



Manaaki Whenua
Landcare Research

Wilding conifers and land use behaviour from the 2023 Survey of Rural Decision Makers

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Wilding conifers and land use behaviour from the 2023 Survey of Rural Decision Makers

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1 Purpose and remit

The Survey of Rural Decision Makers (SRDM) is the leading source of information on New Zealand's primary sector. Conducted by Manaaki Whenua – Landcare Research every 2 years, thousands of farmers, foresters, growers, and lifestyle block owners from Cape Reinga / Te Rerenga Wairua to Oban complete the survey. The Survey of Rural Decision Makers is one of the largest and longest-running rural surveys in the world (Brown 2017; Stahlmann-Brown 2019; Stahlmann-Brown 2021; Stahlmann-Brown 2023).

For the 2023 wave of the survey, Biosecurity New Zealand contracted Manaaki Whenua – Landcare Research to include questions relating to wilding conifers, including perceived sources, management, attitudes toward wilding conifers, and spread risk.

The contract called for the items listed below.

1. *Survey design.* After consultation with the National Wilding Conifer Control Programme team, Manaaki Whenua – Landcare Research will develop and programme the questionnaire. The programming will include extensive branching to ensure all relevant respondents in all sectors and regions were reached.
2. *Survey enumeration.* The survey will be conducted online. It will be open from 1 June 2023 to 15 August 2023. Potential respondents will be invited via email to participate from lists maintained by Manaaki Whenua – Landcare Research and official government databases.
3. *Survey analysis.* Data from the questions of specific interest to Biosecurity New Zealand will be analysed together with other relevant data points to build a better picture of wilding conifers and their management.
4. *Summary report.* A short report will include figures from the agreed questions, presented by region and sector. Short interpretive text will accompany the figures.

Biosecurity New Zealand first approached Manaaki Whenua – Landcare Research about this survey in March 2023. Between then and the launch of the survey on 1 June 2023, Biosecurity New Zealand and Manaaki Whenua – Landcare Research met several times to discuss the project aims and to shape the questionnaire. The questionnaire was finalised on 2 May 2023 and was extensively tested over the subsequent 4 weeks.

2 Data and methods

The SRDM has been conducted biennially since 2013. Each iteration has undergone refinements and major revisions to reflect the dynamic needs and structure of primary industries. Questions relating to wilding conifers were first included in the 2017 wave of the survey.

The 2023 questionnaire yielded approximately 5,200 responses from Northland to Southland, from large-scale commercial farming operations to lifestyle blocks, and across all industries. The survey consisted of 134 questions that were tailored to respondents through adaptive logic

programming. Using adaptive logic both reduced the overall number of questions each respondents saw and only displayed questions that were relevant to each farming operation.

The sampling strategy relied primarily on contacting farmers via email through official government databases and a list of individuals who responded to previous waves of the SRDM. In addition, Manaaki Whenua – Landcare Research recruited respondents at Fieldays. Most respondents were owner-operators.

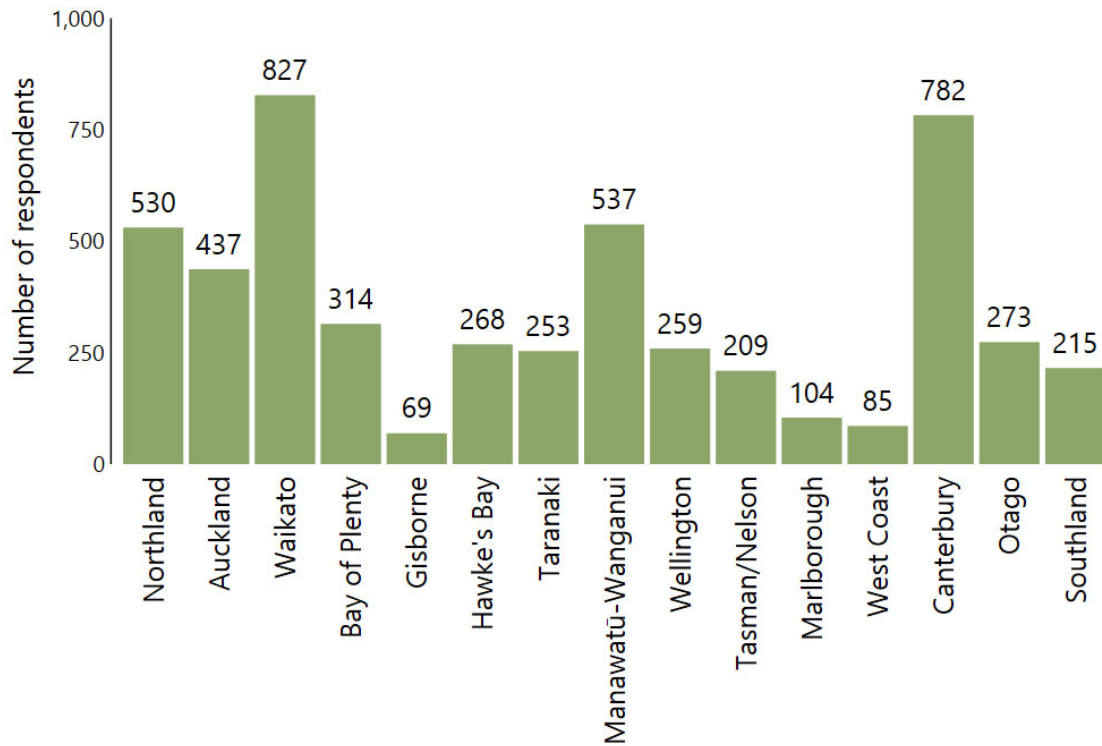
Participation was incentivised by a \$10 contribution to a charity selected by the survey respondent. In addition, five respondents were randomly selected to with one of five \$500 supermarket vouchers.

The 2023 SRDM contained seven questions directly related to wilding conifers (Appendix 1). Adaptive survey logic was used to show the wilding conifer questions to respondents who either have no forestry or who have some forestry in addition to another land use. Respondents whose only land use is forestry were not shown these questions. This logic continued through these seven questions so that only relevant questions were asked of respondents (see flowchart in **Error! Reference source not found.** in Section **Error! Reference source not found.**). A total of 5,162 respondents provided answers to at least one of these questions. Among these respondents, 3,393 (66%) were classified as commercial operations under the StatsNZ definition (based on payment of GST).¹

¹ Our analyses considered GST-registered lifestyle block owners as ‘commercial operators’ consistent with StatsNZ’s definition.

3 Results

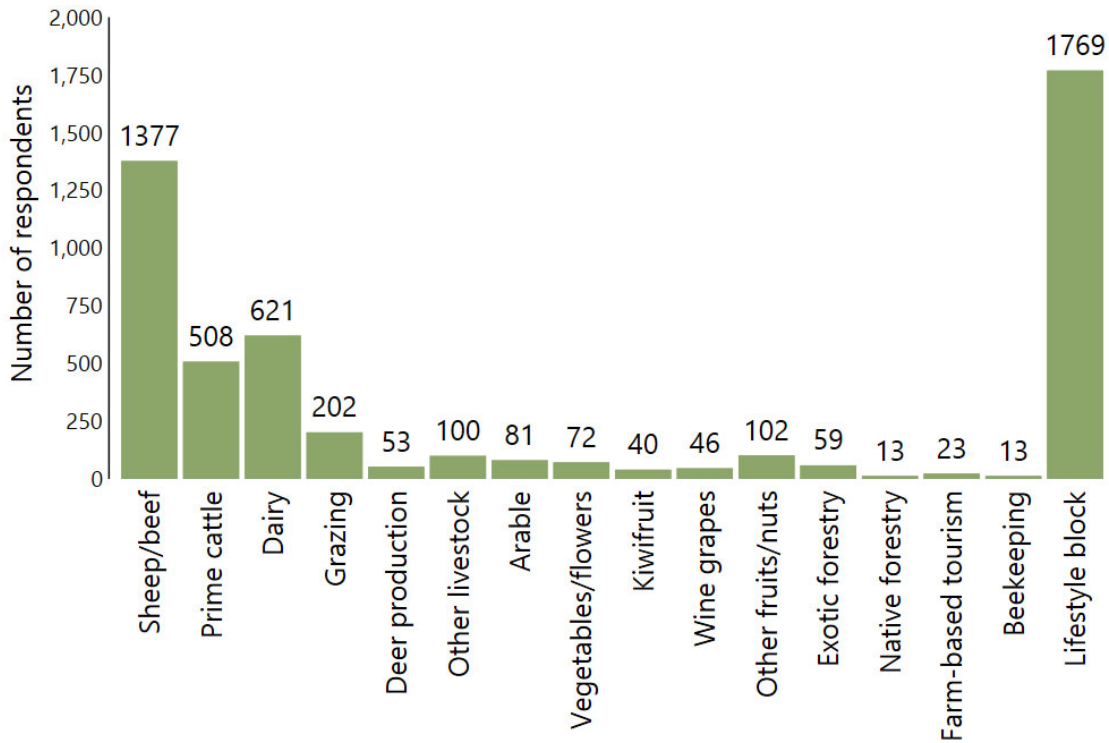
The number of respondents is shown according to the location of their operations (Figure 1). Sixty-eight percent of respondents reported operating in the North Island and 32% of respondents reported operating in the South Island (Figure 1).



Survey of Rural Decision Makers 2023 © Manaaki Whenua Landcare Research

Figure 1. Respondents by region.

Sixty-six percent of respondents identified as commercial operators and 34% identified as lifestyle block owners (Figure 2). Commercial operators were asked to identify their primary land uses, and sheep/beef and prime cattle were the main industries for 56% of commercial operations. Dairying and grazing (sometimes described as 'dairy support') were the main industries for 24% of commercial operations. Forestry was the main industry for 2% of commercial operators.



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Figure 2. Respondents by industry.

Note: 'Other livestock' includes deer, pig, and poultry farming and other farmed livestock.

Among the operators that changed forestry land use in the last two years (either by planting forestry as a new activity, increasing the size of their forestry operation, or increasing the intensity of their forestry operations), 64% sought advice on the Emissions Trading Scheme and 41% sought advice on forest management (**Error! Reference source not found.**Figure 3). Only 5% sought advice on the risks of spread of exotic forestry to other land.

