

Wildfire Statistics and Forest Fire Management

Capabilities Study 2025





Acknowledgments

The FOA/FFA Fire Committee extends its sincere thanks to all respondents who completed the Forest Fire Survey and provided detailed information for the 2025 Wildfire Statistics and Forest Fire Management Capabilities Study. The Committee also acknowledges the Fire Study Project Subcommittee – Sean McBride (Chair), Brendan Gould, Fiona Hennessey, and Don Wallace – for their valuable guidance and support to the Project Leader throughout the development of the final report.

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Image by Craig Brown, One Forty One – Forest fire crew training

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Foreword

The 2025 Wildfire Statistics and Forest Fire Management Capabilities Study provides an important and timely stocktake of the forestry sector's readiness, capability, and exposure to wildfire risk across New Zealand's plantation forest estate.

As in previous studies, the insights presented here draw on survey respondents' information. While not fully exhaustive, they offer a reliable and representative picture of sector-wide trends, emerging pressures, and operational realities.

The past three years have highlighted both the strengths and vulnerabilities of our national wildfire management system. Forest owners continue to invest heavily in preparedness, prevention, and in-house suppression capability – resources that remain essential to protecting forest assets, rural communities, and critical infrastructure. At the same time, the decline in trained personnel, tightening insurance conditions, and gaps in national wildfire reporting underscore the need to rebuild capability, strengthen partnerships, and ensure that our systems remain fit for purpose.

A consistent theme throughout this study is the value of sustained collaboration. Forest owners, small and large, remain committed to working alongside Fire and Emergency New Zealand and other partners to improve readiness, support effective operational response, and share specialist expertise where it can add the greatest value. The findings in this report support an evidence-based conversation about how New Zealand can strengthen its



↑ Image by Juken NZ – Forest Fire 4 x 4 Tanker

wildfire management framework and ensure that sector contributions are recognised, integrated, and used to best effect.

On behalf of the FOA/FFA Fire Committee, I thank all survey participants for their time and effort and acknowledge the Project Leader and subcommittee members for their commitment to producing this valuable report. The insights captured here will help guide our collective focus as we continue to adapt to a changing risk environment and work to protect our forests and rural landscapes.



Sean McBride
Chair, FOA/FFA
Fire Committee

Executive summary

The 2025 Wildfire Statistics and Forest Fire Management Capabilities Study (the 2025 Study), commissioned by the New Zealand Forest Owners Association (FOA) and New Zealand Farm Forestry Association (FFA) Fire Committee, provides an updated assessment of wildfire impacts, fire protection expenditure, and operational capability across New Zealand's plantation forestry sector.

Covering 1.388 million hectares – 77% of the national plantation estate – the study enables direct comparison with the results of the 2022 Quantifying Forest Industry Investment in Fire Risk Management study (the 2022 Study) and provides an evidence-based stocktake that offers insights to inform sector planning and government engagement.

Key findings and trends

In the survey responses from FOA members, the annual fire protection expenditure by large-scale forest owners has decreased by 27% since 2022. Total costs for the past three years, including insurance, average \$16.1 million per year (\$11.60/ha/yr), while excluding insurance, they average \$8.1 million per year (\$5.81/ha/yr). Insurance coverage has declined significantly, with the insured area dropping from 518,400 hectares in 2022 to 304,200 hectares in 2025. This most likely reflects rising premiums, tightening policy conditions, reduced availability of cover, and reassessment of risk relative to cost.

Wildfire losses within FOA and FFA member plantation forests have remained low over the past three years. Most damaging forest fires originated outside forest boundaries, and rapid detection combined with effective initial attack has limited the scale of losses. However, operational capability has shifted: trained Incident Management Team personnel levels have decreased by

21%, and trained crew leaders/firefighters by 11% since 2022. In contrast, equipment investment has increased, with a 233% rise in the number of slip-on units.

The value of forestry-sector capability

The plantation forestry sector remains the only private landowner group in New Zealand maintaining substantial in-house suppression capability. This investment delivers critical national benefits, which include:

- **Rapid, skilled response:** Forest owners operate trained crews and specialised equipment tailored to complex plantation environments.
- **Expanded national capacity:** Sector personnel and assets significantly augment FENZ's ability to manage vegetation fires.
- **Operational resilience:** Ongoing investment in prevention, readiness, and suppression protects forest assets, rural communities, and supply-chain continuity.
- **Specialist expertise:** The sector's aviation, heavy-machinery, incident-management, and tall timber firefighting capability remains a national asset.

Strategic implications

The survey underscores the need for practical, near-term improvements in land-use management, hazard mitigation, training availability and accessibility, operational planning and



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Excluding insurance, they average

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deployment, and tactical suppression capability. Over the longer term, stronger and more systematic coordination between the forestry sector and FENZ will be essential to rebuild lost capability, address operational gaps, and sustain preparedness.

A collaborative, evidence-driven approach – grounded in shared responsibility and transparent performance expectations – will be vital to maintaining the resilience of New Zealand's plantation landscapes and strengthening national wildfire management.

Introduction



↑ Image by One Forty One, Forest Fire 4 x 4 Tanker

The FOA and FFA Fire Committee commissioned the 2025 Wildfire Statistics and Forest Fire Management Capabilities Study (the 2025 Study), updating the 2022 Quantifying Forest Industry Investment in Fire Risk Management study (the 2022 Study).

This study provides an up-to-date review and stocktake of the annual costs incurred by forest owners to maintain plantation fire protection and firefighting capacity. The 2025 Study also collected data on forest owners' fire management capabilities, aircraft use in the forestry sector, wildfire origins and impacts on forest owners' planted forest estates, providing a clearer understanding of current risk exposure, preparedness, and operational needs.

This study continues a long-standing series of similar studies dating back to

the mid-1980s that have monitored the costs of protecting plantation forests from wildfire. With nationally recorded statistics showing rising plantation losses and increasing rural fire response costs, forest owners are increasingly questioning whether Fire and Emergency New Zealand (FENZ) services are effectively reducing the impacts of unwanted fires across forested and rural areas – and whether those services provide good value for money. These rising financial pressures highlight the need for greater transparency and stronger, more reliable performance measures.

Forest owners are increasingly questioning whether Fire and Emergency New Zealand (FENZ) services effectively reduce the impacts of unwanted fires across forested and rural areas.

Project background

The 2025 Study provides valuable insights into the current annual costs of plantation forest fire protection in New Zealand, highlighting the significant investments made by forest owners to safeguard their assets and support national fire management efforts.



↑ Image by Juken NZ – Controlled Burn of Logging Residue

Covering the financial years 2023–2025, the study revealed apparent reductions in fire protection costs and insurance coverage, and a growing reliance on in-house firefighting capabilities among large-scale forest owners.

Building on the findings of the 2022 Study, the investigation into fire protection costs for the 2022/23, 2023/24, and 2024/25 financial years has enabled the forestry sector to track trends, assess the impact of evolving fire risks, and evaluate the effectiveness of current fire management strategies. This extended study examined forest fire statistics and provided vital data to inform consultations with the Government on FENZ funding mechanisms, ensuring that forest owners' contributions to fire protection are properly recognised and supported.

By continuing to monitor fire protection costs and resources, the forestry sector is better able to adapt to emerging challenges, enhance fire prevention and suppression capabilities, and strengthen partnerships with FENZ and other stakeholders in managing fire risks across New Zealand's forest and rural landscapes.

Study methodology

The 2025 Study utilised an updated version of the tailored Excel spreadsheet template used in the 2017 (MartinJenkins) and 2022 studies.



↑ Image by Kate Rankin, Wenita Forest Products – Forestry Fire Pond

The template included operating costs, insurance, capital, indirect costs, resource capability, and detailed guidance on completing the spreadsheet. The 2025 template also included fire personnel, their training levels, and forest losses. This expanded template was circulated to

FOA members and some other large forest owners and forest management companies in late August 2025 for completion.

Following the distribution of the data template, the Project Leader worked with the subcommittee

members to liaise with FOA members responsible for collecting the required information. Gaps in the data were identified, and an estimate was applied using methodologies developed and tested with the subcommittee members to confirm a position on missing data.

New Zealand's plantation forest industry

New Zealand's plantation forest industry is a significant land-based sector, covering about 1.8 million hectares or 7% of the country's land area (Forest Owners Association 2023/24). The estate is mainly made up of radiata pine (*Pinus radiata*), which grows quickly in New Zealand's climate and provides a renewable source of timber, fibre, and energy.



Planted forests contribute significantly to the national economy, generating more than

\$6 billion
annually in export earnings

Planted forests contribute significantly to the national economy, generating more than \$6 billion annually in export earnings and supporting regional economies and jobs, while also providing environmental benefits such as erosion control, carbon sequestration, and watershed protection.

Because of their scale, value, and location in rural landscapes, planted forests are continually at risk of wildfires. New Zealand's dry summers and increasing climate variability heighten this threat. FOA members play an important role in fire protection, safeguarding their own investments and protecting surrounding communities and natural resources.

FOA members' contributions include:

- **Funding and maintaining fire protection systems** such as access roads, water points, fire breaks, and lookout infrastructure.
- **Employing or supporting trained personnel** for fire detection, initial attack, and coordination with FENZ.
- **Developing fire management plans** that outline prevention, preparedness, response, and recovery measures for each forest estate.
- **Participating in regional and national fire protection groups**, working alongside local councils, rural communities, and FENZ to coordinate resources.
- **Investing in technology and research** to improve fire risk modelling, detection, and suppression efficiency.

