TBfree

NATIONAL OPERATIONAL PLAN

2016–2055 NATIONAL BOVINE TUBERCULOSIS PEST MANAGEMENT PLAN

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1. NATIONAL OPERATIONAL PLAN

1.1 EXECUTIVE SUMMARY

This document is the National Operational Plan (NOP) for the National Pest Management Plan (NPMP) for Bovine Tuberculosis. It has been prepared by TBFree New Zealand Ltd (TBfree NZ) as required under Section 100B of the Biosecurity Act 1993 to give operational effect to the Biosecurity (National Bovine Tuberculosis Pest Management Plan) Order 1998 (the Order).

TBfree NZ is the Management Agency for the NPMP pursuant to Section 100 of Biosecurity Act 1993 and Clause 6 of the Order.

Development of this NOP followed a statutory review of the NPMP and consequent amendments to the Order which came into effect on 1 July 2016.

The pest to be managed under the NPMP is *Mycobacterium bovis (M. bovis),* the causal agent of the zoonotic disease bovine tuberculosis (TB).

The amended Order introduced new objectives for the NPMP which in summary are:

- Eradication of *M. bovis* from New Zealand by 2055, with milestone objectives of:
  - TB freedom in cattle and deer by 2026
  - TB freedom in possums by 2040
- Containment of disease in cattle and deer to a national infected herd period prevalence of no more than 0.2% until such time as *M. bovis* is eradicated.
- Livestock disease management approaches towards the achievement of NPMP objectives are based on:
- Surveillance for TB in cattle and deer through routine application of approved diagnostic tests and inspection of carcasses at slaughter premises.
- Controls on the movement of cattle and deer from individual herds or geographic areas of higher TB risk, to prevent transmission of TB from herd to herd via livestock movement.
- Application of test and slaughter plans to eradicate within-herd infection.
- Wildlife vector control, principally of possums, and in some cases ferrets, to prevent wildlife-vectored infection of herds.

Wildlife pest management operations required to meet NPMP objectives involve:

- Intensive possum control within and around designated Vector Risk Areas (VRAs) where it is considered that TB is being maintained in possum populations.
- Surveillance to determine presence/absence of TB in possums or other wildlife.
- Application of a Proof of Freedom (POF) framework in which data is compiled from possum control history, possum population density measures, wildlife disease surveillance and history of wildlife-vectored infection in livestock, which is then analysed to provide a statistical estimate of the probability that the possum population is free of TB .
- The use of POF determinations to guide decisions as to the continuation and intensity of further vector control or surveillance, including decisions to cease active management.

Progress toward achievement of the milestone of TB freedom in livestock will be monitored through annual targets for reduction in the number of TB infected herds, based on stated assumptions.

Progress toward achievement of the milestone of TB freedom in possums will be monitored through annual targets for reduction in the national extent of VRAs, based on stated assumptions.

The NOP will be delivered through sub-division of VRAs into approximately 100 Tuberculosis Management Areas (TMAs). Each TMA is mapped with a defined timeframe for achievement of possum TB freedom, under management plans to be developed for each area.

Key challenges, risks and issues that may impact on achievement of NPMP objectives include those related to:

- Effective implementation of new vector control and pest management approaches sufficiently early in the term of the NPMP.
- Reprioritisation of vector control to maximise cost effective achievement of eradication goals, which may increase the risk of possum-related herd TB breakdowns in the short term.
- Unpredictable TB outbreaks in disease free areas caused by long-distance movement or human translocation of infected wildlife.
- A 1 in 20 chance of incorrect determination of TB freedom in possums, requiring resumption of active control.
- Effective phased implementation of new risk-based livestock TB testing policies, with significant dependencies on NAIT livestock location and movement data.
- Continued availability and acceptance of aerial 1080 baiting for possum control.
- The continuation of funding shares and arrangements as set out in the Order.
- Sufficient access to land where vector management activities are required.
- Assumptions and uncertainty as to the role of ferrets as a TB maintenance host and vector.

The broad quantum of risk is mapped by TMAs and mitigations are outlined.

A range of policies is specified to support delivery of the NPMP, especially where this requires or may lead to the imposition of legal obligations or costs. Inclusion of these within the NOP is based on the possible need for greater clarity or detail than is provided for by the broad legal framework of the Order. These policies describe or provide for:

- Orderly and transparent classifications of organisms and places subject to management.
- Surveillance for, and diagnosis of, TB in livestock and wildlife.
- Procedures for slaughter of livestock when required for disease management and provisions for compensation of owners of such livestock.
- Restrictions on movement of cattle and deer.
- Certain obligations to provide information.
- The use of powers under the Biosecurity Act 1993 for wildlife control and survey.

The inclusion of these policies within the NOP does not preclude further specification of NPMP delivery though subsidiary or related plans or operational procedures.

1.2 INTRODUCTION

Bovine tuberculosis (TB) is a disease of farmed cattle and deer in New Zealand which, if left to spread, it would lead to production losses and animal health issues. This disease can also affect humans. Managing TB 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.

This document is the National Operational Plan (NOP) for the National Bovine Tuberculosis (TB) Pest Management Plan (NPMP). It has been prepared by TBfree New Zealand Limited to meet the requirements for an Operational Plan under Section 100B of the Biosecurity Act 1993. It follows a statutory review of the NPMP in 2015 which led to amendments to the Biosecurity (National Bovine Tuberculosis Pest Management Plan) Order 1998, effective from 1 July 2016.

The 2015 NPMP review found that TB can be eradicated from both farmed cattle and deer herds, and from wildlife species (principally possums) that act as a reservoir and vector of the disease, and determined that eradication of TB from New Zealand should be the overall long term objective of NPMP.

Consequently the NPMP, implemented through an annual National Operational Plan, now aims to achieve TB freedom in livestock in New Zealand by 2026, and TB freedom in possums by 2040. Eradication of *Mycobacterium bovis* (the causal agent of bovine tuberculosis) from New Zealand will be achieved by 2055.

The National Operational Plan provides the detail on how the NPMP objectives will be met, and the key performance indicators against which progress towards the achievement of the objectives will be measured. Operational policies which guide the technical and procedural implementation of TB control activities are documented in Section 4 Operational Policies.

Pursuant to Sections 100B (1) (b) and (c) of the Biosecurity Act 1993, the National Operational Plan is subject to annual review by the Management Agency and any necessary amendments required as a result of such review. This review and amendment process will allow for further development and refinement of operational measures and policies towards effective achievement of NPMP objectives.

This document was prepared by TBfree New Zealand, a wholly-owned subsidiary of OSPRI NZ Ltd, acting as the Management Agency for the National TB Pest Management Plan pursuant to Section 100 of the Biosecurity Act 1993.

2. OBJECTIVES OF MANAGEMENT

2.1 STRATEGIC CONTEXT

The NPMP is implemented through a mix of regulatory and non-regulatory instruments (regulation, operational policies, funding agreements, and area based plans), see Figure 1.

2.1.1 National TB Pest Management Plan

The current NPMP took effect on 1 July 2016 and supersedes the previous Plan, which had a primary objective of eradicating TB from at least 2.5 million hectares of Vector Risk Area (VRA). Progress toward this objective was well ahead of schedule, which led to a fundamental shift in approach – from rolling back and containing the disease, to active eradication in livestock and wildlife.

The primary objective of the NPMP is now the eradication of *M. bovis* from New Zealand by 2055. Key milestones towards this objective are:

- TB freedom in livestock by 2026, and
- TB freedom in possums by 2040.

As at 2016 approximately 8.2 million hectares of New Zealand was classified into 15 different Vector Risk Areas (VRAs) where TB is likely to be present in possums and other wildlife species. TB will need to be eradicated from wildlife within each of these VRAs in order to achieve the primary objective of the NPMP.

The secondary objective is to contain the disease in livestock to a national herd period prevalence <0.2% – the World Animal Health Organisation (OIE) threshold for declaring a country TB free – until such time as the disease is completely eradicated.

The objectives will be achieved through:

- The sound use of a scientific approach to disease management.
- Programmes of work designed for cost-effective disease surveillance (livestock and wildlife).
- Livestock movement controls.
- Management and control of TB in wildlife vectors.

2.1.2 National Operational Plan

This National Operational Plan (NOP) describes the objectives and targets of the NPMP at a more granular and area specific level, and provides measures of progress towards the achievement of these objectives. It also sets out the statutory technical policies and control tactics and methods for implementing the TB Plan.

2.1.3 Area Disease Management Plans

Area Disease Management Plans (ADMP) are multi-year operational plans that set out more specific objectives, targets and operational activity plans that take into account the specific disease management and vector control requirements at a more localised TB Management Area level. The successful implementation of these plans will collectively deliver on the higher level objectives set out in the NPMP and supporting NOP.

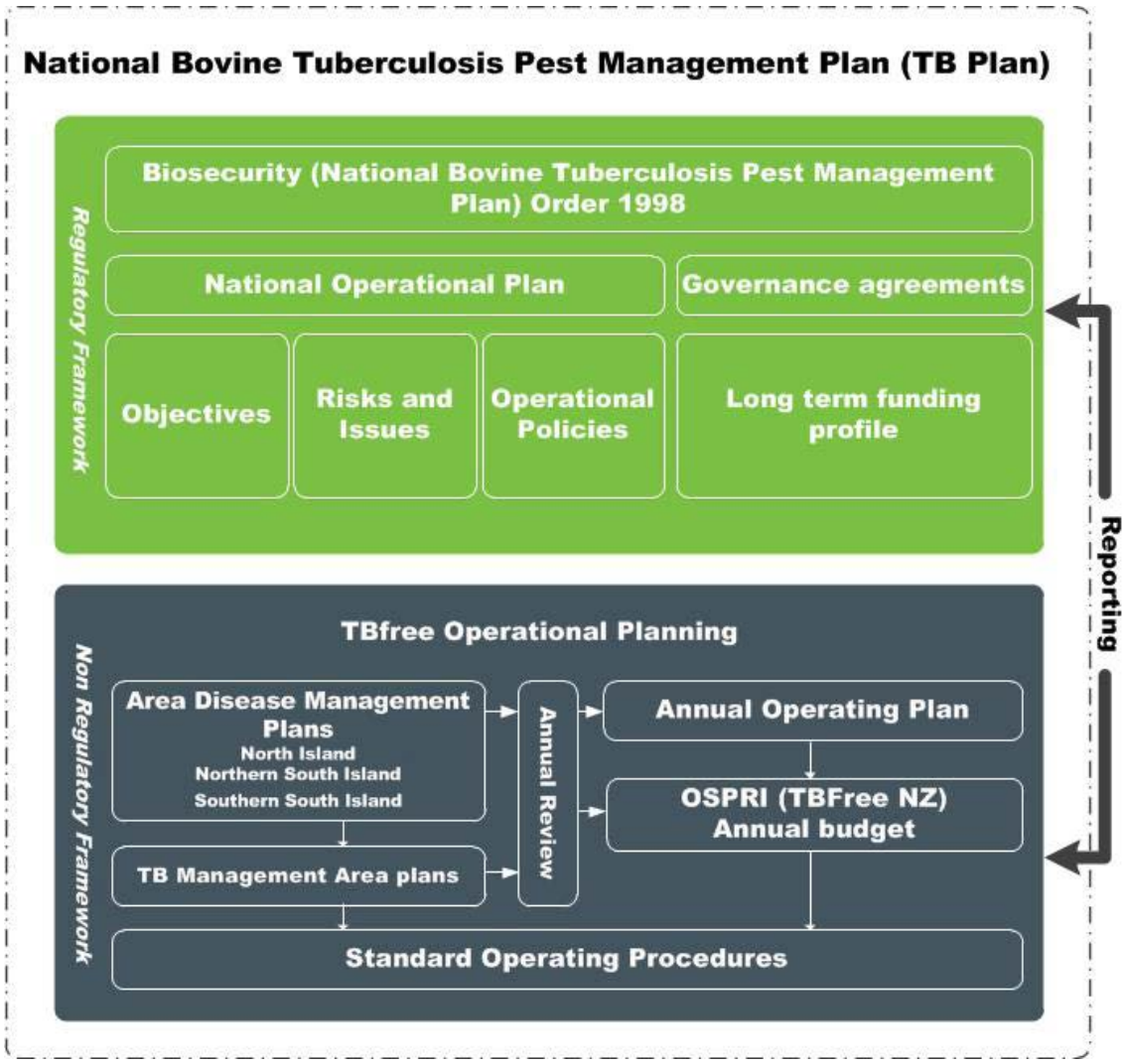


FIGURE 1: The Statutory and Operational hierarchy of the National Pest Management Plan.

2.2 TB DISEASE MANAGEMENT APPROACH

2.2.1 Surveillance

The principal tools for disease surveillance are the routine TB testing of cattle and deer for TB infection, routine surveillance of cattle and deer carcasses through slaughter premises for granulomas, and surveillance of wild animals to detect TB infection. Routine testing of livestock is carried out via the application of approved diagnostic tests that detect the presence of TB. Schedules for routine testing are based on herd location and risk of wildlife infection. Information from wild animal surveys is used to establish the TB status of wildlife populations, provide information for designing the disease and vector control programmes, and to assist in the case for proving an area is free from TB in possums. A risk based livestock testing programme will be incorporated into the surveillance programme in the first 3 years of the plan which will extend the herd risk assessment beyond the current area-based wildlife TB risk.

2.2.2 Movement Control

Movement of cattle and deer from areas or herds with a higher risk of TB infection is controlled to minimise the risk of infection spreading via the movement of infected livestock to other herds and locations. The control of movement is managed through two methods:

- Designated Movement Control Areas (MCAs), and
- Individual herd movement control.

Specific controls on the movement of cattle and deer, irrespective of location, are applied to herds where TB infection has been confirmed, or it is deemed:

- There is a high risk of TB being present,
- TB is suspected, or
- Testing obligations have not been met.

The type of control set will ensure the risk of moving TB infected animals is minimised.

2.2.3 Vector Control

To minimise the transmission of TB to domestic cattle and deer from wild animals that are known carriers of the disease (vectors), possum populations (the main maintenance host) are controlled to low levels. This control is carried out in and around land areas where it is thought that TB is being maintained in the possum population, or in locations where wild animals are under investigation as a possible source of TB infection. In some situations, ferret control may also be required.

2.3 PEST OPERATIONS MANAGEMENT

The plan objective is to eradicate TB from all wild animal populations in land that is currently categorised into 15 Vector Risk Areas (VRAs), and to ensure the continued absence of TB in wildlife in these areas. The VRA land targeted for eradication is located in a number of regions throughout New Zealand. Under the NPMP, the timing of pest operations will be based on the following broad prioritisation principles:

- Ground and aerial possum control to support livestock TB freedom by 2026
- Commencing possum control in as yet uncontrolled high TB risk areas where possum TB freedom will be difficult and take the longest time.
- Ground and aerial possum control to maximise the rate of VRA revocation

early in the new plan when higher annual levels of funding are available.

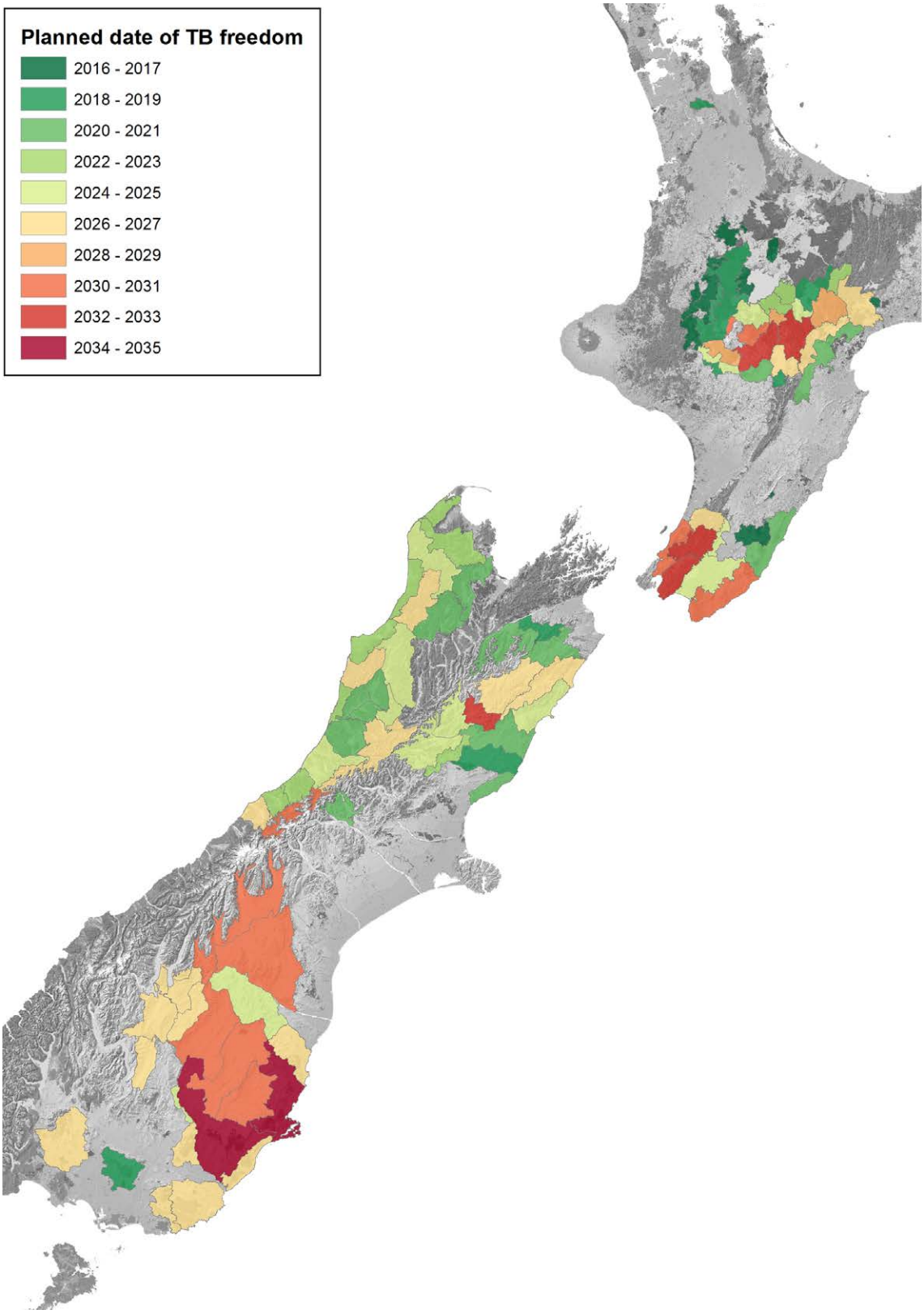
Progress towards eradication of TB from a VRA is measured by the probability that bovine TB has been eradicated from the wild animal population within a defined geographic area. This probability is established within a Proof of Freedom (POF) framework, in which data is compiled on:

- Possum control history
- Possum population density measures
- Surveys for the presence/absence of TB in possums and other wildlife
- Results from TB tests of any cattle or deer herds in the vicinity.

This data is analysed using epidemiological and ecological models, developed to provide a statistical estimate of the probability that the possum population is TBfree. The calculated probability guides the pest control and wildlife surveillance activities that are conducted within the VRA. Control activities take place when the probability of TB freedom in possums is low, and surveillance activities take place when the probability of TB freedom in possums is high. The POF determinations guide decisions as to the continuation and intensity of further vector control or surveillance, including decisions to cease active management.

Once a VRA has met the statistical requirements (known as POF stopping rule) for possum TB freedom, it is reclassified as a Vector Free Area (VFA).

Pest operations will be planned through a division of VRAs into TB Management Areas (TMAs) at a sub-regional level. This will enable possum control, and disease surveillance to be contracted in an efficient manner utilising scales of economy, while still maintaining areas at a manageable size in relation to the disease; i.e. similar methods of control and surveillance can be used in an area. TMAs are therefore contiguous areas with similar epidemiological and geographical characteristics. Each TMA will have an approximate planned target date for eradication, as indicated in Map 1. Each TMA will in turn comprise of one or more Vector Control Zone(s) (VCZ) within which specific vector control, monitoring or wildlife disease surveillance activities may be carried out, and for which a site-specific Proof of Freedom determination may be made.



MAP 1: Planned timeframes for TB freedom in possums in TMAs across New Zealand 2016–2035.

TABLE 1: Planned reduction of infected herds for the period 2016–2026, calculated at the commencement of the plan year.

NUMBER OF INFECTED HERDS	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
North Island	11	10	6	5	4	4	3	2	2	1	0
Northern South Island	19	17	16	16	11	9	6	6	3	2	0
Southern South Island	13	10	7	6	5	4	4	4	1	1	0
Total	43	37	29	27	20	17	13	12	6	4	0

2.4 NATIONAL OPERATIONAL PLAN OBJECTIVES AND TARGETS

This section outlines the planned objectives at the start of the National Operational Plan. Actual reductions will be monitored in Key Performance Indicator reporting.

2.4.1 TB freedom in livestock by 2026

The first National Pest Management Plan (NPMP) primary objective milestone is to achieve TB freedom in domestic livestock populations by 2026. While the term TB freedom is defined under clause 5(1A) of the Biosecurity (National Bovine Tuberculosis Pest Management) Plan Order 1998, a proxy measure of the number of infected status herds will be used to assess progress toward this milestone.

The projected reduction in infected herds is based on the following assumptions:

- Adequate funding is provided for the required level of possum control in key VRAs where possum infection is still the principle cause of new herd TB breakdowns or persistence of infection in existing infected herds.
- The proposed Risk Based Testing framework for the more efficient and effective targeting of livestock TB surveillance effort towards area risk, residual animal/herd risk and movement risk is implemented and fully operating within the first three years of the National Pest Management Plan.
- An efficient and effective individual animal attribute, tracking and traceability system is fully operational within the first three years of the NPMP to enable animals-of-interest, at risk of harbouring TB infection, to be quickly found and managed.
- Movement to slaughter-only for infected status herds (for existing and new breakdowns) is implemented within the first 12 months of the NPMP.
- Some herds that have been previously cleared of infection prior to the commencement of the NPMP will have recurrent breakdowns, but this will progressively diminish as residual infection is detected under a Risk Based Testing framework.
- Robust and cost-effective parallel testing technology is available and used on all infected herds prior to clearance, thus minimising the risk of residual infection persisting post-clearance.
- Slaughter surveillance sensitivity is at an optimum level to detect true TB infection if present.

TABLE 2: Expected VRA reduction over the plan period 2016-2036, as calculated at the beginning of the plan.

