comply with the RMA and relevant council plans. Regional Councils are responsible for managing the effects of discharges to freshwater, land, air and coastal waters and to these ends, Regional Councils apply various levels of control on the aerial discharge of 1080.

The Health Act is used to regulate 1080 to protect public health. Restrictions are set by local health authorities, and generally include measures to protect public drinking water supplies and measures to mitigate human health risks, such as establishing buffer zones around poisoning operations. The Ministry of Health (MOH) operates under this Act when setting conditions on HSNO permissions for 1080 use. In practice, the issue and conditioning of permissions is delegated to the public health units of District Health Boards.

### REASSESSMENT OF 1080

In 2006-07 the EPA (formerly the Environmental Risk Management Authority) completed a significant reassessment of 1080. The application was initiated by the former Animal Health Board) and DOC, driven by the following:

- The need for both agencies to increase the use of 1080 to meet Government targets for reducing the levels of TB in cattle and deer herds and support strategies on sustaining biodiversity.
- The completion of significant research on 1080 since it was first registered in 1964.
- The considerable public concerns about the use of 1080, including concerns about the management of its use and its environmental effects.

The application was five years in the preparation, was assessed over a two year period and involved the consideration of more than 1400 public submissions. The process included an extensive analysis of the costs, benefits and risks of using 1080 in reference to the market economy, the environment, society and communities, the relationship of Maori to the environment and human health and safety.

The EPA's assessment of the application concluded that the benefits of 1080 use far outweighed the costs and that there are no practical alternatives to 1080 for the preservation of native bush, biodiversity and the protection of agriculture.

The reassessment decision established a tighter management regime for 1080 use, and aerial use in particular, with four main elements:

1. Strengthened controls to mitigate the range of risks associated with 1080 use and 1080 aerial drops. The controls cover a range of measures to avoid and mitigate potential adverse effects from 1080 use and manage the risks from operations.
2. The establishment of a public watch list that requires annual reporting on all aerial 1080 operations to the EPA. This reporting is publically available.
3. Promotion of best practice amongst all users of 1080 in relation to pre-operation planning, consultation and notification as well as the management of 1080 aerial operations.
4. Recommendations for further research to be undertaken both into alternatives to 1080 for pest control, and areas where there remains a lack of knowledge about the effects of 1080.

The focus of the reassessment controls and the existing regulations is on the management of the risks and adverse effects associated with the aerial 1080 operations including (but not limited to):

- Impacts on non-target native and introduced species – these are managed through a range of controls specifying maximum application rates, bait types, composition of formulations and restrictions around sensitive areas.
- Water quality impacts – managed through controls requiring buffer zones around waterways, especially drinking water sources. Controls may require pre and post operation water quality monitoring.
- Human health – potential human health impacts are managed locally through permission conditions which require operators to avoid sensitive areas such as houses, public accessways and drinking water supplies.
- Cultural values, including iwi values – controls require a range of notification and consultation procedures and include specific requirements to consult with local iwi. Consultation can result in changes to operations to manage any risks and or potential impacts.

#### PARLIAMENTARY COMMISSIONER FOR THE ENVIRONMENT REPORT

In June 2011, the Parliamentary Commissioner for the Environment released a report titled *“Evaluating the use of 1080: Predators, poisons and silent forests.”* The report represents a comprehensive review and analysis of 1080 use in New Zealand and draws on some 200 individual references to reach its conclusions.

The primary conclusion of the report is:

*“It is my view based on careful analysis of the evidence that not only should the use of 1080 continue (including in aerial operations) to protect our forests, but that we should use more of it.”*

The report also noted issues with the regulation of 1080 stating *“a labyrinth of laws and regulations govern the use of vertebrate toxic agents, resulting in unnecessary complexity, confusion, and potential duplication of costs.”*

In light of these findings, the report recommended:

*“The Minister for the Environment investigate ways to simplify and standardise the way 1080 and other poisons for pest mammal control are managed under the Resource Management Act and other relevant legislation.”*

#### CONTINUED USE OF 1080 WITHIN TB PLAN

Despite the positive findings and recommendations of the Parliamentary Commissioner for the Environment, the use of 1080 – particularly in aerial application - remains a matter of some public debate and concern over possible adverse effects. In the context of continued use of 1080 for TB Plan purposes, such matters of public concern must be recognised and carefully managed. This would include:

- Strict application of standard operating procedures to all operations to ensure full regulatory compliance, effective consultation with affected parties and communities of interest, and minimisation of any adverse effects
- Continued focus on technical improvements in bait quality and application methods, with further reduced application rates
- Cooperation with DOC and other parties to maximise biodiversity benefits from TB control operations
- Carefully planned and managed communications to the public, stakeholders and communities of interest about the need for and benefits of targeted 1080 application for TB control and biodiversity management.