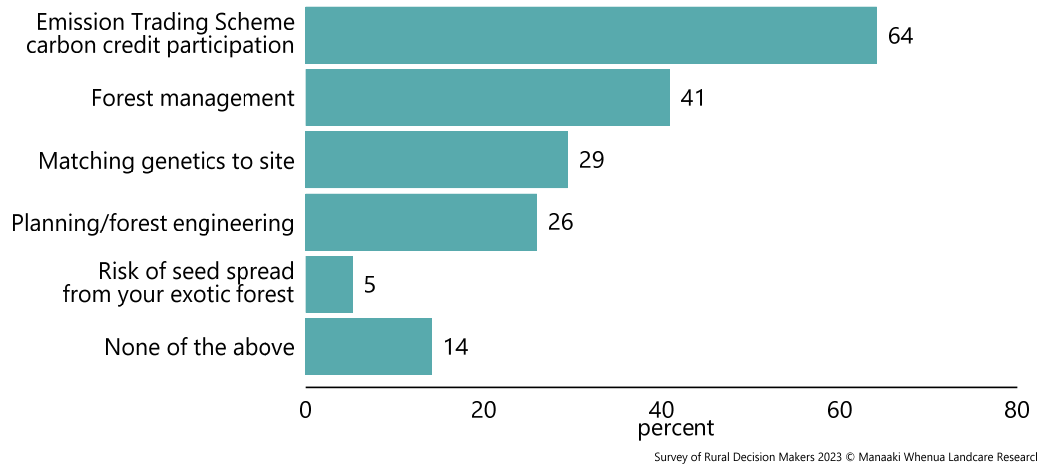


Figure 3. Sources of advice about forestry sought by commercial operations that have added forestry, added land to existing forestry, and/or increased the intensity of their forestry operations in last 2 years.

Notes: Proportions have been weighted by industry and region. N = 220.

Twenty-eight percent of respondents who had changed forestry land use in the last two years (either by planting forestry as a new activity, increasing the size of their forestry operation, or increasing the intensity of their forestry operations) in Otago reported seeking advice on the risk of seed spread (Figure 4). Seeking advice on seed spread was most common among those whose primary industry is exotic forestry.

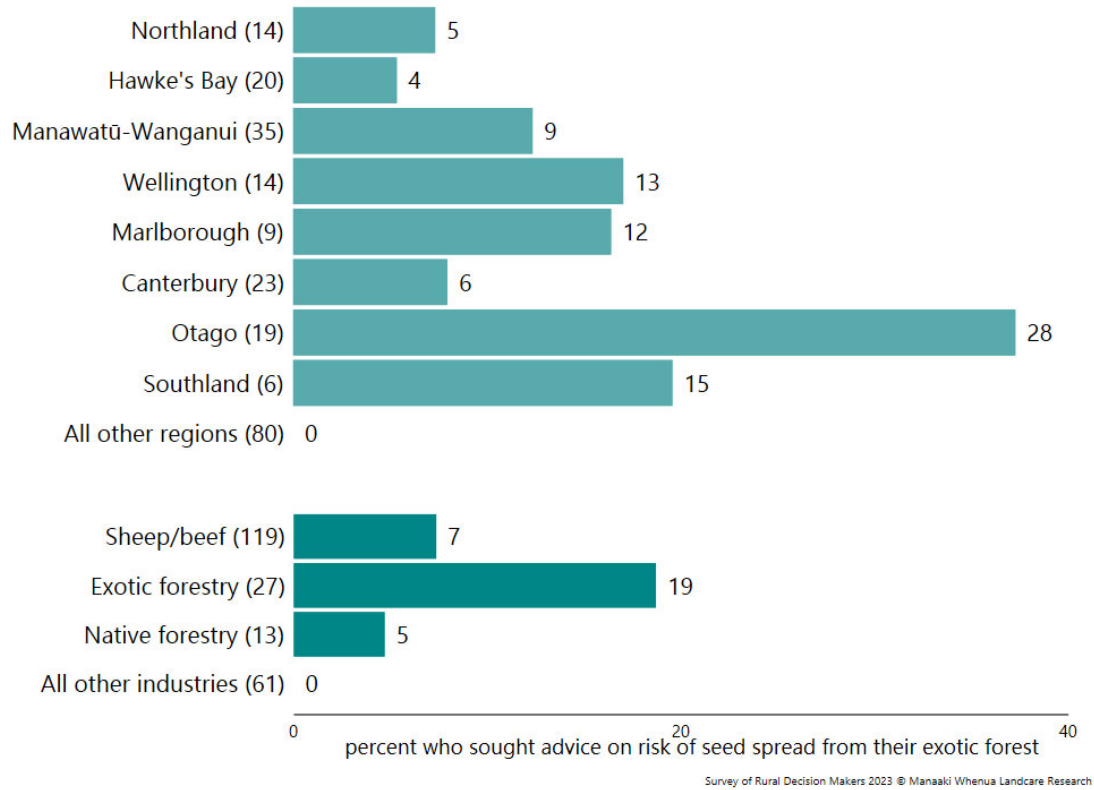


Figure 4. Proportion of commercial operators who sought advice on reducing risk of seed spread from their exotic forest, by region and main industry of respondent.

Notes: Number of respondents in parentheses. Proportions have been weighted by industry and region.

Excepting respondents whose *only* land use was commercial forestry, all respondents were posed a series of questions related to their perceptions of and experiences with wilding conifers. Eleven percent indicated that wilding conifers had spread onto their own land, 12% indicated that wilding conifers had spread onto adjoining properties (whether or not wilding conifers had also spread onto their own land), and 27% indicated that that wilding conifers had spread onto land elsewhere in their district (whether or not they had also spread onto their own land or adjoining properties) (Figure 5).

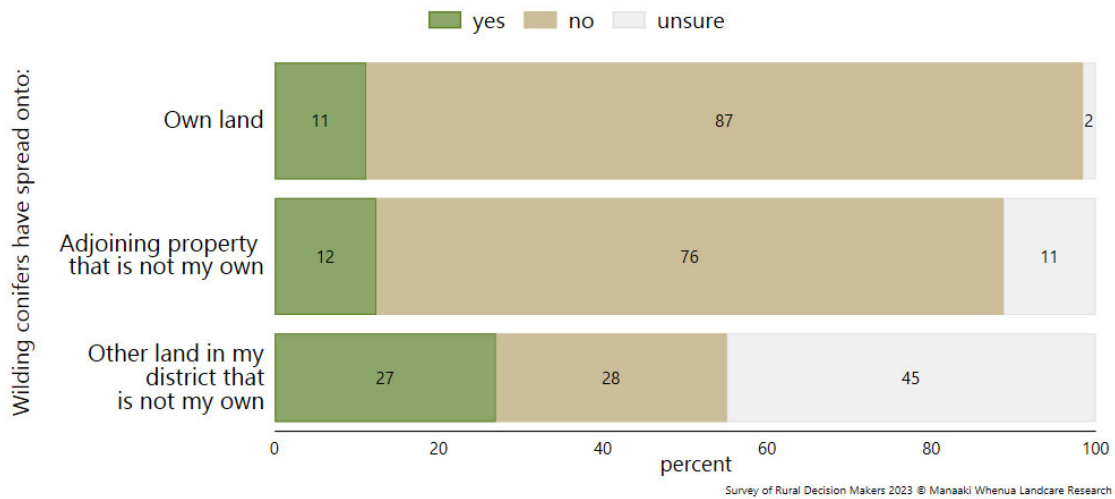


Figure 5. Have wilding conifers spread onto your land, adjoining land, or land elsewhere in the district?

Notes: Proportions have been weighted by industry and region. N = 4,862 respondents.

Respondents in Marlborough report the highest incidence of wilding conifers having spread onto their own land, onto adjoining properties, and onto other land in their district (Figure 6). In addition, at least 10% of respondents in Northland, Auckland, Bay of Plenty, Gisborne, Hawke’s Bay, Taranaki, Manawatū-Wanganui, Wellington, Tasman/Nelson, Marlborough, and Otago report wilding conifers having spread onto their own land. At least 20% of respondents in Northland, Auckland, Bay of Plenty, Gisborne, Hawke’s Bay, Wellington, Tasman/Nelson, Marlborough, Canterbury, Otago, and Southland report that wilding conifers had spread onto other land in their district (whether or not they had spread onto their own land or adjoining properties).



Figure 6. Have wilding conifers spread onto your land, adjoining land, or land elsewhere in the district? by region.

Notes: Number of respondents in parentheses. Proportions have been weighted by industry and region.

Respondents who identified their primary industry as being native forestry report that wilding conifers have spread onto their own land, adjoining properties, and other land in their district with the highest frequency (Figure 7). Those who identified their primary industry as being exotic forestry also reported a high incidence of wilding invasion on their own land and on neighbouring properties.

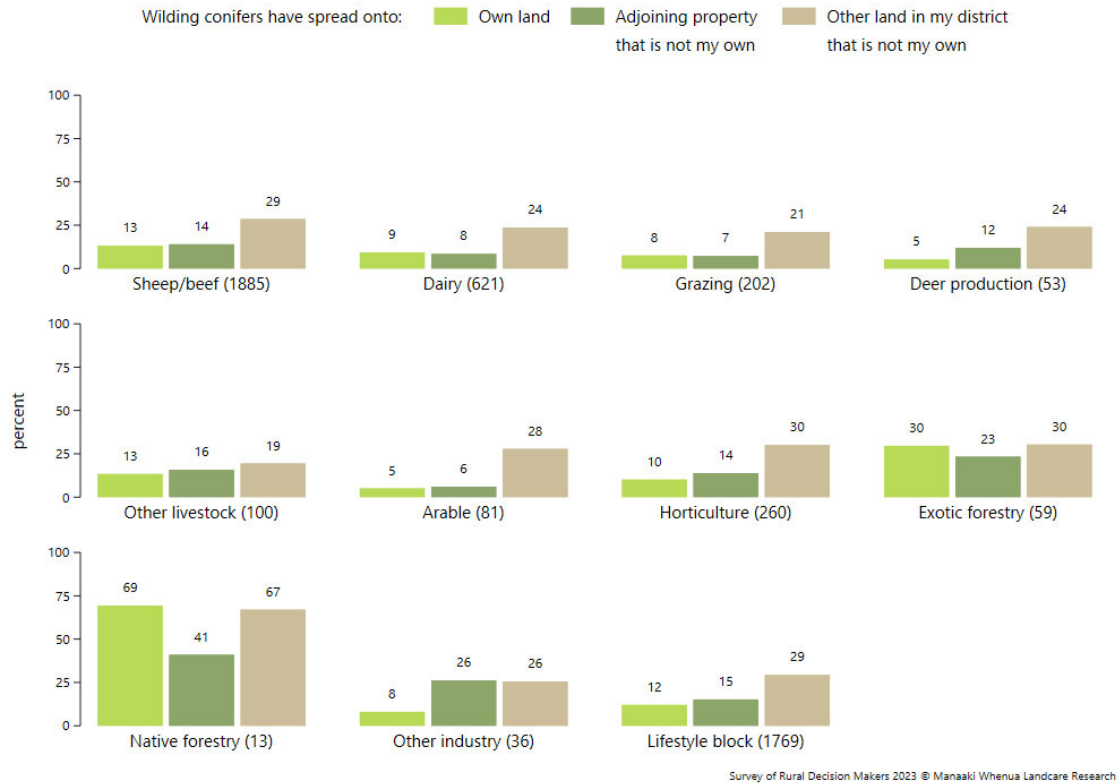


Figure 7. Have wilding conifers spread onto your land, adjoining land, or land elsewhere in the district? by industry.

