

# TB PLAN 2016

## RISK-BASED POSSUM CONTROL

### FACTSHEET 2016-04

This factsheet provides an overview of the new approach to 'vector' or pest control. Vectors are non-native wildlife pests such as possums, deer, pigs and mustelids that spread infectious disease. Vector control is a critical component of the TB eradication strategy New Zealand will continue to pursue from 1 July 2016.

The primary vector (or maintenance host) for bovine TB is the brushtail possum, making that species the target of most of TBfree NZ's control efforts. A key part of the new TB plan is to amend both the design and implementation of TB vector control and surveillance to deliver greater efficiencies. This will allow us to deliver on three key milestones in the proposed plan:

- TB freedom from cattle and deer herds by 2026,
- TB freedom in possums by 2040, and
- Biological eradication of TB from wildlife and farmed cattle and deer herds by 2055.

### EXPLAINING THE APPROACH

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Overall, the general direction of vector control under the new Plan focuses on:

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

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

#### *Vector considerations*

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

### *Herd considerations*

- Occurrence and extent of wildlife-related herd infection (a predictor of new infection or reinfection).
- Number of herds at risk near the control area.
- Risk to herds elsewhere given the area's animal movement profile (supported by NAIT movement data) and history.

### *Investment considerations*

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

## THE CASE FOR ERADICATION

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

Research, strongly supported by field experience, has shown that if the possum density is held at or below two per cent Residual Trap Catch Index (RTCI) for five years, and in the absence of immigration, there is a 95 per cent probability that TB infection will be eradicated from the population. Two per cent RTCI is a measure that equates to only two possums caught from 100 trap nights of effort. Immigration effects can be minimised by carrying out possum control over large continuous areas within short timeframes.

Following the sustained control period, or sometimes before or during it, wildlife surveillance is undertaken. Indicator species – possums, ferrets, pigs or deer – are captured and examined for signs of TB. The absence of TB disease over a significant proportion of sampled population provides proof of freedom from TB.

Control and surveillance undertaken over the last three years of the current strategy - in the two areas with dense bush identified as "Proof of Concept" areas for eradication - has validated the belief that eradication is feasible across all of New Zealand. This work has been independently peer reviewed and supported.

## BIOLOGICAL ERADICATION

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The required outcome of an eradication programme is biological freedom from the bovine TB bacterium *Mycobacterium bovis*. There will be no possum control activity in areas where there is nothing to contain, but TB testing and surveillance will continue. Areas where it is more difficult to eradicate will increasingly come into scope over time.

The core biological eradication policies are:

- Ongoing wildlife surveillance and control in vector control zones prioritised for eradication activity based on best-practice principles
- Passive wildlife surveillance and livestock at slaughter from 10 years post TB freedom in possums.
- Maintain vector population density in buffer zones VFA at 2% to 5% RTCI until eradication is achieved in the area behind the buffer.

## WHAT THIS MEANS FOR WILDLIFE CONTROL

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The core TB freedom in wildlife policies dictate a survey-then-control approach and prescribe a threshold for declaration of freedom. Where high intensity control is required in vector risk areas (VRAs), we use an adaptive approach. This involves the current approach of two controls, surveillance, and a targeted final control.

OSPRI programme designers and management will have the option of using one control, surveillance, and final control as informed by monitoring and assessment of the possum population density in a particular area.

Lower intensity surveillance and control activity will continue until probability of freedom reaches the appropriate benchmark (0.95) at which point a risk area is declared TB-free.

OSPRI veterinary epidemiologists and management will have the option of using the lower probability of freedom stopping rule based on assessment of risk and consequences (plus associated cost) of dealing with residual infection if undetected disease is still present post-stopping.

## MEASURING SUCCESS

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OSPRI's TBfree programme uses a quantitative and qualitative approach to determine whether TB has been eradicated from possum populations in defined areas.

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

This utility then calculates a probability of freedom that is assessed by a team against other known risk factors to determine the likelihood of eradication.

## MAKING USE OF DATA

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The data from possum and other wild animal surveys provides an indication of the land area coverage and the intensity of surveillance that has been used to detect TB possums.

Overlaying the sentinel wild animal locations with possum detection-device sites on a map of possum habitat gives a good visual idea of the intensity of wild animal surveillance in a Vector Control Zone (VCZ). This is supported by an objective measure of the sensitivity of wildlife surveillance from the POF model.

The outcome of the POF analysis provides OSPRI with a probability that the possum population in the defined area is TB-free. OSPRI then assesses that result using qualitative information, such as the cost associated with making the wrong decision and the risk posed by TB possums in adjacent areas.

Provided OSPRI is satisfied that there is a high probability of TB freedom, and low risks and costs if a wrong decision is made, then the defined area will be presented to the OSPRI Board to ratify that TB has been eradicated and that the risk status of the area can be revoked.

## IMPACT ON TESTING REQUIREMENTS

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In all cases, once TB has been eradicated from the wild animal population in a VRA, testing of cattle and deer together with wild animal surveillance would continue for the next four years before changing to risk-based testing. The purpose of undertaking ongoing testing is to provide confirmation, using livestock as an indicator, that TB has been eradicated from the possum population.

*For more information about OSPRI's risk based pest control, visit [www.ospri.co.nz](http://www.ospri.co.nz). For more information on the TB Plan review visit [www.tbplanreview.co.nz](http://www.tbplanreview.co.nz).*