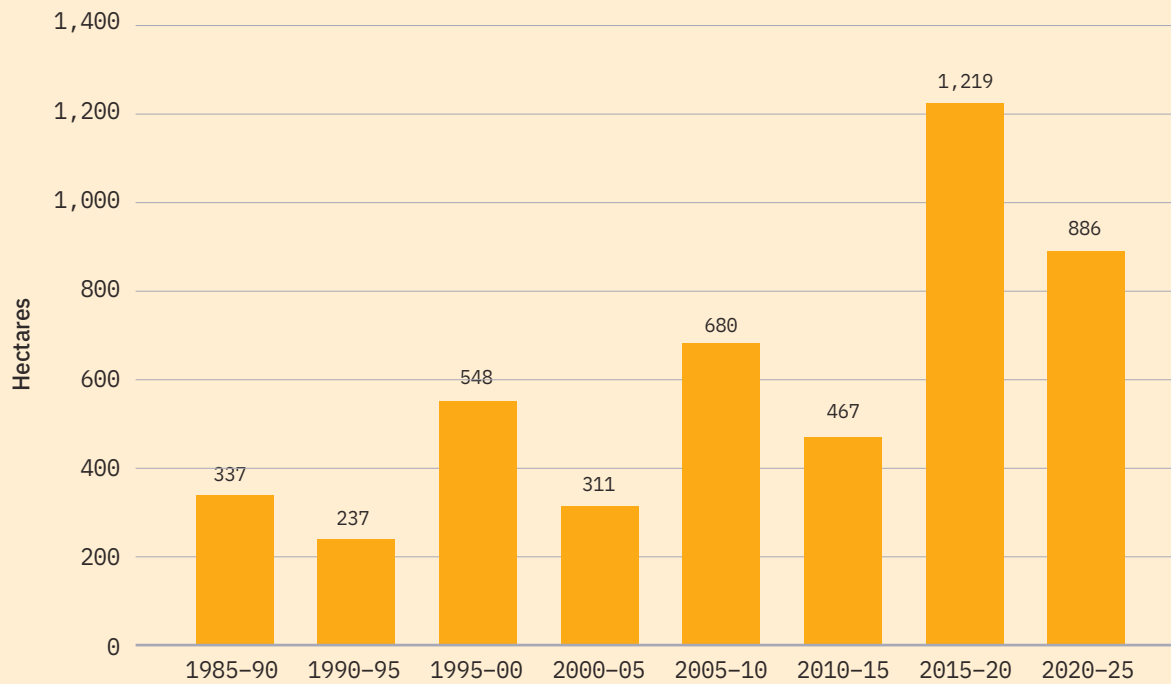


↑ Image by One Forty One – Logging Skid Fire

Planted forest estates are vulnerable to wildfire due to their flammable nature and the scale of contiguous forest areas. High-value assets, rural communities, and critical infrastructure located near forests add to the risk.

Historical wildfire events such as the Port Hills fire (2017) and the Pigeon Valley fire (2019) highlight the significant economic, environmental, and social costs of large wildfires that affect planted forest areas and that have originated outside the forest boundary. Given the value of the protected asset, wildfire has always been a key consideration for New Zealand plantation forest owners and managers. Since 1985, fires have resulted in the loss of over 23,424 ha of plantation forest. Over the past 40 years, national wildfire statistics show that the five-year average annual loss before 2024/25 ranged from 237 ha to 1,219 ha (Figure 1).

Figure 1: Five-year annual average losses for forestry plantation from wildfire 1984/85–2024/25



↑ Source: NRFA, FENZ, NZIF & Rural Fire NZ

It is a concern that the reported increases in burned area since 2017 are being attributed too quickly to climate change as the primary cause. While climate change is likely a contributing factor, land-use change, response capability, and response tactics are likely to be the more influential factors over this short timeframe.

Many of New Zealand's largest forest owners continue to benefit from maintaining a robust in-house fire-protection resource to mitigate the risks of forest fires. Medium-sized and smaller forest owners rely more heavily on a combination of insurance, FENZ resources, and, in some cases, on in-house crews from nearby forest owners to help mitigate fire risk.

Planted forest estates are vulnerable to wildfire due to their flammable nature and the scale of contiguous forest areas.



↑ Image by One Forty One – Wajax Fire Pumps

Forest Fire Risk Management Guidelines

The Forest Fire Risk Management Guidelines were developed by the NZ Forest Owners Association with support from the NZ Farm Forestry Association. The guidelines were first published in 2018 and updated in 2025, and are now widely used by the forest industry.

These Guidelines describe the application of the 4Rs of emergency management – Reduction, Readiness, Response & Recovery. They are specific to forest fire management and enable forest owners and managers to engage with other stakeholders, such as FENZ managers, farmers, and contractors, to mitigate fire risk. This helps ensure the consistent application of risk management principles and the management of forest and rural landscape fires.

Fire management in planted forest lands must address fire risk, personnel safety, and other management goals, including maintaining the supply of both tangible and intangible forest benefits and the forestry supply chain. It may also involve using fire for specific purposes. The Forest Fire Management Guidelines provide a template involving a standardised approach to achieving this goal and are an essential tool in supporting this process.

Fire management in planted forest lands must address fire risk, personnel safety, and other management goals.



↑ Image by Peter Houston – Forest Fire Crew



Download the Forest Fire Risk Management Guidelines [here](#)

Implications of FENZ reform for the forestry sector

The establishment of FENZ in 2017 created a single national organisation responsible for both urban and rural fire services. This marked a major shift from the previous rural fire system, which relied on strong local involvement from forest owners, councils, and rural fire authorities.



↑ Image by Peter Houston – Digger Opening Up Hot Spots

The transition has reshaped roles and responsibilities, and the forestry sector continues to work with FENZ to understand how its specialist expertise can be most effectively integrated within the national model.

Sector feedback indicates that the move to a centralised structure has, in some areas, made it more difficult to maintain the depth of local rural fire knowledge and operational familiarity that previously supported rapid, well-informed decision-making. Strengthening this capability within the current framework is a shared priority, and there is scope for joint work between FENZ and the forestry sector to identify practical ways to reinforce locally informed readiness and response.

Stakeholders in both the forestry and insurance sectors have also raised questions about whether the

current funding model adequately reflects the expanded scope of FENZ's responsibilities. As FENZ now responds to a wide range of non-fire emergencies, some contributors suggest that a review of the model could help ensure long-term equity, transparency, and alignment between contributions and the services delivered across urban and rural environments. Exploring alternative risk-based approaches – similar to those used internationally – may support constructive discussion on future funding settings.

Comparisons with pre-2017 arrangements suggest there may be opportunities to rebuild aspects of local capability and strengthen operational alignment within the national system. Further joint analysis could help identify where improvements in coordination, resourcing, and performance

measurement would deliver the greatest benefit.

Any future funding model will need to provide transparency, maintain sector confidence, and ensure a clear relationship between contributions and service outcomes across both urban and rural contexts.

Comparisons with pre-2017 arrangements suggest there may be opportunities to rebuild aspects of local capability and strengthen operational alignment within the national system.

Past plantation forest fire expenditure studies in New Zealand

Over the past 40 years, several studies have analysed the annual costs to forest owners of protecting their forest assets from wildfires. Those studies are summarised below.

A A N Cooper and C Ashley-Jones 1987

The A N Cooper and C Ashley-Jones 1987 Economics of Fire Prevention in New Zealand Plantation forests report analysed the fire prevention costs for the NZ Forest Service from 1967 to 1982. They also analysed private forest owners' costs at that time. This study assessed the annual direct fire prevention cost for the NZ Forest Service at \$8.02 per hectare. It also appeared the private plantation average was \$11.00 per hectare. These costs did not include overheads and capital value of the equipment.

B NZ Forest Owners Association 2007

In 2007, the NZ Forest Owners Association completed a study on aspects of rural fire management in plantation forests. This study obtained current fire protection costs on a \$/ha basis for the total forest estate and the net stocked forest area (in most cases, results were very similar). The average fire protection cost was \$15.48 per stocked hectare or \$12.36 per hectare of the protected area. Fire organisation (\$6.94/ha and \$5.12/ha, respectively) and fire administration (\$5.95/ha and \$4.78/ha, respectively) are the most significant contributors to those costs.

C BERL 2009

BERL was commissioned by the National Rural Fire Authority in 2009 to study the economic costs of wildfires in New Zealand.

The results of the 1987 A N Cooper and C Ashley-Jones estimates for some expenditure categories provide an opportunity to compare the two periods, 1985–86 and 2002–07. For comparative purposes, BERL adjusted these numbers to reflect 2008 dollars and used the Statistics NZ series for the Producer Price Index for industrial inputs. The 2008 price index was 2.04 times the 1987 index; consequently, the \$9.6 million expenditure in 1985–86 would be equivalent to \$19.6 million in 2008 prices.

Excluding the after damages effects per year and fire suppression costs, the five-year average cost for the fire management of the stocked forest area from 2002 to 2007 was \$10.68/ha.

D MartinJenkins 2017

The MartinJenkins 2017 report analysed the baseline costs of servicing New Zealand's rural fire sector. The primary purpose of this cost analysis was to inform the setting of the Fire Service Levy for 2018/19 and the development of FENZ operating budgets for the 2017/18 financial year.

The scope of the study included estimating the costs of rural fire mitigation and protection incurred by Rural Fire Authorities, which totalled \$35 million. Forest owners' proportion of the \$35 million was \$10.6 million.