Notes: Number of respondents in parentheses. Proportions have been weighted by industry and region. 'Other livestock' includes deer, pig, and poultry farming and other farmed livestock. 'Horticulture' includes vegetables, flowers, kiwifruit, wine grapes, fruit, nuts, and edible crops. 'Other industry' includes farm-based tourism, beekeeping, and other.

Respondents who reported that wilding conifers had spread onto their own land were asked to identify the sources of the invasion (Figure 8). The top three sources were commercial forest outside respondents' own land (35%), amenity plantings from respondents' own land (26%), and commercial forests from respondents' own land (23%).

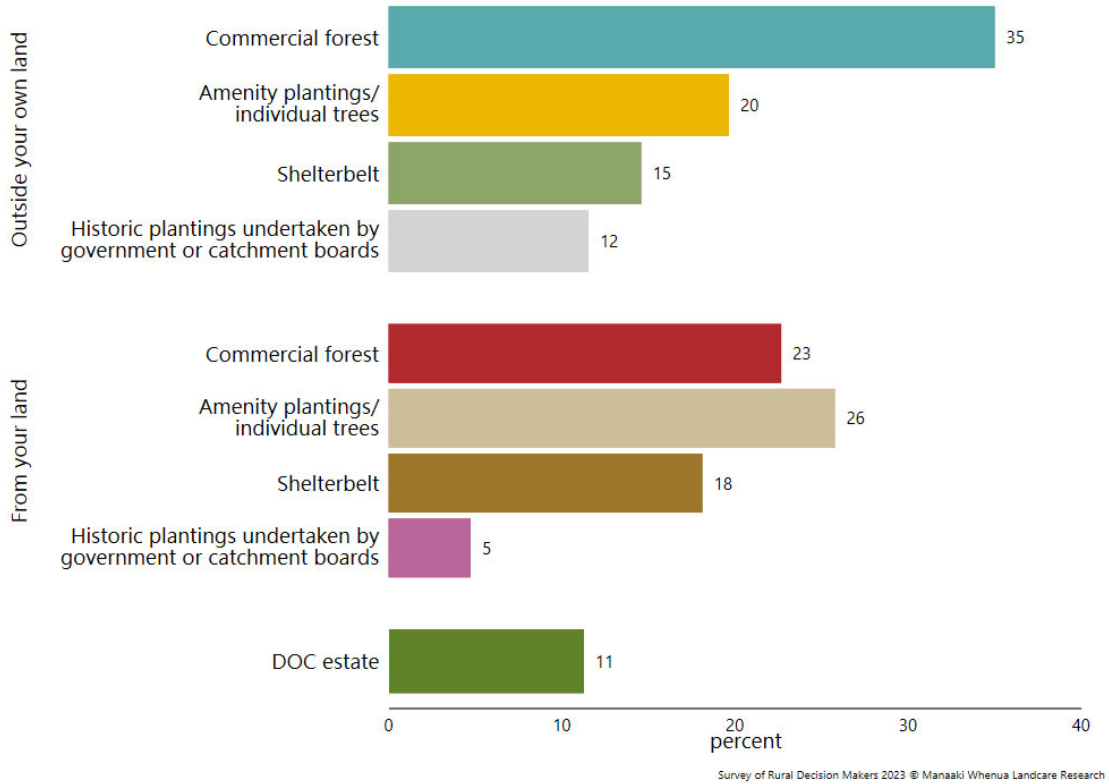


Figure 8. What are the source(s) of wilding conifers that spread onto your land?

Notes: Proportions have been weighted by industry and region. N = 629. Respondents could indicate more than one source.

Figure 9aFigure 9b show the perceived sources of wilding conifer invasions by region. Respondents in Northland (42%), Bay of Plenty (60%), Gisborne (88%), Hawke’s Bay (53%), Wellington (45%), Tasman/Nelson (48%), and Marlborough (59%) reported that commercial forests from outside their own land were the largest source of wilding conifers on their land. Respondents in Auckland reported that wilding conifers spread primarily from sources outside their land (e.g. commercial forestry, amenity plantings and/or shelterbelts) while respondents in Waikato reported that wilding conifers spread primarily from sources on their land (e.g. amenity plantings and/or shelterbelts). Respondents in the remaining regions reported that wilding conifers spread from various sources on and off their own land.



Figure 9a. What are the source(s) of wilding conifers that spread onto your land? by region in the North Island.

Notes: Number of respondents in parentheses. Proportions have been weighted by industry and region. Respondents could indicate more than one source.

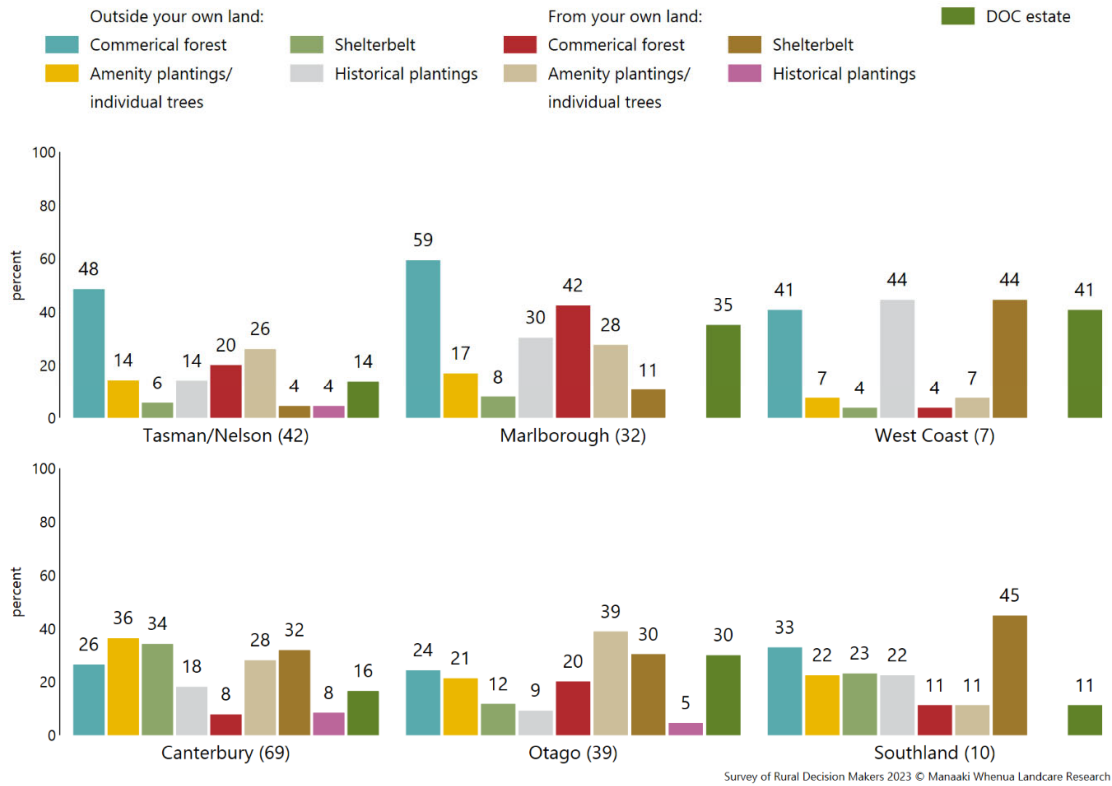


Figure 9b. What are the source(s) of wilding conifers that spread onto your land? by region in the South Island.

Notes: Number of respondents in parentheses. Proportions have been weighted by industry and region. Respondents could indicate more than one source.

Figure 10 shows the perceived source of wilding conifer invasions by main industry. Sixty-seven percent of respondents whose main industry is horticulture reported that wilding conifers spread from commercial forests outside their land while 61% of respondents whose main industry is exotic forestry reported that wilding conifers spread from commercial forests on their own land.

