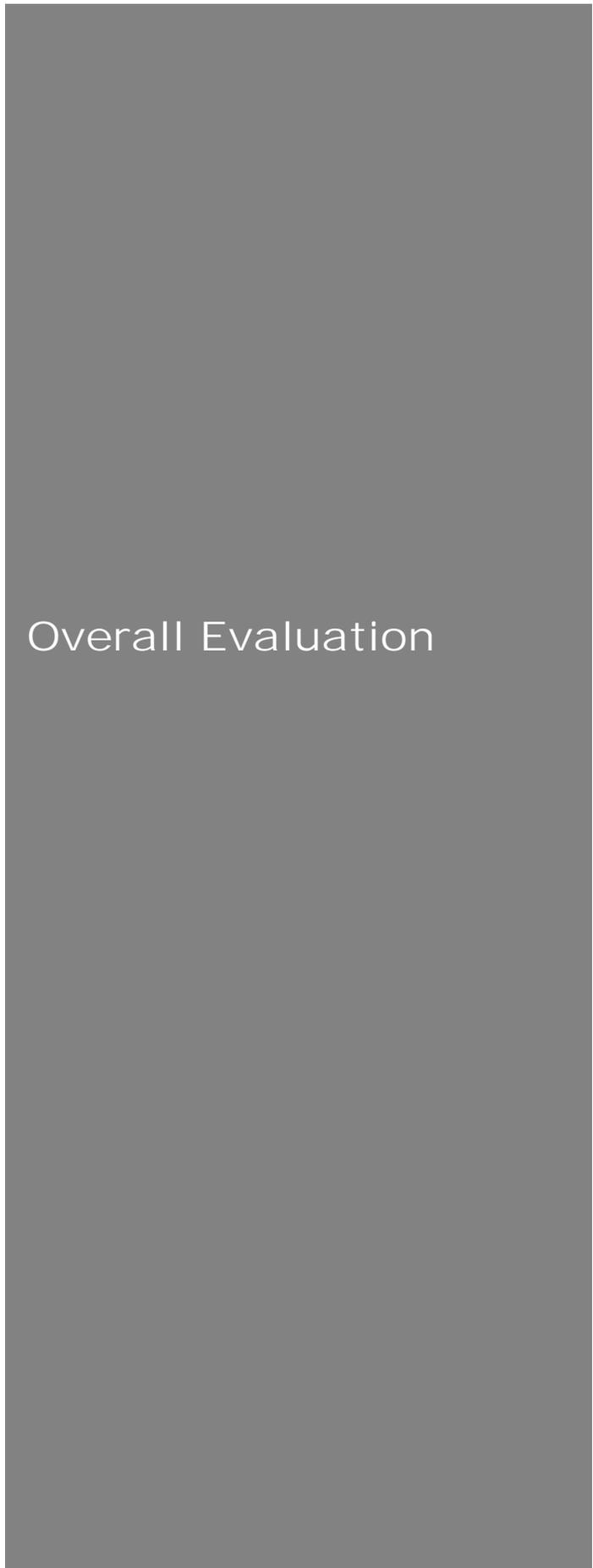


Section 4.6

Overall Evaluation



1. Summary of Method

In preparing this application for the reassessment of 1080, the applicants and their consultants have undertaken research and consultation as follows:

1. Preparation of *The use of 1080 for pest control: A discussion document* for public consultation and accompanied by a request for submissions.
2. Analysis of submissions from the public consultation document.
3. Separate consultation with Maori and analysis of findings.
4. Lifecycle workshop for 1080 with the purpose of experts describing how 1080 is handled and used from the time it arrives in New Zealand until the time it is used or disposed of.
5. Extensive national and international literature review of effects of 1080 on New Zealand's market economy, society and community, environment and human health. Phone interviews with, and information requests from, New Zealand experts in the relevant fields (e.g. regional councils, MAF, NZ Food Safety Authority, DOC, AHB, Landcare Research, HortResearch).
6. Development of realistic national outcome scenarios that describe how New Zealand will be in the future if 1080 remains in use (WITH 1080), and how New Zealand will be in the future if the next best pest control option is used (WITHOUT 1080, involving a combination of trapping and cyanide). These scenarios were developed during workshops of experts in 1080 use, Tb epidemiology, and conservation outcomes.
7. Identification of risks, costs and benefits in the WITH 1080 and WITHOUT 1080 scenarios through literature review and expert input (i.e. workshops, interviews, commissioned research, peer review).
8. Extensive consultation with ERMA.