TOTAL VRA (M HECTARES)	2016	2018	2020	2022	2024	2026	2028	2030	2032	2034	2036
North Island	2.12	1.69	1.33	1.26	1.11	0.84	0.67	0.44	0.34	0	0
Northern South Island	3.13	3.13	2.70	1.81	0.97	0.53	0.11	0.11	0.06	0	0
Southern South Island	2.95	2.92	2.92	2.92	1.86	1.86	1.86	0.53	0.53	0.53	0
Total	8.20	7.74	6.95	5.99	3.94	3.23	2.64	1.08	0.93	0.53	0

- TB will be re-detected in possum populations in some Vector Control Zones (VCZs) after they have been declared TB free, but this is expected to occur in fewer than 1 in 20 cases. In addition, surveillance processes are expected to detect infection before TB can escalate within the wider livestock population.
- Infrequent possum TB cases (no more than one every five years based on Mt Algidus and Mt Cargill outbreaks) are expected to occur in VFAs. Surveillance processes will detect these quickly, and a rapid eradication response will be implemented before the disease can escalate within the wider livestock population.

2.4.2 TB Freedom in possums by 2040

The second primary objective milestone is to achieve TB freedom in possums by 2040. While the term TB freedom is defined under clause 5(1A) of the (National Bovine Tuberculosis Pest Management) Plan Order 1998, a proxy measure of the number of VRA hectares will be used for the second milestone.

The projected reduction in VRA hectares is based on the following assumptions:

- Funding available for the pest management programme within the NPMP is consistent with both the total amounts and annual cash-flows projected within the 2015 TB Plan Review proposal.
- Pest programme design and planning is effective and consistent with the requirements of TBfree's Pest Management Design Guidelines.
- Implementation of the pest programme through efficient and cost-effective delivery mechanisms continues.
- The use of aerial 1080 baiting for possum control remains available throughout the term of the NPMP.
- Required timely access to land for ground and aerial control activities is ensured.
- A plan of continuous improvement that is in-line with OSPRI's Annual Operating Plan and Research and Development processes is implemented within the first 12 months of the NPMP, incorporating pest programme design, and programme delivery.
- TB will be re-detected in some VCZs after they have been declared TB free, but is expected to occur in fewer than 1 in 20 cases, and surveillance processes will detect this before the disease can escalate within the wider wildlife population.
- Infrequent possum TB cases (no more than one every five years based on Mt Algidus and Mt Cargill outbreaks) are

TABLE 3: Planned possum TB Freedom timeframes for North Island Vector Risk Areas.

VRA NAME	VRA HECTARES	VRA POSSUM TB FREEDOM DATE
Central North Island	1,397,585	2033
North Waikato	13,365	2018
Southern North Island	708,327	2033

expected to occur in VFAs. Surveillance processes will detect these quickly, and a rapid eradication response will be implemented before the disease can escalate within the wildlife population.

2.4.3 National Annual Infected Herd Period Prevalence

The National Pest Management Plan secondary objective is to contain the disease in livestock to a national annual infected herd period prevalence of < 0.2% until such a time as the disease is fully eradicated.

2.5 REGIONAL OBJECTIVES AND TARGETS

For the purposes of this National Operational Plan, New Zealand is divided into three regions, each with specific strategic objectives that will contribute to the overall national strategic objective. The three regions contain the individual Vector Risk Areas (VRAs) which are in turn made up of TB Management Areas (TMAs). Each TB Management Area has an operational plan and objectives for TB freedom in possums. The section below outlines, via maps and tables, the possum TB freedom timeframes of each of the regions and the respective TMAs.

2.5.1 North Island

The North Island contains two major VRAs (Central North Island; Southern North Island) and the smaller North Waikato VRA. These collectively total 2.12 million hectares. These VRAs are made up of one or more management units (TMAs) each of which will have a prescribed operational strategy[1] to achieve:

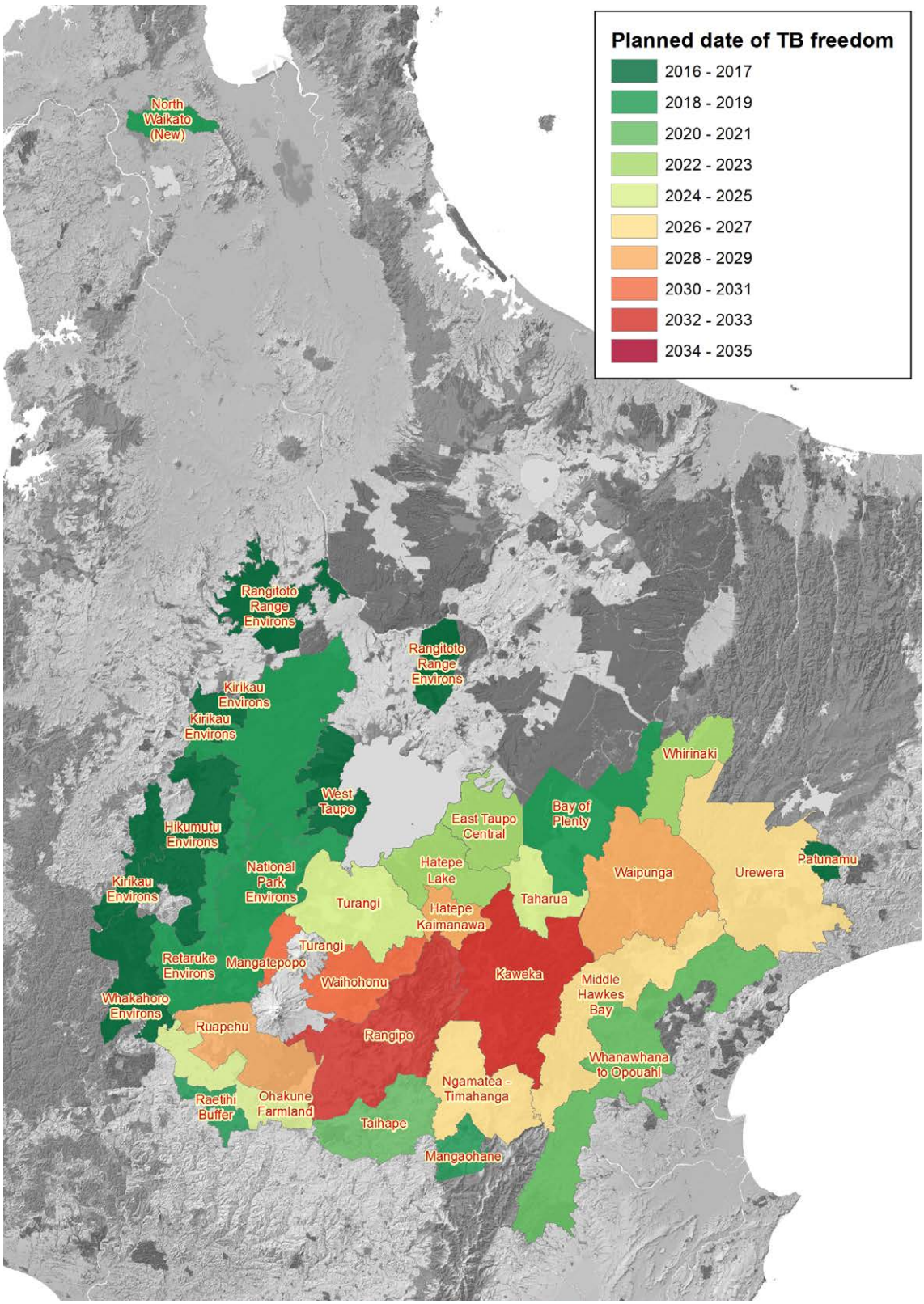
- Livestock TB freedom by 2026 (if applicable),
- Possum TB freedom by 2040, and
- Biological eradication of TB from livestock and wildlife by 2055.

Each TMA will have a target date for the achievement of possum TB freedom. When the last TMA within a VRA reaches possum TB freedom, the VRA will have reached possum TB freedom.

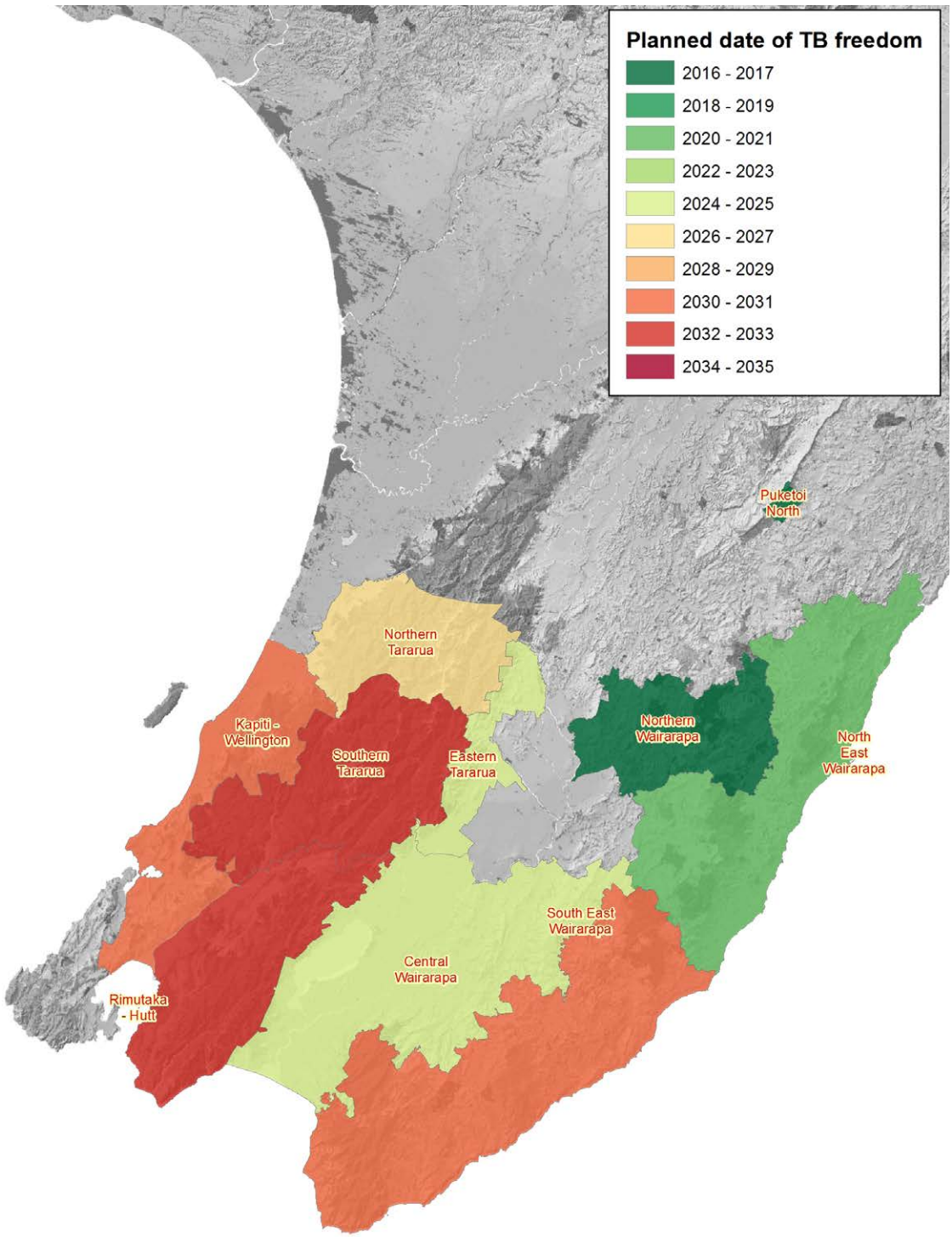
North Island TMAs are shown in Maps 2 and 3, and the respective VRA target dates for possum TB freedom are shown in Table 3.

Note: More detailed information on planned TB freedom in possums for individual TB Management Areas can be found in Appendix 1 – Page 103.

1 Details of the prescribed operational strategies for each TMA are contained in the North Island Bovine Tuberculosis Disease Management Plan.



MAP 2: Map of Central North Island and North Waikato TB Management Areas and planned timeframes for TB freedom in possums 2016–2035



MAP 3: Map of Southern North Island TB Management Areas and planned timeframes for TB freedom in possums 2016–2035.

TABLE 4: Planned possum TB Freedom timeframes for Northern South Island Vector Risk Areas.

VRA NAME	VRA HECTARES	VRA POSSUM TB FREEDOM DATE
North Canterbury/Marlborough	1,266,858	2033
Rolleston Range	55,648	2020
West Coast/Tasman	1,812,616	2031

2.5.2 Northern South Island

The Northern South Island contains two major VRAs (West Coast-Tasman; North Canterbury-Marlborough) and the smaller Rolleston Range VRA. These collectively total 3.13 million hectares. These VRAs are made up of either one or more management units (TMAs), each of which will have a prescribed operational strategy[2] to achieve:

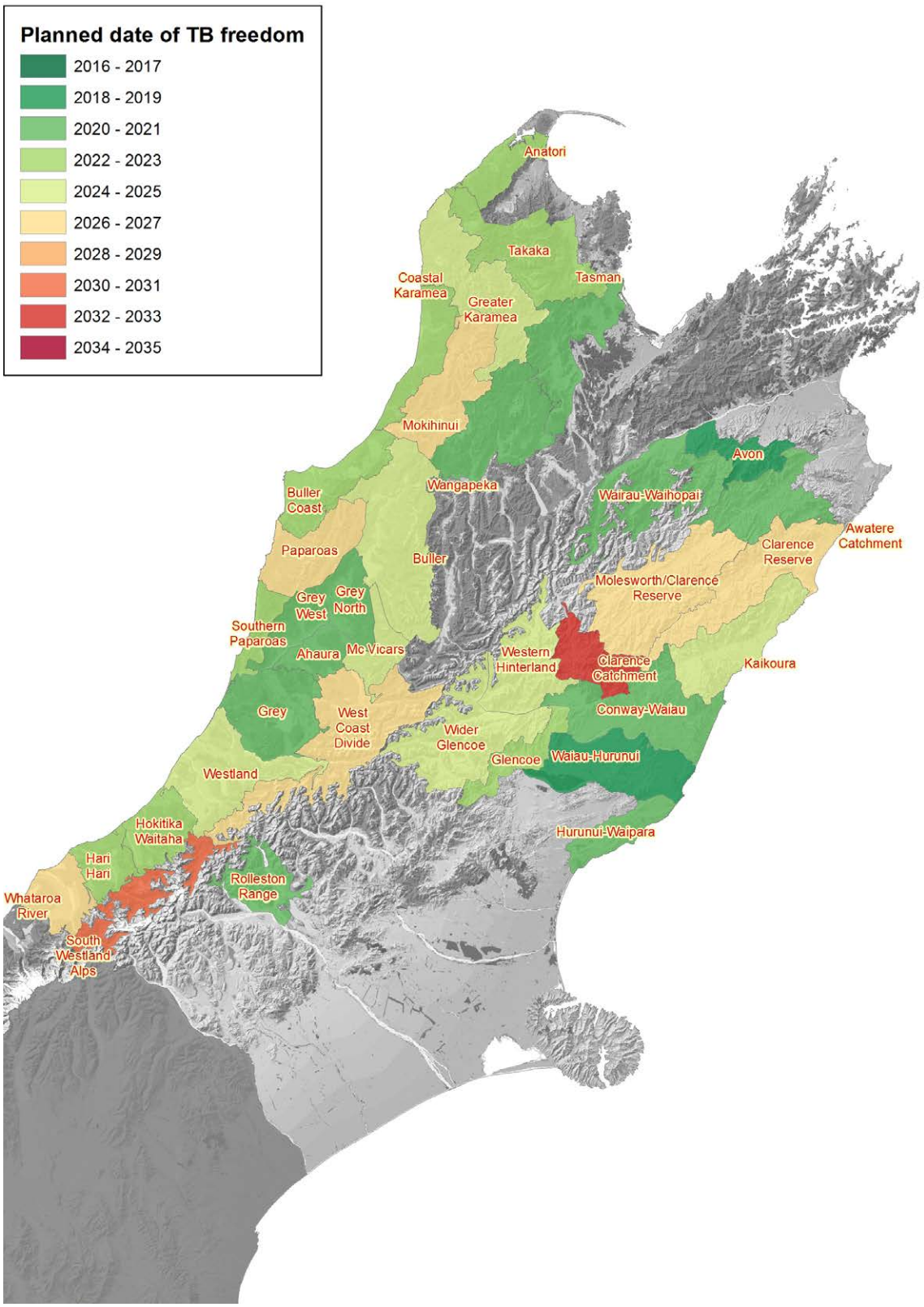
- Livestock TB freedom by 2026 (if applicable),
- Possum TB freedom by 2040, and
- Biological eradication of TB from livestock and wildlife by 2055.

Each TMA will have a milestone date for the achievement of possum TB freedom. When the last TMA within the VRA reaches possum TB freedom, the VRA will have reached possum TB freedom.

Northern South Island TMAs are shown in Map 4 and the respective VRA milestone dates for possum TB freedom are shown in Table 4.

NOTE: More detailed information on planned possum TB freedom for individual TMAs can be found in Appendix 2 – Page 105.

2 Details of the prescribed operational strategies for each TMA are contained in the Northern South Island Bovine Tuberculosis Disease Management Plan.



MAP 4: Northern South Island TB Management Areas and planned timeframes for TB freedom in possums 2016–2035.

TABLE 5: Planned possum TB freedom timeframes for Southern South Island Vector Risk Areas.

VRA NAME	VRA HECTARES	VRA POSSUM TB FREEDOM DATE
Blue Mountains	43,084	2026
Catlins	230,197	2026
Hokonui Hills	27,184	2018
Nevis	61,795	2026
Otago	1,522,833	2035
Pisa	126,704	2026
Roxburgh	6,594	2024
South Canterbury	797,317	2030
Western Southland	131,494	2026

2.5.3 Southern South Island

The Southern South Island contains two major TB VRAs (Otago; South Canterbury) and seven medium-to smaller sized VRAs (Blue Mountains; Hokonui Hills; Pisa; Catlins; Nevis; Roxburgh; Western Southland). These collectively total 2.95 million hectares. These VRAs are made up of one or more management units (TMAs) each of which will have a prescribed operational strategy[3] to achieve:

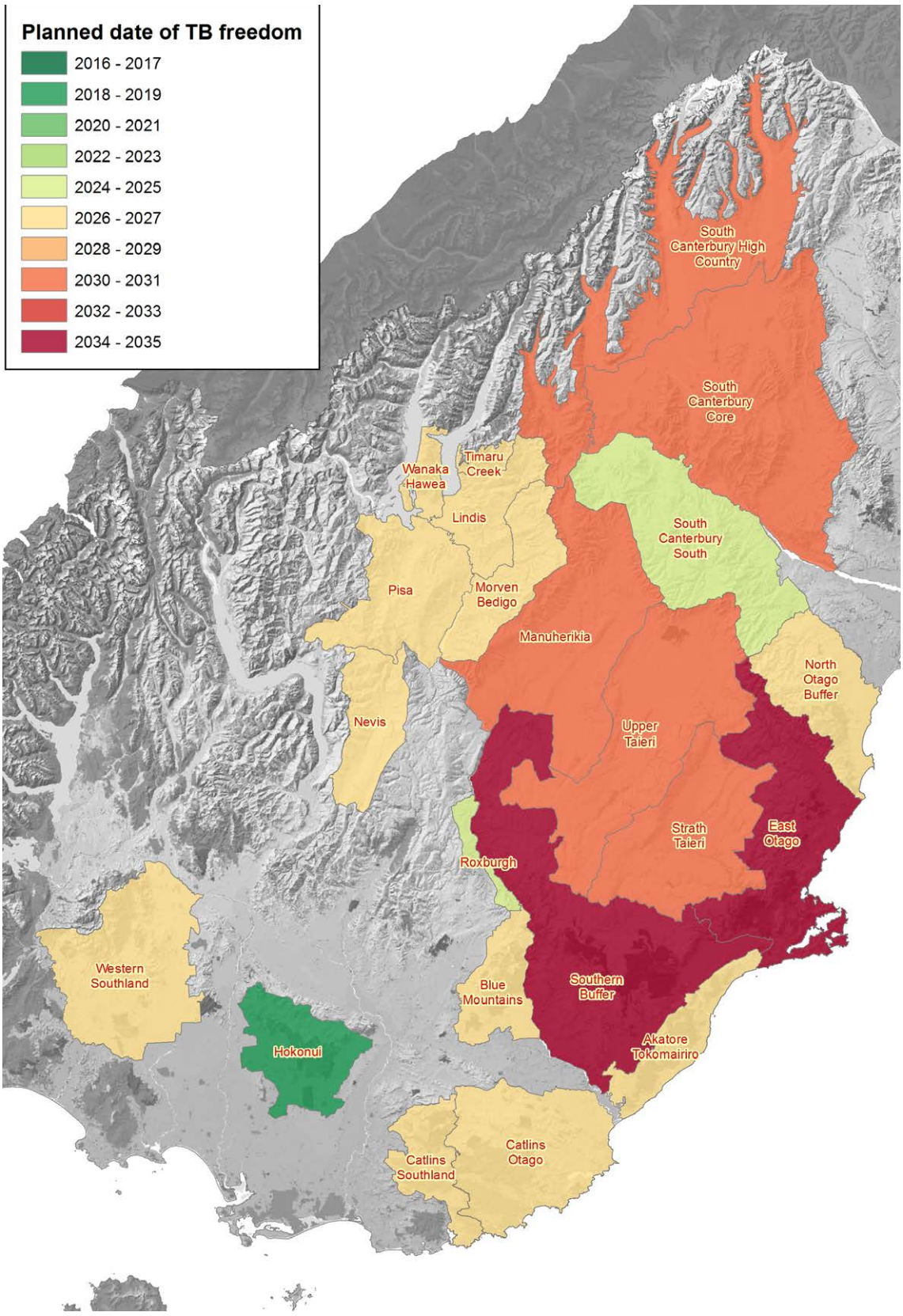
- Livestock TB freedom by 2026 (if applicable),
- Possum TB freedom by 2040, and
- Biological eradication of TB from livestock and wildlife by 2055.

Each TMA will have a milestone date for the achievement of possum TB freedom. When the last TMA within a VRA reaches possum TB freedom, the VRA will have reached possum TB freedom.

Southern South Island TMAs are shown in Map 5 and the respective VRA milestone dates for possum TB freedom are shown in Table 5.

Note: More detailed information on planned possum TB freedom for individual TMAs can be found in Appendix 3 – Page 106.

3 Details of the prescribed operational strategies for each TMA are contained in the Southern South Island Bovine Tuberculosis Disease Management Plan.