E The 2022 Study Quantifying Forest Industry Investment in Fire Risk Management study

The 2022 Study verified the forest fire protection costs for the financial years 2019–2022. Key findings include:

- Annual fire protection costs for large-scale forest owners totalled \$21.4 million, including insurance (\$15.87/ha), and \$11 million excluding insurance (\$8.16/ha).
- Insurance covered 38.5% of large-scale forest estates and 35% of small/medium-scale estates, with premiums exceeding \$10.8 million in 2021/22.

The report highlights a 31% increase in fire protection costs per hectare since 2016 and underscores the importance of collaboration between forest owners and FENZ. It provides valuable insights for future consultations on FENZ funding mechanisms and emphasises the forestry sector's contributions to fire prevention and management.

Forest fire protection costs 2025

To assess current fire protection costs, the 2025 Study surveyed FOA members and other targeted large forest owners or managers regarding expenditures during the 2022/23, 2023/24, and 2024/25 financial years. Respondents were also asked to report on their firefighting resources – including trained personnel, land-use fires, the extent of wildfire losses on their estates, and the level of tree-crop insurance held.

Twenty-one of New Zealand's largest forest owners and managers participated in the 2025 survey, providing verified data for 1,156,066 hectares – representing approximately 62% of the 1.76-million-hectare national plantation estate. To maintain methodological consistency with the 2017 MartinJenkins study and the 2022 Study, the established gap-filling approach was applied to account for non-responding owners. This standardised method increased the area analysed to 1.388 million hectares, ensuring coverage of 77% of the national estate and enabling

robust, like-for-like comparisons across all three studies.

Key findings include:

- Total fire protection costs, including insurance, are approximately \$16.1 million per year, equivalent to \$11.60/ha/yr.
- Total fire protection costs excluding insurance are approximately \$8.1 million per year, equivalent to \$5.81/ha/yr.
- Approximately 304,200 hectares of the large-scale forest estate are insured against tree-crop losses, down from 518,400 hectares reported in the 2022 Study.

Many forest owners continue to make substantial contributions to rural fire readiness through their personnel, equipment, and operational capabilities, thereby significantly expanding the resources available to FENZ for wildfire suppression in the forest and rural landscape. The sector also supports national initiatives such as the National Fire Prevention Campaign and Rural Fire Research, and provides in-kind contributions to FENZ working groups, incident management teams, and international deployments.



↑ Image by One Forty One – Wajax Fire Pumps

Survey results: key findings



The total area analysed from the survey returns

1,388,000 ha

Production forest area (21 largest owners)

1,156,066 ha¹

The area added for compatibility with previous surveys ('gap-filling')

231,934 ha²

Total annualised costs for 2022/23, 2023/24 and 2024/25 are:



Total forest fire protection costs including insurance

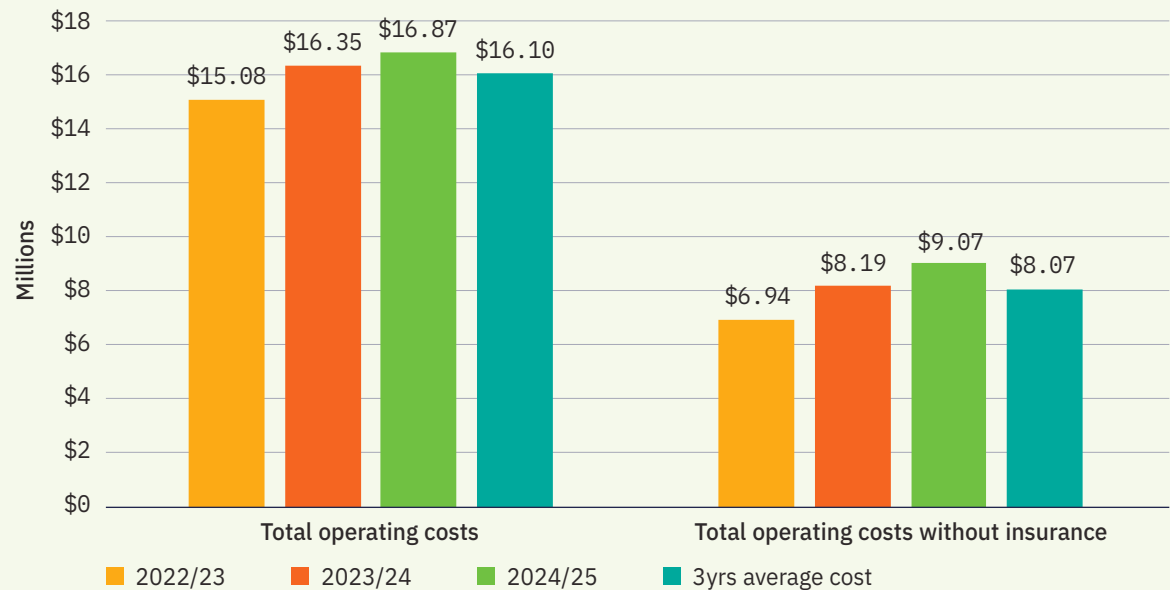
\$16.1m/year
(\$11.60/ha/yr)

Total forest fire protection costs excluding insurance

\$8.07m/yr
(\$5.81/ha/yr)

The annual forest owner fire protection total operating costs for 1.4m hectares with the inclusion of insurance costs and without insurance for 2022/23, 2023/24 and 2024/25 are outlined in Figure 2. The full annual breakdown of expenditure for 2022/23, 2023/24, and 2024/25 for forest fire protection across the 1.388m hectares is outlined in Figures 3 & 4. A comparison of expenditure between the 2022 Study and the 2025 Study is outlined in Figure 5.

Figure 2: Large scale forest owners' annual fire protection costs (1.4m ha)



1. This area excludes the carbon farming area of 110,000 ha, and the small forest owner estate (estimated at 200,000 ha).
2. Note: To ensure comparability with the 2017 MartinJenkins study, the gap-filling methodology used in the 2022 Study was applied in this 2025 analysis to estimate costs for forest owners who did not provide survey data. This added 231,934 hectares, resulting in a total analysed forest area of 1.388 million hectares.

Figure 3: Breakdown of expenditure for 2022–23, 2023–24, and 2024–25 for forest fire protection across the 1.388m hectares

	With gap fill of 16% 1.3m Ha		
	2022/23	2023/24	2024/25
Total personnel costs	\$1,015,440	\$1,181,577	\$1,335,441
Training	\$222,562	\$326,506	\$345,431
Operating costs	\$1,836,435	\$2,861,915	\$3,046,885
Building costs	\$588,552	\$574,527	\$527,150
Equipment and vehicle costs	\$1,977,331	\$1,844,524	\$2,000,392
Publicity and other fire prevention/reduction costs	\$17,620	\$14,466	\$207,632
Total insurance cost	\$8,147,854	\$8,153,726	\$7,799,204
Total depreciation cost	\$906,089	\$851,960	\$904,828
Total fire suppression costs net of recoveries	\$28,542	\$163,335	\$253,076
Administration and overhead costs	\$343,825	\$375,172	\$450,023
Total operating costs	\$15,084,250	\$16,347,709	\$16,870,062

Figure 4: Three year average annual forest fire expenditure 2019–22 versus 2022–25

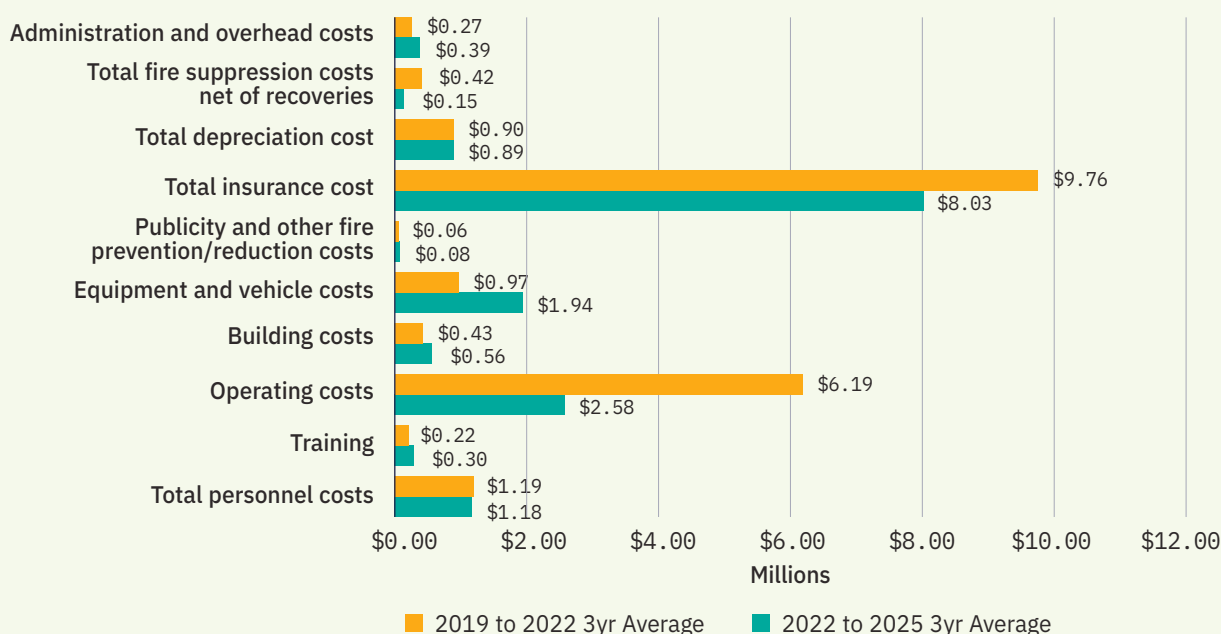


Figure 5: Large-scale forest owners' annual fire protection costs comparison between the 2022 study and the 2025 study