All of the work listed above informed the risk, cost and benefit assessment contained in the application. For consistency, the same rating matrices (contained in the Introduction to Section 4.1) were used for both WITH 1080 and WITHOUT 1080 assessments.

The assessment has given effect to the precautionary principle by the structure of the Level of Risk and Level of Benefit matrices (refer Section 4.1). The "significance zone" of the matrices (those labelled E and F) is approximately three times larger in the Risk matrix compared to the Benefit matrix. This structure means that a benefit must be about three times larger to be considered significant (i.e. very likely and very large) than an equivalently significant risk (i.e. moderately likely and moderately large).

2. Findings

This section summarises the findings of the risk assessments presented in the previous sections of the application. Figure 1 (on page 445) summarises the risk rating of the significant risks and benefits of a future both WITH 1080 and WITHOUT 1080 and may provide a useful visual aid when reading the following sections.

2.1 Market Economy

There are no significant risks to New Zealand's market economy when a future WITH 1080 is compared to a future WITHOUT 1080.

There are four significant market economy benefits when a future WITH 1080 is compared to a future WITHOUT 1080:

- Removal or relaxation of restrictions on livestock movements [M-B4, extreme benefit]
- Reduced competition for grazing from pests (wallabies, possums, rabbits and hares) [M-B5, great benefit]
- Reduced costs to the agricultural sector and government associated with vector control [M-B7, great benefit]
- Reduced risk of loss of markets due to market perceptions of New Zealand's Tb status [M-B10, great benefit]

These benefits primarily arise from New Zealand attaining bovine-Tb free status, and the resultant reduction in costs of control and monitoring (estimated to be \$50 – \$100M over 10 years). The total amount of economic benefit accruing from these four significant benefits is \$350-\$1100M over 10 years.

Analysis of risks, costs and benefits relating to New Zealand's market economy support the continued use of 1080 as the benefits of its use substantially outweigh the risks of its use. It is only through the continued, effective use of 1080 that New Zealand will fulfil the primary objective of the National Pest Management Strategy, that New Zealand be officially recognised as free of bovine Tb by 2012/13.

2.2 Social and Community

There are no significant risks to New Zealand society and community when a future WITH 1080 is compared to a future WITHOUT 1080. However, two risks have been discussed in detail due to their controversial nature. They are: S-A1, relating to a loss of opportunity to hunt deer, and S-A6, relating to grief caused by pet suffering or mortality resulting from pest control operations. Local deer populations can reduce in the short term after 1080 operations, and this loss of opportunity to hunt is an adverse effect for the hunting community, that consider deer as a resource rather than a pest. Pets, particularly dogs, are at risk from secondary poisoning from scavenging poisoned carcasses after 1080 operations, however controls are set in place to minimise these risks. As this assessment requires a focus on the social and community risk or benefit to all New Zealanders, these effects have been assessed as not significant at a national scale, using the agreed matrices.

There is one significant social and community benefit when a future WITH 1080 is compared to a future WITHOUT 1080: Enjoyment of recreational activities that rely on maintenance of healthy forest habitat and native biodiversity [S-B5, great benefit].

Analysis of risks, costs and benefits relating to New Zealand's society and community supports the continued use of 1080 as the benefits of its use outweigh the risks.

2.3 Human Health

There are no significant adverse risks to the health of New Zealanders in a future WITH 1080. However, as contamination of surface water in water supply catchments during aerial operation is perceived by the public as a potentially significant exposure, this risk (H-A14) was discussed in detail in the assessment. The risk assessment demonstrates that significant contamination of water is highly improbable, and the effects on human health would be minimal. It is therefore concluded that this potential exposure pathway is not significant.