MAP 5: Southern South Island TB Management Areas and planned timeframes for TB freedom in possums 2016–2035.

2.6 REVIEWING AND REPORTING

The successful implementation of the NPMP will be assessed against achievement of plan objectives within the following cascading geographic hierarchy:

- The statutory objectives and associated milestones contained in clause 5 of the Biosecurity (National Bovine Tuberculosis Pest Management Plan) Order 1998.
- The National Operational Plan objectives and targets contained in section 2.4 of the National Operational Plan.
- Area Disease Management Plan objectives and targets for the North Island, Northern South Island and Southern South Island.
- TMA objectives and targets within each Area Disease Management Plan.

While the TB freedom milestones for the primary NPMP objective are defined under clause 5(1A) of the Order-in-Council, proxy measures for possum TB freedom (hectares of VRA) and livestock TB freedom (number of infected status herds) will be used. Objectives and targets for these proxies will be set respectively in the National Operational Plan, the Area Disease Management Plans and in the TMA plans.

Possum TB freedom is determined at Vector Control Zone level through the results of control and surveillance activity combined to achieve a predetermined probability level that possums are TB free, objectively assessed through the Proof of Freedom (POF) utility, or similar methodology for deriving the probability. When each Vector Control Zone within a TMA has achieved the predetermined probability of freedom, the possum population within the TMA will be deemed to have achieved TB freedom; when the possum population of all the TMAs that together comprise the VRA have achieved the predetermined probability of TB freedom, the possum population within the VRA as a whole will be deemed to have achieved TB freedom.

A formal process for review and reporting on the achievement of objectives, milestones and targets will developed for each level within the planning hierarchy. This includes Board reporting. Progress towards the achievement of the secondary objective of the NPMP, i.e. to contain the disease in livestock to a national herd prevalence of less than 0.2% until such a time as the disease is fully eradicated, will be tracked nationally and reported in the annual National Operational Plan review and the Annual Report.

It is likely that additional measures and Key Performance Indicators, e.g. herd TB breakdown/clearance rates, numbers of reactor animals and their status at post-mortem, and pest management activity measurements, will be required as components of the governance agreements between TBfree New Zealand and its funders/stakeholders. These will be documented within these separate agreements and be reported in the annual report to ensure that stakeholders and the wider public are informed on progress relative to milestones and targets.

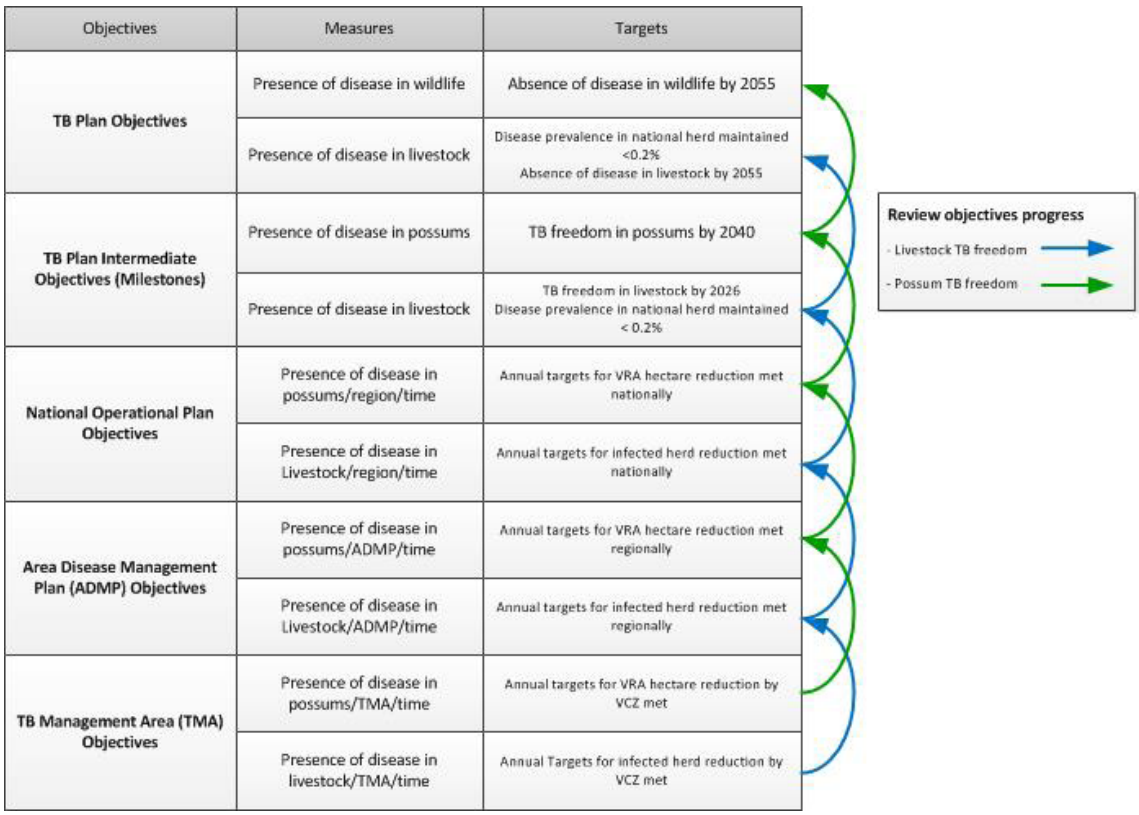
There will also be additional goals and objectives to be reviewed and reported on within OSPRI's Annual Operating Plan.

Any significant changes in operational and policy matters specified within the NOP will be introduced and documented through annual review (and amendment where necessary) of the NOP pursuant to Sections 100B (1) (b) and (c) of the Biosecurity Act 1993. This will allow for further development and refinement of operational measures and policies towards effective achievement of NPMP objectives.

FIGURE 2: Planning Hierarchy and Objectives

PLANNING HIERARCHY AND OBJECTIVES		
TB Plan Objectives	Eradication of TB in wildlife and livestock by 2055. Disease prevalence in national herd maintained < 0.2% period prevalence	
TB Plan intermediate objectives (milestones)	TB freedom in possums by 2040	TB freedom in livestock by 2026
National Operational Plan objectives	VRA reduction objectives	Infected herd reduction objectives
Area Disease Management Plan objectives	VRA reduction objectives by ADMP	Infected herd reduction targets by ADMP
TB Management Area objectives	VRA reduction objectives by TMA	Infected herd reduction targets by TMA

FIGURE 3: National Pest Management Plan objectives, measures, reporting and review framework.



3. RISKS AND ISSUES

3.1 CHALLENGES, RISKS AND ISSUES

There are a number of challenges, risks and issues that may impact on the achievement of the plan objectives.

3.1.1 Challenges to implementation of new vector control and disease management approaches

There is a risk that TBfree New Zealand will not be able to implement the proposed changes in vector control and disease management soon enough (particularly within the first three years of the amended TB Plan) to achieve the milestones and eradication objective in the timeframes set.

We consider that this risk can be effectively mitigated by:

- A planned 'health check' by TBfree New Zealand and funding parties after the first two years of implementing the amended TB Plan;
- Efficiencies gained through removal of a previous funding model which constrained funding allocation to specific regions or programme outputs;
- Heads of Agreement arrangements with funders has included the planned 'health check' and strong commitment by funders to supporting TBfree New Zealand's implementation of the new approaches;
- Increased emphasis on monitoring and surveillance to inform adaptive decision-making in vector control; and
- A less risk-averse approach to probability of freedom decisions, allowing vector control to be stopped earlier.

3.1.2 Risk of increased incidence of herd TB breakdowns

Changing the vector control priorities will enable a quicker and more cost-effective route to eradication of TB from infected possum populations in New Zealand. It nevertheless does carry a higher risk of some possum-related disease breakdowns occurring in herds in those areas not prioritised for immediate control. However, research has identified that it is cheaper to control these breakdowns when they occur, rather than undertaking control across all risk areas until they are declared TB free.

The intensity and frequency of these breakdowns will be monitored and the resulting information used to adjust vector control strategy and plans if necessary.

3.1.3 An outbreak occurs in Vector Free Area

Experience has shown that there is a pattern of new outbreaks in VFAs occurring approximately once every 5 years. The most recent outbreaks have occurred at Mt Algidus in 2011 and Mt Cargill in 2016.

These outbreaks can be caused by unpredictable factors such as:

- Infected non-vector wildlife (deer/pigs) travelling large distances before dying and spreading infection into VFA
- Human activities, such as hunters unwittingly translocating and releasing infected game animals into a VFA

Such outbreaks are expected periodically and the risk of wide spread infection is expected to be largely mitigated by detecting it through routine slaughter surveillance of cattle and farmed deer. Once found, localised wildlife control and whole herd testing will be used to first contain and then eradicate the infection. Publicity and advocacy will be aimed at discouraging risky translocation of game animals by hunters.

3.1.4 Failure of previously eradicated Vector Free Area

The amount of wildlife surveillance conducted is intended to be cost effective and it cannot

be 100% precise, which predicates that there will some incorrect determinations of TB freedom in possums. The current 'stopping rules' for surveillance are modelled in such a way that failure to detect TB when present in the possum population is expected to occur in fewer than 1 in 20 Vector Control Zones.

Detection of any failure may take considerable time after the area's VRA status has been revoked, as immediately following control the possum population density will be low. It will take time for possum density to increase to a level where it will be able to express any residual infection and for it to be detected by routine surveillance of livestock or wildlife. In the previous 5 years there has yet to be a recorded failure.

The risk of periodic wildlife TB detection failures is partially mitigated by livestock slaughter surveillance and wildlife surveys in selected areas, followed up by localised wildlife control where TB is detected.

3.1.5 NAIT and risk based testing

Under the previous plan, different TB livestock testing policies were applied across broad geographical areas based on associated infected wildlife TB risk. The current plan will target livestock TB testing to smaller geographic areas, or to specific herds or cohorts of animals, using 'risk-based testing'. To implement this concept, TBfree New Zealand will undertake detailed design work for a new methodology over the first 3 years of this plan. The methodology will take into account the risk of disease posed by the herd's location, its previous history of TB and movement of stock. This will include modelling work, design of a testing framework that can be applied in practice, provision of clear explanations and guidance to farmers, and changes to existing contract arrangements for testing. A key feature of risk-based testing will be the use of livestock animal movement data to inform the appropriate TB testing policy for individual herds, because the extent and pattern of this movement are important determinants of TB risk. NAIT livestock location and movement data will, therefore, play a key role and will be required to be timely and accurate. Given a number of policy and implementation issues to work through, risk-based testing will be phased in.

3.1.6 Continued use of 1080 within the TB Plan

The plan is based on the continued availability of aerial 1080 baiting or practical cost-effective alternatives for possum control. It is planned that the move to eradication will require a significant increase in the amount of aerial 1080 usage over the next five years. After this time, the use of aerial 1080 for TB control purposes is expected to fall away very quickly to zero by 2030. Ground control is neither a practical nor an economically viable alternative for aerial 1080 control of possums in many areas.

It is also noted that there have been considerable improvements in aerial control methods, baiting technology and reduced levels of bait use over the years, which are expected to continue. Science reviews have supported this view. Research is currently being undertaken into alternative toxins that, subject to the results of further research and assessment work, may at some time in the future be approved for aerial application. Research and new technologies have also identified improvements for multi-species ground control. It is expected that the new technologies and tools will be adopted into future work programmes.

Until they are available and found to be cost-effective, the safeguards for the use of 1080 and other toxins for possum control will continue to be applied. These safeguards principally operate through the Hazardous Substances and New Organisms Act 1993, and include requirements to obtain approval for most 1080 operations from the local Medical Officer of Health. TBfree New Zealand will continue to ensure that 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, to see if toxic bait application rates can be reduced further;
- Cooperation with Department Of Conservation (DOC) and other parties to maximise biodiversity benefits from TB control operations; and
- 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.

3.1.7 Vector control funding provided is less than the assumed estimates

The design of the proposed vector control and wildlife surveillance programme has been based on an agreed annual funding amount.

Any reduction in funding will result in an inability to meet aspects of the vector control programme and may impact on the ability to achieve targets or milestone within the NPMP objectives.

The impact of any fund reduction, and the effects of inflation, may be mitigated by improvements in the effectiveness and efficiency of operations.

3.1.8 Access to land

Access to land is crucial to the success of ground and aerial vector control activities. Any inability to access land within a VRA limits the effectiveness of possum control, which must achieve uniformly low and even possum densities without gaps in land coverage.

Any sections of land where access is denied may continue to harbour populations of possums at a high enough density to maintain infection. Any remaining clusters of TB possums pose a potential source of infection to neighbouring cattle and deer herds, other wild animals and, through migration, adjacent TB free possum populations.

Where land access is critical to meeting NPMP objectives, then use of legal powers may be required to ensure the prescribed level/form of control is achieved.

This risk can be mitigated by maintaining a high level of consultation with landowners, including education into the benefits of achieving consistent even control of possums.

3.1.9 Ferrets as a significant TB maintenance host

The implicit assumption within the NPMP is that possums are the only wildlife host capable of independently sustaining TB for more than a few years. That crucial fundamental assumption has been valid for the majority of Vector Risk Areas. In those areas where there has been some doubt as to the role of ferrets in the TB transmission cycle, historically there has not been an objective or funding for full eradication.

With the influence of Rabbit Haemorrhagic Disease (RHD) waning, both rabbit and ferret numbers in large parts of South Island VRAs are again high, meaning that it is possible that in some areas ferret densities now probably exceed the TB persistence threshold. There are also a number of recent observations in the Southern South Island suggesting that TB is indeed persisting in ferrets but not in possums.

If so, then the current operational paradigm of implementing or continuing intensive possum control whenever TB is found in ferrets is likely to be both ineffective and wasteful. This will be exacerbated if ferrets are not simultaneously subject to control

TABLE 6: Quantum of risk at the TB Management Area level.

RISK CATEGORY	NUMBER OF TMAS AFFECTED	HECTARES
Landowner access issues due to 1080	30	2,085,329
Geographical Complexity	15	1,173,909
Proximity to urban areas	2	132,446
Access to passive wildlife surveillance data	2	222,156
Low risk to operational objectives	2	2,620,300
Ferrets as a maintenance host	11	1,967,462

because there would be no eradication pressure on TB infection in ferrets, thereby allowing TB to continue to persist or decline only slowly, therefore placing the eradication objective at risk.

This risk will be mitigated by undertaking applied research and operational studies into the epidemiology of TB in ferrets as a maintenance host of TB in several areas of the Southern South Island. If proven to be a significant maintenance host of TB, further studies into effective means of controlling ferret populations will become a research priority.

3.1.10 Risks at the TB Management Area Level

Localised risks which could impact individual operations include:

- Landowner access issues due to 1080 – areas where individual landowners are potentially denying use of aerial application of 1080 on their land and there are no other cost-effective means of controlling possums.
- Concerns from hunting groups – areas where there is a risk of non-target by-kill impacting on recreational activity.
- Geographical complexity– areas which due to their habitat/topography cause difficulties in the implementation of even possum population reduction.
- Ferrets as a TB maintenance host – areas where ferret densities are high enough to self-sustain TB infection for long periods in the absence of concurrent possum TB infection.
- Proximity to urban areas – control in peri-urban areas where there are a large number of residential properties adjacent to continuous forested areas.
- Access to passive wildlife surveillance data including the legality and ability of accessing hunting post mortem records from helicopter hunting companies.

4. OPERATIONAL POLICIES

4.1 POLICY 1
LIVESTOCK AND HERD CLASSIFICATION

Policy	To effectively manage the control of bovine TB in individuals and groups of cattle and deer, individual animals and herds will be classified according to TB risk or to facilitate management. Any proposed variations to policy specifications must be approved by the National Disease Manager. During the term of this Operational Plan, new animal and herd classifications will be phased in to support the introduction of risk-based testing and disease management policies which will take account of more detailed risk analysis based on herd and animal location, disease history and livestock movement patterns.
Implementation Statement	The following classifications for individual cattle and deer, and herd status will be applied: **Cattle and deer** • In-contact animal • Reactor • Test-positive animal • Test-negative animal • Tuberculous animal • Animal of interest **Herd status** • Infected status, followed by a sequential numerical index. • Clear status, followed by a sequential numerical index. • Suspended status.
Specifications	**1. Classification of Cattle and Deer:** 1.1 In-contact animal: An animal that is suspected of having been in contact with a reactor or tuberculous animal. 1.2 Reactor: An animal that is positive to an approved TB test or tests and which is directed to be slaughtered. Such animals are to be identified with official Reactor ear tags up to the time of slaughter.

Specifications

1.3 Test-positive animal:
An animal that responds to an approved test with a positive result to that test at specified criteria. Such animals are to be identified with official Reactor ear tags which are to be removed under Management Agency direction when animals are subsequently negative to one or more ancillary TB test(s).

1.4 Test-negative animal:
An animal which is deemed negative to an approved test under specified criteria for that test.

1.5 Tuberculous animal:
Cattle or deer will be classified as tuberculous (infected with TB) when any of the following apply to that animal:

1.5.1 Lesions histologically typical of TB are identified at slaughter

1.5.2 *Mycobacterium bovis* has been cultured or identified by PCR test

1.5.3 An animal is positive to at least two different approved TB tests

1.5.4 A test-positive animal is slaughtered or dies without an approved post mortem examination carried out by a registered veterinarian, an official assessor under the Animal Products Act 1999 who has attained competency in necropsy for the particular species, or any other person who has demonstrated competency in post mortem technique and lymph node identification for the particular species through a training programme acceptable to the Management Agency.

1.6 Animal of interest:
Cattle or deer may be classified, identified and their movements traced as animals of interest. Such classification will be based on herd infection, testing results or location history, to enable further testing or management of such animals throughout their lifetime.

2. Classification of Herd Status:

2.1 Infected Status:

2.1.1 An Infected TB status will be applied to a herd in which tuberculous (see 1.5) cattle or deer have been diagnosed and, in respect to that herd, information available from subsequent testing or inspection of carcasses of animals is not sufficient to exclude the likelihood that bovine tuberculosis remains in animals within the herd.

2.1.2 A herd's Infected TB status will numerically increase to reflect the number of years that the herd remains infected.

2.1.3 For herds under test, a herd will remain with an Infected TB status until the completion of two clear whole herd tests of eligible animals at a minimum interval of six months following the slaughter of any tuberculous cattle or deer, unless section 2.1.5 applies.

For cattle herds the second clear whole herd test must include a clear caudal fold test, and may require a clear parallel blood (Bovigam™) test as provided for under the Infected Herd Case Management Best Practice.

Specifications

2.1.4 For herds under slaughter surveillance, a herd will remain under an Infected TB status until at least 12 months after the slaughter of the last tuberculous cattle or deer, provided 100% of in-contact animals have either been slaughtered or tested clear.

2.1.5 Infected cattle herds being forced to move as a result of farm sales or legally-binding agreements (e.g. sharemilker agreement) may be eligible for the Short Interval Testing (SIT) procedure to enable the herd to move to a clear status within a shorter timeframe than in 2.1.3 above. Approval to apply the SIT procedure to an infected herd must come from the National Disease Manager. SIT procedures will be documented in the Infected Herd Case Management Best Practice.

2.1.6 For any infected herd, if subsequent testing, e.g. DNA-typing of non-*Mycobacterium bovis* strains, indicates TB is no longer, or never was, present in the herd, the herd can be classified as Clear. Such cases should be discussed with the National Disease Manager before moving to a Clear status.

2.2 Clear Status:

2.2.1 A Clear TB status will be applied to herds that have neither an Infected nor Suspended TB status.

2.2.2 Once a herd has been free of any evidence of TB, based on use of standard TB testing techniques over a minimum period of 18 months (one year after reaching Clear 1 status) the herd status will change to Clear 2 (C2).

2.2.3 For all herds under test, a Clear herd's status will numerically increase at each successive clear whole herd test by the number of whole years between tests, to a maximum of Clear 10 (C10).

2.2.4 For drystock herds which are predominantly non-breeding herds (usually less than 25% of adult animals being breeding stock) the Clear herd status will be described as Clear Monitored (CM).

2.2.5 For Game Estate herds (as defined in Policy 9 Game Estate Herds) the Clear herd status will be described as Clear Monitored (CM).

2.3 Suspended Status:

2.3.1 A Suspended (S) TB status may be applied to Clear status herds under any of the following conditions:

2.3.1.1 TB reactors are awaiting slaughter and uncontrolled stock movements from that herd may present an infection risk to other herds

2.3.1.2 Test-positive cattle or deer have no visible TB lesions when slaughtered but there is epidemiological evidence to suggest the animal(s) are infected with TB

2.3.1.3 Cattle or deer are found with lesions histologically typical or suspicious of TB at slaughter

Specifications

2.3.1.4 Test-positive animals have not been re-tested or slaughtered as directed by an Authorised Person

2.3.1.5 Whole herd tests have not been completed as directed by an Authorised Person

2.3.1.6 There has been contact with an Infected status cattle or deer herd, or with cattle or deer of unknown or unconfirmed TB status, including during the formation of a new herd.

2.3.1.7 Cattle or deer from an Infected status herd have been introduced into the herd.

2.3.2 A herd will remain with a Suspended status until either the herd owner has complied with a directive issued by an Authorised Person, or the Area Disease Manager is satisfied the herd is not infected with TB.

2.4 Establishing Herd Status:

2.4.1 All newly created herds will be assigned a status of Suspended (S) unless the founding herd includes any stock from an Infected herd. When a founding status of S is applied, the S status will apply until a Clear whole herd test has been completed, at which point the herd status will be set at C2 or CM according to herd type.

2.4.2 Herd owners may apply to the Management Agency for a higher herd status if they can demonstrate that all of the founding stock originated from herds of higher status.

2.4.3 If the newly created herd includes stock moving from an Infected status herd, the initial herd status should be set as per policies for movement control restrictions in infected cattle and deer herds (see Policy 12 clauses 4.2 to 4.7 and Policy 13 clauses 4.2 to 4.7)

2.4.4 If the newly created herd is made up entirely of stock moving from an Infected status herd, the initial herd status should be set to Infected.

2.4.5 Apart from the circumstances covered by policies 12 and 13, if more than 25% of a herd is made up of introduced stock, then its status should be that of the lowest status of the animals being introduced.

4.2 POLICY 2
DISEASE CONTROL AREA CLASSIFICATIONS

Policy

To enable effective application of livestock testing and movement control measures, geographical areas will be classified according to disease risk, which includes risk of infection from wildlife (vector) sources. These areas are referred to as Disease Control Areas.

Any proposed variations to policy specifications must be discussed with the National Disease Manager.