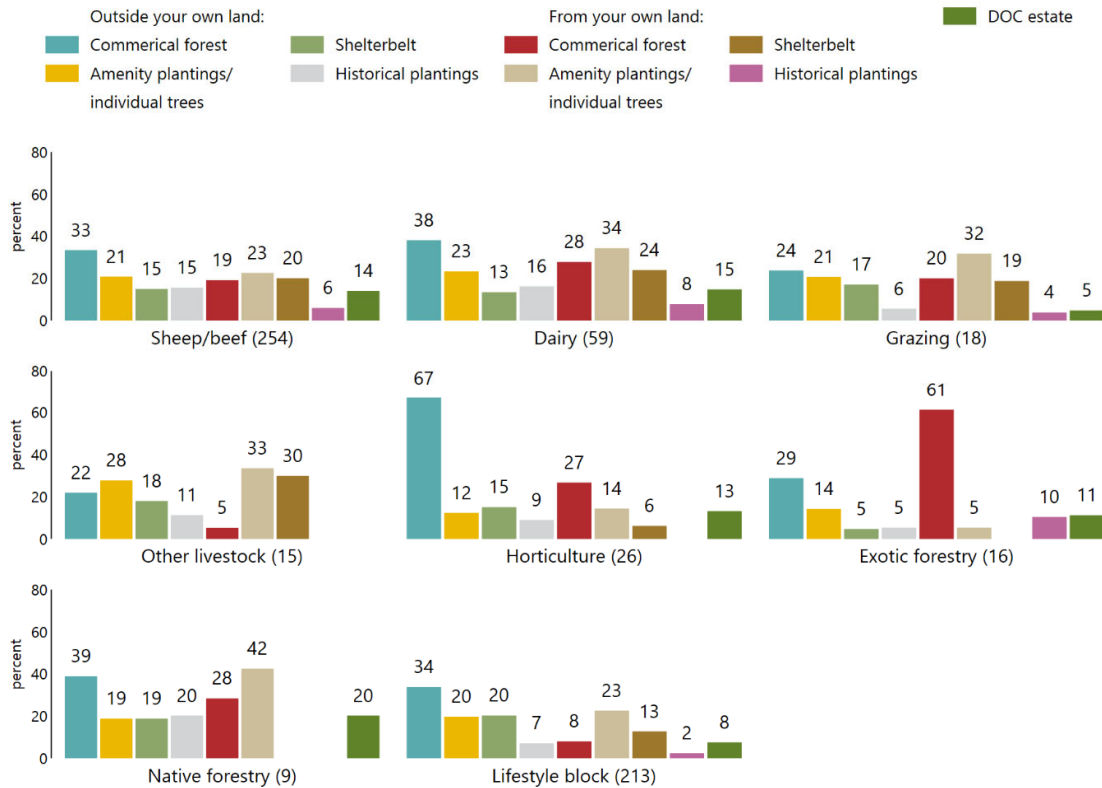


Figure 10. What are the source(s) of wilding conifers that spread onto your land? – by main industry.

Notes: Number of respondents in parentheses. Proportions have been weighted by industry and region. Respondents could indicate more than one source.

Respondents were also asked which of the above sources of wilding conifers was the *main* source of invasion onto their land (Figure 11). Forty-five percent of respondents reported that the invasion originated from their own land while 44% of respondents reported that the invasion originated from outside of their own land. Three percent reported that the invasion originated from the DOC estate.

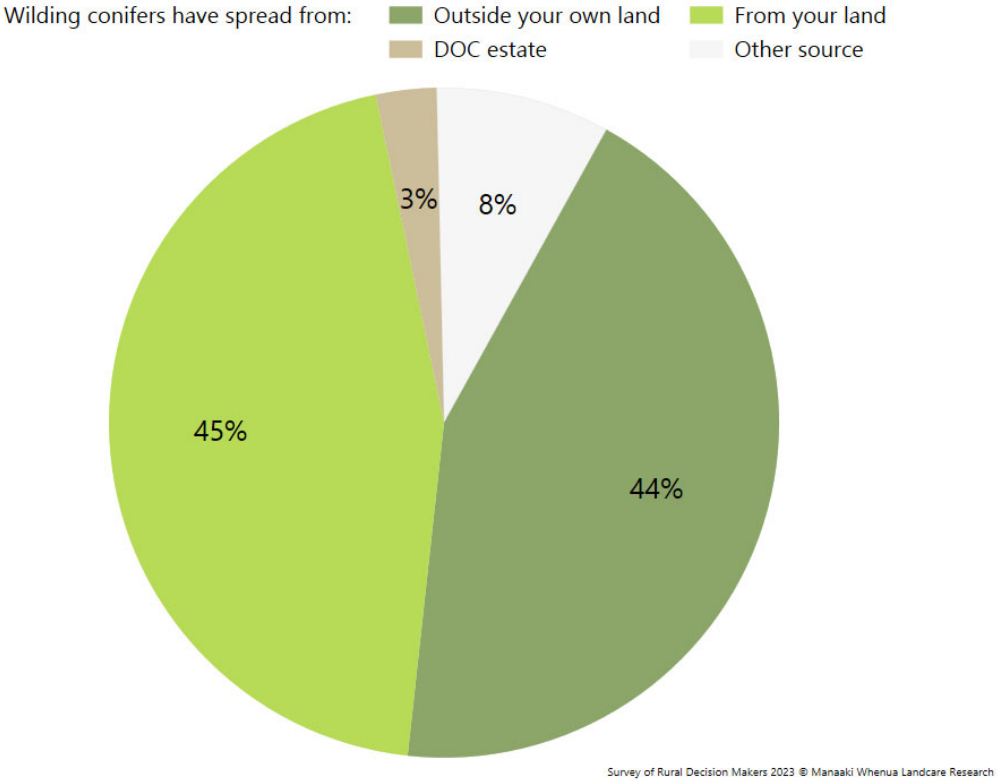


Figure 11. What is the main source of wilding conifers that spread onto your land?

Notes: Proportions have been weighted by industry and region. N = 562.

Figure 12 reports the main perceived source of wilding conifer invasions by region. A majority of respondents in Northland, Auckland, Gisborne, Wellington, Marlborough, West Coast and Southland reported that invasions originated from outside of their land (Figure 12). A small proportion of respondents in Waikato, Bay of Plenty, Tasman/Nelson, Marlborough, Canterbury, and Otago reported that the invasions originated from the DOC estate.

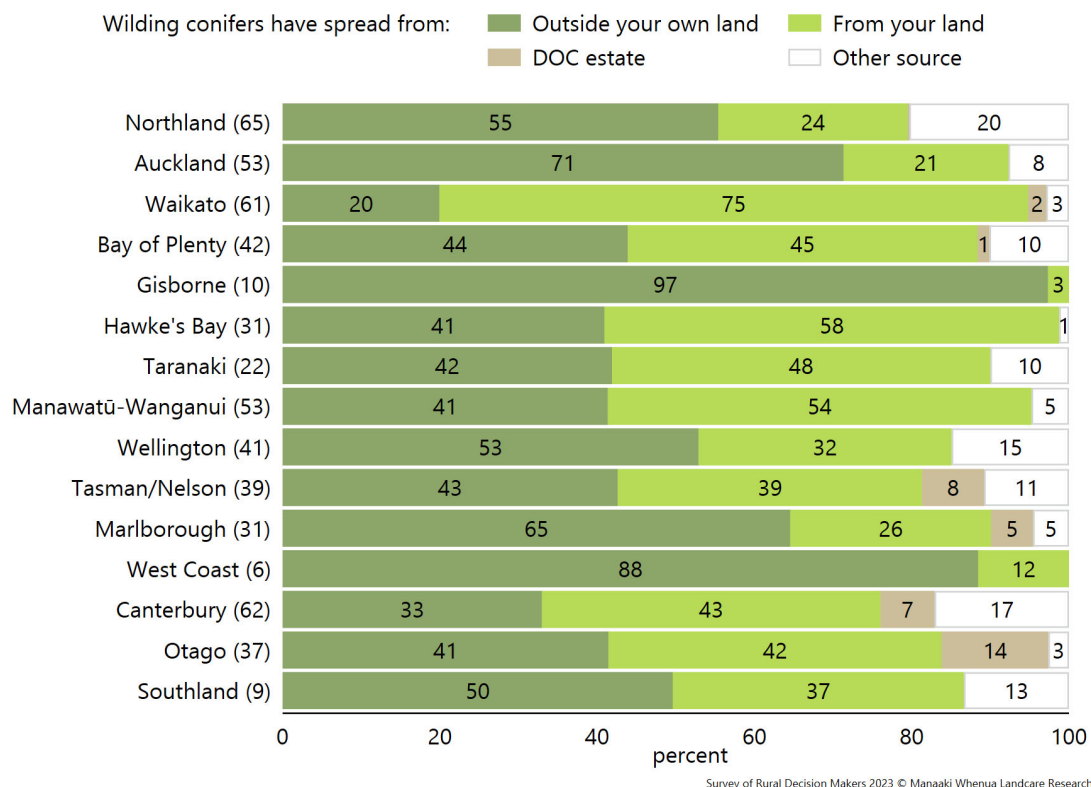


Figure 12. What is the main source of wilding conifers that spread onto your land? by region.

Notes: Number of respondents in parentheses. Proportions have been weighted by industry and region.

Figure 13 analogously presents the main perceived source of wilding conifer spread by industry. A majority of respondents in horticulture and native forestry as well as lifestyle block owners reported that the invasions originated from outside of their land.

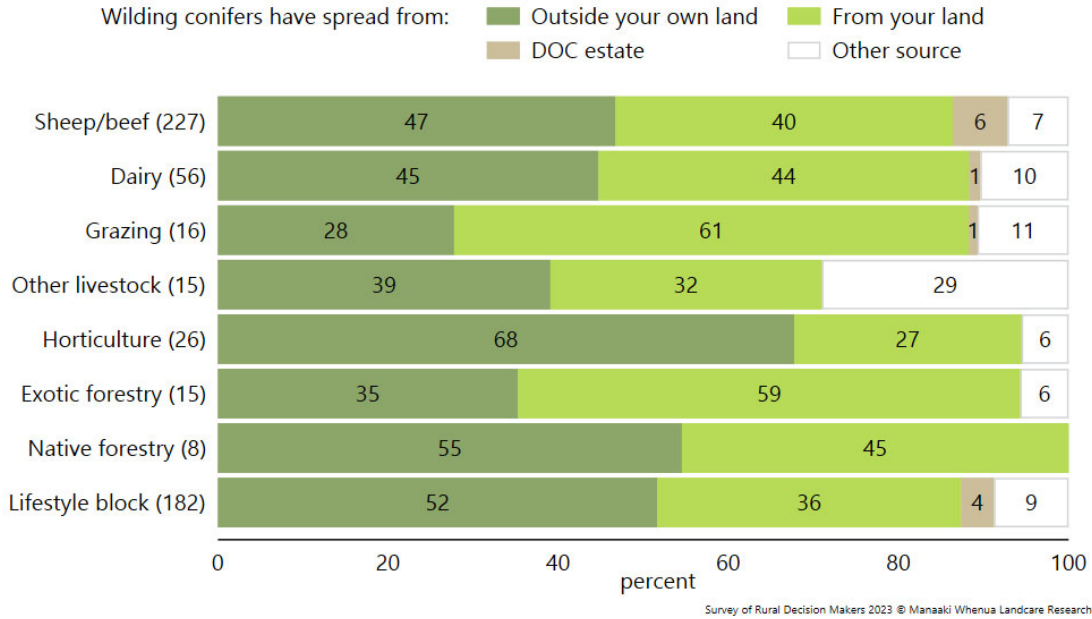
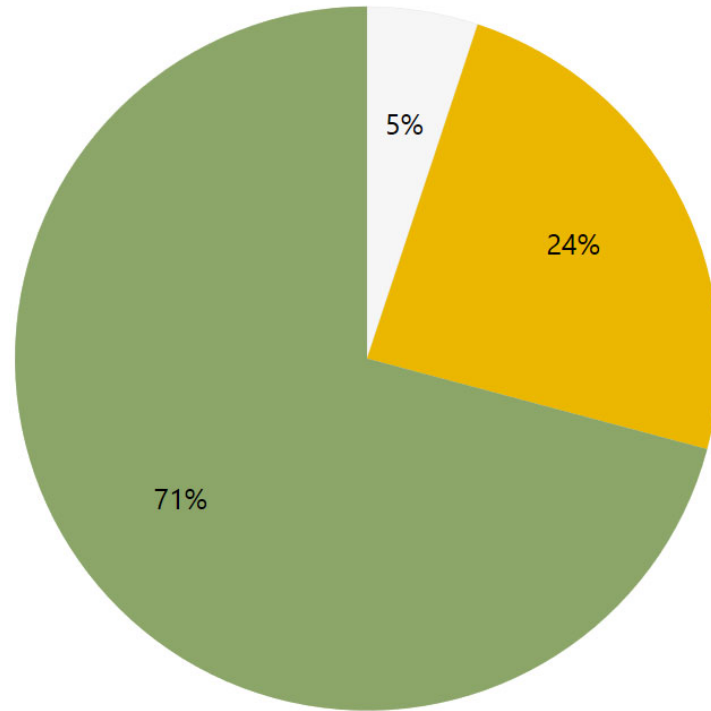