	2022 to 2025 3yr Average	2019 to 2022 3yr Average	Difference	% difference between 2019–22 and 2022/25
Total personnel costs	\$1,177,485.84	\$1,190,823	-\$13,337	-1.1%
Training	\$298,166.40	\$216,199	\$81,967	27.5%
Operating costs	\$2,581,745.11	\$6,191,057	-\$3,609,312	-139.8%
Building costs	\$563,409.68	\$433,037	\$130,372	23.1%
Equipment and vehicle costs	\$1,940,749.21	\$966,009	\$974,740	50.2%
Publicity and other fire prevention/reduction costs	\$79,906.21	\$62,882	\$17,024	21.3%
Total insurance cost	\$8,033,594.60	\$9,758,787	-\$1,725,192	-21.5%
Total depreciation cost	\$887,625.43	\$896,231	-\$8,605	-1.0%
Total fire suppression costs net of recoveries	\$148,317.60	\$418,529	-\$270,211	-182.2%
Administration and overhead costs	\$389,673.66	\$266,883	\$122,791	31.5%
Total operating costs	\$16,100,673.73	\$20,400,438	-\$4,299,765	-26.7%

Trends and challenges in tree-crop insurance

For some forest owners, tree-crop insurance remains a central component of plantation forest risk management, providing financial protection against the potentially severe impacts of wildfire on high-value forest assets.

While large forest owners continue to invest heavily in prevention, preparedness, and in-house suppression capability, insurance plays a crucial role for some forest owners in safeguarding long-term crop value and supporting business continuity in the event of fire losses.

The survey results show that the largest forest owners, those managing more than

50,000 hectares

generally self-insure by maintaining their own fire equipment and trained firefighting personnel.

Approximately

24%

of New Zealand's large plantation forest estates are insured.

The 2025 Study highlights a notable shift in insurance coverage and expenditure across the sector. Rising premiums, tightening policy conditions, and reduced availability of cover have contributed to a decline in the insured forest-area share compared with previous years. These trends reflect both the insurance

industry's reassessment of wildfire risk and the broader pressures affecting global insurance markets.

In addition, from 1 July 2026, the Government will introduce a new requirement for holders of tree-crop insurance policies to pay an annual fire levy of 1.94 cents per \$100 of the sum insured. This change adds another cost consideration for forest owners evaluating the role of insurance within their wider risk-management strategy.

For many forest owners – particularly small- and medium-scale growers – insurance remains the primary mechanism for managing financial exposure to wildfire. However, rising costs and reduced access to comprehensive coverage are prompting some owners to reconsider the scope of their insurance or rely more heavily on operational mitigation measures. Ultimately, each forest owner must weigh the cost of premiums against their own risk profile, risk appetite, and – where relevant – the need for insurance to support financing arrangements. This means the level of insurance cover will vary from forest to forest, reflecting differences in exposure, management approach, and individual business requirements.

Based on the information provided, we estimate that approximately 24% of New Zealand's large plantation forest estates are insured. Additionally, our survey of farm foresters (NZ Farm Forestry Association members) indicates that approximately 46.5% of small forest estates are insured.

Survey responses from large forest owners also allow an estimate of annual tree-crop insurance premiums over the past three years: \$8.1 million in 2022/23, \$8.1 million in 2023/24, and \$7.8 million in 2024/25. This equates to an average annual insurance cost of approximately \$8.0 million across the survey period.

The survey results show that the largest forest owners – those managing more than 50,000 hectares – generally self-insure by maintaining their own fire equipment and trained firefighting personnel. This group continues to invest in training and operational readiness, operating 4x4 forest fire trucks, pumps, hoses, and waterway equipment to ensure rapid initial attack capability. Collectively, these owners manage an estimated 600,000 hectares.

Forest managers with estates between 20,000 and 50,000 hectares present a more mixed picture. Some maintain a firefighting capability, while others hold minimal equipment and rely heavily on FENZ or neighbouring forest owners for suppression support. This group is far more likely to have tree-crop insurance rather than invest in dedicated in-house resources. In FY2024/25, their combined annual insurance premiums exceeded \$8 million, covering approximately 350,000 hectares.

Insurance costs varied widely, ranging from \$8.45/ha to \$32.51/ha, with an average of \$26.34/ha. This variation reflects factors such as forest age class, total insured area, first-loss limits, and overall insured value.

Wildfire risk and insurance gaps for small forest owners

As part of this project, NZ Farm Forestry Association (FFA) members and some other small forest owners were invited to complete a short online questionnaire designed to gather information on forest area, levels of tree-crop insurance, and any wildfire incidents experienced over the past three years.

The survey provided an important opportunity to better understand how small-scale forest owners – who collectively manage a substantial portion of New Zealand’s plantation estate – are approaching wildfire risk and financial protection.



This means that more than half of the surveyed area –

8,658 hectares

– remains uninsured, leaving many small-scale growers financially exposed should a significant wildfire occur.

A total of 190 questionnaire responses were received, representing 16,175 hectares of planted forest. This sample accounts for roughly 16–17 percent of the estimated 100,000 hectares owned by FFA members nationally. As not all small-scale forest owners are members of the FFA, the dataset ultimately reflects only a subset of the wider small-forest-owner estate.

Nevertheless, the responses provide a statistically useful indication of current insurance uptake and risk-management practices within this segment of the sector.

The results show that 46.5% of the reported forest area is insured against tree-crop loss. This means that more than half of the surveyed area – 8,658 hectares – remains uninsured, leaving many small-scale growers financially exposed should a significant wildfire occur. The detailed breakdown is as follows:

Number of small forest owner survey responses		190
Forest area hectares involved	16,175	Ha
Forest area hectares insured	7,517	Ha
Forest area hectares not insured	8,658	Ha
Percentage of forest area insured	46.5%	

These findings indicate variation in how small-scale forest owners manage financial risk. Some continue to use insurance as part of their wildfire resilience strategy, while others do not – potentially reflecting factors such as premium levels, policy availability, or confidence in on-property mitigation. The resulting proportion of uninsured forest area shows that a significant share of small-scale forests currently sits outside formal financial risk-transfer mechanisms.



↑ Image by Paul Hart, Ernslaw One – Wilding Pine Burn

Forest owners' firefighting capability in 2025

The forest industry operates across extensive rural landscapes, where ongoing improvements in forest productivity have increased the value of these assets and underscored the need to protect them from unwanted fires.

As a result, maintaining a robust and specialised wildfire response capability has become essential. Effective protection of forest assets now depends not only on highly trained firefighters and experienced Incident Management Team (IMT) personnel, but also on the continued availability of specialised equipment designed specifically for plantation fire suppression.

Historically, forest owners maintained dedicated firefighting crews equipped with 4x4 tanker units, high-pressure portable pumps, extended hose-lay capability into remote forest terrain, and heavy machinery, including bulldozers, excavators, and graders, to construct firebreaks, manage fuels, and support suppression operations. These purpose-built resources enabled rapid and decisive

initial attack – the phase of wildfire suppression most strongly associated with early containment and minimal fire growth – and were staffed by personnel with detailed knowledge of forest road networks, fuel complexes, silvicultural systems, and operational hazards, which remains a unique and specialised skill set.

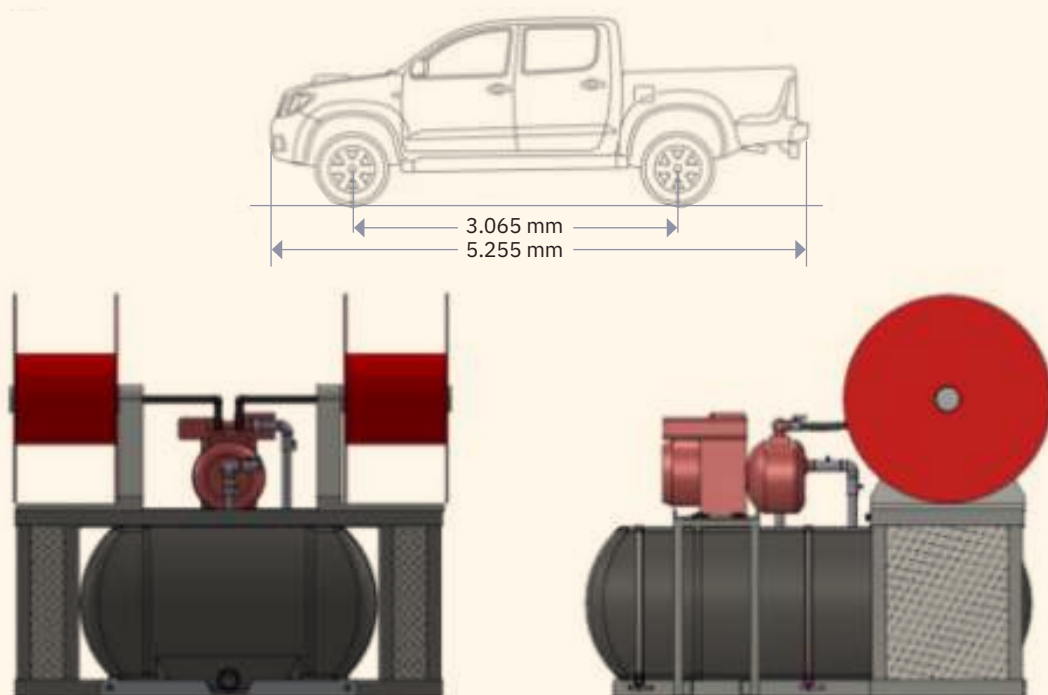
Structural changes implemented in 2017 included a deliberate shift toward greater reliance on community-based volunteer fire brigades as the first responders to plantation fires. This has materially reduced the system's capacity to deliver a timely, forest-appropriate initial attack. Forest owners note that volunteer brigades play a crucial role in rural communities, but their availability and equipment can vary across regions. Strengthening interoperability between FENZ volunteers and forestry resources – particularly during initial attack – may help ensure capacity is aligned with risk, especially in complex plantation environments. The operational consequences of this mismatch are evident. Delays in capability and equipment during the initial attack phase increase the likelihood of fires escaping early containment, leading to larger burn areas, greater impacts on biological or timber assets, longer campaign fires, and a step change in suppression effort. As wildfires grow in size and complexity, suppression costs escalate disproportionately, driven by longer deployment periods