However, the assessment identified three significant risks to human health in a future WITHOUT 1080 (i.e. H-CN-A10, A11 and A12). The high rating of these risks relate directly to the high toxicity of cyanide when ingested by humans. However, due to good management controls, there have been no recent fatalities as a result of cyanide poisoning from pest control. The risk ratings represent a combination of the chance that cyanide poisoning might occur (improbable) and the impact of that poisoning (extreme).

There are no significant benefits to human health when a future WITH 1080 is compared to a future WITHOUT 1080.

Analysis of risks relating to human health supports the continued use of 1080 as the significant risks from use of the alternative (WITHOUT 1080) exceed the nil significant health risks from the use of 1080.

2.4 Environment

There are no significant risks to New Zealand's environment in a future WITH 1080.

There are six significant benefits for New Zealand's environment when a future WITH 1080 is compared to a future WITHOUT 1080:

- Increased protection of vulnerable plant species from browsing by pest species and resulting biodiversity benefits [E-B1, extreme benefit]
- Increased protection of native ecosystem health and habitat values [E-B2, great benefit]
- Reduced predation of mohua, kakariki and Southern New Zealand dotterel [E-B4, extreme benefit]
- Reduced predation of native birds, particularly threatened species (excluding mohua, kakariki and Southern New Zealand dotterel) [E-B5, extreme benefit]
- Reduced competition for food supply and some habitat resources for native birds, particularly threatened species [E-B6, great benefit]
- Protection of *Powelliphanta* land snails from predation [E-B10, great benefit]

By achieving the benefits listed above New Zealand is fulfilling its international and domestic conservation obligations. 1080 is the only pest control method that is able to be applied effectively to New Zealand's valuable and inaccessible areas. Inability to undertake effective pest control undermines all of New Zealand's international obligations that require habitat and ecosystem protection, securing the future of threatened species, and reducing the further range expansion of biosecurity pests.

The assessment identified no significant adverse risks to New Zealand's environment in a future WITH 1080, but did identify two significant risks in a future WITHOUT 1080:

- Risk to weka from contained cyanide pellets, encapsulated paste, and non-encapsulated paste [E-CN-A15, unacceptable]
- Risk to weka from traps [E-TR-A1, require further controls]

Analysis of risks relating to New Zealand's environment supports the continued use of 1080 as the benefits of its use substantially outweigh risks of using 1080; and the risks of the alternative (WITHOUT 1080) are also greater than using 1080 (WITH 1080).

2.5 Maori Perspective

Maori views need to be considered in the context of the holistic approach that is central to Maori knowledge systems. To Maori, environmental outcomes need to be considered as interrelated to cultural outcomes along with human health and wellbeing concerns.

The environmental outcome from 1080 use of improved wellbeing for forests and bird species is reluctantly accepted by some Maori, strongly by others, but it is also held that aerial 1080 operations, in particular, violate wairua and mauri. Therefore in a spiritual context Maori are generally opposed in principle to aerial operations which are perceived as a pollution of the environment. Objections to aerial use of 1080 include concerns about adverse effects on wahi tapu and their associated wairua and mauri.

It was generally agreed by Maori that removing possums is desirable for the restoration of natural habitats. There is, however, a strong preference for alternative methods of control, or for less frequent 1080 drops to be done by controlling larger areas of forest and greater employment opportunities for iwi during maintenance activities.