Figure 13. What is the *main* source of wilding conifers that spread onto your land? – by main industry.

Notes: Number of respondents in parentheses. Proportions have been weighted by industry and region. 'Other livestock' includes deer, pig, and poultry farming and other farmed livestock. 'Horticulture' includes vegetables, flowers, kiwifruit, wine grapes, fruit, nuts, and edible crops. 'Arable farming' and 'other industries' not shown due to an insufficient number of responses.

Seventy-one percent of respondents who reported wilding conifers on their own land control them (Figure 14). Twenty-four percent who reported wilding conifers on their own land do not control them. The remaining respondents reported being unsure about control.

On my own land wilding conifers are: ■ Controlled ■ Not controlled ■ Unsure



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Figure 14. Are wilding pines controlled in any way?

Notes: Proportions have been weighted by industry and region. N = 629.

Except in Gisborne and West Coast, a majority of respondents controlled wilding conifers, including 92% of respondents in Auckland and 88% of respondents in Canterbury (Figure 15).

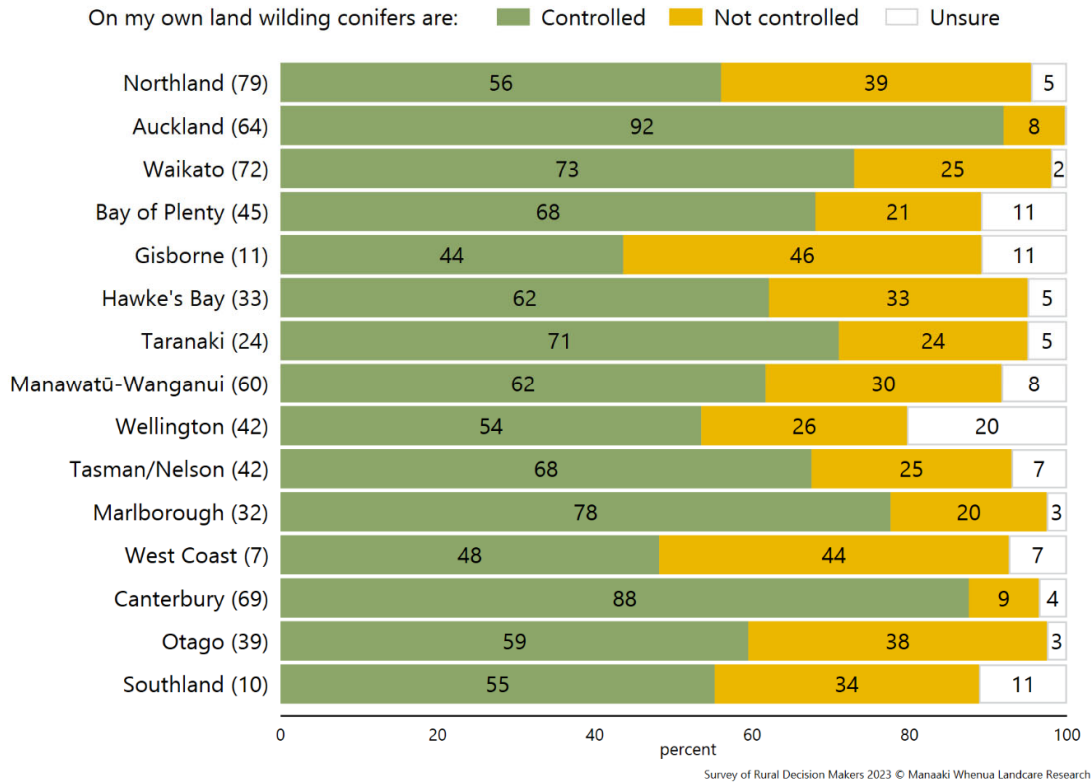


Figure 15. Are wilding pines controlled in any way? – by region.

Notes: Number of respondents in parentheses. Proportions have been weighted by industry and region.

Nearly all respondents who identified their primary industry as being forestry reported controlling wilding conifers (Figure 16). Indeed, wilding conifer control is common across all industries.

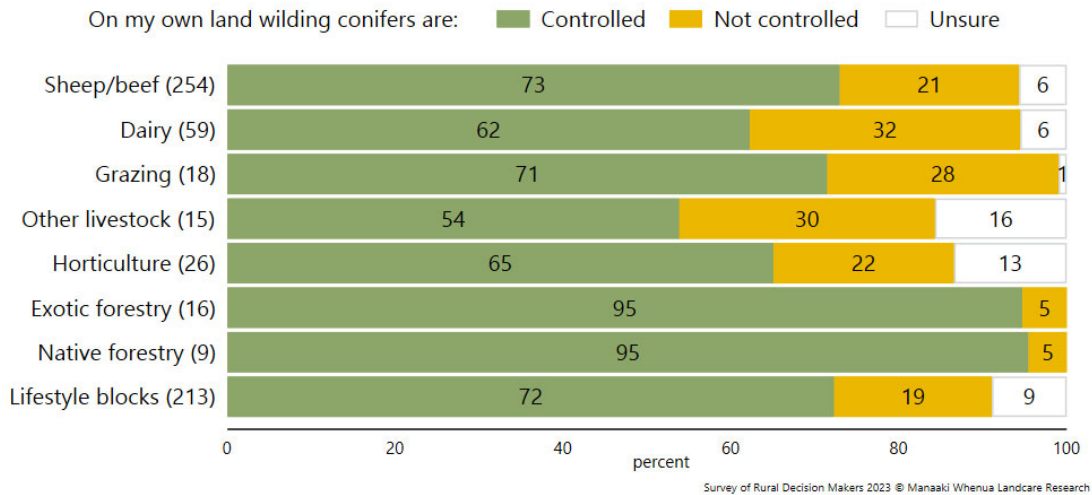


Figure 16. Are wilding pines controlled in any way? – by main industry.

Notes: Number of respondents in parentheses. Proportions have been weighted by industry and region. 'Other livestock' includes deer, pig and poultry farming and other farmed livestock. 'Horticulture' includes vegetables, flowers, kiwifruit, wine grapes, fruit, nuts, and edible crops. 'Arable farming' and 'other industries' not shown due to insufficient number of responses.

Respondents who reported wilding conifers on their own land but who do not control them reported several reasons for either choosing not to control them or for being unable to control them (Figure 17 **Error! Reference source not found.**). These reasons include lack of interest (34%), the high cost of control (29%), time constraints (23%), the difficulty of control (20%), a lack of knowledge about how to control wilding conifers (11%), and wilding conifers having being useful (9%). In qualitative comments, some of the respondents who reported a lack interest in controlling wilding conifers reported that they would start controlling conifers if they spread onto more productive land/paddocks. Respondents also indicated that they let stock control wilding conifers, that removal should be the responsibility of the landowners from where the seedlings originated, and/or that they were about to start controlling wilding conifers.

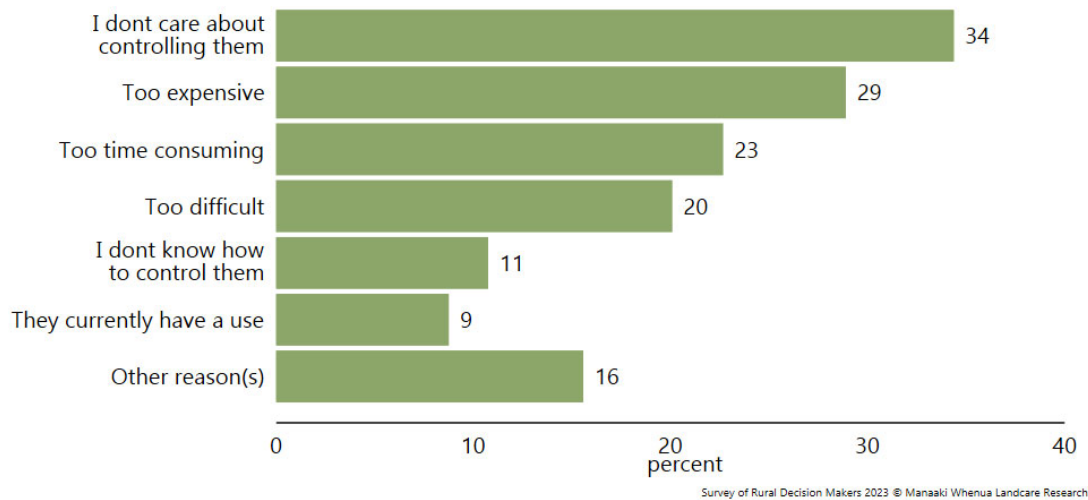


Figure 17. What are the reasons wilding conifers are not controlled on your land?

Notes: Proportions have been weighted by industry and region. N = 139. Respondents could choose more than one reason.

