

27 August 2021

Alan Mackenzie
Ministry for Primary Industries
Wellington

Sent by email to: Alan.McKenzie@mpi.govt.nz

Dear Alan

This letter provides a summary of the key points of our report on the costs and benefits of Kauri Disease National Pest Management Plan.

The report outlines our estimate of quantifiable net benefits of current funding of the National Pest Management Plan for Kauri Disease (KD).

Section 1 backgrounds the issue of KD and its current distribution and rate of spread.

Section 2 frames the issue in terms of ecosystem services and total economic value approaches (in contrast to the Deloitte CBAs of 2018 and 2019).

Section 3 describes some stylised spread modelling that provides guidance on the relative benefit of treating areas or linear tracks to minimise KD spread, and that can be scaled up to cover wider areas in northern North Island. It shows tracks can significantly increase the rate of penetration of KD into Kauri forests, and hence the importance of managing tracks and access to contain the spread of KD.

Section 4 describes results of our economic modelling, subject to the limitations of quantification. The principal quantifiable benefit is averted loss of carbon stored in kauri trees, which if they die would add to New Zealand's greenhouse gas emissions for international reporting. There are other benefits in maintaining other ecosystem services such as soil and water conservation in the forest catchments and benefits to Māori in protecting their taonga and to all New Zealanders in protecting biodiversity, but these cannot be reliably quantified or valued at this time.

Kauri disease threatens a keystone species in New Zealand's biodiversity

KD threatens a keystone species in New Zealand's biodiversity that supports distinctive communities of other native species. Kauri are also taonga for Māori and iconic to New Zealanders at large. There is no current cure for KD, but mitigation measures have potential to reduce the spread of KD by restraining access to areas and reducing risk of transmitting the disease in contaminated soil and organic matter on the feet of people and animals.

Economic costs are likely to result from further spread of the disease, most readily quantifiable of which is depletion of the store of carbon in kauri trees that die, which would count as emissions of greenhouse gases. Mature kauri forest also provides a range of other ecosystem services of value to human activities, regulating rainfall impacts to reduce erosion, conserve soils, and moderate water flows and quality in natural watercourses.

If KD proceeded unchecked the area of affected forest would increase from its current level, incurring costs for New Zealand in loss of carbon storage and other ecosystem services. In the long

term other tree species than kauri that are not affected by KD would emerge to create new forest communities with similar ecosystem service value to other mature forest. But ecosystem services would be diminished in the interim until the new trees have grown to maturity.

The NPMP for kauri disease aims to check its spread

A National Pest Management Plan for kauri disease is being developed which would spend \$28 million over 4 years with possible addition of \$4 million in the fifth year. It would fund a range of programmes to build capability of iwi and local communities in managing the forests and disease, continue monitoring of disease spread and effects, continue research into better forest health treatments, and extend mitigation measures on the ground.

In our report a partially quantified cost benefit analysis compares NPMP costs against the benefit of slowing KD spread and its release of stored carbon over a 15 year period, discounted at 5% and 3%. This compares the effects of NPMP spending against a counterfactual in which KD continues to spread at rates recently observed or higher. Because of uncertainty about the full extent of KD affected forest, the rate of disease spread over time and the causes of spread, the CBA examines a range of different input assumptions.

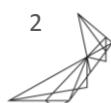
Well-chosen mitigation interventions can be net beneficial

The CBA shows that if mitigation measures are targeted at areas where the risks of spread are greatest, such as areas with high density of kauri trees or with tracks running through or around kauri stands, additional mitigation could break even and deliver benefits for carbon storage in excess of costs, given changes from an initial conservative assumption set. These include a higher value attached to retaining carbon stores in kauri forests and immediate accounting for carbon emitted from dying trees rather than the 0 to 10 year lag initially assumed. Net benefits would be larger if the disease is spreading faster than currently appears, and if the initial area of infected trees is larger than is currently known: that would make the expected value of costs from each successive year of unchecked growth in the counter-factual higher than in the current assumptions, so the benefit of intervention through the NPMP would also be higher than estimated here.

All these results are subject to considerable uncertainty at present. Wider benefits of mitigation that cannot be valued in this report, including the high significance of kauri to Māori, would add to benefits and may be considered as offsetting the net costs of NPMP in protecting an iconic species whose extinction would be irreversible.

This cost benefit analysis has not delivered a simple number showing the net worth of the NPMP, but it has shown that there are activities that can be funded to deliver a benefit in checking the spread of the disease. The kauri is an iconic species, and the costs of the NPMP are relatively small in reducing the risks of its extinction, which would have significant impact on New Zealanders' wellbeing and sense of identity in their environment.

Results of some of the assumption sets are summarised in the table below. The partial analysis compares the costs of mitigation on the ground against the benefit of slowing KD spread, tree death and the resultant release of carbon to the atmosphere. This analysis shows positive net benefits under some assumption sets. The full analysis includes the components of the partial analysis plus the costs of forest monitoring and surveillance, research into forest health and treatments, and iwi and community capacity building. The full analysis does not show positive net benefits under current information, but there are also unquantifiable benefits that could change that. For instance, iwi and community capacity building has potential to improve the speed and response to new cases of KD detected, and science and research may deliver more effective treatments for use in future.



Combining costs and benefits of NPMP measures under different assumption sets

	Base analysis	High C Price	Early carbon loss	0.5% KD growth	3% DR
Total analysis	PV\$m	PV\$m	PV\$m	PV\$m	PV\$m
PV Benefits	1.5	5.7	8.7	9.6	11.6
PV Costs	28.0	28.0	28.0	28.0	29.5
NPV	-26.5	-22.3	-19.3	-18.4	-17.9
BCR	0.05	0.20	0.31	0.34	0.39
Partial analysis: P4 only					
PV Benefits	1.5	5.7	8.7	9.6	11.6
PV Costs	8.4	8.4	8.4	8.4	8.9
NPV	-6.9	-2.7	0.3	1.2	2.7
BCR	0.18	0.68	1.04	1.14	1.30

Source: NZIER

More details behind these findings are provided in the report. If you have any other questions about the analysis, please get in touch.

Yours sincerely



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