During the term of this Operational Plan, new animal and herd classifications will be phased in to support the introduction of risk-based testing and disease management policies which will take account of more detailed risk analysis based on herd and animal location, disease history and livestock movement patterns.

Implementation Statement

Three classes of Disease Control Area will be created. Details of these areas will be described in Management Agency plans which will be reviewed and updated annually. The Disease Control Area classes are as follows:

Movement Control Areas

The purpose of these areas is to control the risk of transmission of TB through cattle or deer movements and provide surveillance for the presence of infected vector species via an intensive testing programme. Defined parts of Movement Control Areas may be further classified as High Risk Movement Control Areas to enable the application of additional livestock movement or testing requirements.

Special Testing Areas

These areas have the purpose of providing additional TB surveillance, mainly to detect the presence and location of TB wild animals.

Surveillance Areas

These areas contain the balance of New Zealand's land area outside of Movement Controlled Areas and Special Testing Areas and are free of known or suspect TB wild animals.

General herd testing and movement control policies for each Disease Control Area class are described in Policy 8.

Specifications

1. Movement Control Areas

Criteria for defining a Movement Controlled Area will be based on a smoothed infected herd TB prevalence of ≥ 1.00% for a spatially defined area such as 64 km^2 grids.

Further classification of Movement Control Areas as High Risk Movement Control Areas will take account of further analysis of the density of Infected herds, concurrent identification of infected wildlife and DNA strain typing of *M. bovis* cases in livestock and wildlife.

Consideration is to be given to herd management factors when defining the boundary.

When declaring a new Movement Controlled Area, or when extending an existing one, the annual herd period prevalence must be expected to remain above the minimum criteria at 1.1 above for at least 12 months after the declaration of the area.

Consideration for revoking part or all of a Movement Controlled Area can be made when the smoothed infected herd TB prevalence, based on a spatially defined area (64 km2 grids) falls below 1.00% and is not expected to exceed this level in the next 12-month period.

Movement Controlled Areas will be legally declared pursuant to Section 131 of the Biosecurity Act 1993.

2. Special Testing Areas:

2.1 Special Testing Areas will be created in or adjacent to areas where TB exists or is suspected in wild animal populations but which do not meet the herd infection prevalence criteria for establishing a Movement Control Area. They may also be created where there is uncertainty as to whether herd breakdowns are related to wild animal infection or other factors, where there is an industry requirement for additional testing of herds, or following the revocation of the VRA status of VCZs as a means of providing assurance that the possum (or ferret) population is TB free.

2.2 The size and boundaries of Special Testing Areas will take account of historic information on presence of TB vectors, the extent of relevant vector habitat, movement patterns of likely TB vectors, geographic features that may affect the movement of vectors and the history of vector control or surveillance.

2.3 When a Special Testing Area is established where there is uncertainty as to whether herd breakdowns are related to wild animal infections or other factors, the special requirements will be applied for a limited and defined period (2–3 years) during which the period prevalence within the defined Special Testing Area should return to 0.2% or less.

3. Surveillance Areas:

3.1 Surveillance Areas will make up the balance of New Zealand's land area outside of Movement Controlled Areas and Special Testing Areas. They are free of and beyond the likely natural migration range of known or suspect TB wild animals.

3.2 Within Surveillance Areas, herd TB surveillance will be carried out with sufficient intensity to detect infection in herds caused by possible movement of infected livestock or translocation of infected wildlife into the area.

4.3 POLICY 3
CLASSIFICATION OF VECTOR RISK AREAS

Policy	New Zealand's land area is classified according to the presence or absence of TB in wildlife. This classification will be used as a geographic descriptor for the purposes of reporting progress towards the achievement of plan objectives and the design of vector control programmes. Any proposed variations to policy specifications must be discussed with the National Disease Manager.
Implementation Statement	This policy will provide for classification of New Zealand's land area into one of two classes: • TB Vector Risk Area • TB Vector Free Area
Specifications	1. TB Vector Risk Areas are those areas of New Zealand where any one of the following conditions apply: 1.1 The finding of *Mycobacterium bovis* infection which persists in a maintenance host (usually possums). 1.2 The finding of *Mycobacterium bovis* infection in both wild animal(s) and domestic livestock, where there is evidence that they are of a related DNA strain type, within the vicinity of where the infected wild animal was found, taking into account the host status of the wild animal species. 1.3 There is a clustering of infected cattle/deer herds both in time (up to 3 years) and space (up to 5 kms from the boundary of one infected herd to another) and there is an absence of other non-vector related factors for these breakdowns. 2. The boundaries of Vector Risk Areas will take account of the ecology of the suspect/confirmed TB vectors, the presence or absence of natural barriers to movement of vectors in relation to relevant infected herds and the estimated time TB has been present in the wild animal population. 3. Revocation of a Vector Risk Area classification will be considered when the Probability of Freedom (PFree) from TB in the possum population, as assessed via the Proof of Freedom Framework, or similar proven methodologies, exceeds the prescribed Pfree percentage set for the area-of-interest under consideration. 4. TB Vector Free Areas will be all areas of New Zealand outside of the TB Vector Risk Areas.

4.4 POLICY 4
APPROVED TB TESTS FOR LIVE CATTLE AND DEER

Policy	Diagnostic tests for TB must be approved by the Chief Technical Officer (CTO) of the Ministry for Primary Industries. The CTO may approve tests for a specific purpose, such as to restrict the use of a test or allow the test to be used for the purpose of research. Approved TB tests may only be applied by Inspectors, Authorised Persons or Accredited Persons who are appointed under the Biosecurity Act 1993, or by veterinarians who may in the ordinary course of their work apply approved TB tests when diagnosing illness in an animal. Any variations to testing specifications must be approved by the National Disease Manager. All tests and test results are to be recorded and reported in a format prescribed by the Management Agency. Reporting times and procedures stated in this document are indicative and may be varied in contract agreements between the Management Agency and its service providers.
Implementation Statement	Diagnostic tests will be applied to live cattle and deer for the following purposes: • To obtain surveillance data on the presence or absence of TB in cattle and deer herds • As screening tests to limit the risk of TB transmission via movements of cattle and deer • To eradicate TB from herds or groups of cattle and deer through test and slaughter programmes usually applied under an Infected Herd Management Plan • To provide an interim diagnosis of TB where necessary for legal implementation of further TB control measures. • Diagnostic tests are functionally classified as follows: • Primary Tests: generally applied as initial surveillance or screening tests in cattle and deer herds • Serial Ancillary Tests: generally applied to primary test-positive cattle and deer to provide more reliable diagnosis and to reduce unnecessary slaughter where the primary test has produced false positive results • Parallel Ancillary Tests: generally applied to identify suspected infection in primary test-negative cattle or deer.

Implementation Statement

The following diagnostic tests are approved for live cattle and deer:

Diagnostic tests in cattle

Primary Tests:

- Caudal Fold Test
- Comparative Cervical Test

Serial Ancillary Tests:

- Standard Bovigam® (Interferon-gamma) Test
- Special Antigen Bovigam® (ESAT-6/CFP10 Interferon-gamma) Test
- Comparative Cervical Test

Parallel Ancillary Tests:

- Bovigam® (Interferon-gamma) Test
- Special Antigen Bovigam® (ESAT-6/CFP10 Interferon-gamma) Test

Diagnostic tests in deer

Primary tests:

- Mid Cervical Test.
- Comparative Cervical Test.

Ancillary Serial Tests:

- Comparative Cervical Test.
- IgG1 ELISA (ETB)
- Modified-ETB

Ancillary Parallel Tests:

- ELISA.

NB: With diagnostic tests conducted on the live animal, care must be exercised in testing animals that may be in an immuno-compromised state, e.g. late pregnancy, early lactation, poor condition, etc. Testing should be avoided in breeding females 3 weeks before and/or 3 weeks after giving birth.

Test Specifications

1. Caudal Fold Test (CFT) – Cattle

1.1 The Caudal Fold Test (CFT) is approved as a primary diagnostic test for tuberculosis in cattle.

1.2 The test is not to be applied to any cattle beast within 60 days of any previous tuberculin test (either another Caudal Fold Test or Comparative Cervical Test).

1.3 The test may be applied in either the animal's right or left caudal fold.

1.4 The test is applied by the intradermal injection of 0.1 ml of bovine tuberculin into the caudal fold. The intradermal blebs are to remain visible for a minimum of 30 seconds after injection in all cattle injected.

1.5 A testing syringe capable of delivering 0.1ml accurately and consistently must be used.

1.6 The tuberculin to be used on cattle is to be bovine purified protein derivative (PPD) tuberculin, registered for use in New Zealand by the MPI ACVM Group.

1.7 The National Disease Manager will determine any variation from the registered concentration of tuberculin to be used in any intradermal diagnostic tests in herds with an Infected or Suspended status.

Test Specifications

1.8 The caudal fold skin test is to be read 72 hours (± 6 hours) after the injection of tuberculin.

1.9 A test-positive result of the CFT is any palpable or visible reaction at the site of the injection.

1.10 All test-positive animals are either to be ancillary serial tested with an approved test, or declared reactors and slaughtered at the direction of the Area Disease Manager.

1.11 Test results are to be recorded and submitted as required by the Management Agency within 5 working days of the testing episode if no test-positives are detected, or to the Area Disease Manager within one working day if test-positives are detected, unless the Area Disease Manager directs otherwise.

2. Comparative Cervical Test (CCT) – Cattle

2.1 The Comparative Cervical Test (CCT) is approved for use both as a primary test and as an ancillary serial test in cattle. While the CCT will remain as an approved test for the purposes of the NPMP, routine use has essentially been discontinued.

2.2 The CCT can only be used as a primary test in cattle with the approval of the National Disease. Manager.

2.3 The test is not to be applied to any cattle beast within 60 days of any previous tuberculin test (either a CFT or CCT).

2.4 The test is applied in the middle of the neck (i.e. the mid cervical region) using 2 injection sites.

2.5 The hair at the each site is to have a mean length of 2 mm and is to be evenly clipped.

2.6 Each injection site is to be a minimum size of 100 x 100 mm and the distance between the centres of each site is to be a minimum of 120 mm.

2.7 Prior to the injection of tuberculin, the thickness of a double skin fold at each site is to be measured (to the nearest 0.5 mm) and recorded.

2.8 The test is to use 0.1 ml of bovine tuberculin and 0.1 ml of avian tuberculin injected intradermally, using testing syringes capable of delivering 0.1 ml accurately and consistently. Separate syringes must be used for the avian and the bovine tuberculins.

2.9 The tuberculins are to be purified protein derivatives (PPD) and registered for use in New Zealand by the MPI ACVM Group.

2.10 The bovine and avian tuberculins to be used in the CCT are to be biologically balanced.

2.11 The avian tuberculin is to be injected into the centre of the anterior or dorsal site and the bovine tuberculin into the centre of the posterior or ventral site (i.e. the rule: avian over bovine).

2.12 The intradermal blebs are to remain visible for a minimum of 30 seconds after injection in all cattle injected.

2.13 The CCT is to be read 72 hours (± 6 hours) after the injection of tuberculins.

Test Specifications

2.14 The test is to be read by re-measuring the double fold skin thickness at each of the injection sites. The result of these measurements may be interpreted in one of two ways.

2.15 **Standard Interpretation:** A positive test is any reaction at the site of the bovine injection that is greater than any reaction at the site of the avian tuberculin.

2.16 **Modified Interpretation:** A positive test is any reaction at the site of the bovine tuberculin which is at least 4 mm larger than the reaction at the site of the avian tuberculin.

2.17 When measuring the size of reactions, callipers with an accuracy of ± 0.5 mm are to be used.

2.18 When the CCT is applied as an ancillary serial test, all test-positive animals are to be declared reactors and slaughtered.

2.19 Where the CCT has been approved for use as a primary test, test-positive animals may be ancillary serial tested with an approved test at the direction of the Area Disease Manager.

2.20 Test results are to be recorded and submitted as required by the Management Agency within 5 working-days of the testing episode if no test-positives are detected, or to the Area Disease Manager within one working day if test-positives are detected, unless directed otherwise by the Area Disease Manager.

3. Standard Bovigam (ancillary serial) – Cattle

3.1 The test is restricted for use in cattle positive to a Caudal Fold Test (CFT) unless specifically approved by the National Disease Manager for use as a primary test.

3.2 The test may be applied any time on or after read day of the CFT, however it is desirable that the test is conducted no later than 33 days following the inject day of the CFT.

3.3 The test requires that at least 5 mls of blood is taken in a heparin tube and submitted for culture within 30 hours of collection. Until bloods are processed, they are to be kept between 10 and 26oC.

3.4 Using absorbencies multiplied by 1000, the interpretation of the Bovigam test is as follows:
Positive: Bovine antigen minus Avian antigen is ≥ 100.
Negative: Bovine antigen minus Avian antigen is < 100.

3.5 Standard Bovigam testing is to be completed and the results are to be reported to the submitter, within 5 working days of receipt of samples by the laboratory.

3.6 A copy of the report should also be dispatched to the Area Disease Manager, if different from the submitter, within the same working day.

3.7 All test-positive animals are to be declared reactors and slaughtered.

4. ESAT-6/CFP10 Interferon-γ (Special Antigen Bovigam) Test – Cattle

4.1 The Special Antigen Bovigam (SA Bovigam) Test is approved as an ancillary serial test in cattle, unless specifically approved by the National Disease Manager for use as a primary test.

Test Specifications

4.2 Subject to the approval of the National Disease Manager, the SA Bovigam may also be used as an ancillary parallel test.

4.3 Unless otherwise approved by the National Disease Manager, the SA Bovigam Test should only be used on CFT-positive animals from a herd that is not located in a VRA, has had no history of TB for a minimum of three years and where there is no evidence of movement of risk animals into the herd or the movement of the herd to risk areas for a minimum of 3 years.

4.4 Heparinised blood samples (8 mls minimum, i.e., full 10 ml tube) for the SA Bovigam Test are to be taken any time on or after read day of the CFT, however it is desirable that the test is conducted no later than 33 days following the inject day of the CFT.

4.5 Test interpretation will be based on the results of the difference between the absorbency readouts of the ESAT-6/CFP10 antigen stimulated cultures and the control (i.e. Nil) cultures, with a cutpoint of 0.04. As with the Standard Bovigam, the absorbency reading will be multiplied by 1,000 and interpreted as follows:
Negative: ESAT-6/CFP10 antigen minus Nil <40 OD units.
Positive: ESAT-6/CFP10 antigen minus Nil ≥ 40 OD units.

4.6 SA Bovigam testing is to be completed and the results are to be reported to the submitter within 5 working days of receipt of samples by the laboratory.

4.7 A copy of the report should also be dispatched to the Area Disease Manager, if different from the submitter, within the same working day.

4.8 All test-positive animals are to be declared reactors and slaughtered.

5. Bovigam (ancillary parallel) test:

5.1 This test is only to be used on cattle which are negative to a Caudal Fold Test (CFT) unless specifically approved by the National Disease Manager for use as a primary test.

5.2 The test may be applied any time on or after read day of the CFT, however it is desirable that the test is conducted no later than 33 days following the inject day of the CFT.

5.3 Collection, handling and processing of bloods should be undertaken as outlined in Section 3.3.

5.4 The result, in terms of high and medium risk animals, will be set, as follows:
High risk: Bovine-Avian ≥ 70;
Medium risk: Bovine-Avian < 70 and ≥ 40

5.5 Parallel Bovigam testing is to be completed and the results are to be reported to the submitter within 7 working days of receipt of samples by the laboratory for parallel testing.

5.6 A copy of the report should also be dispatched to the Area Disease Manager, if different from the submitter, within the same working day.

5.7 The Area Disease Manager must obtain National Disease Manager approval before declaring reactors**.**

Test Specifications

6. Mid Cervical Test (MCT) – Deer

6.1 The Mid Cervical Test (MCT) is approved for use as a primary TB test.

6.2 The test is not to be applied to any deer within 90 days of any previous tuberculin test (either another Mid Cervical Test or CCT).

6.3 The test may be applied on either side of the animal's neck in the mid cervical area.

6.4 The hair at the injection site is to have a mean length of 2 mm and is to be evenly clipped.

6.5 The site where the injection is to be placed is to have a minimum size of 100 x 100 mm.

6.6 The test is applied by injecting 0.1 ml of bovine tuberculin intradermally. The intradermal blebs are to remain visible for a minimum of 30 seconds after injection in all deer injected.

6.7 A testing syringe capable of delivering 0.1ml accurately and consistently must be used.

6.8 The tuberculin is to be a purified protein derivative (PPD) and registered for use in New Zealand by the MPI ACVM Group.

6.9 The National Disease Manager will determine any variation from the standard concentration of tuberculin to be used in deer.

6.10 The Mid Cervical test is to be read 72 hours (± 6 hours) after the injection of tuberculin.

6.11 A positive test is any palpable/visible reaction at the site of the injection. Hard nodular or rice grain reactions which are less than 5 mm in diameter and the skin thickness difference is less than 2 mm, are to be classified as being negative to the test.

6.12 All test positive animals will either be ancillary tested with an approved test, or be declared reactors and slaughtered, at the direction of Area Disease Manager.

6.13 Test results are to be recorded and submitted as required by the Management Agency within 5 working days of the testing episode if no test-positives are detected, or to the Area Disease Manager within one working day if test-positives are detected, unless directed otherwise by the Area Disease Manager.

7. Comparative Cervical Test – Deer

7.1 The Comparative Cervical Test (CCT) may be used both as a primary test and as an ancillary serial test in deer.

7.2 The CCT is not approved for use in herds with either an Infected or Suspended status (where the suspension is the result of a suspect TB case or the owner/manager has failed to slaughter/retest TB positive deer as directed) unless authorised by the National Disease Manager.

7.3 The test is not to be applied to an animal within 90 days of any previous tuberculin test (either a MCT or CCT).

7.4 The test is applied in the middle of the neck (i.e. the mid cervical region).

Test Specifications

7.5 The hair at each injection site is to have a mean length of 2 mm and is to be evenly clipped.

7.6 Prior to the injection of tuberculin, the skin thickness of a double skin fold at each site is to be measured (to the nearest 0.5 mm) and recorded.

7.7 Each injection site is to be a minimum size of 100 x 100 mm and the distance between the centres of each of site, is to be a minimum of 120 mm.

7.8 Prior to the injection of tuberculin, the thickness of a double skin fold at each site is to be measured (to the nearest 0.5 mm) and recorded.

7.9 The test is applied by injecting 0.1 ml of bovine tuberculin intradermally at the ventral site and 0.1 ml of avian tuberculin intradermally at the dorsal site, using testing syringes capable of delivering 0.1ml accurately and consistently. Separate syringes must be used for the avian and for the bovine tuberculins.

7.10 The bovine and avian tuberculins to be used in the CCT are to be biologically balanced.

7.11 The tuberculins are to be purified protein derivatives (PPD) and registered for use in New Zealand by the MPI ACVM Group.

7.12 The avian tuberculin is to be injected into the centre of the anterior or dorsal site and the bovine tuberculin into the centre of the posterior or ventral site.

7.13 The intradermal blebs are to remain visible for a minimum of 30 seconds after injection.

7.14 The CCT is to be read 72 hours (± 6 hours) after the injection of tuberculins.

7.15 The test is to be read by re-measuring the double fold skin thickness at each of the injection sites.

7.16 A positive test is any reaction at the site of the bovine tuberculin which is 2 mm or more and this reaction is equal to or greater than any reaction at the site of the avian tuberculin.

7.17 Where the CCT has been used as a primary test, test-positive animals may be ancillary serial tested with an approved test at the direction of the Area Disease Manager.

7.18 Where the CCT has been used as an ancillary serial test, all test-positive animals are to be declared reactors and slaughtered.

7.19 Test results are to be recorded and submitted as required by the Management Agency within 5 working-days of the testing episode if no test-positives are detected, or to the Area Disease Manager within one working day if test-positives are detected, unless directed otherwise by the Area Disease Manager.

8. IgG1 ELISA (ETB) Test – Deer

8.1 A serial IgG1 ELISA is approved for use as an ancillary serial test for deer positive to the MCT.

8.2 MCT-positive animals are to be re-tested in the period 13 to 33 days following injection of tuberculin.

Test Specifications

8.3 Bloods are to be drawn using plain blood tubes from the MCT-positive deer and must reach the laboratory within 24 hours of being drawn.

8.4 Test interpretation is to be based on the difference between the bovine and avium read-outs with two levels of interpretation:
Negative: (< 20);
Positive: (≥ 20).

8.5 Positive animals are to be declared reactors and slaughtered.

8.6 Testing is to be completed and the results are to be reported to the submitter and to the Area Disease Manager, if different from the submitter, within 8 working days of receipt of samples by the laboratory.

9. Modified ETB Test – Deer

9.1 The Modified ETB is approved for use as an ancillary serial test for deer positive to the MCT.

9.2 The Modified ETB test shall only be applied to MCT-positive deer that have not been brought into the herd within the previous 12 months, and are

from a Clear 5 or higher status deer herd located in a Surveillance or Special Testing Area;

or

from a Clear 5 or higher status deer herd located in a Movement Control Area after assessment and approval by the National Disease Manager who may require further supplementary testing.

9.3 MCT-positive deer are to be bled in the period 13 to 33 days following injection of tuberculin.

9.4 Bloods are to be drawn using plain blood tubes from the MCT-positive deer and must reach the laboratory within 24 hours of being drawn.

9.5 A deer is considered **positive** to the Modified ETB if:

Bovine PPD OD – Avian PPD OD ≥ 20; and

the MPB70 titre is greater than or equal to 50; or

the paratuberculosis titre is less than or equal to 50; or

the ELISA titre to bovine PPD minus the paratuberculosis PPAs is equal to or greater than 0.

9.6 A deer is considered **negative** to the Modified ETB if:

Bovine PPD OD – Avian PPD OD < 20; or,

the MBP70 titre is less than 50; and

the paratuberculosis titre is greater than the bovine titre; and

the paratuberculosis titre is greater than 50.

Test Specifications

9.7 Positive animals are to be declared reactors and slaughtered.

9.8 Testing is to be completed and the results are to be reported to the submitter within 8 working days of receipt of samples by the laboratory.

9.9 A copy of the report should also be submitted to the Area Disease Manager, if different from the submitter, within the same working day.

10. ELISA – Deer

10.1 The ELISA TB Test is approved for use as an ancillary parallel test on deer negative to the MCT.

10.2 Bloods are to be drawn using plain blood tubes from deer which have been injected with a MCT 13 to 33 days previously.