and greater reliance on aerial resources. These dynamics erode the perceived cost-efficiency of a volunteer-led response model and shift financial risk downstream, contributing to higher emergency-response expenditures and greater economic losses to forest assets and surrounding communities (Dudfield M., Easton M., Carle J., 2024). Findings from the 2024 Matakana Island Forest Fire Field Visit Report <https://www.nzfoa.org.nz/resources/file-libraries-resources/fire/952-industry-forest-fire-review-report/file> reinforce this pattern, highlighting how delays in resourcing and coordination can amplify both suppression costs and the scale of resulting losses.

There are also significant safety implications. Larger, more intense fires expose firefighters – particularly volunteers – to elevated fatigue, heat stress, and dynamic fire behaviour, increasing the likelihood of near-miss events, injuries, and serious harm. The loss of forest-experienced crews during the initial attack phase further increases reliance on reactive suppression in extreme conditions, thereby compounding the risk to personnel and the public. From a policy perspective, the current response model therefore increases exposure to avoidable fire growth, escalating costs, and heightened safety risk, rather than reducing overall wildfire risk and impacts across the system.

Strengthening interoperability between FENZ volunteers and forestry resources - particularly during initial attack - may help ensure capacity is aligned with risk, especially in complex plantation environments.

Figure 6: Example of a forest fire Slip-On Unit



Delays in capability and equipment during the initial attack phase increase the likelihood of fires escaping early containment, leading to larger burn areas, greater impacts on biological or timber assets, longer campaign fires, and a step change in suppression effort.

Modern wildfire events increasingly require integrated, multi-agency operations, in which trained forest-industry firefighters and IMT managers must work seamlessly with FENZ, rural contractors, and aviation resources. Their expertise is crucial in coordinating specialised assets,

including off-road tankers capable of accessing remote areas, pump-and-hose systems that deliver water across steep or confined terrain, and heavy machinery essential for constructing containment lines and restoring control when fire behaviour escalates. Without skilled operators and managers familiar with both the equipment and the forest environment, these assets cannot be deployed effectively or safely.

Ensuring the continued availability of trained personnel and well-maintained equipment is fundamental to protecting New Zealand's commercial forest estate. Strengthening the industry's operational readiness, competence pathways, and collaboration mechanisms with FENZ is essential to maintaining a resilient wildfire response system capable of addressing emerging risks and safeguarding both economic and environmental values.

The 2025 Study collected detailed information on trained Incident Management Team (IMT) members,

The industry allocated approximately

\$8.03 million

per year to fire protection operating costs (~\$6.20 per hectare per year) in 2024/25 to maintain its firefighting capability and forest protection initiatives.

trained forest firefighters, and the types and quantities of firefighting equipment owned or available to forest owners and managers. A comparison with the 2022 Study reveals several notable trends. The number of trained IMT members has fallen by 21.4%, from 215 to 169, indicating a significant drop in leadership capacity for wildfire management within the forest industry.

Figure 7: In-house forest firefighting resources maintained by forest owners

		2022	2025	% Change
Number of trained IMT members				
	Incident Controllers	21	19	-9.5%
	Operations Managers	47	25	-46.8%
	Logistic Managers	18	14	-22.2%
	Planning Managers	18	18	0%
	Aviation Managers	18	24	+33.3%
	IMT Others	93	69	-25.8%
	IMT Total	215	169	-21.4%
Number of trained crew leaders/firefighters				
		870	778	-10.6%
	Skilled Chainsaw Operators	NR	443	
Forest firefighting equipment				
	Tanker 4 x 4	59	54	-8.5%
	Tanker 10,000 litres plus	7	8	+14.2%
	Smoke chasers	12	13	+8.3%
	Wajax HPLV	173	211	+21.9%
	Heavy pumps	85	86	+1.2%
	Slip-on units	12	28	+233.3%
Forest firefighter hose	25mm	12,240m	20,370m	
	41mm	40,020m	49,740m	
	75mm	7,275m	10,525m	
Heavy bulldozers		85	95	
20 to 50-tonne excavators		256	258	

Similarly, the number of trained Crew Leaders and firefighters has decreased by 11%, from 870 to 778, reflecting a modest decline in frontline firefighting resources. Key factors behind the reduction in trained personnel appear to be due to FENZ's reduced deployment of forest owner resources during wildfire events and reduced availability of, and access to, relevant wildfire training. This limited engagement reduces opportunities for trained IMT personnel to apply their skills in real-world incidents, negatively affecting retention and ongoing professional development within the forest industry.

Despite these declines in personnel, major forest owners have increased their firefighting equipment inventories, with Slip-On Units (Figure 6) up 233%, providing greater rapid-response capability and operational flexibility on the fireground. These trends underscore the importance of maintaining a skilled workforce, continuing investment in firefighting equipment, and strengthening cooperation between FENZ and the forest industry to ensure effective wildfire readiness. Figure 7 (above) provides a detailed summary of the survey results and makes a

The number of trained Crew Leaders and firefighters has decreased by

11%

from 870 to 778, reflecting a modest decline in frontline firefighting resources.

comparison between the 2022 Study and 2025 Study.

The 2025 survey results reaffirm the substantial ongoing investment by forest owners in protecting planted forests. Our findings show that the industry allocated approximately \$8.03 million per year to fire protection operating costs (~\$6.20 per hectare per year) in 2024/25 to maintain its firefighting capability and forest protection initiatives.

The maintenance of this firefighting resource also implies that forest owners contribute significantly to the overall rural fire sector's readiness in terms of workforce and equipment, substantially increasing the resources that FENZ has available for effective fire suppression and extending its national coverage to respond. The forestry sector also contributes to, or supports, national initiatives, such as the National Fire Prevention Campaign and Rural Fire Research and provides in-kind support for activities including FENZ Working Groups/Committees, national and regional IMT, and international deployments.

Unit Standard framework and its application by forest owners for forest fire management

A structured, nationally recognised competency framework is essential to ensuring that personnel involved in forest fire management possess the skills, knowledge, and practical capabilities required to operate safely and effectively in planted forest environments.

For decades, New Zealand's forest industry has relied on the NZQA Unit Standard (US) framework to provide a consistent, auditable basis for training and qualification across both operational firefighting and broader forest management activities.

Importantly, the unit standard system does more than certify competence – it provides clear development, growth, and career pathways for forestry staff and contractors. By progressing through increasingly advanced unit standards, individuals can build specialist capability, gain recognition for their experience, and move into higher-responsibility roles within both fire management and the wider forestry sector.

Forest owners apply a suite of fire-specific unit standards to develop and maintain core wildfire competencies. These include foundational skills such as wildfire behaviour, safe use of pumps and hoses, crew leadership, and sector-specific operational tactics. Higher-level unit standards support the development of Incident Management Team (IMT) personnel, including roles such as Incident Controller, Operations Manager, Planning Manager, Logistics Manager, and Air Operations functions. Together, these qualifications ensure that forest-industry personnel can integrate effectively into multi-agency wildfire operations (i.e. CIMS) and meet the competency expectations required under the NZQA framework.

However, effective wildfire management in plantation forests requires more than fire-specific training alone. Forest owners also

draw on a broader suite of NZQA unit standards that underpin safe and competent performance in the wider forestry environment. These additional qualifications – while not fire-specific – provide essential operational capability that directly enhances wildfire readiness and response.

Examples include:

- **Forest establishment and silviculture unit standards** (e.g., US 17765, US 17769), which build understanding of forest structure, fuel development, and operational hazards.
- **Environmental management and compliance standards** (e.g., US 17772, US 6963, US 6965), supporting safe and compliant operations during suppression, mop-up, and rehabilitation.
- **Chainsaw and tree-felling standards** (e.g., US 6916, US 17763, US 12541), which are critical for safe line construction, hazard-tree removal, and access creation during wildfire operations.
- **Machine operation standards** for excavators, bulldozers, and other heavy plant, which underpin safe and effective use of machinery for firebreak construction and containment-line reinforcement.

These broader forestry qualifications significantly strengthen the capabilities of forest industry personnel deployed to wildfire events. They enhance situational awareness, improve decision-making in complex terrain, and ensure that personnel understand the

The unit standard system does more than certify competence – it provides clear development, growth, and career pathways for forestry staff and contractors.

operational, environmental, and safety context of plantation firefighting. When combined with fire-specific unit standards, they form a comprehensive competency framework that supports safe, efficient, and effective wildfire management across the plantation estate.