Expense was the top reason for not controlling wilding conifers indicated by respondents in the Upper North Island and Upper South Island (Figure 18). Lack of interest was the top reason for not controlling wilding conifers in the Central North Island, Lower North Island, and Lower South Island. 'Currently have a use' was the top reason for not controlling wilding conifers given by respondents in the Central South Island.

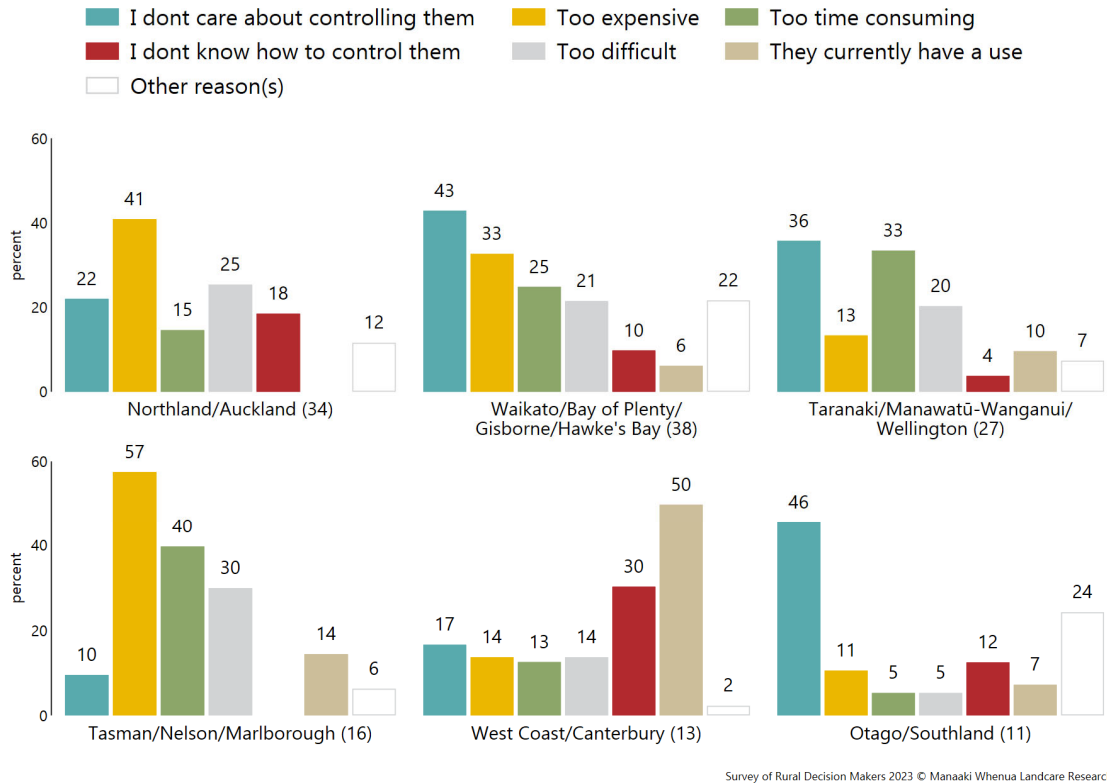


Figure 18. What are the reasons wilding conifers are not controlled on your land? – by region.

Notes: Number of respondents in parentheses. Proportions have been weighted by industry and region. Respondents could choose more than one reason.

A lack of interest was the top reason for not controlling wilding conifers given by respondents whose main industries are grazing and other livestock industries (Figure 19).

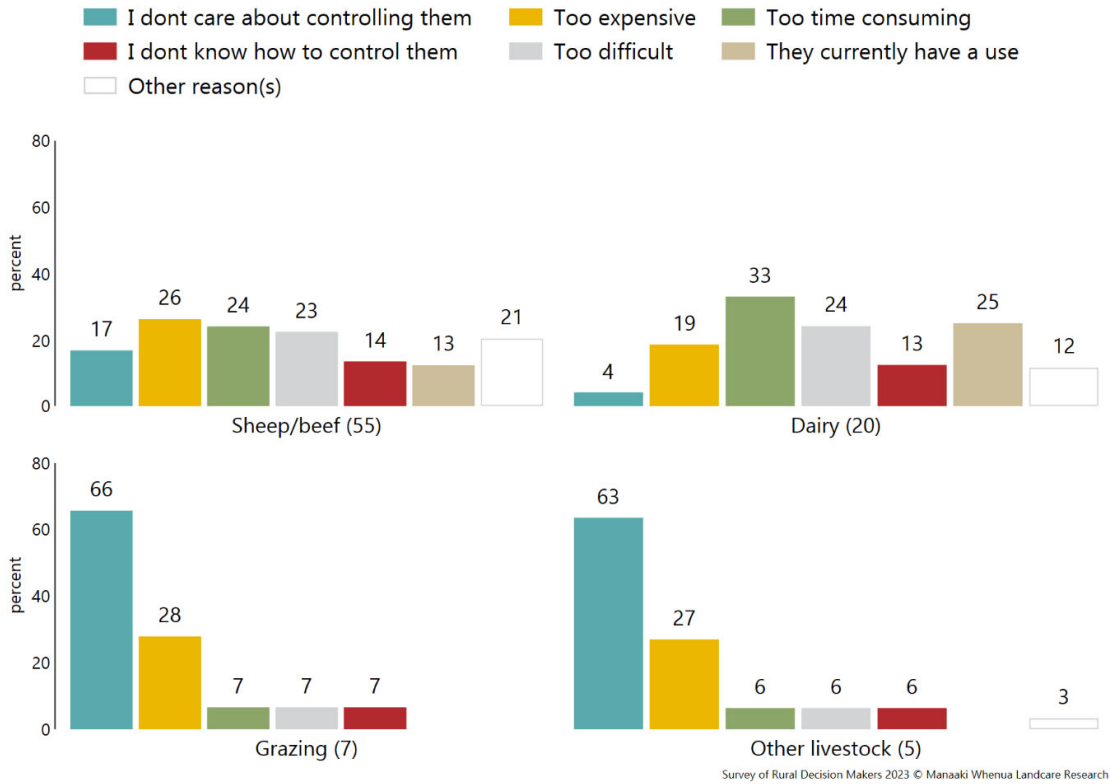


Figure 19. What are the reasons wilding conifers are not controlled on your land? – by main industry.

Notes: Number of respondents in parentheses. Proportions have been weighted by industry and region. All other industries excluded due to insufficient number of responses. Respondents could choose more than one reason.

There are costs associated with wilding conifer control (Figure 20). Nearly all of those who control wilding conifers reported self-funding those activities (96%). Five percent reported receiving funding from the National Wilding Conifer Control Programme, 5% reported receiving funding from councils, and 1-2% reported receiving funding from national or local trusts.

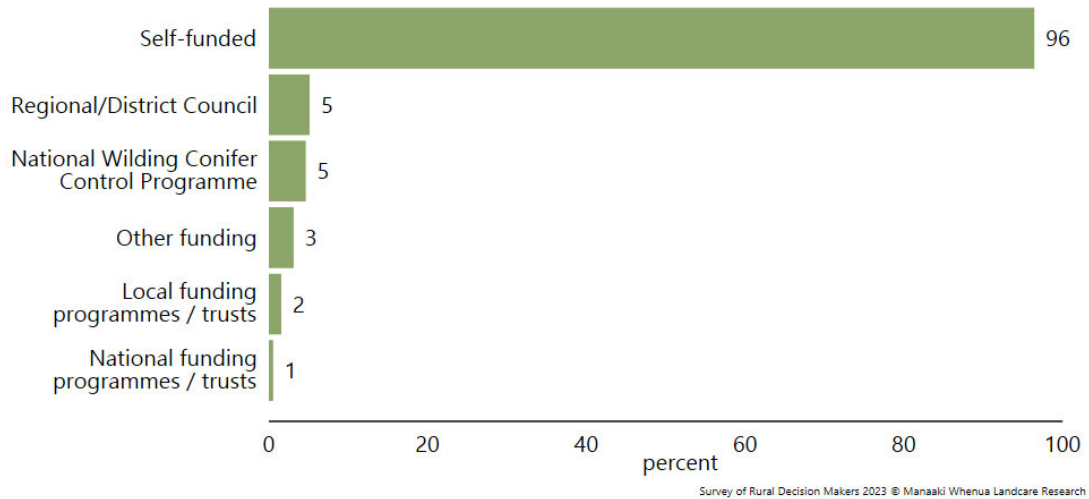


Figure 20. Who has funded removal of wilding conifers on your property?

Notes: Proportions have been weighted by industry and region. N = 448. Respondents could choose more than one option.

Figure 21 shows sources of funding for wilding conifer control by region. All respondents in Waikato, Hawke’s Bay, Taranaki, Marlborough, and Southland reported self-funding their control activities, as did a majority of respondents in other regions.

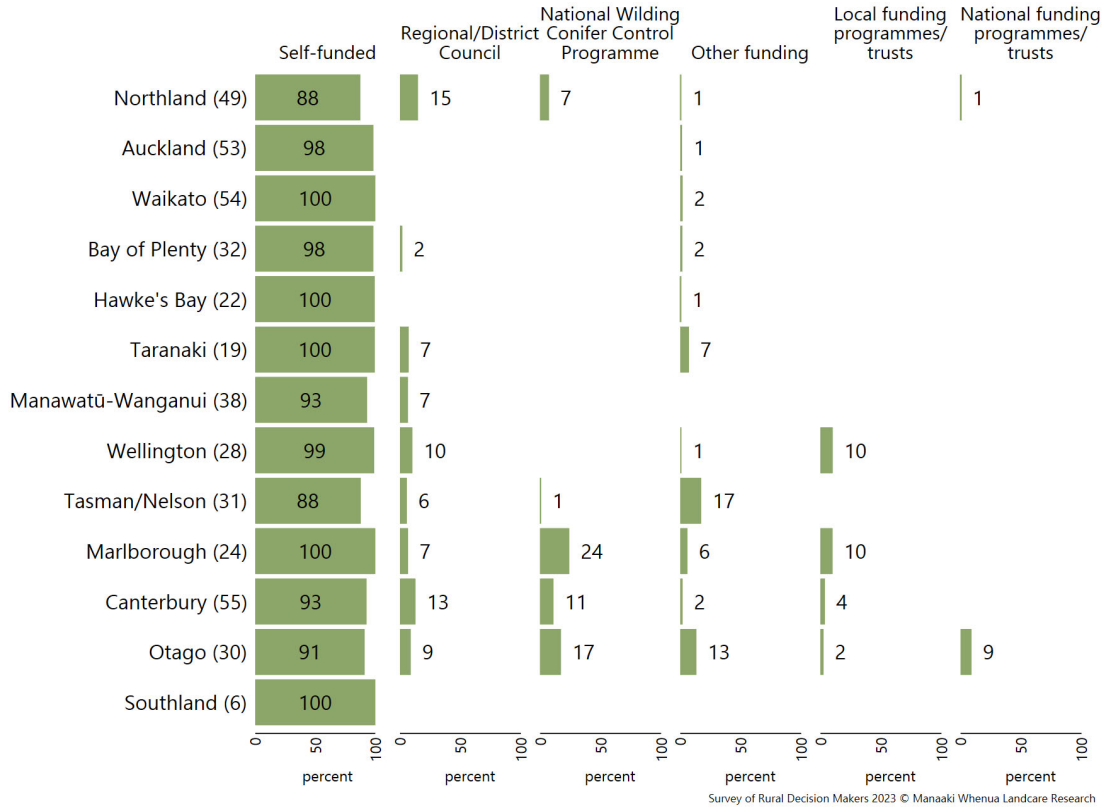


Figure 21. Who has funded removal of wilding conifers on your property? – by region.