10.3 Bloods are to reach the laboratory within 24 hours of being drawn from the deer.

10.4 Criteria for interpreting an ELISA test in deer are:

Bovine Positive:

The ELISA reactivity to M. bovis antigen minus the ELISA reactivity to M. avium antigen is > 20; or

The ELISA reactivity to M. bovis antigen minus the ELISA reactivity to M. avium antigen is > 10 and the reactivity to ELISA MPB70 antigen is > 10

Negative:

The ELISA reactivity to M. bovis antigen minus the ELISA reactivity to M. avium antigen is < 10.

10.5 Testing is to be completed and the results are to be reported to the submitter and to the Area Disease Manager, if different from the submitter, within 8 working days of receipt of samples by the laboratory.

10.6 All bovine positive animals are to be declared reactors and slaughtered.

4.5 POLICY 5
POST-MORTEM DIAGNOSTIC TESTS FOR CATTLE, DEER AND WILDLIFE

Policy

Diagnostic tests for TB, including post-mortem diagnostic procedures, must be approved by the Chief Technical Officer (CTO) of the Ministry for Primary Industries. The CTO may approve tests for a specific purpose such as to restrict the use of a test or allow the test to be used for the purpose of research.

Approved TB tests may only be applied by Inspectors, Authorised Persons or Accredited Persons who are appointed under the Biosecurity Act 1993, by persons conducting tests on any blood, serum or tissue in an approved diagnostic laboratory, or by veterinarians who may in the ordinary course of their work apply approved TB tests when diagnosing illness in an animal.

Any variations to testing specifications must be approved by the National Disease Manager.

All tests and test results are to be recorded and reported in a format prescribed by the Management Agency. Reporting times and procedures stated in this document are indicative and may be varied in contract agreements between the Management Agency and its service providers.

Implementation Statement

Post-mortem tests to diagnose TB will be applied to samples from slaughtered cattle and deer to confirm preliminary diagnosis of TB obtained from tests on live animals or from post-mortem inspection of carcasses. Post-mortem tests will also be applied to samples from wildlife species to assist in confirming the presence or absence of TB in wildlife populations.

The following post-mortem diagnostic tests are approved:

- Histopathological examination to detect lesions of bovine tuberculosis in domestic animals and wildlife.
- Methods for culturing *Mycobacterium bovis* and other mycobacterial species in domestic animals and wildlife.
- Polymerase Chain Reaction (PCR) tests for the detection of mycobacteria in tissues from domestic animals and wildlife.

Strain types of isolates of *Mycobacterium bovis* may also be determined through DNA strain typing methods. Strain typing does not require CTO approval.

Test Specifications

1. Histopathology Tests to Detect Lesions of Bovine Tuberculosis in Domestic Animals and Wildlife

1.1 Permanent, stained sections of tissue, in which there has been no distortion or alteration, are to be prepared for microscopic study. The exact technique used by the laboratory must be documented within the laboratory's quality assurance system and will need to be validated.

1.2 Embedded tissue blocks remaining after slide preparation are to be stored by the laboratory for a minimum of 12 months (longer if the laboratory's quality assurance system requires it) to enable the case to be re-examined if required.

1.3 Both haematoxylin and eosin (H & E), and Ziehl-Neelson (ZN) stained slides are to be prepared. Validated techniques are to be used and must be documented within the laboratory's quality assurance system.

1.4 Slides are to be examined by a pathologist skilled in the examination of tuberculosis cases, particularly domestic animal and feral/wild animal species. The pathologist shall use a high quality binocular microscope in the transmitted light mode capable of Kohler illumination.

1.5 A histopathological diagnosis of tuberculosis is to be made based on standard guidelines. These guidelines are to be documented in the laboratory's quality assurance system.

1.6 For the purposes of differential diagnosis, other stains should be used. Validated techniques are to be used and must be documented within the laboratory's quality assurance system.

1.7 Case slides should be retained at the laboratory for at least 12 months (longer if the laboratory's quality assurance programme requires this) for audit purposes.

1.8 All records relating to the case are to be retained by the laboratory for a minimum period of three years.

1.9 The pathologist shall produce a histopathological report in a standard format detailing:

- Laboratory accession number
- Sample identification number or code assigned by the Management Agency
- Name and address of owner
- Name and address of submitter
- Species of animal examined
- Identification of animal(s) if provided
- The tissues examined
- A description of the lesions present (or the absence of lesions)
- The presence or absence of acid fast organisms.

A diagnosis within three broad diagnostic categories

Typical of tuberculosis: Typical lesions of tuberculosis for the species concerned; or

Test Specifications

Suspicious of tuberculosis: Some but not all of the features of tuberculosis are present; or

Not tuberculosis.

1.10 The report must include both a description and a diagnosis. Descriptions and diagnosis, and the terminology used shall be consistent with the description of lesions and disease as given in the referenced texts.

1.11 Where a diagnosis cannot be made or the results require an explanation, a "Comment" section should be added. This should cover likely possible diagnoses or causes, and any follow-up tests needed.

1.12 Histopathology reports (in the standard format) must be issued to the person or persons nominated by the Management Agency , including the submitter, within a mean time of three working days and a maximum of five working days from the date of receipt of samples.

1.13 If the submitter requires priority processing of a submitted case and a more urgent report, e.g. for a detained carcass at a slaughter premises, this shall be indicated on the original laboratory submission form. In this case the pathologist may phone or fax a hand-written report to the submitter but this must be followed up with a standard report as above.

2. Methods for Culturing *Mycobacterium bovis* and other Mycobacterial Species in Domestic Animals and Wildlife.

2.1 Conventional Culture Using Solid Media:

2.1.1 Tissue processing: The lesion must be dissected away from normal tissue and homogenised using an appropriate apparatus.

2.1.2 Half of the homogenate is to be stored at –20°C for a minimum of one year.

2.1.3 A smear is to be made of the lesions from all animals. The smear is to be stained using a validated method for identifying acid-fast organisms which must be specified in the application for approval of the laboratory's mycobacterial culturing method. An oil immersion objective is to be used to examine a minimum of 100 fields for acid-fast organisms. A minimum of three acid-fast organisms must be seen if the smear is to be reported as "acid-fast" positive.

2.1.4 The homogenised tissue is then decontaminated using a validated procedure that suppresses contaminants without adversely affecting the viability of any mycobacteria present in the lesion. This procedure is to be specified in the application for approval of the laboratory's mycobacterial culturing method.

Test Specifications

2.1.5 The decontaminated homogenate is centrifuged and the spun deposit inoculated onto a minimum of two different types of media that have been demonstrated to support the primary isolation of small numbers of *M. bovis.* The types of media are to be specified in the application for approval of the laboratory's mycobacterial culturing method. A minimum of three slopes should be used for each sample.

2.1.6 The media are incubated at 37°C and inspected weekly for growth of mycobacteria.

2.1.7 Any colonies of mycobacteria are identified using validated methods which are to be specified in the application for approval of the laboratory's mycobacterial culturing method. These methods can be either conventional biochemical/growth tests or the use of DNA probes.

2.1.8 If no mycobacteria are isolated, media must be incubated for 12 weeks before being reported as negative.

2.1.9 If cultures are overgrown with contaminants, the stored homogenate must be cultured using an alternative and validated decontamination procedure. This procedure is to be specified in the application for approval of the laboratory's mycobacterial culturing method.

2.2 Laboratory Methodology – Liquid Media:

2.2.1 Tissue processing: The lesion must be dissected away from normal tissue and homogenised using an appropriate apparatus.

2.2.2 Half of the homogenate is to be stored at –20°C for a minimum of one year.

2.2.3 A smear is to be made of the lesions from all animals. The smear is to be stained using a validated method for identifying acid-fast organisms which must be specified in the application for approval of the laboratory's mycobacterial culturing method. An oil immersion objective is to be used to examine a minimum of 100 fields for acid-fast organisms. A minimum of three acid-fast organisms must be seen if the smear is to be reported as "acid-fast" positive.

2.2.4 The homogenised tissue is then decontaminated using a validated procedure that suppresses contaminants without adversely affecting the viability of any mycobacteria present in the lesion. This procedure is to be specified in the application for approval of the laboratory's mycobacterial culturing method.

2.2.5 The liquid culture system must have been validated for primary isolation of low numbers of *M. bovis* from tissues. The method must be specified in the application for approval of the laboratory's mycobacterial culturing method.

2.2.6 In addition to the liquid culture vial, an additional slope of solid medium must be inoculated. This medium must have been shown to support the primary isolation of low numbers of *M. bovis* and is to be specified in the application for approval of the laboratory's mycobacterial culturing method.

Test Specifications

2.2.7 Liquid cultures are to be read at intervals recommended by the manufacturer or those shown to be optimal for the culture of *M. bovis*.

2.2.8 Liquid cultures showing evidence of bacterial growth must be checked for contaminating bacteria and the presence of acid-fast organisms.

2.2.9 Any cultures containing mycobacteria (acid-fast positive) must be speciated using validated methods which are to be specified in the application for approval of the laboratory's mycobacterial culturing method

2.2.10 Identification of mycobacteria as belonging to the *Mycobacterium tuberculosis* complex is acceptable.

2.2.11 The liquid culture vial must be incubated for a minimum of 30 days before being reported as "no mycobacterium isolated".

2.2.12 The solid medium must be incubated for 12 weeks before being discarded.

2.3 Laboratory Method – Isolation and Identification of Mycobacteria other than M. bovis.

2.3.1 Procedures for isolating and identifying species of mycobacteria other than M. bovis must be validated for these additional species.

2.3.2 These procedures are to be specified in the application for approval of the laboratory's mycobacterial culturing method.

2.4 Reporting

2.4.1 A report shall be issued that contains the following information:

- Laboratory accession number
- Management Agency sample identification number or code
- Name and address of owner
- Name and address of submitter
- Species of animal examined
- Tissue examined
- Result of examination
- Official identification of animal examined

2.4.2 Interim reports should be issued to contain the following information:

- Report stating that the "sample" is being cultured and the result of the ZN smear if it has been carried out;
- Report if a mycobacterium has been isolated. The sending out of this report is not necessary if a rapid procedure, such as the use of DNA probe, is used to speciate the isolated mycobacterium.

Test Specifications

2.4.3 A final report shall be issued stating either the identity of the isolated mycobacterium or that no mycobacteria have been isolated.

2.4.4 An approved signatory shall sign the reports.

2.4.5 Testing is to be completed and results are to be reported to the submitter within 37 days of receipt of samples by the laboratory for liquid media where *Mycobacterium bovis* is detected and within 75 days of receipt of samples by the laboratory for other results from valid liquid cultures, unless otherwise negotiated.

2.4.6 Due to the very strong agreement between liquid and solid media results, the liquid media result is to be used as the definitive culture result, all other factors (e.g. herd history, other diagnostic criteria and risk factors) being taken into consideration.

2.4.7 Final negative results from solid media are to be reported to the submitter within 97 days of receipt of samples by the laboratory.

2.4.8 Copies of the report must also be sent to the Area Disease Manager, if different from the submitter, within the same working day.

3. Polymerase Chain Reaction Tests for the Detection of Mycobacteria in Tissues from Domestic Animals and Wildlife.

3.1 Tissue processing. The lesion must be dissected away from normal tissue and homogenised using an appropriate apparatus. The saved homogenates from culturing can be used for PCR.

3.2 A smear is to be made of the lesions. The smear is to be stained using a validated method for identifying acid-fast organisms which must be specified in the application for approval of the laboratory's PCR testing method. An oil immersion objective is to be used to examine a minimum of 100 fields for acid-fast organisms. A minimum of three acid-fast organisms must be seen if the smear is to be reported as "acid-fast" positive.

3.3 DNA extraction and purification. The procedure used for DNA extraction must be validated on tissue samples from lesions. This procedure must be specified in the application for approval of the laboratory's PCR testing method.

3.4 The primers used in the PCR test must be validated as being appropriate for the species of mycobacterium being detected and must be specified in the application for approval of the laboratory's PCR testing method. Ideally the primers should be derived from a multi-copy sequence to ensure the maximum sensitivity of the test. Identification of mycobacteria as belonging to the Mycobacterium tuberculosis complex is acceptable. M. bovis is the only member of this complex that has been isolated during the last twenty years from cattle and deer in New Zealand. The DNA sequence of the primers used for M. paratuberculosis should be unique to this organism and should not be present in other members of the M. avium complex. Similarly, the DNA sequence of the primers used for M. avium should not be present in M. paratuberculosis.

Test Specifications

3.5 Optimal temperatures and, when used, optimal Mg++ concentration for running the PCR must be determined and validated for each PCR. These must be specified in the application for approval of the laboratory's PCR testing method.

3.6 Procedures must be implemented to reduce the possibility of contamination with amplified product and must be specified in the application for approval of the laboratory's PCR testing method.

3.7 A negative extraction control, a positive DNA control and a positive control tissue must be examined for each PCR test.

3.8 A validated procedure must be used for detecting the amplified product. This procedure must be specified in the application for approval of the laboratory's PCR testing method.

3.9 A valid test is one where all the control tests give the appropriate results. If any of the controls do not give appropriate results the test is invalid and must be repeated.

3.10 A report shall be issued that contains the following information:

- Laboratory accession number
- Management Agency sample identification number or code
- Name and address of owner
- Name and address of submitter
- Species of animal examined
- Tissue examined
- Result of examination
- Official identification of animal

3.11 If PCR tests are used on acid-fast negative tissues, negative results should be reported with the qualification that the result does not preclude the presence of low numbers of the mycobacterial species which the test was designed to detect.

3.12 An approved signatory shall sign the reports.

3.13 Testing is to be completed and results are to be reported to the submitter, and to the Area Disease Manager if different from the submitter, within 7 working days of receipt of samples by the laboratory.

4. Variable Number Tandem Repeat (VNTR) as a Method for DNA Typing of Mycobacterium bovis.

4.1 Cultural isolates of *Mycobacterium bovis*, suitable for conducting VNTRs, must be retained by the laboratory for at least 20 working days after isolation.

4.2 Validated procedures, acceptable to the Management Agency, must be used for VNTR.

Test Specifications

4.3 At the conclusion of VNTR analysis, a report shall be issued that contains the following information:

- Laboratory accession number
- Management Agency sample identification number or code
- Name and address of owner
- Name and address of submitter
- Species of animal examined
- Result of examination
- Official identification of animal.

4.4 The results are to be reported to the submitter by referring to the location of strains of the identical type to that of the newly examined strain.

4.5 Testing is to be completed and results are to be reported to the submitter, and to the Area Disease Manager if different from the submitter, within 90 working days of receipt of samples by the laboratory.

5. Whole Genome Sequencing for DNA typing of Mycobacterium bovis

5.1 During the term of this Operational Plan, Whole Genome Sequencing methods for DNA typing of Mycobacterium bovis will be phased in to replace VNTR methods.

4.6 POLICY 6
TB SURVEILLANCE

Policy	Effective surveillance to determine the presence or absence of TB in cattle and deer herds is essential for the rational planning and implementation of disease control and eradication activities, and to monitor the achievement of TB control objectives. To this end policies will define requirements for TB surveillance in cattle and deer and in wildlife species. Any variations to surveillance specifications must be approved by the National Disease Manager.
Implementation Statement	TB surveillance strategies will be applied as follows: 1. TB testing of farmed cattle and deer. 2. TB surveillance of Game Estates. 3. Post-mortem inspection of all cattle and deer carcasses processed at registered slaughter premises and game packing houses. 4. Post-mortem inspection of test-positive and reactor cattle and deer slaughtered other than at registered slaughter premises and game packing houses. 5. Direct surveys of specified wildlife populations 6. Reporting of clinical or pathological evidence of TB in any species by registered veterinarians, diagnostic laboratories, farmers, hunters, trappers and members of the general public.
Specifications	**1. TB Testing of Farmed Cattle and Deer** 1.1 All cattle and deer herds are to be tested in accordance with the specifications contained in Policy 7, On-farm Testing Programmes. Where local variations to these policies are required, these will be specified in the relevant Area Disease Management Plan. 1.2 Only approved TB tests (Policy 4) are to be used for the testing of farmed cattle and deer within the National Bovine Tuberculosis Pest Management Plan. **2. TB Surveillance of Game Estates** 2.1 Cattle and deer which have been kept within a Game Estate for 30 days or more are to be subject to a TB surveillance programme based on and approved under Policy 8 Game Estates.

Specifications

3. Post Mortem Inspection of Cattle and Deer Processed at Registered Slaughter Premises and Game Packing Houses

3.1 A post-mortem inspection for TB is to be conducted at slaughter of all cattle and deer processed through registered slaughter premises and game packing houses. Such inspection must be conducted by an official assessor under the Animal Products Act 1999 and must follow official inspection procedures

3.2 When TB-like lesions are identified at the time of carcass inspection, the official assessor must notify the Area Disease Manager using the appropriate submission form or electronic method as directed by the Management Agency

3.3 Samples, fresh for culture and fixed for histopathological diagnosis, will be taken from the suspect post-mortem cases

3.4 Unless directed otherwise, a maximum of three cases per line of animals (and up to and including three lesions per case) from the same property are to be sampled

3.5 Where there are more than three lesions per case, samples must be taken from those lesions that are typical of gross TB

3.6 Samples (fresh and fixed) are to be submitted, with the appropriate submission forms, to a diagnostic laboratory approved by the Management Agency

3.7 Samples shall be couriered to the laboratory on the same day of collection provided these will arrive at the receiving laboratory on the same working day or overnight (provided this is a working day for the laboratory)

3.8 If samples need to be held prior to dispatch, then fixed samples should be refrigerated but must not be frozen

3.9 For fresh samples, special care must be taken to ensure that samples for culture are not kept at room temperature for excessive periods. Samples should be held at 5°C prior to forwarding them to the laboratory using couriers. If there are delays of greater than three days in forwarding samples to the laboratory, they should be frozen at a temperature of less than –12°C.

4. Post mortem inspection for slaughter other than at a registered slaughter premises or game packing house

4.1 When TB reactors or test-positive cattle or deer are slaughtered other than at a registered slaughter premises or game packing house (for example on-farm slaughter) then post-mortems are to be performed by a registered veterinarian, an official assessor under the Animal Products Act 1999 who has attained competency in necropsy for the particular species or any other person who has demonstrated competency in post mortem technique and lymph node identification for the particular species through a training programme acceptable to the Management Agency.

4.2 The registered veterinarian, official assessor or other person conducting the post-mortem must notify the findings to the Area Disease Manager using the appropriate submission form or electronic method as directed by the Management Agency.

Specifications

4.3 Samples for laboratory diagnosis will be collected and submitted as for procedures at slaughter premises or game packing houses described above.

4.4 The registered veterinarian, official assessor or other person may choose, or be directed by the Area Disease Manager, to sample more than three cases per line.

5. Direct Surveys of Feral or Wild animals

5.1 Direct TB surveillance of wildlife species will be undertaken where needed to confirm the presence or absence of TB in wildlife in any given area.

5.2 Proposals for undertaking direct TB surveillance of wildlife populations must be submitted to the National Disease Manager, in a format prescribed by the Management Agency, for approval prior to commencement.

5.3 Survey proposals must take into account:

- Adequacy of livestock surveillance, with reference to current livestock density (tested and untested) and available livestock surveillance capacity
- Potential vectors of concern, including likely host status (i.e. maintenance vs spillover hosts) and likely TB prevalence
- Stratification of habitat
- Timing of year for survey and capture likelihood
- Sample size

5.4 Independent Surveys will be designed to achieve a 95% probability of detecting at least one infected case given the likely vector TB prevalence

5.5 Survey design will consider the relative effectiveness and cost-efficiency of direct sampling of maintenance hosts versus indirect sampling of spillover hosts

5.6 Potential methods of indirect sampling of maintenance host, e.g. possums, are to target scavenging hosts, e.g. ferrets and feral pigs; or the use of indicator species such as released TB-free feral pigs and wild deer.

5.7 Post mortems of animals captured during surveys are to be performed by a registered veterinarian, an official assessor under the Animal Products Act 1999 who has attained competency in necropsy for the particular species, or any other person who has demonstrated competency in post mortem technique and lymph node identification for the particular species through a training programme acceptable to the Management Agency.

5.8 Post mortem procedure must follow Management Agency protocols for the respective species.

5.9 Samples for laboratory diagnosis must be collected and submitted as in 3.6 to 3.9 above

5.10 The person performing the post-mortem must notify the findings to the Area Disease Manager using the appropriate submission form.

Specifications

5.11 Notification must be made to the Management Agency within 5 working days of any wildlife taken during surveys which are found to have lesions considered typical or suspicious for TB by the laboratory.

5.12 If requested, detailed survey reports must be provided to the Management Agency within 10 working days of the final laboratory report being received.

5.13 The powers of Section 109 and Section 121 A of the Biosecurity Act 1993 are available to authorised persons to implement TB surveillance of feral or wild animal populations.

6. Reporting of Clinical or Pathological Evidence of TB:

6.1 The Biosecurity (National Bovine Tuberculosis Pest Management Plan) Order 1998 obliges bodies such as registered veterinarians, diagnostic laboratories, farmers, hunters, trappers and members of the general public to report suspect cases of bovine tuberculosis to the Management Agency or to an Authorised Person.

6.2 A breach of this reporting rule, without reasonable excuse, is an offence under the Biosecurity Act 1993.

7. Other information to be reported from slaughter premises

7.1 In accordance with Clause 15A of the Biosecurity (National Bovine Tuberculosis Pest Management Plan) Order 1998, the Management Agency will require operators of commercial premises for the slaughter of cattle and deer to record and report the official identification and supplier's herd number for all cattle and deer slaughtered, and for this information to be reliably linked to reports of all suspect TB cases found at slaughter.

7.2 Information to be reported to in 7.1 above shall be reported in a manner specified by the Management Agency.

7.3 Operators of slaughter promises will enable and assist the Management Agency to audit compliance with requirements of 7.1 and 7.2 above.

