

# Benefits and Costs of the Wilding Pine Management Programme Phase 2

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Executive summary

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## Wilding conifers are a serious pest

Wilding conifers are a serious and pressing established pest in New Zealand. They reduce the productivity of primary industries and damage the environmental values that New Zealand is renowned for.

### Context

The Government has been running a national programme to control wilding conifers since 2016. The Wilding Conifer Management Programme is run by the Ministry for Primary Industries. Since 2016 the Ministry has been leading and coordinating stakeholders around the country, understanding the profile of infestation and future vulnerability and planning for a wider roll-out of control efforts.

The first phase harnessed the funding support and commitment of wilding tree management groups, land holders, and central and local government. That phase treated wilding conifers across approximately 1.5 million hectares of New Zealand's high country.

MPI is seeking to extend this work into further phases. Phase 2 of the Programme – the subject of this cost-benefit analysis – involves increasing control to roll back the area occupied by wilding conifers to the point where they can be sustainably managed by landowners.

### The aim is to achieve sustainable management

A national Wilding Conifer Control Programme in Phase 2 aims to fight wilding conifer spread by:

- coordinating efforts and harnessing skills across multiple agencies in central and local government alongside other stakeholders
- developing and maintaining information systems to monitor infestations and areas at risk from invasion, and to support control planning
- improving prevention through raising community awareness and promoting best practice in the planting of conifers.

### Predicting the consequences of leaving wilding pines to spread

This cost-benefit analysis (CBA) takes data about the extent and location of wilding pines and predicts the consequences of leaving wilding pines to spread uncontrolled versus the proposed programme of treating and clearing wilding conifers.

Clearing wilding conifers ("CONTROL") will restore the land and protect surrounding areas from invasion ("PROTECT"). Surrendering to wilding spread ("SURRENDER") will destroy the value of the land and make surrounding areas vulnerable to invasion.

This CBA costs the consequences of three strategies: Doing Nothing, Minimum Plus (“Treading Water”) and Intermediate (“Turning the Tide”).

- **Doing Nothing** – some control is achieved at a local level at first, but this is not sufficient to achieve protection in the long term and vast tracts of vulnerable land are surrendered to wilding conifers. 7.5 million hectares are lost.
- **Minimum Plus (“Treading Water”)** – a national programme is run with a slightly broader scope than Phase 1, achieving control over 3 million hectares. Over the long term, 3 million hectares are protected but 4.5 million hectares are surrendered.
- **Intermediate (“Turning the Tide”)** – a national programme is run with a wide scope (but not across all of New Zealand’s wilding-affected areas). Control efforts are scaled up to achieve nationwide containment and eradication, focussing control across the most vulnerable landscapes. The programme controls 1.8 million hectares, almost all of New Zealand’s current infestation. The programme is effective at sustaining control into the long term, and 7.25 million hectares are protected. A small amount, 0.25 million hectares, is surrendered.

To illustrate the long-term consequences of surrendering land to wilding conifer invasion, annualised impacts of surrender are examined over a 50-year time horizon, then discounted to present day values.

## The benefits of control and protection are clear and greatly outweigh the costs

Both intervention options (Minimum Plus and Intermediate) have a demonstrably higher benefit return than costs.

Doing nothing, or doing little, generates a large negative impact: a loss of \$4.6 billion. Without national intervention wilding pines will then spread to 7.5 million ha of vulnerable land. This could take as little as 15 to 30 years.

The consequences of doing nothing to stop this spread are profound. For example, the 7.5 million hectares of surrendered land by year 50 in the Do Nothing scenario includes 537,000 hectares of productive land, which is worth \$739 million of productive potential. In addition, the surrender affects water with productive potential of \$2.9 billion (consisting of \$1.95 billion of irrigation impacts and \$955 million of hydro impacts). The biodiversity loss will include New Zealand’s most sensitive landscapes and water catchments.

Not only will doing nothing fail to achieve the objective of sustainable management, it will result in substantial cost for the country. It can be as little as \$5–\$10 per hectare to treat sparse infestations however control costs escalate over time. And treating dense infestations will typically cost \$2,000 per hectare to aerial boom spray.

The CBA demonstrates that the Intermediate option for Phase 2 is enough to markedly roll back the area occupied by wilding conifers and 'turn the tide'. It will achieve a net benefit of \$6.1 billion (net present value), a benefit ratio of 38:1.

The Minimum Plus scenario will achieve control but will have a smaller net benefit, because it achieves less control and protection in the near term. The net benefit of this option is \$2.6 billion (net present value).