Notes: Number of respondents in parentheses. Proportions have been weighted by industry and region. 'Gisborne' and 'West Coast' excluded due to insufficient number of responses. Respondents could choose more than one option.

Survey respondents in most industries reported self-funding wilding conifer control (Figure 22).

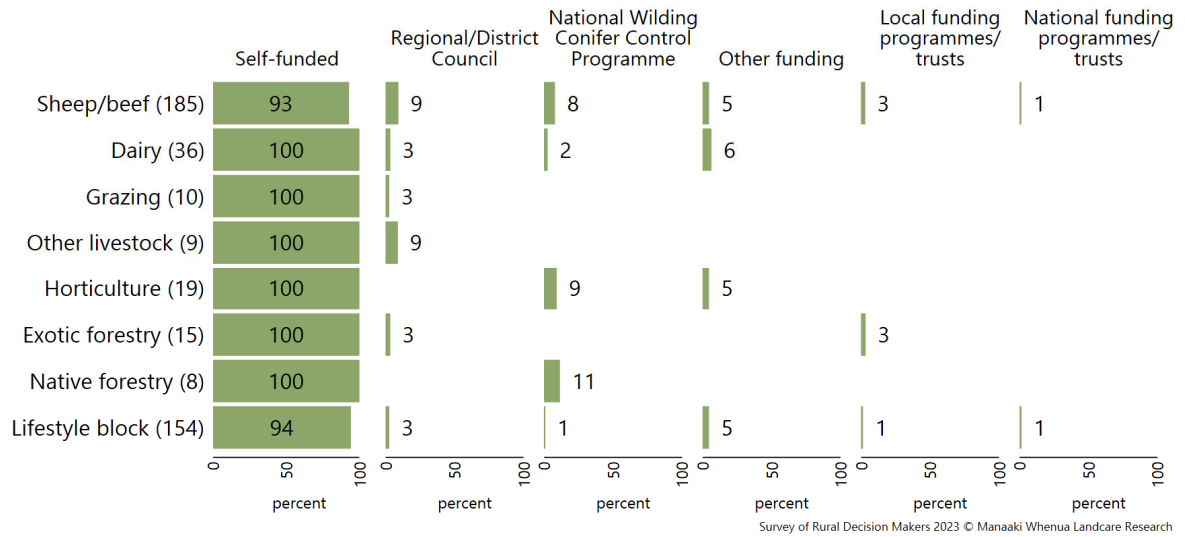


Figure 22. Who has funded removal of wilding conifers on your property? – by main industry.

Notes: Number of respondents in parentheses. Proportions have been weighted by industry and region. 'Other livestock' includes deer, pig and poultry farming and other farmed livestock. 'Horticulture' includes vegetables, flowers, kiwifruit, wine grapes, fruit, nuts, and edible crops. 'Arable farming' and 'other industries' not shown due to small number of observations. Respondents could choose more than one source.

All respondents apart from those who are exclusively involved in exotic forestry were also asked about their personal feelings toward wilding conifers (Figure 23). Thirty-one percent of respondents considered wilding conifers to be 'extremely harmful' and 37% considered wilding conifers to be 'more harmful than beneficial'. In addition, 7% considered their harms and benefits to balance, 2% considered them to be 'more beneficial than harmful', and less than 1% considered them to be 'extremely beneficial'. An additional 22% reported having no opinion on wilding conifers.

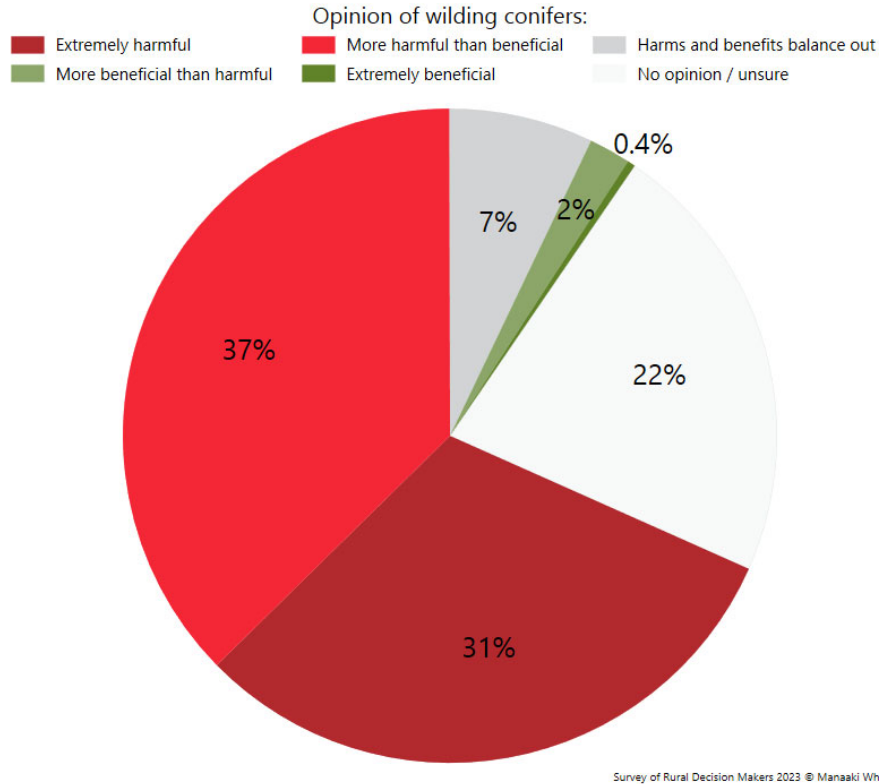


Figure 23. What are your personal feelings about wilding conifers?

Notes: Number of respondents in parentheses. Proportions have been weighted by industry and region. N = 5,151.

Negative attitudes toward wilding conifers dominates perspectives across the country and were especially pronounced in Marlborough (Figure 24). Respondents in Taranaki were most likely to report having no opinion about wilding conifers.

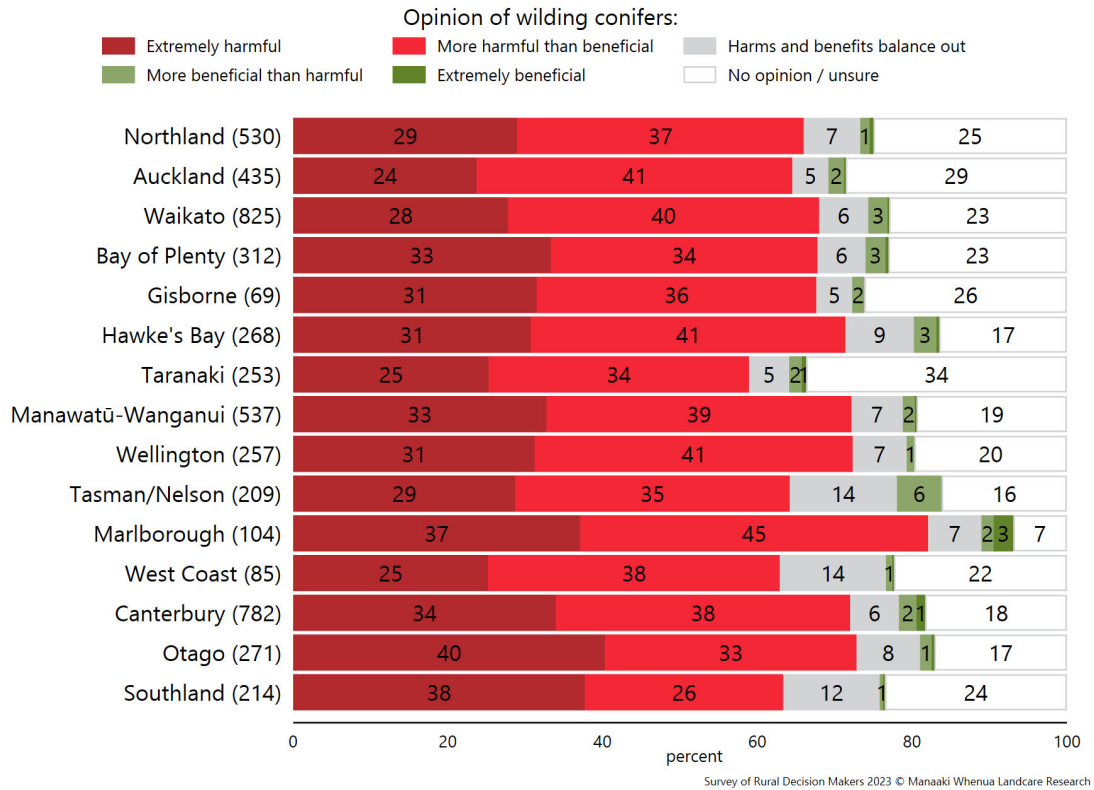


Figure 24. What are your personal feelings about wilding conifers? – by region.

Notes: Number of respondents in parentheses. Proportions have been weighted by industry and region.

Perspectives on wilding conifers varied only modestly across industries (Figure 25).