4.7 POLICY 7
ON-FARM TESTING PROGRAMME

Policy	To ensure effective on-farm TB surveillance for both livestock and vector infection on-farm testing programmes for cattle and deer herds will be defined and undertaken based on TB risk. Any variations to on-farm testing programme specifications must be approved by the National Disease Manager. During the term of this Operational Plan, new risk-based testing programmes and policies will be phased in based on more detailed risk analysis associated with herd and animal location, disease history and livestock movement patterns. Policy variations to enable piloting of new risk-based testing programmes are outlined in Policy 7B.
Implementation Statement	On-farm testing specifications for cattle and deer herds, including ancillary testing, will be set by the Management Agency for all cattle and deer herds. Tests to be applied to cattle and deer will be approved by the Chief Technical Officer of MPI (see Policy 4). Tuberculins and tuberculin strengths to be used in tests will be approved by the National Disease Manager. For the purposes of testing deer herds, all deer will be assumed to have a birth date of 1 January. This is to better enable integration of on-farm testing with seasonal events in deer farming. Provided TB tests are conducted within the nominated time frames, testing is to be undertaken by mutual agreement between the person in charge of the herd and an authorised/accredited person. If the person in charge of the herd fails to present animals for testing as required and with reasonable notice, an Authorised Person may utilise powers under section 121 of the Biosecurity Act 1993 to arrange to have the animals mustered and tested. When animals cannot be captured, penned, mustered, tested and sampled as required, an Authorised Person and any assistants may enter any place and destroy the cattle and deer (using powers under section 121 of the Biosecurity Act 1993). For herds with a Clear status, herd tests are to be completed within 180 days of the due date, unless an exemption has been granted by the Area Disease Manager. For herds with an Infected or Suspended status, herd tests are to be completed within 90 days of the due date unless an exemption has been granted by the Area Disease Manager. On-farm testing may be replaced with slaughter surveillance for certain classes of herds as described in policy specifications.

Implementation Statement	Ancillary tuberculin tests are to be completed within 60 days of their due date unless an exemption has been granted by the Area Disease Manager. Exemptions will only be granted for deer herds when: • The ancillary test cannot be undertaken on or about the due date because of the roar/rut; and • The date of the test does not exceed 180 days after the due date; and • The Area Disease Manager is satisfied there are no epidemiological factors within the herd or surrounding area which would require an earlier test result to be obtained; and • The herd's TB status is set to Suspended. Ancillary blood tests are to be completed within the eligible time frames as an approved test.

1. **Cattle herd testing Policies for herds with an infected status**
   General policies for infected cattle herds are summarised in the following table. Further specific testing details for an infected herd will be contained within the Infected Herd Management Plan (Infected Herd Case Management Best Practice: version 1) for that herd. Cattle from infected herds may also require further testing under Policy 12 Movement Control Restrictions – Infected Status Cattle Herds.

SURVEILLANCE TYPE	FREQUENCY OF WHOLE HERD TESTING PROGRAMME	STOCK TO TEST	TEST INTERPRETATION
On-farm testing	2 to 12 months with the following specific requirements: 1. A whole herd test should be performed within 6 months of the slaughter of any tuberculous cattle and the herd should be tested at least twice per year until there is a clear whole herd test; 2. When infection has been detected through an on-farm test or the period prevalence is greater than 2%, the **ideal** retest interval is 3–4 months, with a minimum of two tests/year, until there is a clear whole herd test; 3. To fit within management constraints (e.g. late pregnancy or early lactation), the retest interval may be extended from 2–6 months until there is a clear whole herd test;	Beef cattle ≥ to 3 months of age Dairy cattle ≥ 6 weeks of age	Standard

SURVEILLANCE TYPE	FREQUENCY OF WHOLE HERD TESTING PROGRAMME	STOCK TO TEST	TEST INTERPRETATION
On-farm testing	4. If for exceptional reasons the whole herd testing intervals in 1, 2 or 3 cannot be achieved, the following measures are to be considered: 4.1 Testing cattle mobs to fit in with the farmer's stock management programme; 4.2 When the disease was diagnosed at an on-farm test, giving priority to testing animals in the cohort group as well as those not presented at that test; 4.3 When the disease was diagnosed at a slaughter premises, giving priority to the testing of the cohort group and/or mobs grazed alongside the cohorts; 4.4 The current, or any proposed, vector control programme.		
Slaughter Surveillance	The status of infected herds may be monitored using slaughter surveillance when 100% of the test-eligible cattle remaining in the herd following the diagnosis of TB go directly to slaughter within the following 12 months. A combination of slaughter surveillance and testing of eligible stock may also be used.	N/A	N/A

1.1 Parallel Blood Tests – Bovigam Tests
Infected herds will be considered for parallel blood testing based on the guidelines contained in the Infected Herd Case Management Best Practice procedures.

2. Cattle Testing polices for herds with a clear status
General note for Clear status herds in all areas:
Eligible stock going to slaughter within 3 months of test completion may be excluded from the requirements of herd testing

2.1 Herds with Clear 1 status (Movement Controlled, Special Testing and Surveillance Areas)

SURVEILLANCE TYPE	FREQUENCY OF WHOLE HERD TESTING PROGRAMME	STOCK TO TEST	TEST INTERPRETATION
On-farm testing	The interval between successive whole herd tests is not to exceed 12 months	Cattle ≥ 3 months of age NB: To overcome the issue of non-specificity, specific age groups may be tested at different times of the year with the written agreement of the National Disease Manager.	Standard
Slaughter Surveillance	The status of C1 herds may be monitored using slaughter surveillance when 100% of the test-eligible cattle in the herd at a designated point-in-time will go directly to slaughter within the following 12 months. A combination of slaughter surveillance and testing of eligible stock may also be used.	N/A	N/A

2.2 Clear 2 or Higher or CM Status Herds within a Movement Controlled Area

SURVEILLANCE TYPE	HERD STATUS	FREQUENCY OF WHOLE HERD TESTING PROGRAMME	STOCK TO TEST	TEST INTERPRETATION
On-farm testing	C2 or higher	Annual	Cattle ≥ 3 months of age NB: To overcome the issue of non-specificity, specific age groups may be tested at different times of the year with the written agreement of the National Disease Manager.	Standard

SURVEILLANCE TYPE	HERD STATUS	FREQUENCY OF WHOLE HERD TESTING PROGRAMME	STOCK TO TEST	TEST INTERPRETATION
Slaughter Surveillance	CM	The TB status of a herd may be monitored using slaughter surveillance when 100% of the test-eligible cattle in the herd at a designated point-in-time will go directly to slaughter within the following 12 months. A combination of slaughter surveillance and testing of eligible stock may also be used.	N/A	N/A

2.3 Clear 2 or Higher or CM Status herds within a Special Testing Area (STA)

The following table is provided for guidance in developing on-farm testing programmes for Special Testing areas (annual/biennial). Policies may be modified for properties neighbouring infected cattle or deer herds.

SURVEILLANCE TYPE	HERD STATUS	FREQUENCY OF WHOLE HERD TESTING PROGRAMME	STOCK TO TEST	TEST INTERPRETATION
On-farm testing	C2 or higher	Annual Biennial Other	Cattle ≥ 12 months of age; Cattle ≥ 24 months of age Variations to standard annual or biennial testing policies within defined parts of STAs may be approved by the National Disease Manager. The choice of stock to test will be based on a consideration of: 1. Whether the dynamics of TB in the wild animal population within the neighbouring area is stable or progressive; and 2. The density of livestock within the Special Testing Area; and 3. The location of infected or suspected TB wild animals in relation to the Special Testing Area within the last 3 years.	Standard

SURVEILLANCE TYPE	HERD STATUS	FREQUENCY OF WHOLE HERD TESTING PROGRAMME	STOCK TO TEST	TEST INTERPRETATION
Slaughter Surveillance	CM	The TB status of a herd may be monitored in an **annual special testing area** using slaughter surveillance when 100% of the test-eligible cattle in the herd at a designated point-in-time will go directly to slaughter within the following 12 months. The TB status of a herd may be monitored in a **biennial special testing area** using slaughter surveillance when 100% of the test-eligible cattle in the herd at a designated point-in-time will go directly to slaughter within the following 24 months. A combination of slaughter surveillance and testing of eligible stock may also be used.	N/A	N/A

2.4 Clear 2 or Higher of CM Status herds within a Surveillance Area

The following policies may be modified for properties neighbouring infected cattle or deer herds.

SURVEILLANCE TYPE	HERD STATUS	FREQUENCY OF WHOLE HERD TESTING PROGRAMME	STOCK TO TEST	TEST INTERPRETATION
On-farm testing	C2 or higher	Triennial	All cattle ≥ 24 months of age In herds other than dairy herds with more than 250 test-eligible cattle, a random sample of at least 250 animals will be tested.	Standard

SURVEILLANCE TYPE	HERD STATUS	FREQUENCY OF WHOLE HERD TESTING PROGRAMME	STOCK TO TEST	TEST INTERPRETATION
Slaughter surveillance	CM	The TB status of a herd may be monitored using slaughter surveillance when 100% of the test-eligible cattle in the herd at a designated point-in-time will go directly to slaughter within the following 36 months. A combination of slaughter surveillance and testing of eligible stock may also be used.	N/A	N/A

2.5 Quality Assurance Programmes
Derogation from the above on-farm testing specifications may be allowed for herds managed under a quality assurance programme which has been approved by the National Disease Manager.

3. Cattle herd testing polices for herds with a suspended status
The testing programme for Suspended status cattle herds will be developed by the Area Disease Manager. The testing programme will include the eligible herds, eligible cattle for testing, the frequency of testing and the interpretation of tests. Pre-movement testing requirements are to follow the specifications contained within Policy 14.

4. Ancillary serial testing for cattle
Specifications for ancillary serial testing of cattle must be developed by the Area Disease Manager and will be based on the following policies:

4.1 Herds with a Clear Status
If an ancillary serial test is to be applied to cattle positive to a Caudal Fold test, the following policies apply:

4.1.1 The Bovigam test is to be applied to all cattle positive to the Caudal Fold test;

4.1.2 The type of Bovigam test to be used (Standard Bovigam or Special Antigen) and the circumstances in which it will be used should be consistent with the specifications of use of the individual tests contained in Policy 4, Approved TB Tests.

4.2 Herds with an Infected or Suspended Status
The policy of applying ancillary serial tests in herds with an Infected or Suspended status should be based on the guidelines contained within the Infected Herd Case Management Best Practice.

5. Deer herd testing policies for herds with an infected status
General policies for infected deer herds are summarised in the following table. Further specific testing details for an infected herd will be contained within the Infected Herd Management Plan (Infected Herd Case Management Best Practice: version 1) for that herd. Deer from infected herds may also require further testing under Policy 13 Movement Control Restrictions – Infected Status Deer Herds.

SURVEILLANCE TYPE	FREQUENCY OF WHOLE HERD TESTING PROGRAMME	STOCK TO TEST	TEST INTERPRETATION
On-farm testing	2 to 12 months with the following specific requirements: 1. A whole herd test must be performed within 6 months of the slaughter of any tuberculous deer and the herd must be tested at least twice per year until there is a clear whole herd test; 2. When infection has been detected through an on-farm test or the herd period prevalence is greater than 2%, the ideal retest interval is 3–4 months, with a minimum of two tests/year, until there is a clear whole herd test; 3. To fit within management constraints (e.g. late pregnancy, fawning or the rut), the retest interval may be extended from 2–6 months until there is a clear whole herd test; 4. If for exceptional reasons the whole herd testing intervals in 1, 2 or 3 cannot be achieved, the following measures are to be considered: 4.1 Testing deer mobs to fit in with the farmer's stock management programme; 4.2 When the disease was diagnosed at an on-farm test, giving priority to testing animals in the cohort group as well as those not presented at that test; 4.3 When the disease was diagnosed at a slaughter premises, giving priority to the testing of the cohort group and/or mobs grazed alongside the cohorts. 4.4 The current, or any proposed, vector control programme.	All deer ≥ 6 months of age	Standard
Slaughter Surveillance	The status of infected herds may be monitored using slaughter surveillance when 100% of the test-eligible deer remaining in the herd following the diagnosis of TB go directly to slaughter to within the following 12 months. A combination of slaughter surveillance and testing of eligible stock may also be used.	N/A	N/A

5.1 Parallel Blood Testing – ELISA
Infected herds will be considered for parallel blood testing based on guidelines contained within the Infected Herd Case Management Best Practice.

6. Deer herd testing policies for herds with a Clear status
General note for Clear status herds in all areas:
Eligible stock going to slaughter within 3 months of test completion may be excluded from the requirements of herd testing.

6.1 Herds with a Clear 1 Status (Movement Controlled, Special Testing and Surveillance Areas)

SURVEILLANCE TYPE	HERD STATUS	FREQUENCY OF WHOLE HERD TESTING PROGRAMME	STOCK TO TEST	TEST INTERPRETATION
On-farm testing	C1	The interval between successive herd tests is not to exceed 12 months.	All deer ≥ 8 months of age NB: To overcome the issue of non-specificity, specific age groups may be tested at different times of the year with the written agreement of the National Disease Manager.	Standard
Slaughter Surveillance	C1	The status of C1 herds may be monitored using slaughter surveillance when 100% of the test-eligible deer in the herd at a designated point-in-time will go directly to slaughter within the following 12 months. A combination of slaughter surveillance and testing of eligible stock may also be used.	N/A	N/A

6.2 Clear 2 or higher or CM Status herds within a Movement Controlled Area

SURVEILLANCE TYPE	HERD STATUS	FREQUENCY OF WHOLE HERD TESTING PROGRAMME	STOCK TO TEST	TEST INTERPRETATION
On-farm testing	C2 or higher	Annual	All deer ≥ 8 months of age NB: To overcome the issue of non-specificity, specific age groups may be tested at different times of the year with the written agreement of the National Disease Manager.	Standard
Slaughter Surveillance	CM	The status of a herd may be monitored using slaughter surveillance when 100% of the test-eligible deer in the herd at a designated point-in-time will go directly to slaughter within the following 12 months. A combination of slaughter surveillance and testing of eligible stock may also be used.	N/A	N/A

6.3 Clear 2 or Higher or CM Status herds within a Special Testing Area

The following table is provided for guidance in developing on-farm testing programmes within a Special Testing Area. Policies may be modified for properties neighbouring infected cattle or deer herds.

SURVEILLANCE TYPE	HERD STATUS	FREQUENCY OF WHOLE HERD TESTING PROGRAMME	STOCK TO TEST	TEST INTERPRETATION
On-farm testing	C2 or Higher	Annual Biennial Other	Deer ≥ 15 months of age. Deer ≥ 24 months of age Variations to standard annual or biennial testing policies within defined parts of STAs may be approved by the National Disease Manager. The choice of stock to test will be based on a consideration of: 1. Whether the dynamics of TB in the neighbouring area is stable or progressive; and 2. The density of livestock within the Special Testing Area; and 3. The location of infected or suspect TB wild animals in relation to the Special Testing Area within the last 3 years.	Standard

SURVEILLANCE TYPE	HERD STATUS	FREQUENCY OF WHOLE HERD TESTING PROGRAMME	STOCK TO TEST	TEST INTERPRETATION
Slaughter Surveillance	CM	The TB status of a herd may be monitored in an annual testing area using slaughter surveillance when 100% of the test-eligible deer in the herd at a designated point-in-time will go directly to slaughter within the following 12 months. The TB status of a herd may be monitored in a biennial testing area using slaughter surveillance when 100% of the test-eligible deer in the herd at a designated point-in-time will go directly to slaughter within the following 24 months. A combination of slaughter surveillance and testing of eligible stock may also be used.	N/A	N/A

6.4 Clear 2 or Higher or CM Status herds within a Surveillance area

The following policies may be modified for properties neighbouring infected cattle or deer herds.

SURVEILLANCE TYPE	HERD STATUS	FREQUENCY OF WHOLE HERD TESTING PROGRAMME	STOCK TO TEST	TEST INTERPRETATION
On-farm testing	C2 or higher	Triennial	All deer ≥ 24 months of age. In herds with more than 250 test-eligible deer, a random sample of at least 250 animals will be tested.	Standard
Slaughter Surveillance	CM	The TB status of a herd may be monitored in using slaughter surveillance when 100% of the test-eligible deer in the herd at a designated point-in-time will go directly to slaughter within the following 36 months. A combination of slaughter surveillance and testing of eligible stock may also be used.	N/A	N/A

6.5 Quality Assurance Programmes
Derogation from the above on-farm testing specifications for herds managed may be allowed under a quality assurance programme which has been approved by the National Disease Manager.

7. Deer herd testing policies for herds with a suspended status
The testing programme for Suspended status deer herds will be developed by the Area Disease Manager. The testing programme will include the eligible herds, the eligible deer for testing, the frequency of testing and the interpretation of tests. Pre-movement testing requirements are to follow the specifications contained within Policy 14.

8. Ancillary serial testing for deer
Specifications for ancillary serial testing of deer must be developed by the Area Disease Manager based on the following policies:

8.1 Herds with a Clear status
If an ancillary serial test is to be applied to deer positive to a Mid Cervical test, the following policies apply:

8.1.1 If there are 3 or less mid cervical positive deer to retest, the IgG1 (ETB or Modified ETB) test is to be applied to all of the test positive deer;

8.1.2 If there are 4 or more deer to retest, either:

8.1.2.1 A combination of the IgG1 and CCT tests may be used; or

8.1.2.2 All the positive deer may be tested with a CCT.

8.2 Herds with an Infected or Suspended Status
The policy of applying ancillary serial tests in herds with an Infected or Suspended status should be based on the guidelines contained within the Infected Herd Case Management Best Practice procedures.

9. Compliance management for untested, small, uncontrolled and non-commercial cattle and deer herds

Herds which are essentially closed and are not used for commercial animal production (e.g, zoos, display animals, pets, etc.) other small herds or herds with uncontrolled stock which are overdue for TB testing may be managed through a compliance process that effectively manages TB risk by preventing sales or movements of live animals and permanently suspending the herd status.

Where a herd is assessed as having low disease risk and is deemed by the Management Agency as being impractical to test, then an alternative option to an enforced muster procedure may implemented. This will involve Suspension of herd status and the issue of an Official Directive pursuant to S (122) (1) (c) of the Biosecurity Act preventing movement of stock from the herd, apart from directly to slaughter.

Criteria for compliance management of non-commercial, untested, small herds or uncontrolled herds will be according to guidelines described in Untested Small or Uncontrolled Herd Management Standard Operating Procedures.

4.8 POLICY 7B
ON-FARM TESTING PROGRAMMES: RISK BASED TESTING VARIATIONS

Policy	During the term of this Operational Plan, the Management Agency may apply Risk-based testing variations to Policy 7 and policies 12–16 for the purpose of piloting new on-farm testing policies to be based on more detailed evaluation of herd and individual animal infection risk factors related to location, livestock movement history and herd infection history.
Implementation Statement	Any testing policy variations to be applied under this policy shall be: • Approved by the National Disease Manager in accordance with the Management Agency's Risk-Based Testing Pilot Design • Communicated in writing to the to the herd or animal owner no less than 60 days prior to the variation being applied • Applied in addition to, or as a substitute for, any testing requirements under Policy 7 and 12–16 at the discretion of the Area Disease Manager • Applied irrespective of current herd TB status and Disease Control Area location.
Specifications	Testing policy variations under this Policy may include combinations of all or some of the following; • More frequent herd testing (annual or biennial) on previously infected herds where risk is assessed as high by Area Disease Manager. • Parallel herd testing at whole herd testing in previously infected herds where risk is assessed as high by Area Disease Manager. • Identification of High-Risk Animal of Interest (HRAOI) to the traced and subject to additional testing (primary and parallel). • Post-movement testing for animals and in-contact cohorts leaving herds located in areas or with disease histories where risk is assessed as high by Area Disease Manager. • Testing at a higher frequency of herds with annual inward and outward movements exceeding 50% of maximum herd size. • Cessation of herd testing of herds where their risk is assessed as low by Area Disease Manager.

4.9 POLICY 8
GAME ESTATES

Policy

Policies for Game Estate herds within the National Pest Management Plan will recognise their special conditions of management without putting at jeopardy the TB status of the areas in which such operations are established.

Policies will define the following requirements for Game Estate herds:

- Registration
- Record keeping
- TB surveillance
- TB control.

During the term of this Operational Plan, new policies for Game Estates may be phased in to provide for equivalence with wider risk-based testing and disease management policies to be introduced, which will take account of more detailed risk analysis based on herd and animal location, disease history and livestock movement patterns.

Specifications

1. Definition of a Game Estate

1.1 Owners of deer must register their herd with the Management Agency. On registration, the herd will be classified either as a deer herd or as a Game Estate herd.

1.2 For the purpose of this policy a Game Estate herd is as defined as a herd of deer, of any species, which are the private property of the herd owner (as distinct from deer owned by the Crown) and which are managed under **controlled conditions** for the predominant purpose of hunting.

1.3 "Controlled conditions" is defined as the implementation of measures (including the use of natural features) to constrain deer to a defined area from which they are not free to move out at will;

1.4 Crown-owned deer on land (either private or public) where there is no specific control of movement, are excluded from this policy

1.5 Deer herds which are kept under controlled conditions, but are not classified as Game Estates, are required to meet all conditions of the National Pest Management Plan for farmed deer herds.

1.6 An owner may have both a Game Estate on one part of their property and a farmed deer herd on another.

Specifications

2. Game Estates – General Conditions

2.1 Each Game Estate is to have an individual management plan developed.

2.2 The Area Disease Manager is responsible for initiating and producing the management plan in a format prescribed in "Game Estate Management Best Practice."

2.3 The owners of Game Estates are to adhere to all conditions and policies as determined by the Management Agency.

2.4 A Game Estate will operate under a set of approved standards, which will include auditing procedures to ensure those standards are met.

2.5 Herds registered as Game Estates which are neither Infected nor Suspended shall be assigned a herd TB status of CM.

2.6 Live deer must not be moved from a Game Estate apart from directly to slaughter and only then if permitted by the Ministry for Primary Industries. In certain permitted circumstances, live deer may leave a Game Estate but must move directly to slaughter as farmed deer under the same ownership and be subject to the requirements of the Ministry for Primary Industries.

2.7 Any cattle leaving the Estate (other than those going directly to slaughter) are to be TB tested prior to allowing them to come in contact with other farm stock and no later than within 30 days of exiting the Estate. The methods for this will be established in conjunction with the Area Disease Manager and set out in the management plan.

2.8 The external boundaries of the Game Estate must prevent the movement of deer out of the area defined as a Game Estate, either by secure fencing or by the use of geographic features which would prevent deer movement.

2.9 In consultation with the Area Disease Managers and Area Programme Manager, each Estate is to implement an agreed on-going TB vector control programme. This programme is to be documented within the management plan.

2.10 Any deer or cattle released into the Game Estate are to come from a herd with a status of C5 or higher.

2.11 If deer being introduced into the Game Estate originated from a Movement Controlled Area, they must be either pre-movement tested clear or move under an exemption from pre-movement testing requirements granted by the Area Disease Manager.

2.12 Owners of Game Estates will be required to maintain and make available to the Management Agency or its agent records of:

TB test results;

Dates, numbers and sources of deer/cattle released into the Estate;

Dates and numbers of deer carcasses and cattle removed from the Estate and their destination; and

A log of the activities/resources involved in feral animal control.