Unlike most FENZ firefighters – who generally do not hold these forestry-based qualifications – forest management organisations (FMO) personnel bring specialist knowledge of plantation environments, silviculture, terrain, and operational forestry systems. This complementary skillset is critical to safe and effective integration during wildfire response.

Forest owners continue to invest in maintaining these competencies despite FENZ's reduced utilisation of industry resources in recent years. The decline in deployment opportunities has affected the ability of trained personnel to maintain currency and operational experience, particularly at the IMT

Strengthening alignment between FENZ qualification pathways and the forest-industry competency framework remains a key opportunity.

level. In addition, the reduction in FENZ-delivered training to FMOs has further constrained the sector's ability to keep skills current and progress personnel through the required unit standards. Nevertheless, the sector remains committed to sustaining a high-quality, professionally trained workforce capable of supporting both initial attack and extended operations when required.

From the 2025 Study, the table on the following page (Figure 8) provides an overview of the current level of forest-owner-based personnel available to both forest owners and FENZ for each Incident Management Team (IMT) position, broken down by FENZ Region. This regional mapping of qualified forestry staff is more than a stocktake – it highlights a critical capability asset that is unevenly distributed across the country and currently under-utilised within the national response model.

The Study shows that IMT capacity within the forestry sector has declined by 22% since 2022, with reductions across key leadership roles, including Operations Managers (-46.8%) and Logistics Managers (-22.2%). As noted in the report, “the number of trained IMT members has fallen by 21%, from 215 to 169” and this decline is closely linked to “reduced availability of, and access to, relevant wildfire training” for FMOs.

Against this backdrop, the spatial distribution of remaining qualified forestry personnel becomes strategically important. Forestry IMT members bring deep operational knowledge of plantation environments, terrain, fuel complexes, and heavy machinery integration – skills not widely held within the general FENZ workforce. The Study emphasises

that Forest Management Organisations (FMO) personnel bring specialist knowledge of plantation environments, silviculture, terrain, and operational forestry systems, which is essential for safe and effective wildfire operations.

By presenting regional IMT availability in a consolidated national view, Figure 8 provides FENZ with a practical tool to:

- **Identify regional capability gaps** in critical IMT roles where forestry personnel currently provide the majority of national expertise.
- **Prioritise training delivery** to ensure that each region maintains sufficient depth across Operations, Planning, Logistics, and Air Operations functions.
- **Strengthen interoperability** by aligning FENZ qualification pathways with the forestry competency framework, ensuring that forestry-based skills are recognised and integrated.
- **Support a more resilient partnership model**, where FENZ, forest owners, and agencies such as the Department of Conservation can jointly plan for regional coverage, surge capacity, and succession.

In effect, the regional IMT distribution is a blueprint for rebuilding national rural-fire leadership capability. When combined with similar datasets from DoC and other land management agencies, it enables FENZ to design a training and deployment model that reflects actual risk, leverages specialist expertise, and restores the depth of rural fire knowledge that has eroded since 2017.

Fifteen large forest owners have FMO service agreements with FENZ that set out mutual expectations for the availability, training, authorisation, management, and cost-recovery arrangements for FMO personnel and equipment responding to wildfires within or beyond FMO estates. A central element of these agreements is FENZ's commitment to deliver training across the relevant unit standards – from firefighter qualifications through to Incident Management Team roles – so FMOs can maintain an authorised and capable workforce.

However, since the establishment of FMO agreements, the level, frequency, and availability of training opportunities provided to FMOs have not aligned with the provisions of those agreements. This shortfall has constrained FMOs' ability to maintain the trained personnel required to meet their contractual obligations and sustain the operational capability needed to support vegetation fire response. Alternative training delivery options have been explored, but issues relating to assessment and certification have limited the feasibility of pursuing options outside FENZ.

This gap reflects wider pressures on national training capacity for FMOs. Forest owners remain committed to working with FENZ to ensure that the training components of the service agreements are delivered consistently, enabling FMOs to continue contributing effectively to wildfire suppression and rural fire readiness.

Strengthening alignment between FENZ qualification pathways and the forest-industry competency framework remains a key opportunity. Improved recognition of forestry-based qualifications – particularly in aviation supervision, heavy-machinery operations, and initial attack leadership – would enable more effective integration of industry expertise into wildfire response. This would not only enhance operational performance but also help rebuild national capability in areas where

Forestry IMT members bring deep operational knowledge of plantation environments, terrain, fuel complexes, and heavy machinery integration - skills not widely held within the general FENZ workforce.

Figure 8: Overview of forest owner-based personnel available to both forest owners and FENZ for each Incident Management Team (IMT) position by FENZ Region

North Island FENZ Regions	Northland	Waitematā	Auckland	Counties Manukau	Waikato	Bay of Plenty	Tairāwhiti	Hawke's Bay	Manawatu-Whanganui	Taranaki	Wellington	North Island Total
Incident Controller Positions	1				2	3	1	5			1	13
IMT Operations Managers	1				4	4	6					15
IMT Planning/Intelligence Managers	2				1	4		2				9
IMT Logistics Managers	1				1	3	4	1				10
IMT Air Division Commanders						1						1
IMT Air Attack Supervisors	1					1					1	3
IMT Air Support Supervisors					1	8		1			3	13
IMT Division Commanders	1				2	6						9
IMT Sector Supervisors	11				6	16		2			3	38
IMT Crew Leaders	5	2			15	24	8	7			22	83
Safety Officers	1				2	4	1				3	11
Chain Saw Operators (Basic)	7				16	21	66	18			53	181
Qualified Tree-fellers	3				4	8	42	16			37	110
Advanced Tree-fellers	3				4	8	12	4			10	41
Firefighters	1				23	39	86	41			32	222
Contract Firefighters	32	8			69	122	43	84			40	398

South Island FENZ Regions	Nelson Marlborough	West Coast	Canterbury	Mid-South Canterbury	Otago	Southland	South Island Total	National Total
Incident Controller Positions	3				3		6	19
IMT Operations Managers					4		4	19
IMT Planning/Intelligence Managers	5		1		2	1	9	18
IMT Logistics Managers	1				3		4	14
IMT Air Division Commanders					1		1	2
IMT Air Attack Supervisors	1				1		2	5
IMT Air Support Supervisors	2				2		4	17
IMT Division Commanders	6				2		8	17
IMT Sector Supervisors	9				5		14	52
IMT Crew Leaders	14		2	4	14	1	35	118
Safety Officers	3				4		7	18
Chain Saw Operators (Basic)	21	6	4		37	4	72	253
Qualified Tree-fellers	6	4	2		10	2	24	134
Advanced Tree-fellers	1	8			4	2	15	56
Firefighters	19	4	2	6	61	2	94	316
Contract Firefighters	16		8		28	12	64	462

specialist skills have diminished and continue to do so.

A key outcome of the July 2025 Management of Fire in Our Forest and Rural Landscape Conference, held in Christchurch and attended by representatives of the forest industry, the Department of Conservation, and FENZ, was a strong call for a more comprehensive, collective perspective

on fire management in the forest and rural landscape. Participants emphasised that a carefully coordinated national approach is now essential, reflecting widespread concern about the erosion of rural fire expertise and a shared commitment to structural reform, inclusive leadership, and meaningful cultural change (Tāngata Matatau, 2025). These insights extend well beyond workforce

retention, advocating instead for a systemic shift that genuinely values, develops, and integrates rural fire skills and knowledge across the entire sector.

Collectively, unit standards form the backbone of the forestry sector's wildfire readiness, underpinning a professional, interoperable, and highly capable response framework across New Zealand's plantation estate.

Leveraging forestry aviation expertise for wildfire operations

For day-to-day forest management, the forest industry is widely recognised as a major and experienced user of aviation services. Aircraft play an integral role in achieving effective and timely outcomes across a broad range of routine plantation-forest operations. Their use supports the ongoing maintenance and enhancement of the forest estate as a renewable, sustainable, and economically significant resource.

Aviation delivers capabilities that are either impractical or impossible to achieve from the ground. This includes rapid access to remote or rugged terrain, the ability to cover large areas efficiently, and the capacity to apply treatments with high precision. Consequently, aircraft are routinely used to manage key risks such as forest health or wildfire, and monitoring for pest incursions and disease outbreaks – and to conduct operational activities including aerial fertiliser application, herbicide treatment, and support for harvesting and silviculture.

Given the operational and safety-critical nature of aviation, forest companies place strong emphasis on ensuring that aircraft services are delivered efficiently, effectively, and safely. Supervising

aviation operations requires personnel with the necessary technical competence, practical experience, and current training to oversee flights, verify safe procedures, and assess whether productivity and environmental outcomes are being achieved. Equally, pilots must demonstrate the skill and professionalism needed to operate safely in challenging forest environments and earn the confidence of the supervising foresters who manage the operation.

To inform the 2025 survey, participating forest owners were asked to provide details on their aircraft use across routine forest management activities. Responses from the fifteen large forest companies indicate a combined three-year expenditure

of approximately \$32.3 million on aviation services. This figure reflects not only the scale of operations involved in managing New Zealand's plantation estate but also the sector's reliance on aviation as an essential tool for sustaining forest health, productivity, and resilience.

Given this extensive operational experience and the forest industry's continual, high-value engagement with aviation services, there is a strong case for FENZ to make greater use of forestry aviation managers in the coordination and oversight of aircraft at wildfires. Their current operational and practical expertise in supervising complex aviation operations represents a significant capability that could enhance the safety, efficiency, and effectiveness of wildfire aviation response.