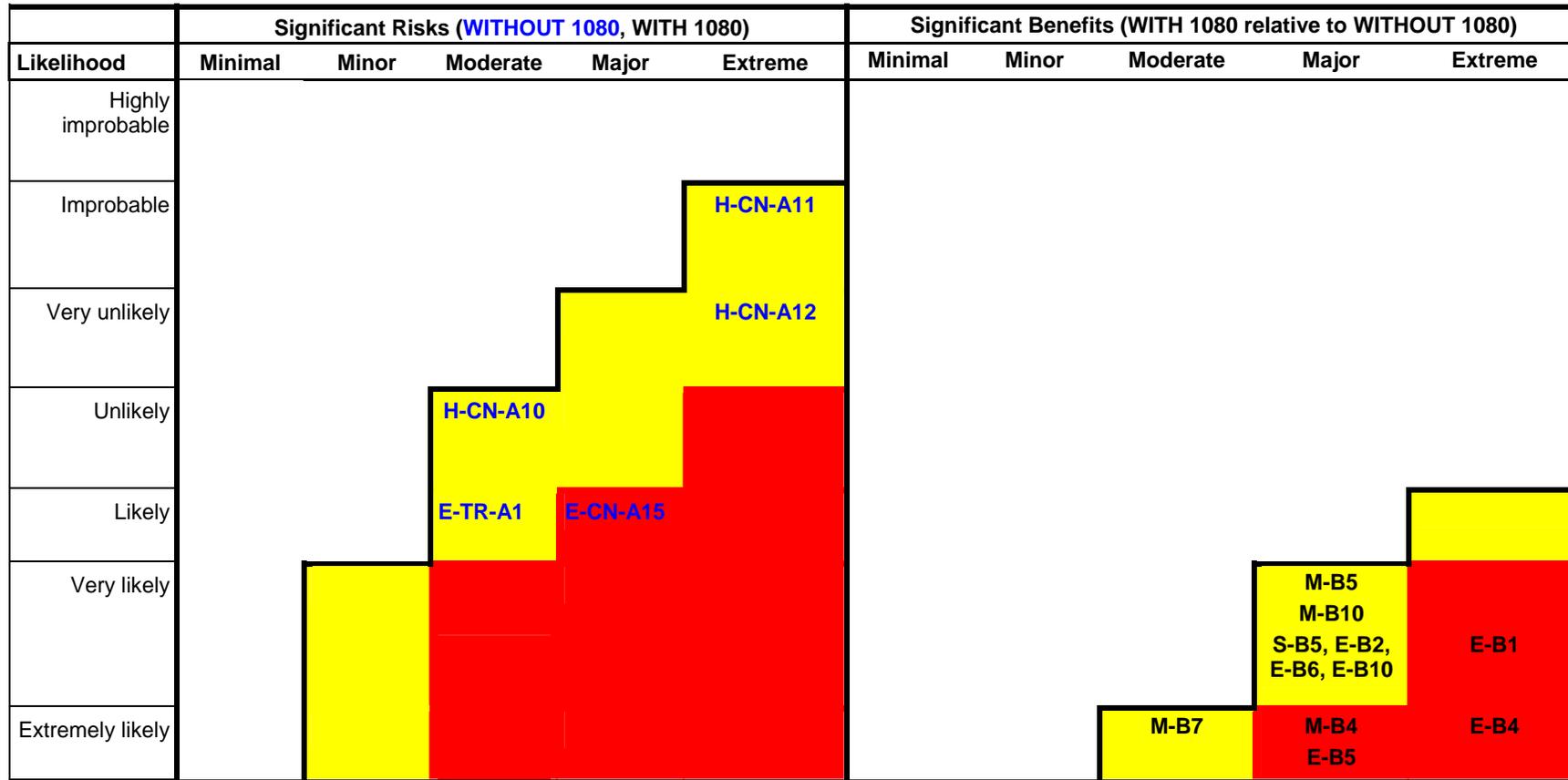
At best, Maori reluctantly accept 1080 for its benefits and, at worst, oppose its widespread use (especially aerial use). However, because Maori did not assess the risks, costs and benefits of the WITHOUT 1080 situation it is not possible to draw a conclusion on whether Maori consider 1080 as better or worse than the alternative.

3. Conclusions

Based on the contents of this application, and the findings from this overall evaluation, the applicants consider that a future WITH 1080 delivers more benefits and less risks to New Zealand than does a future WITHOUT 1080 (i.e. with greater use of cyanide and traps).

The relative benefits of 1080 are primarily due to 1080 delivering effective pest control (including treating inaccessible areas via aerial operations) for both conservation objectives and Tb reduction outcomes. Use of 1080 also represents less of a risk to human health than the alternative if 1080 was not available.

Figure 1 | Significant Risks and Benefits Identified in the Risk Assessment



Refer Section 4.1 for further explanation of matrices, and details of each risk or benefit identified