Specifications

2.13 Deer entering a Game Estate which are identified with official ear tags as required under the National Animal Identification and Tracing Act 2012 may have official ear tags removed with the express permission of the NAIT organisation approved under that Act.

3. TB Surveillance

3.1 Each Game Estate must have a TB surveillance programme which will provide at least an equivalent surveillance outcome to that of a farmed deer herd which is running a similar stocking rate to the deer being run on the Game Estate.

3.2 The equivalence guideline will be to set the number of "annual deer test equivalents", based on the size of the deer herd on the Game Estate and the testing frequency that would apply to that herd if it were managed as a conventional farmed deer herd.

3.3 The surveillance programme is to be documented within the management plan.

3.4 The surveillance programme is to be based on a tiered approach (primary, followed by secondary surveillance), designed to achieve the required surveillance equivalence.

3.5 Primary tier surveillance will require:

- Skin or blood testing of deer using approved primary tests (Policy 4); and
- Necropsy, and subsequent laboratory culture, of trophy and cull animals, which must be undertaken by either a registered veterinarian, an official assessor under the Animal Products Act 1999 who has attained competency in necropsy of deer or any other person who has demonstrated competency in post mortem technique and lymph node identification of deer through a training programme acceptable to the Management Agency.

3.6 Where the desired level of surveillance cannot be attained practicably by primary tier surveillance, the assessed shortfall in "annual deer test equivalents" should be made up by secondary tier surveillance activities.

3.7 Where required under 3.6 above, secondary tier surveillance will comprise (in priority order):

- Necropsy surveys of possums, as part of the TB vector control programme;
- Necropsy surveys of resident pigs and ferrets, coupled with some assessment of the proportion of each population surveyed;
- Use of released sentinel animals, subject to any consent which may be required under the Wild Animal Control Act 1977.

3.8 The Management Agency will provide specifications for "annual deer test equivalents" for secondary tier surveillance methods.

3.9 Post mortems of animals captured during secondary tier surveillance activities, and any subsequent laboratory work, must follow Management Agency protocols for the respective species.

Specifications

3.10 Post mortems of animals captured during secondary tier surveillance activities must be undertaken by either a registered veterinarian with experience in wildlife necropsy for the particular species, an official assessor under the Animal Products Act 1999 who has attained competency in necropsy for the particular species or any other person who has demonstrated competency in post mortem technique and lymph node identification for the particular species through a training programme acceptable to the Management Agency.

4. TB Control

4.1 When TB is diagnosed within any deer or cattle beast within a Game Estate, the following options exist:

4.1.1 Establish a programme to TB test all deer and cattle within the Estate and slaughter any reactors diagnosed. This testing programme would be identical to that for farmed cattle or deer; or

4.1.2 De-stock the Estate to slaughter; or

4.1.3 A combination of testing and destocking.

4.2 The time to allow for destocking will take account of the estimated level of disease, the end of the hunting season for the predominant deer species and the location of the herd. In any event the length of time is to be no longer than 24 months from the initial diagnosis of TB.

4.3 Outside of the Movement Controlled Areas, an intensive feral animal control programme is to be established.

4.4 When TB is first diagnosed in a wild animal on the Game Estate, the Area Disease Manager, in consultation with the National Disease Manager and the estate owner, will determine an appropriate response.

This will be dependent on the wild animal species TB is diagnosed in (host status considerations) and may include additional surveillance (both deer and wild animals) and appropriate vector control. The objective of the increased surveillance is to provide assurance to the Area Disease Manager that over a 3 year period, the probability of the game estate herd being infected is ≤ 10%.

5. Non-Compliance

5.1 Game Estates which do not operate within the requirements of the policy will receive initial warnings from an Authorised Person and then be de-registered should non-compliance continue. De-registering will re-classify the animals as a deer herd.

6. Charges

6.1 Owners of Game Estates will be required to fund all programme activity under this policy (excluding costs of Area Disease Manager involvement), including but limited to costs of registering the Estate, inspections, and costs associated with testing, necropsy, laboratory services, and destocking.

4.10 POLICY 9
HERDS OVERDUE FOR TB TESTING

Policy	The Management Agency will maintain and implement policies and procedures for herds which are overdue for testing as well as test positive animals which are overdue for ancillary tests. Any variations to these specifications must be approved by the National Disease Control Manager.
Implementation Statement	To maintain the integrity of TB surveillance within the National Pest Management Plan, all TB tests required within the Plan are to be completed by the **test expiry date***. * *Test expiry date = test due date + specified number of days to complete test*
Specifications	1. For herds with a Clear status, herd tests are to be completed within 180 days of the due date unless an exemption has been granted by the Area Disease Manager. 2. For herds with an infected status, herd tests are to be completed within 90 days of the due date unless an exemption has been granted by the Area Disease Manager. 3. For herds with a Suspended status, herd tests are to be completed by the date determined by an Authorised Person. 4. Ancillary tests are to be completed within the eligible time frames as an approved test. 5. Post movement TB tests are to be completed by the date determined by an Authorised Person and documented on the permit to move that accompanies the animal/s. 6. Further detailed procedures for management of overdue herd tests will be specified Overdue Test Management Best Practice Guidelines. 7. If the person in charge of the herd fails to present animals for testing as required and with reasonable notice, an Authorised Person may arrange to have the animals mustered and tested. When animals cannot be captured, penned, mustered, tested and sampled as required, an Authorised Person and any assistants may enter any place and destroy the cattle and deer.

4.11 POLICY 10
SLAUGHTER OF TB REACTORS

Policy	The Management Agency will require identification and expeditious slaughter of TB Reactor cattle and deer as defined in Policy 1. Unless otherwise approved by the Management Agency, slaughter of TB Reactors will be carried out in circumstances which provide for reliable post-mortem inspection and diagnosis of any TB infection.
Specifications	1.1 All TB Reactors must be identified with official TB Reactor ear tags issued by the Management Agency. 1.2 All TB Reactors must be identified with an approved NAIT RFID tag at time of the reactor tag being applied. 1.3 All TB Reactors are to be directed to slaughter by an Authorised Person 1.4 TB Reactors are to be slaughtered as soon as practical after diagnosis. 1.5 Unless agreed otherwise with the owner, the Management Agency shall make necessary arrangements for transport and slaughter of TB Reactors and shall meet the cost of these arrangements. 1.6 When it is necessary to seize a TB Reactor for slaughter, the person in charge of the animal(s) is to be given a minimum of 24 hours' notice to present the cattle or deer. 1.7 Whenever possible, all TB Reactors are to be slaughtered at a registered slaughter premise. This is to ensure: • The animals are subject to a standard post mortem inspection. • Control over the sale/disposal of meat from TB Reactor carcasses is maintained. • Meat value for the carcass is retained by the Management Agency to off-set the costs of compensation. 1.8 When an Authorised Person agrees to the slaughter of a TB Reactor at a place other than a registered slaughter premise, the animal(s) may be sent to a rendering plant or be slaughtered on-farm under the supervision of either a registered veterinarian, an official assessor under the Animal Products Act 1999 who has attained competency in necropsy for the particular species, or any other person who has demonstrated competency in post mortem technique and lymph node identification for the particular species through a training programme acceptable to the Management Agency.

Specifications

1.9 All TB Reactors which are moved off-farm for slaughter must be accompanied by an Official Permit to Move issued by an Authorised Person prior to movement.

1.10 TB Reactors which are not subject to post mortem inspection by either a registered veterinarian, an official assessor under the Animal Products Act 1999 who has attained competency in necropsy of cattle, or any other person who has demonstrated competency in post mortem technique and lymph node identification for cattle through a training programme acceptable to the Management Agency, may be considered by the Area Disease Manager to be infected with TB.

1.11 TB Reactors which have been treated with a hormonal growth promotant or a chemotherapeutic agent (for example anthelmintics, antibiotics and injectable mineral supplements) are not to be slaughtered for human consumption within the product's withholding period.

1.12 Owners who choose to slaughter cattle or deer which have been positive to an approved TB test and are awaiting a retest are to seek permission from an Authorised Person, and notify that Authorised Person of the intended date and place of slaughter. The owner must notify the receiving meat processor prior to despatch of any test-positive animal.

4.12 POLICY 11
COMPENSATION

Policy	Compensation will be payable to the owners of cattle and deer slaughtered according to Clause 18 of the Biosecurity (National Bovine Tuberculosis Pest Management Plan) Order 1998.
Specifications	1. Compensation will be payable to the owners of cattle or deer which are directed to slaughter by the Management Agency, pursuant to Section 122 of the Biosecurity Act 1993, under the following circumstances: 1.1 The animal has tested positive to an approved test or tests for bovine tuberculosis and direction to slaughter has been approved by the Area Disease Manager 1.2 Movement to slaughter is the only permitted or practicable option for an animal following the imposition of restrictions on the movement of its herd under section 130 of the Act, and direction to slaughter has been approved by the Chief Executive of the Management Agency. 1.3 Movement to slaughter is the only permitted or practicable option for an animal as a direct result of the implementation of this plan, and direction to slaughter has been approved by the Chief Executive of the Management Agency. 2. Unless agreed otherwise with the owner, the Management Agency shall make necessary arrangements for transport and slaughter of animals eligible for compensation and shall meet the cost of these arrangements. 3. Notwithstanding Clauses 1 and 2 above, compensation and any associated transport and slaughter costs will not be payable when: 3.1 The owner wishes to slaughter cattle or deer which have been positive to an approved TB test, and the animals are awaiting a retest as directed by an Authorised Person. In this circumstance the owner is to: • Sign a Waiver of Compensation • make arrangements for and meet the costs of transport and slaughter • notify the slaughter premises of the consignment of any TB Reactor for slaughter if this is the means of disposal • Obtain a Permit-to-Move from an Authorised Person.

Specifications

3.2 The owner chooses to slaughter and retain the animal for home consumption. In this circumstance the owner is to:

- obtain the permission of an Authorised Person
- sign a Waiver of Compensation form provided by the Management Agency
- reasonably facilitate and meet the costs of any post-mortem examination of the animal as required by the Management Agency
- dispose of any unwanted carcass parts as required by the Management Agency

3.3 The owner has not complied with any legal directive or other legal obligation under Biosecurity (National Bovine Tuberculosis Pest Management Plan) Order 1998.

4. When compensation is payable, it will be at the following rates:
   - 100% Fair Market Value when TB is not diagnosed at post mortem
   - 65% Fair Market Value when TB is diagnosed at post-mortem, unless the animal is from a herd subject to a High Risk Infected Herd Management Plan agreed between TBfree New Zealand and the herd owner, in which case the rate will be 100% Fair Market Value.

5. Fair Market Value is to be determined under processes to be agreed between the Management Agency and the respective dairy, beef and deer industry organisations specified in Clause 18 of the Biosecurity (National Bovine Tuberculosis Pest Management Plan) Order 1998.

4.13 POLICY 12
MOVEMENT CONTROL RESTRICTIONS – INFECTED STATUS CATTLE HERDS

Policy

To prevent the spread of disease and allow the tracing of stock, the Management Agency will restrict the movements of cattle from Infected status herds.

Any variations to movement control specifications must be approved by the National Disease Manager.

The following movement restriction requirements apply for the 2016/17 financial year. From the beginning of the 2017/18 financial year, movements of cattle from Infected status herds will only be permitted directly to slaughter. The only exceptions will be cattle moving to another place occupied and managed by the owner where there is no contact with any other herd (e.g. cattle moving to another property for grazing before returning home) or cattle which must be moved as the result of civil disaster or for reasons of animal welfare.

This transitional period is being allowed to give existing infected cattle herd owners reasonable time to implement the necessary management changes to move to a slaughter-only operation. It also gives TBfree New Zealand sufficient time to develop the legislative framework and supplementary policy options on animal depopulation (cohort or full herd) to enable full implementation of a movement to slaughter-only policy for both existing and any new infected status herds.

Specifications

1. The Issue and Revocation of Movement Restrictions

1.1 The movement of cattle will be restricted from herds with an Infected TB status (see Policy 1) via a Restricted Place Notice issued pursuant to Section 130 of the Biosecurity Act 1993.

1.2 The Restricted Place Notice is to be signed by an Authorised Person under the Biosecurity Act 1993.

1.3 Restricted Place Notices are to be served within 5 working days of the Area Disease Manager's decision to change the herd's TB status to Infected

1.4 When cattle are to be moved from an Infected status herd, and the animals being moved are required to be identified with official Movement Control ear tags, every effort shall be made to serve the Restricted Place Notice prior to the movement occurring.

Specifications

1.5 The Restricted Place Notice is to be personally delivered to the occupier of the place by an Authorised Person unless the circumstances under 1.6 below apply.

1.6 When for exceptional reasons a Restricted Place Notice cannot be delivered within the required time frame or by an authorised person, the Notice is to be mailed by registered mail or couriered provided the occupier of the place is visited within 10 working days of the Notice being sent.

1.7 A Restricted Place Notice should be revoked when the herd status moves from Infected to Clear as per the criteria listed in Policy 1, sections 2.1.3 to 2.1.6. Any proposal to extend the duration of a Restricted Place Notice past the date at which an infected herd's status is changed to Clear must be approved by the National Disease Manager.

1.8 Restricted Place Notices are to be revoked in writing by an Authorised Person under the Biosecurity Act 1993.

2. Movement Control Restrictions for Herds with an Infected Status

The movement control restrictions to be applied to Infected Status herds will be as follows:

2.1 A Restricted Place Notice (RPN) will be issued by an Authorised person pursuant to Section 130 of the Biosecurity Act.

2.2 A Permit to Move must be issued for cattle to be moved from the herd. A Permit-to-Move must be in a format prescribed by the Management Agency. Requests for Permits-to-Move are to be processed within 2 working days.

2.3 Cattle being moved must be negative to a pre-movement Caudal Fold Test (CFT) applied within 60 days prior to movement.

2.4 When pre-movement TB testing is required, the person in charge of the herd is to give an Authorised Person at least 14 days' notice of intended movements.

2.5 Cattle being moved must be identified with official Movement Control ear tags issued by the Management Agency. All official Movement Control ear tags are to be inserted either by or under the direct supervision of an Authorised Person, or an Accredited Person or an approved person who has been approved at the discretion of an Authorised Person.

2.6 Cattle being moved must be retested post-movement (see 4.4 below under post-movement requirements).

The following additional movement control restrictions may be applied by the Area Disease Manager:

2.7 Cattle being moved must be negative to an ancillary parallel Bovigam test

2.8 Pre-movement testing of cohort or in-contact herd mates.

Specifications

3. Exemptions and variations

3.1 **Movement direct to slaughter:** The above movement control measures do not apply to non-reactor cattle being moved direct to slaughter.

3.2 **Movement of TB reactors:** TB reactor cattle may only be moved to slaughter and require a Permit to Move as in clause 2.2 above. See also Policy 11.

3.3 **Movement of cattle less than 6 weeks of age**: Cattle less than 6 weeks of age being moved from any herd do not require pre-movement TB testing. All other control measures will apply.

3.4 **Movements to and from short term** (i.e. 90 days or less) **grazing**: Cattle may be permitted to move to short term grazing from a herd with an Infected status, without the need for a further pre-movement test prior to returning to the herd of origin, provided:

- The cattle are negative to a Caudal Fold test applied within 60 days prior to the initial proposed movement, and
- The cattle will be grazed separately from any other cattle or deer, and
- The cattle remain under the day-to-day management of the owner, and
- The cattle are identified with official Movement Control ear tags unless an Authorised Person is satisfied the cattle from the Infected herd will be effectively contained while grazing, and
- The owners of properties neighbouring the grazing block are notified.

If these conditions cannot be met, normal pre-movement testing criteria are to apply.

3.5 **Movements as a result of a civil disaster or for reasons of animal welfare:** Cattle required to be moved as a result of a civil disaster or for reasons of animal welfare may have some or all of the requirements for movement restrictions temporarily waived by an Authorised Person after receiving a direction from the Area Disease Manager. In such circumstances, the Authorised Person will specify to the owner the follow-up actions required at the time of movement.

4. Post-Movement Requirements

4.1 All cattle which are required to be identified with official Movement Control ear tags are to be traced.

4.2 The status of a Clear status herd receiving official Movement Control ear-tagged cattle from an infected status herd is to be set to Suspended.

4.3 The Suspended herd should also be issued with an Official Directive by an Authorised Person pursuant to section 122(1)(c). The official directive will specify any subsequent conditions the herd will be subject to while it remains under a Suspended status.

Specifications

4.4 The official Movement Control ear-tagged cattle from an infected herd and any cattle with which they have been grazed, are to be post movement tested with a Caudal Fold test 90–120 days after the pre-movement TB test.

4.5 For cattle less than 6 weeks of age at the time of leaving the herd, a post-movement TB test is to be performed 90–120 days after the date of the movement.

4.6 The Suspended status for the herd which has received official Movement Control ear-tagged cattle may only be revoked when the herd has a clear whole herd test 6–12 months after the post movement test.

4.7 On obtaining a clear whole herd test, the status of the herd is to be set at C1.

4.8 The official Movement Control ear tags are not to be removed until the tagged animals are clear to the post movement test and no TB is detected at the subsequent whole herd test.

4.9 There is no need to perform a whole herd test when all the cattle on the farm at the time of arrival of the official Movement Control ear-tagged animals, and any cattle purchased prior to the official Movement Control ear-tagged cattle being post-movement tested or slaughtered (whichever occurred first), will be slaughtered within 12 months after the post-movement test or slaughter date of the official Movement Control ear-tagged cattle.

5. Non Compliance

5.1 When the conditions of a Restricted Place Notice served on an Infected status herd are not complied with, the person to whom the Restricted Place Notice was issued is to receive an official warning issued by an Authorised Person

5.2 The official warning will specify any additional movement restrictions over and above those specified in the Restricted Place Notice.

5.3 For persons who have been subject to a warning on more than one occasion, a case for prosecution is to be made.

4.14 POLICY 13
MOVEMENT CONTROL RESTRICTIONS – INFECTED STATUS DEER HERDS

Policy

To prevent the spread of disease and allow the tracing of stock, the Management Agency will restrict the movements of deer from Infected status herds.

Any variations to movement control specifications must be approved by the National Disease Manager.

The following movement restriction requirements apply for the 2016/17 financial year. From the beginning of the 2017/18 financial year, movements of deer from Infected status herds will only be permitted directly to slaughter. The only exceptions will be for deer moving to a place occupied and managed by the owner where there will be no contact with another herd (e.g. deer moving to another property for grazing before returning home) or for deer which must be moved as the result of civil disaster or for reasons of animal welfare.

This transitional period is being allowed to give existing infected deer herd owners reasonable time to implement the necessary management changes to move to a slaughter-only operation. It also gives TBfree New Zealand sufficient time to develop the legislative framework and supplementary policy options on animal depopulation (cohort or full herd) to enable full implementation of a movement to slaughter-only policy for both existing and any new infected status herds.

Specifications

1. The Issue and Revocation of Movement Restrictions

1.1 The movement of deer will be restricted from herds which have an Infected TB status (see Policy 1) via a Restricted Place Notice issued pursuant to Section 130 of the Biosecurity Act 1993).

1.2 The Restricted Place Notice is to be signed by an Authorised Person under the Biosecurity Act 1993.

1.3 Restricted Place Notices are to be served within 5 working days of the Area Disease Manager's decision to change the herd's TB status to Infected

1.4 When deer are to be moved from an Infected status herd, and the animals being moved are required to be identified with official Movement Control tags, every effort shall be made to serve the Restricted Place Notice prior to the movement occurring.

1.5 The Restricted Place Notice is to be personally delivered to the occupier of the place by an Authorised Person unless under the circumstances in 1.6 below.

Specifications

1.6 When for exceptional reasons a Restricted Place Notice cannot be delivered within the required time frame or by an Authorised Person, the Notice is to be mailed by registered mail or couriered, provided the occupier of the place is visited within 10 working days of the Notice being sent.

1.7 A Restricted Place Notice should be revoked when the herd status moves from Infected to Clear as per the criteria listed in Policy 1, sections 2.1.3 to 2.1.6. Any proposal to extend the duration of a Restricted Place Notice past the date at which an infected herd's status is changed to Clear must be approved by the National Disease Manager.

1.8 Restricted Place Notices are to be revoked in writing by an Authorised Person under the Biosecurity Act 1993.

2. Movement Control Restrictions for Herds with an Infected Status

Movement control restrictions will be applied to Infected Status herds as follows:

2.1 A Restricted Place Notice (RPN) will be issued by an Authorised Person pursuant to Section 130 of the Biosecurity Act.

2.2 A Permit to Move must be issued for deer to be moved from the herd. A Permit to Move must be in a format prescribed by the Management Agency. Requests for Permits to Move are to be processed within 2 working days.

2.3 Deer cannot move, apart from directly to slaughter, until there has been a clear whole herd test.

2.4 In addition to the whole herd test as above, deer being moved must be negative to a pre-movement Mid Cervical Test (or Comparative Cervical Test with the approval of the National Disease Manager) applied within 60 days prior to movement. When pre-movement TB testing is required, the person in charge of the herd is to give an Authorised Person 14 days' notice of intended movements.

2.5 Deer being moved must be identified with official Movement Control ear tags issued by the Management Agency. All official Movement Control ear tags are to be inserted either by or under the direct supervision of an Authorised Person, or an Accredited Person or an approved person who has been approved at the discretion of an Authorised Person.

2.6 Deer being moved are retested post-movement (see 4.4 below under post movement requirements).

In addition to the above, pre-movement testing of cohort or in-contact herd mates may be required by the Area Disease Manager.

3. Exemptions and variations

3.1 **Movement direct to slaughter:** The above movement control measures do not apply to non-reactor deer being moved direct to slaughter.

3.2 **Movement of TB test reactors:** TB test reactor deer may only be moved to slaughter and require a Permit to Move as in 2.2 above. See also Policy 11.

Specifications

3.3 **Movement of deer less than 6 weeks of age**: Deer less than 6 weeks of age being moved from any herd do not require pre-movement TB testing. All other control measures will apply.

3.4 **Movements to and from short term** (i.e. 90 days or less) grazing: Deer may be permitted to move to short term grazing from a herd with an Infected status, without the need for a further pre-movement test prior to returning to the herd of origin, provided:

- The deer are negative to a Mid Cervical Test (MCT) applied within 60 days prior to the proposed movement, and
- The deer will be grazed separately from any other deer or cattle., and
- The deer remain under the day-to-day management of the owner, and
- The deer are identified with official Movement Control ear tags, unless an Authorised Person is satisfied the deer from the Infected herd will be effectively contained while grazing, and
- The owners of properties neighbouring the grazing block are notified.