↑ Image by Matariki Forests – Aircraft involved in 1st February 2013 Plantation Fire, Castledowns Forest, Northern Southland

Responses from the fifteen large forest companies indicate a combined three-year expenditure of approximately

\$32.3
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Evidence-based insights into fire danger patterns affecting plantation forests

The impacts of climate change on New Zealand's environment are a major concern for many people. In the context of fire protection for planted forests, a key question is whether climate change is already influencing wildfire frequency or severity, extending periods of elevated fire danger, or – contrary to expectations – resulting in little change or even reductions in fire danger in some regions.

Attributing the increase in burned area observed since 2017 solely to climate change oversimplifies a more complex set of drivers. Recent wildfire impacts reflect not only the influence of a warming climate but also expanding development in fire-prone landscapes, constraints in current response capability, and variability in operational effectiveness (GNS Science, 2023). While climate remains an important factor, emerging wildfire patterns increasingly reflect changes in land use that alter fuel continuity, ignition likelihood, and fire behaviour across the landscape (Parliamentary Commissioner for the Environment, 2024).

Forest owners monitor fire danger levels daily during the fire season using outputs from the New Zealand Fire Danger Rating System (NZFDRS). This system is a critical tool for assessing the ease with which a fire may start, the rate at which it may spread, the difficulty of control, and the potential consequences (Merrill & Alexander, 1987). It integrates weather, fuel conditions, topography, and other fire environment variables to produce indices that support day-to-day operational decisions – such as operational restrictions, resource allocation, alert levels, mobilisation, and positioning – as well as longer-term planning, including prescribed burning, budgeting, and forecasting future risk. Fire danger rating is a mature and well-validated science,

underpinned by nearly a century of research and practical application.

A 2021 study examining the influence of recent climate on fuel availability – drawing on up to 60 years of weather data from multiple locations in New Zealand – found no evidence of a dramatic nationwide increase in days with elevated fire danger (Dudfield, Cameron & Pearce, 2021). Instead, the analysis indicates that only a substantial and sustained shift in prevailing weather patterns would drive a marked rise in average annual fire danger levels over the next 20 to 40 years.

A 2025 assessment examined whether fire danger ratings – quantitative indicators of fuel dryness, ground moisture, and potential fire spread – have changed over the past 15 years relative to pre-2010 levels. Using the NZFDRS as a scientifically robust framework, the study found a general decline in fire danger indicators across most of the country (Dudfield, Thompson, 2025). These findings contrast with earlier projections by the Ministry for the Environment (2017), the Ministry for the Environment and Stats NZ (2020), and Watt et al. (2018), which anticipated a significant increase in fire danger by 2040. This divergence highlights the need to revisit modelling assumptions and undertake further research to ensure New Zealand remains well-prepared for potential climate-driven changes in wildfire risk.

A 2025 assessment examined whether fire danger ratings – quantitative indicators of fuel dryness, ground moisture, and potential fire spread – have changed over the past 15 years relative to pre-2010 levels. Using the NZFDRS as a scientifically robust framework, the study found a general decline in fire danger indicators across most of the country.

Despite the recent downward trend, continuous monitoring of fire danger remains essential for safeguarding the forestry estate. Fire danger can shift quickly due to seasonal variability, extreme weather events, land-use changes, and fuel-load dynamics. Ongoing surveillance enables forest managers and FENZ to detect emerging risks, refine preparedness measures, and deploy suppression resources more effectively.

Controlled burning as a wildfire-risk reduction tool

Controlled burning is an established land-management tool used within and around New Zealand’s planted forests to reduce hazardous fuel loads and strengthen wildfire resilience. In plantation environments – where slash, litter, and post-harvest residues accumulate quickly – controlled burns provide an efficient means of reducing the fine and moderate fuels that drive rapid fire spread.

Figure 9: Number and area of controlled burns 2022–25

	2022/23		2023/24		2024/25	
	Number of Controlled Burns	Hectares involved	Number of Controlled Burns	Hectares involved	Number of Controlled Burns	Hectares involved
Broadcast Burns	6	468	7	80	3	56
Logging Site Burns	41	25	15	7	32	12
Total	47	493	22	87	35	68

When conducted under defined weather, fuel, and operational conditions, controlled burns reduce the likelihood of high-intensity wildfire behaviour, ease suppression, and improve safety for forest workers and emergency responders.

Within the plantation cycle, controlled burns are used for pre-planting site preparation, boundary fuel management, and post-disturbance clean-up where storms or other events create heavy fuel loads. In many settings, they offer a more practical and cost-effective option than mechanical fuel reduction, particularly where terrain or scale limit ground-based treatments.

Strategically applied, controlled burning disrupts fuel continuity, reduces the risk of surface fires transitioning to crown fires, and strengthens defensible space around

high-value assets, infrastructure, and neighbouring communities. Additional benefits include improved access for establishment operations, nutrient recycling, and reduced pest habitat associated with heavy slash.

Effective implementation requires clear burn prescriptions, robust risk assessment, trained personnel, and full compliance with environmental and regulatory requirements.

Controlled burning also provides valuable opportunities for personnel to gain hands-on experience in fire behaviour, ignition techniques, and suppression operations – skills essential to building and maintaining operational capability across the sector. Post-burn monitoring ensures objectives are achieved, and any residual hazards are identified and addressed.

When integrated with silvicultural fuel management, roading design, detection systems, and rapid-response arrangements, controlled burning remains a core component of comprehensive wildfire-risk mitigation in New Zealand’s plantation forestry sector.

A component of the 2025 Forest Fire Survey included a request from forest

owners to provide information on their use of prescribed and broadcast burns for fuel management. Survey responses indicate that several forest companies routinely use controlled burns to manage fuel buildup at skid sites and to conduct broadcast burns after recent harvesting operations. Data from the 2022 to 2025 period (Figure 9) show that prescribed burning continues to play an important operational role for many organisations, particularly in managing high-fuel locations where alternative treatments are limited or cost-prohibitive. These findings reaffirm the ongoing relevance of controlled burning as a practical, scalable tool in reducing wildfire risk across the plantation forestry sector.

Controlled burning remains a core component of comprehensive wildfire-risk mitigation in New Zealand’s plantation forestry sector.



↑ Image by Paul Hart, Ernslaw One – Wilding Pine Burn

Forestry-sector insights into wildfire occurrence and impacts

Accurate and comprehensive wildfire statistics are essential for understanding fire occurrence, behaviour, and impacts within New Zealand's planted forest estate. These data form the evidence base for evaluating trends in fire incidence, assessing management effectiveness, and identifying emerging risks associated with climate variability and land-use change.

Consistent reporting of wildfire events enables forest owners, researchers, and FENZ to track changes in ignition sources, seasonal patterns, and fire-size distribution over time. This information underpins effective prevention strategies, strengthens the accuracy of risk modelling, and supports the targeted deployment of suppression resources. It also provides a reliable basis for benchmarking performance across regions and years, helping both the forestry sector and FENZ assess operational effectiveness across the wider rural landscape.

However, the lack of recent meaningful national and regional reporting on area burned by rural land use reflects a weakening connection with rural land users and creates a significant gap in understanding sector-wide wildfire impacts. This information is a critical source of intelligence for assessing wildfire-response performance and informing risk-reduction efforts.

The last national report to include area-burned data by land-use class was the 2020/21 Wildfire Summary Report, which recorded 1,663 hectares of planted forest affected by wildfire. Subsequent reports for 2021/22 and 2022/23 have not provided any information on wildfire impacts in planted forests or other rural land uses, leaving a growing void in the evidence base.

Information on planted-forest wildfire losses since 2017 appears to be limited, offering little insight into the sector's true risk exposure or the performance of FENZ in

reducing and mitigating wildfire impacts. The absence of consistent, verified reporting on area burned by land-use type – particularly for production forests – creates a significant gap in understanding sector-wide effects and undermines the ability to assess trends, evaluate response performance, or inform risk-reduction planning.