## **Biodiversity valuation is highly conservative**

Biodiversity values are significant but in this CBA they are conservatively quantified. The quantified value on biodiversity does not adequately capture the values protected. For example scaling up to the Intermediate scenario will mean that there are large areas of dense infestation that will be treated early, such as in Wakatipu, the Mackenzie region and near Twizel. Waiting to control these areas (as the Programme would have to in the Minimum Plus scenario) would mean that these trees would cone and spread, not only affecting the flora and fauna in these sensitive landscapes but also making the treatment problem more difficult and costly in the future.

About three quarters of New Zealand's 70 identified "naturally rare landscapes" are potentially threatened by invasion from wilding conifers, including a zone above the current tree line. These include such highly valued areas as: alpine herb fields, dry tussock lands, geothermal areas and the volcanic plateau, the South Island mineral belt, Coromandel scrub lands, coastal dunes, frost flats and seasonal wetlands.

## **Clearing wilding pines will not harm New Zealand's carbon reduction efforts**

We found that clearing wildings will not penalise New Zealand in its efforts to reduce carbon and meet its international commitments.

New wilding forests are ineligible to be registered as post-1989 forests in the ETS, so they have no value as emissions credits. Allowing the spread of new wilding conifer forests is incompatible with other beneficial land uses (such as plantation forests) that do operate as carbon sinks.

Deforestation liabilities can arise when old, dense infestations are removed and the land is used for a different activity e.g. grazing land. But, deforestation liabilities can be avoided when a tree weed exemption has been granted and if old, sparse wilding trees are removed before they become forests such liabilities can be avoided altogether.

Therefore, we have found that the potential carbon liability from removing wildings is small enough to be immaterial for the purposes of the CBA. Any such liability accruing to private landowners can be managed through remediation activities.

## Ongoing investment will be required

The Intermediate option is enough to turn the tide, but not sufficient on its own to win the war. To achieve sustainable management will require ongoing investment beyond four years and into further phases. A wider area will need to be treated, to avoid cross-infestation of already controlled sites.

MPI expects that up to five control phases will be needed, with costs tailing off as a greater degree of control is achieved.

This CBA does not account for the control phases beyond Phase 2.

## An intergenerational investment in natural capital




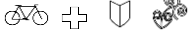
Most of the benefits of Phase 2 will be realised beyond the four years this Phase will run.

The CBA analysis demonstrates the value of a ‘stitch in time’—what is done now has large impacts on natural capital in the future. If the objective is to reach a point where wilding conifers can be sustainably managed using a combination of private landowner action and government support, it is better to act swiftly and decisively now.

The CBA analysis shows that the Intermediate scenario offers a higher overall net benefit. Each additional hectare of land treated in the Intermediate scenario offers a positive return, with benefits higher than the costs.

## Alignment with the living standards framework

Many Living Standard Framework domains are affected by wilding conifer removal activities, but the major impacts are on income and consumption and the environment. These domains underpin New Zealand’s Natural Capital, Financial/Physical Capital and, to a lesser extent, Social Capital.

	Income and consumption (Quantified)
	Environment (Quantified)
	Jobs and earnings (Quantified)
	Time use, health and cultural identity (Unquantified)

## Results

The results shown below are of impacts over the long term, 50 years. They show the impact of reducing the area of wilding conifers, sustaining the reduced area into the future and protecting surrounding areas. This is reflected in the positive impact in the scenarios where intervention occurs. They also show the impacts of surrendering land to wilding conifers. Doing nothing has a catastrophic impact on vulnerable land and this is reflected in the negative impact figure.

Costs, benefits and ratios of marginal cost to marginal benefit (\$NZ, present value)

	<b>Do Nothing</b>	<b>“Treading Water”</b>	<b>“Turning the Tide”</b>
<b>Total quantified benefit of Phase 2</b>	-\$5.3 billion	\$2.6 billion	\$6.3 billion
<b>Total quantified cost of Phase 2 control</b>	\$8 million	\$64 million	\$166 million
<b>Net benefit</b>	-\$5.3 billion (loss)	\$2.6 billion	\$6.1 billion
<b>Ratio benefit to cost</b>	n/a	42:1	38:1

Present value of impact, 2018, discount rate 6% over 50-year projection, \$NZ Millions, end-period discounting

The \$6.3 billion quantified benefit figure above can be further broken down as follows:

Breakdown of impacts from the “Turning the Tide” scenario

<b>Impact</b>	<b>(\$Millions)</b>
Impacts on productive land (Income and Consumption)	2,228
Impacts on water for irrigation and energy (Income and Consumption)	2,966
Impacts on biodiversity (Environment)	429
Impacts on fire safety (Safety)	654
Impacts on household income and social benefits of employment (Jobs and Earnings)	16
<b>TOTAL BENEFIT</b>	<b>6,295</b>

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