If these conditions cannot be met, normal pre-movement testing criteria are to apply.

3.5 **Movements as a result of a civil Disaster or for reasons of animal welfare:** Deer required to be moved as a result of a civil disaster or for reasons of animal welfare may have some or all of the requirements for movement restrictions temporarily waived by an Authorised Person after receiving a direction from the Area Disease Manager. In such circumstances, the Authorised Person will specify to the owner the follow-up actions required at the time of movement.

4. Post-Movement Requirements

4.1 All deer which are required to be officially identified with official Movement Control ear tags are to be traced.

4.2 The status of a Clear status herd receiving official Movement Control ear-tagged deer from an infected status herd is to be set to Suspended.

4.3 The Suspended herd should also be issued with an Official Directive by an Authorised Person pursuant to section 122(1)(c). The official directive will specify any subsequent conditions the herd will be subject to while it remains under a Suspended status.

4.4 The official Movement Control ear-tagged deer from an infected herd and any cattle with which they have been grazed, are to be post movement tested with a Mid Cervical Test or Comparative Cervical Test 90–120 days after the pre-movement TB test.

4.5 For deer less than 6 weeks of age at the time of leaving the herd, a post-movement TB test is to be performed 90–120 days after the date of the movement.

4.6 The Suspended status for the herd which has received official Movement Control ear-tagged deer may only be revoked when the herd has a clear whole herd test 6–12 months after the post movement test.

Specifications

4.7 On obtaining a clear whole herd test, the status of the herd is to be set at C1.

4.8 The official Movement Control ear tags are not to be removed until the tagged animals are clear to the post-movement test and no TB is detected at the subsequent whole herd test

4.9 There is no need to perform a whole herd test when all the deer on the farm at the time of arrival of the official Movement Control ear-tagged animals, and any deer purchased prior to the official Movement Control ear-tagged deer being post-movement tested or slaughtered (whichever occurred first), are slaughtered within 12 months after the post-movement test or date of slaughter for the official Movement Control ear-tagged deer.

5. Non Compliance

5.1 When the conditions of a Restricted Place Notice served on an Infected status herd are not complied with, the person to whom the Restricted Place Notice was issued is to receive an official warning issued by an Authorised Person

5.2 The official warning will specify any additional movement restrictions over and above those specified in the Restricted Place Notice.

5.3 For persons who have been subject to a warning on more than one occasion, a case for prosecution is to be made.

4.15 POLICY 14
MOVEMENT CONTROL RESTRICTIONS – SUSPENDED STATUS HERDS

Policy

To prevent the spread of disease and allow the tracing of cattle or deer during a period of indeterminate herd TB status, or in the case of non-compliance with TB strategy requirements, the Management Agency may restrict the movements of cattle and deer from herds with a Suspended status.

Any variations to movement control specifications must be approved by the National Disease Manager.

Specifications

1. The Issue and Revocation of Movement Restrictions

1.1 Herds with a Suspended TB status may have their cattle or deer movements restricted when:

1.1.1 TB Reactors are awaiting slaughter and uncontrolled animal movements from that herd are considered to be a significant TB risk to the status of another herd; or

1.1.2 Test-positive cattle or deer have no visible TB lesions when slaughtered but there is other epidemiological evidence to suggest the animal(s) may be infected with TB. (Examples: proximity to TB-infected vectors or an Infected herd); or

1.1.3 Cattle or deer are found at slaughter with lesions histologically typical or suspicious for TB and prior to confirmation by culture; or

1.1.4 Owners fail to retest or slaughter test-positive cattle or deer as directed by an Authorised Person; or

1.1.5 The herd is in direct contact with cattle or deer from a herd with an Infected status; direct contact being defined as any animals from the herd being grazed in the same paddock as those from an infected herd; or

1.1.6 The herd has received official Movement Control ear-tagged cattle or deer from an Infected status herd; or

1.1.7 The herd owner fails to complete whole herd tests within timeframes required by the Management Agency.

Specifications

1.2 Movements will be restricted by an Official Directive issued pursuant to Section 122(1)(c) of the Biosecurity Act 1993 and signed by an Authorised Person.

1.3 An Official Directive may be personally delivered, mailed, emailed (with receipt required) or couriered.

1.4 Official Directives are to be revoked in writing by an Authorised Person under the Biosecurity Act 1993, when the suspect TB case has been resolved, the case of non-compliance has been addressed or the Official Directive has been complied with.

2. Movement Control Restrictions

The specific movement restrictions to be applied to a Suspended status herd are to be determined by the Area Disease Manager and Compliance Manager on a case-by-case basis, depending on the circumstances leading to the herd's status being suspended. The Movement Control measures to be applied may be one or more of the following:

2.1 A Permit to Move must be issued for any cattle or deer to be moved from the herd.

2.2 Cattle or deer being moved must be negative to a pre-movement primary test applied within 60 days of movement.

2.3 Cattle or deer being moved must be identified with official Movement Control ear tags issued by the Management Agency.

2.4 Pre-movement testing of cohort or in-contact herd mates as required by the Area Disease Manager.

2.5 Cattle or deer being moved are retested post-movement.

4.16 POLICY 15
MOVEMENT CONTROL RESTRICTIONS – CLEAR STATUS HERDS LOCATED IN MOVEMENT CONTROLLED AREAS

Policy

To prevent the spread of disease via movement of infected cattle or deer, the Management Agency will restrict the movements of stock from Clear Status herds in specific areas based on TB risk. Such areas will be declared as Movement Control Areas under Section 131 of the Biosecurity Act 1993.

Any variations to movement control specifications must be approved by the National Disease Manager.

During the term of this Operational Plan, new Movement Control Area specifications and policies will be phased in to support the introduction of risk-based testing and disease management which will take account of more detailed risk analysis based on herd and animal location, disease history and livestock movement patterns. This will include further classification of some Movement Control Areas as High Risk Movement Control Areas, to enable further or alternative testing and movement control requirements to be applied to livestock within and moving from herds within these areas.

Specifications

1. Movement Restrictions for Herds with a Clear Status Located within Movement Controlled Areas (MCAs).

1.1 For the owners of herds with a Clear status that are located within a MCA who intend to move cattle or deer 3 months of age and older from the herd, apart from movements directly to slaughter, the animals to move must be negative to an approved TB test applied within 60 days prior to the movement

1.2 If a test-positive animal is found, it must remain on the property or be sent directly to slaughter. The balance of in-contact animals may move under a Suspended status and a Permit to Move.

1.2.1 If there is a significant risk posed by the movements of these animals, the Area Disease Manager can apply additional movement restrictions and can require them to be tagged with official Movement Control ear-tags.

1.2.2 If on slaughter, TB is found in the test-positive animal, then the status of all the in-contact animals will change to Infected, otherwise they will regain their original status.

1.3 If no test positives are identified at this test, neither a Permit to Move nor tagging with official white Movement Control ear tags is required.

Specifications

2. Exemptions from Movement Controlled Area Pre-movement Testing Requirements

2.1 Persons in charge of herds with a status of Clear within a Movement Controlled Area may apply to an Authorised Person for an exemption from the requirement for pre-movement TB testing of eligible animals under the following conditions, provided the animals are not going for private or public sale and are staying under the same ownership:

2.1.1 Where the animals have been, or will be, grazing for a short term (less than 90 days) within the Movement Controlled Area; or

2.1.2 Where facilities for the TB testing of cattle or deer are not available; or

2.1.3 Where animals are required to be moved as a result of a civil disaster; or

2.1.4 For reasons of animal welfare, or

2.1.5 Where animals are likely to be in an immuno-compromised state which would affect TB test results, or

2.1.6 Humanitarian reasons e.g. family death etc.

2.2 Requests for exemptions are to be processed within two working days.

2.3 If exemptions are approved, a Permit to Move is to be issued for all cattle or deer moving under such exemptions.

2.4 Cattle or deer exempted from pre-movement testing requirements may be subject to additional requirements post-movement. The additional requirements will be specified in the Permit to Move and may be one or more of the following:

2.4.1 Post-movement testing of the exempted animals plus any in-contact animals if they have not been held in isolation;

2.4.2 Suspension of recipient herd's status;

2.4.3 Applying movement restrictions temporarily, via an Official Directive, on the recipient herd until post-movement testing is completed.

Specifications

2.5 Specific additional requirements are to be determined by the Area Disease Manager and/or Compliance Manager, taking into account:

2.5.1 The reason the exemption was granted;

2.5.2 The duration the exempted animals were present in the Movement Controlled Area;

2.5.3 The herd type and management regime of the recipient herd;

2.5.4 The Disease Control Area of the recipient herd.

2.6 Any test-positive animals detected at post-movement testing are to be managed as per usual Management Agency policy for herds of that type, status and Disease Control Area.

4.17 POLICY 16
INFECTED HIGH RISK HERDS

Policy

Infected cattle and deer herds in which the disease risks are identified as high will be subject to additional movement restrictions and are classified as Infected (High Risk). The Management Agency will define the criteria for classifying Infected cattle and deer herds as High Risk. To prevent the assessed high risk of spread of TB infection from stock leaving such herds, restrictions allowing movements only to slaughter will be applied. Infected (High Risk) herds must be operating under an Infected (High Risk) Herd Management Plan approved by the Management Agency.

Specifications

1. Criteria for an Infected (High Risk) herd status

1.1 An Infected-High Risk classification will apply to cattle or deer herds where the Area Disease Manager considers that sustainable clearance of TB from the herd will take more than three sequential herd tests.

1.2 Consideration of herds with an Infected status to be classified as Infected (High Risk) will include (but not be restricted to) any of the following:

1.2.1 the TB lesion incidence at any on-farm test is 3% or greater

1.2.2 five or more lesion cases in the herd in any 12-month period

1.2.3 the herd has had TB diagnosed at two or more sequential herd tests

1.2.4 the herd has had more than one episode of infection, i.e. having an infected herd status previously

1.2.5 Infected herds in VCZs where the assessed Probability-of-Freedom from TB in possums is less than 50%

2. Movement restrictions for Infected (High Risk) herds

2.1 Deer and cattle from Infected (High Risk) Herds can only move directly to slaughter.

The only exceptions will be for deer or cattle remaining under the same ownership and management when there will be no contact with another herd (e.g. deer or cattle moving to another property for grazing before returning home) or when movement is needed as the result of civil disaster or for reasons of animal welfare.

Specifications

3. Assistance for owners of Infected (High Risk) herds

3.1 Owners of herds with an Infected High Risk status may apply to the Management Agency for financial assistance.

3.2 This assistance will be granted when:

3.2.1 The TB situation in the herd has suddenly changed and this will have a major impact on the viability of the farming business e.g. sale of a farm or change of sharemilker contract; or

3.2.2 Epidemiological information indicates the herd TB incidence will not fall below the Infected (High Risk) trigger level within a 12-month test and slaughter programme.

3.3 The purpose of the financial assistance is to enable herd owners to obtain advice on management options for the farm business while operating under the movement restrictions for Infected (High Risk) herds.

3.4 The types and levels of assistance approved are to document within the herd's Infected (High Risk) Herd Management Plan.

3.5 All applications are to be sent directly from the herd owner to the National Disease Manager.

4.18 POLICY 17
TB DECLARATIONS AND HERD INFORMATION

Policy

To minimise the risk of TB spread through the movement of cattle and deer, the Management Agency will require declarations to be made of the TB risk relating to cattle/deer movements and will provide TB risk information in relation to specified herds.

Specifications

1. TB Declaration Requirements

1.1 All cattle or deer 30 days or older being moved either from their herd of origin to any other herd, or to a place of slaughter, or being offered for sale at a public sale yard are to be accompanied by a TB Declaration completed by the owner or a person acting with the authority of the owner.

1.2 The TB Declaration may be included in other industry documents (such as Animal Status Declaration Cards) where these are approved by the Management Agency.

1.3 The TB Declaration may be made and transmitted in electronic form where systems and processes for this are approved by the Management Agency and the Ministry for Primary Industries.

1.4 Obligations in relation to TB Declarations, and the information to be declared, are specified in clauses 12B-12F of the Biosecurity (National Bovine Tuberculosis Pest Management Plan) Order 1998.

2. Herd Information

2.1 Any person requiring TB information for any herd is to be given all of the following information:

- The herd's current TB Status;
- Whether the herd is located in a Movement Controlled Area;
- Any legal requirements which have to be fulfilled before cattle or deer can be moved from the herd.

Specifications

2.2 Additional information which may be given on any herd to any person includes:

- The date of the last whole herd test;
- The TB Status history of the herd;
- The testing programme for the herd;
- The Vector Status and the Disease Control Area status for the location of the herd;
- Whether the herd is located within a vector control operational area.

2.3 Immediate neighbours to herds with an Infected TB status will be notified by the Area Disease Manager at or around the time the herd is classified as being infected or when an infected herd is first moved onto a farm.

4.19 POLICY 18
WILDLIFE VECTOR CONTROL AND SURVEILLANCE

Policy

Achievement of TB Plan objectives requires effective identification, control, and eradication of TB-infected wildlife and vector-borne sources of TB. To ensure optimal delivery of vector control and surveillance activities, the Management Agency will implement an orderly planning and management framework and robust quality management systems. Safe, effective operations which comply with relevant statutes and regulations will be delivered through conformance with documented best practice and standard operating procedures. Where required, any use of legal powers by Authorised Persons must be approved by the appropriate senior manager of the Management Agency.

Specifications

1. Planning and Management Framework

1.1 All wildlife vector control and surveillance activities (the vector programme) will be carried out under an annual programme to be approved by the Chief Operating Officer of the Management Agency.

1.2 Technical design of the vector programme to achieve TB strategy objectives will be according to the Management Agency's Technical Design Guidelines.

2. Vector Programme Implementation

2.1 The Management Agency will follow formal documented policies and procedures for procurement of vector programme services.

2.2 Operations will be carried out under standard operating procedures or Technical Design Guidelines.

2.3 Sufficient resources will be allocated for auditing or monitoring the delivery and/or performance outcomes of vector operations.

2.4 Effective consultation and communications will be carried out with affected parties in the implementation of the vector programme.

3. Legal Powers

3.1 The willing cooperation of land occupiers and other affected parties will be sought where this is required to implement the vector programme.

3.2 Where necessary the Management Agency will use the powers conferred under Clause 8 of the Biosecurity (National Bovine Tuberculosis Pest Management Plan) Order 1998 to implement the vector programme.

3.3 The use of legal powers as above must have the prior written approval of the Chief Operating Officer of the Management Agency.

5. APPENDICES

APPENDIX 1: Planned TB possum freedom timeframes for North Island Vector Risk Areas

VRA NAME	VRA TOTAL HECTARES	TMA NAME	TMA HECTARES VRA	TMA POSSUM TB FREEDOM DATE	VRA POSSUM TB FREEDOM DATE
Central North Island	1,397,634	Hikumutu Environs	50,773	2016	2033
		Kirikau Environs	38,028	2016	
		Rangitoto Range Environs	55,300	2016	
		West Taupo	27,326	2016	
		Whakahoro Environs	38,144	2016	
		Patunamu	6,726	2017	
		Hauhungaroa Environs	91,004	2018	
		Mangaohane	8,151	2018	
		Retaruke Environs	44,062	2018	
		Bay of Plenty	43,668	2019	
		National Park Environs	65,967	2018	
		Raetihi Buffer	11,263	2019	
		East Taupo (Central)	31,790	2020	
		Taihape	39,995	2020	
		Whanawhana to Opouahi	95,485	2020	
		Hatepe Lake	34,720	2022	
		Whirinaki	13,543	2023	
		Ohakune Farmland	31,561	2024	
		Taharua	22,868	2024	
		Turangi	52,899	2024	
		Urewera	103,219	2026	
		Middle Hawkes Bay	73,114	2027	
		Ngamatea-Timahanga	51,926	2027	
		Ruapehu	44,306	2028	
		Hatepe Kaimanawa	15,064	2030	
		Waipunga	81,886	2029	
		Mangatepopo	8,614	2031	
		Waihohonu	35,786	2031	
		Kaweka	91,657	2033	
		Rangipo	88,737	2033	

VRA NAME	VRA TOTAL HECTARES	TMA NAME	TMA HECTARES VRA	TMA POSSUM TB FREEDOM DATE	VRA POSSUM TB FREEDOM DATE
North Waikato	13,365	North Waikato	13,365	2018	2018
Southern North Island	713,128	Northern Wairarapa	50,521	2017	2033
		Puketoi North	1,985	2017	
		North East Wairarapa	107,046	2020	
		Central Wairarapa	125,960	2025	
		Eastern Tararua	23,629	2025	
		Northern Tararua	50,863	2026	
		South East Wairarapa	140,276	2030	
		Kapiti-Wellington	58,337	2031	
		Southern Tararua	80,402	2032	
		Rimutaka-Hutt	74,109	2033	

TABLE 7: Planned possum TB freedom timeframes for North Island Vector Risk Areas and associated TB Management Areas (Full detail)

APPENDIX 2: Planned possum TB freedom timeframes for Northern South Island Vector Risk Areas

VRA NAME	VRA TOTAL HECTARES	TMA NAME	TMA HECTARES VRA	TMA POSSUM TB FREEDOM DATE	VRA POSSUM TB FREEDOM DATE
North Canterbury/ Marlborough	1,266,858	Avon	46,267	2019	2033
		Waiau-Hurunui	114,600	2019	
		Awatere Catchment	90,396	2021	
		Conway-Waiau	137,834	2021	
		Hurunui-Waipara	45,444	2021	
		Wairau-Waihopai	115,418	2021	
		Glencoe	44,276	2022	
		Wider Glencoe	132,798	2024	
		Kaikoura	104,378	2025	
		Western Hinterland	89,358	2025	
		Clarence Reserve	127,656	2026	
		Molesworth/ Clarence Reserve	159,512	2027	
		Clarence Catchment	58,291	2033	
Rolleston Range	55,648	Rolleston Range	55,648	2020	2020
West Coast/ Tasman	1,812,674	Ahaura	35,730	2020	2031
		Grey	99,224	2020	
		Tasman	86,697	2020	
		Grey North	51,658	2021	
		Grey West	42,557	2021	
		Wangapeka	123,354	2021	
		Anatori	42,233	2022	
		Hokitika Waitaha	61,274	2022	
		Takaka	130,324	2022	
		Buller Coast	76,284	2023	
		Coastal Karamea	47,938	2023	
		Hari Hari	42,706	2023	
		Southern Paparoas	30,347	2023	
		Buller	172,909	2027	
		Greater Karemea	179,219	2024	
		McVicars	40,659	2024	
		Westland	114,834	2024	
		Mokihinui	74,347	2026	
		Whataroa River	51,788	2026	
		Paparoa Ranges	84,714	2027	
		West Coast Divide	167,917	2027	
		South Westland Alps	55,961	2031	

TABLE 8: Planned possum TB freedom timeframes for Northern South Island Vector Risk Areas and associated TB Management Areas (Full Detail)

APPENDIX 3: Planned possum TB freedom timeframes for Southern South Island Vector Risk Areas

VRA NAME	VRA TOTAL HECTARES	TMA NAME	TMA HECTARES VRA	TMA POSSUM TB FREEDOM DATE	VRA POSSUM TB FREEDOM DATE
Blue Mountains	43,084	Blue Mountains	43,084	2026	2026
Catlins	230,197	Catlins Southland	60,557	2026	2026
		Catlins Otago	169,640	2026	
Hokonui Hills	27,184	Hokonui Hills	27,184	2018	2018
Nevis	61,795	Nevis	61,795	2026	2026
Otago	1,522,833	Lindis	67,040	2026	2035
		Akatore-Tokomairiro	63,082	2026	
		Manuherikia	257,997	2030	
		Morven Bendigo	81,660	2026	
		North Otago Buffer	44,152	2026	
		Upper Taieri	268,279	2030	
		Timaru Creek	11,907	2026	
		Wanaka-Hawea	23,871	2026	
		Strath Taieri	175,176	2030	
		East Otago	180,894	2035	
		Southern Buffer	348,775	2035	
Pisa	126,704	Pisa	126,704	2026	2026
Roxburgh	6,594	Roxburgh	6,594	2024	2024
South Canterbury	797,317	South Canterbury South	165,895	2024	2030
		South Canterbury Core	399,380	2030	
		South Canterbury High Country	232,042	2030	
Western Southland	131,494	Western Southland	131,494	2026	2026

TABLE 9: Planned possum TB freedom timeframes for Southern South Island Vector Risk Areas and associated TB Management Areas (Full detail)

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APPENDIX 5: Glossary of terms

Biological eradication	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.
Breakdown/ Infected Herd	Refers to TB being diagnosed in a Clear or Suspended status cattle or deer herd.
Herd	A group of cattle or deer, or cattle and deer that is, (a) managed as 1 unit; or (b) kept within the same enclosure or behind the same fence.
Infected herd annual period prevalence (also herd infection rate)	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.
Livestock TB freedom	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.
Management agency	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, a subsidiary of OSPRI New Zealand.
Movement Control Areas (MCA)	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.
National Operational Plan (NOP)	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.
Passive surveillance	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 *per se*).
Probability of freedom (POF)	The probability that TB has been eradicated from the possum population in a defined area.
Special Testing Area (STA)	Special Testing Areas (STAs) are defined geographical areas which specify the TB testing regime of cattle and deer. The frequency of the testing is determined by the area risk, or the need to obtain surveillance data for Proof of Freedom purposes.

Stopping rule	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.
Surveillance	The process of conducting formal field surveys to detect the continued presence of TB in possums. It includes direct necropsy surveys of possums (usually by trapping) and/or necropsy of sentinels 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.
TB	Used as an abbreviation for bovine tuberculosis. *Mycobacterium bovis*, is the bacterium that causes the disease of bovine tuberculosis and is the 'pest' managed by the TB Plan.
TB Management Areas (TMA)	TMAs are a contiguous area with broadly similar: habitat and geography level of control and surveillance disease history and risk
TB Pest Management Plan	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.
TB Plan Order	Is the Biosecurity (National Bovine Tuberculosis Pest Management Plan) Order 1998 that gives effect to the regulatory elements of the TB Plan.
TB freedom	Freedom from bovine tuberculosis means that the statistical likelihood of bovine tuberculosis being present in the population of the species concerned is assessed by TBfree New Zealand as being no greater than 0.0001% throughout the preceding 12-month period.
Vector Control Zone (VCZ)	A defined geographical area in which activities are undertaken to control or survey the population of wild animals for the purposes of managing bovine tuberculosis.
Vector Free Area (VFA)	A defined geographical area where bovine tuberculosis is not maintained in the wildlife populations.
Vector Risk Area (VRA)	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.