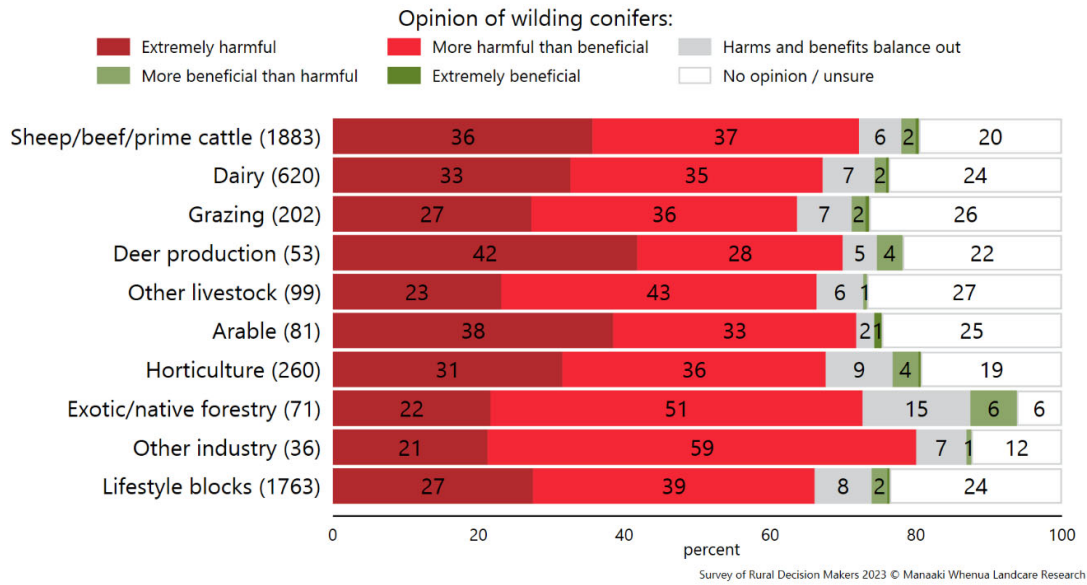


Figure 25. What are your personal feelings about wilding conifers? - by main industry.

Notes: Number of respondents in parentheses. Proportions have been weighted by industry and region. 'Other livestock' includes pig and poultry farming and other farmed livestock. 'Horticulture' includes vegetables, flowers, kiwifruit, wine grapes, fruit, nuts, and edible crops.

In the 2019 and 2021 waves of the survey, only respondents who reported that wilding conifers had spread onto their own land, spread onto adjoining properties, and/or spread to property elsewhere in their district were asked their personal feelings toward wilding conifers. In Figure 26, we restricted the 2023 sample in the same way to enable analysis of trends over time.

For 2023, the share of respondents who reported that wilding conifers were 'extremely harmful' or 'more harmful than beneficial' remained high at 79% (compared to 81% in 2021 and 79% in 2019). Slightly fewer respondents reported that 'harms and benefits balance out' (6%) than in previous years (9% in 2021 and 11% in 2019), and slightly more reported being unsure or having no opinion (12% versus 8% in both 2021 and 2019).

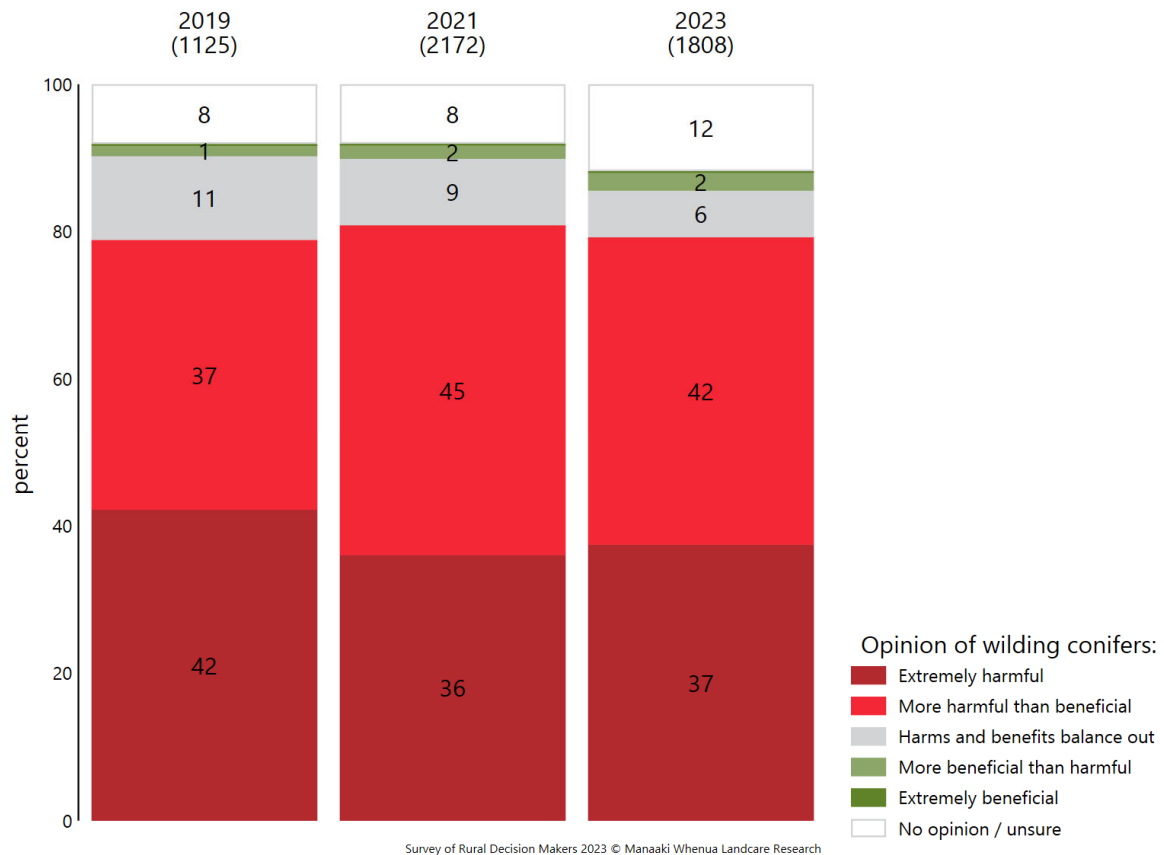


Figure 26. What are your personal feelings about wilding conifers? 2019, 2021, and 2023.

Notes: Number of respondents in parentheses. Proportions have been weighted by industry and region. All years are restricted to respondents who reported that wilding conifers had spread onto their own land, spread onto adjoining properties, and/or spread to property elsewhere in their district.

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Appendix 1 – Selected questions from the 2023 SRDM questionnaire

Q27 Which of the following land uses apply to the land that you actively managed during the previous 12 months? *Tick all that apply.*

- Grazing livestock that are NOT OWNED by the farming business (e.g. dairy support)
- Farming sheep and / or beef
- Raising and / or finishing prime cattle, including bull beef
- ...

Q31 In {district 1}, which activity do you consider to be your primary activity?

- Grazing livestock that are NOT OWNED by the farming business (e.g. dairy support)
- Farming sheep and / or beef
- Raising and / or finishing prime cattle, including bull beef
- ...

Q38 Are any of the land uses on your property in {Region 1} new in the last 2 years? Have any existing land uses been allocated more land in the last 2 years?

Current land use	New in the last 2 years		More land allocated during the last 2 years	
Grazing livestock	• Yes	• No	• Yes	• No
Sheep/beef	• Yes	• No	• Yes	• No
...	

Q39 Have any of the land uses on your property in {District 1} become more or less intensive in the last 2 years (or when the activity started if less than 2 years ago)?

Current land use	Intensive		
Grazing livestock	• Less intensive	• Same intensity	• More intensive
Sheep/beef	• Less intensive	• Same intensity	• More intensive
...

Q49 'Wilding conifers' is a term used to describe exotic coniferous trees that self-seed (in contrast to planted pines in forest plantations). As far as you are aware, have wilding conifers affected your property, adjoining properties, or other land in {District 1}? *Tick all that apply.*

Own land	• Yes	• No	• Unsure
Adjoining properties	• Yes	• No	• Unsure
Other land in {District 1}	• Yes	• No	• Unsure

Q50 As far as you are aware, what are the sources of wilding conifers on your property in {District 1}? *Tick all that apply.*

- DOC estate
- Commercial forest other than your own
- Historic plantings undertaken by government or catchment boards outside your land
- Shelterbelt other than your own
- Amenity plantings and individual trees outside your land
- Commercial forest on your land
- Historic plantings undertaken by government or catchment boards on your land
- Shelterbelt on your land
- Amenity plantings or individual trees on your land
- Other (please describe) _____
- Unsure

Q51 Among those sources of wilding conifers on your property in {District 1}, which do you consider the main source?

- DOC estate
- Commercial forest (other than your own)
- Historic plantings undertaken by government or catchment boards (outside your land)
- Shelterbelt (other than your own)
- Amenity plantings and individual trees (outside your land)
- Commercial forest on your land
- Historic plantings undertaken by government or catchment boards on your land
- Shelterbelt on your land
- Amenity plantings or individual trees on your land
- {Q50 Other text}

Q52 Are wilding conifers controlled in any way on your property in {District 1}?

- Yes
- No
- Unsure

Q53 What are the reasons wilding conifers are not controlled on your property in {District 1}? Tick all that apply.

- I don't know how to control them
- Too difficult
- Too time consuming
- Too expensive
- I don't care about controlling them
- Other (please describe) _____

Q54 Who has funded removal of wilding conifers on your property in {District 1}, including self-funding? *Tick all that apply.*

- National Wilding Conifer Control Programme (MPI / Biosecurity New Zealand)
- Regional or District Council
- Iwi
- National funding programmes / trusts
- Local funding programmes / trusts
- Self-funded
- Other (please describe) _____
- None of the above

Q55 Which of the following best describes your personal attitude toward wilding conifers?

- They are extremely harmful
- They are more harmful than beneficial
- Harms and benefits balance out
- They are more beneficial than harmful
- They are extremely beneficial
- No opinion

Q124 On which of the following did you seek advice before or during planting of exotic or native trees/bush during the last 2 years, if any? *Tick all that apply.*

- Risk of seed spread from your exotic forest
- Emission Trading Scheme carbon credit participation
- Matching genetics to site
- Forest management
- Planning / forest engineering
- None of the above