High-quality wildfire data would include:

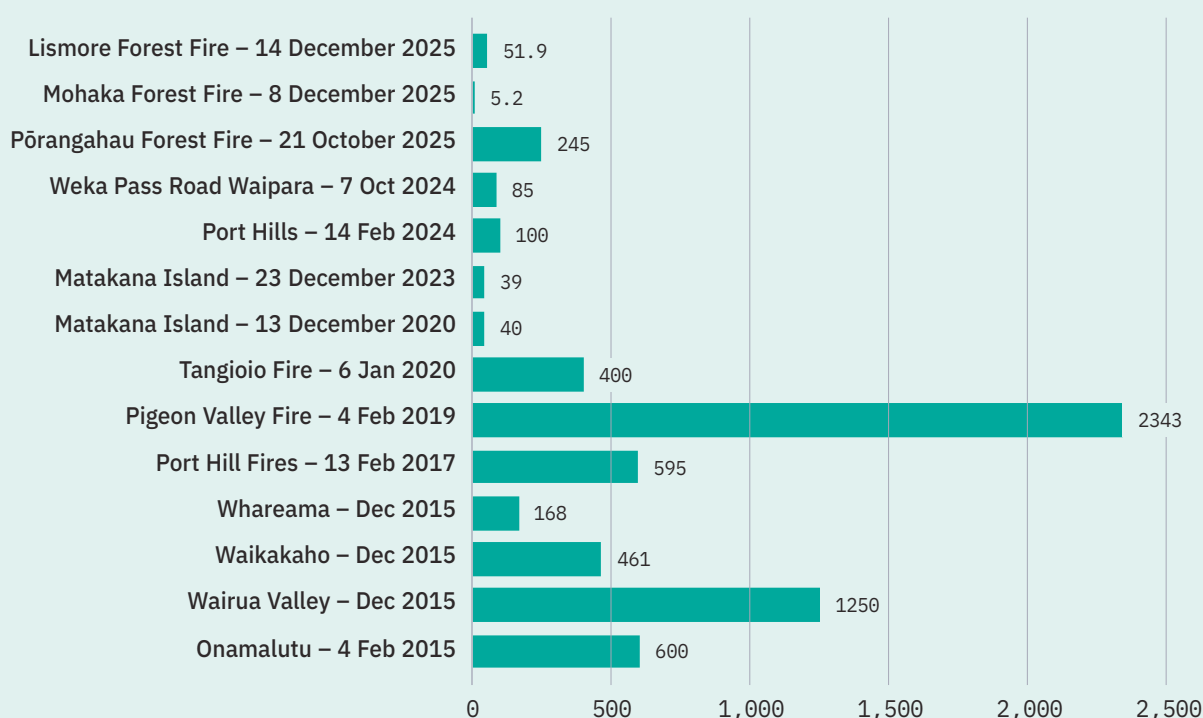
- **Verified production forest land area affected** – consistently reported at national and regional scales, with clear identification of whether fires originated *within the planted forest estate* or *outside the forest boundary* before entering plantation land.
- **Breakdowns by land-use type** – including planted forest, scrub, pasture, conservation land, carbon forests, and other rural categories, enabling a full understanding of cross-boundary fire spread and exposure pathways.
- **Plantation-specific attributes** – such as age class, species, silvicultural regime, stand density, and management type, recognising that fire behaviour and loss severity vary significantly across these variables.
- **Fire behaviour and suppression context** – including ignition source, point of origin relative to forest boundaries, detection time, initial attack actions, resource deployment, and containment timelines, allowing assessment of both risk drivers and response performance.

- **Loss metrics** – such as area burned, value of crop lost, salvageable volume, and secondary impacts (infrastructure, environmental, operational), with explicit differentiation between losses caused by *internally ignited fires* and those driven by *external ignitions* entering the forest.
- **Standardised definitions and reporting intervals** – ensuring consistent year-to-year and region-to-region comparison, and enabling integration with other rural-land-use datasets and national fire danger monitoring systems.

Such data would provide a robust evidence base for evaluating wildfire risk, understanding exposure across different forest types, and assessing the effectiveness of suppression strategies and resource deployment.

The lack of recent meaningful national and regional reporting on area burned by rural land use reflects a weakening connection with rural land users and creates a significant gap in understanding sector-wide wildfire impacts.

Figure 10: Notable Planted Forest Hectares Burnt Since 2015



↑ Source: NRFA, FENZ, NZIF & Rural Fire NZ

In the absence of this level of reporting, only partial insights can be drawn. Based on information from known wildfire events, Figure 10 lists known plantation-forest areas exceeding 20 hectares that have been affected by wildfire since 2015. While useful, this dataset represents only a subset of total losses and highlights the need for more comprehensive, transparent, and systematically verified national reporting.

The findings from the 2025 Study – covering forest owners responsible for approximately 1.1 million hectares, or around 61% of

New Zealand’s managed planted forest estate – provide several valuable insights. This dataset represents an up-to-date picture of plantation forests impacted by wildfires. The scale and quality of the information provided by participating forest owners enable meaningful comparisons over the past three years and a clearer understanding of how fire-management practices and risk exposures are evolving across the industry.

In addition to information provided by survey participants, the Project Leader was aware of two plantation-

involved wildfires that occurred during the survey period but were not reported through the survey: the Weka Pass Road (Waipara) fire on 7 October 2024 and the Port Hills wildfire on 14 February 2024.

Including this additional information, together with gap-filled data (Refer to Footnote 2), the past three fire seasons (2022/23 to 2024/25) recorded eleven fires that originated outside planted forest boundaries and subsequently spread into plantation areas. Two of these external-origin fires accounted for an estimated 185 hectares burned,



↑ Image by Craig Brown, One Forty One – Forest Fire Training

Figure 11: Forest fire occurrences and estimated impacted area reported by survey respondents

Large Forest Owners	Total Fires	2022/23 Ha	2023/24 Ha	2024/25 Ha	3 Yr Av No	3 yrs Av Ha Burnt
Originated outside the planted forest	4	0	6	6	1.3	4
Originated within the planted forest	22	16	52	4	7.3	24
1.1m hectares	26	16	58	10	8.7	28
Small Forest Owners	Total	2022/23 Ha	2023/24 Ha	2024/25 Ha	3 Yr Av No	3 yrs Av Ha Burnt
Originated outside the planted forest	4	0	185	7	1.3	64
Originated within the planted forest	0	0	0	0	0.0	0
15,690 hectares	4	0	185	7	1.3	64
All Forest Owners	Total	2022/23 Ha	2023/24 Ha	2024/25 Ha	3 Yr Av No	3 yrs Av Ha Burnt
Originated outside the planted forest	8	0	191	13	2.7	68
Originated within the planted forest	22	16	52	4	7.3	24
1.116m hectares	30	16	243	17	10.0	92

Reported & Gap Filler Summary

All Forest Owners	Total	2022/23 Ha	2023/24 Ha	2024/25 Ha	3 Yr Av No	3 yrs Av Ha Burnt
Originated outside the planted forest	11	0	264	18	4	94
Originated within the planted forest	30	22	72	5	10	33
1.4m hectares	41	22	336	23	14	127

while the remaining incidents were minor – most were contained to less than 1 hectare due to rapid detection and effective initial attack.

Over the same period, 30 fires originated within planted forest boundaries, burning a total of 99 hectares. One internally originated fire accounted for approximately 40 hectares of the total. When the gap-filling information is incorporated, wildfires that burned planted forests over the past three years were predominantly external in origin: 282 of the 381 hectares burned resulted from fires that started outside plantation boundaries, compared with 99 hectares from fires that originated within the forest boundary (Figure 11).

The small forest owner survey also revealed a very low incidence of wildfire, with only 2 of the 190 respondents reporting a single fire in 2023/24 and 2024/25. Both fires were minor, affecting less than one hectare. One fire originated outside the forest boundary, while the other began within it, highlighting that both external and internal ignition sources are relevant even for small forest owners.

Although based on a limited sample, these findings suggest that the

frequency and scale of wildfires in small owner-managed forests are minimal, reflecting the effectiveness of current mitigation and management practices and the generally low risk profile.

Overall, the survey indicates relatively few fires and a modest burned area across the three-year period, reflecting the sector's sustained emphasis on proactive fire management planning and operational readiness. Continued investment in prevention – such as maintaining access networks, managing fuel loads, improving firebreaks, and promoting fire danger awareness – remains central to reducing both the frequency and severity of wildfire events.

High-quality, consistent data are essential for enabling decision-makers to prioritise investment, design targeted prevention strategies, and strengthen community resilience. Over time, robust statistics support meaningful comparisons and ensure that policy and operational decisions are grounded in evidence rather than assumptions, anecdotal opinions, or deliberate misinformation – transforming raw incident data into

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2 of the 190 respondents reporting a single fire in 2023/24 and 2024/25.



↑ Image by Paul Hart, Ernslaw One, Land Clearing Burn

actionable insights and intelligence, helping reduce the social and economic impacts of wildfires, and ensuring that resources and interventions are transparently targeted to the highest-risk areas.

There is broad agreement across the forestry sector that robust, consistent vegetation-fire data are fundamental to effective risk management. Re-establishing comprehensive national reporting would enable clearer analysis of location, fire size, ignition patterns, fuel-type influences, and long-term performance – supporting both FENZ and landowners to make better-informed decisions. The sector remains willing to work with FENZ to help strengthen these systems.

At present, however, the lack of reliable rural-fire statistics has widened the gap between the operational performance of forest owners – who continue to invest heavily in trained personnel, equipment, and prevention systems – and the national agency responsible

for rural-fire regulation and reporting. Without dependable data, New Zealand lacks the foundational information needed to assess system performance, identify emerging risks, or design effective prevention and readiness strategies. This weakens operational planning, undermines policy development, and leaves rural communities and land managers without the insights required to reduce wildfire risk and build long-term resilience.

In response to this gap, forest owners have undertaken their own survey to produce an independent overview of wildfire occurrence, resource use, and impacts across 1.4 million hectares of planted forest estates over the past three years. This work has contributed to a clearer evidence base to support prevention, readiness, and response planning, while also enabling more constructive engagement with FENZ on the need to restore and maintain robust national data collection.

As the demand for reliable wildfire statistics grows, it is increasingly important to consider how data are

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collected, verified, and shared with rural stakeholders and partners such as the forestry sector. Differences in reporting systems, event classification, and spatial resolution all influence the consistency and comparability of results. Understanding these methodological variations provides essential context for interpreting national fire statistics and helps identify opportunities to improve data quality, integration, and accessibility.

Assessment of wildfire management effectiveness: forest industry concerns and opportunities for partnership

Over the past five to eight years, FOA members have shared a range of observations regarding the services delivered by FENZ and their alignment with the needs of forest and rural stakeholders.

These reflections, informed by operational experience, industry data, and recent operational reviews, identify several areas where opportunities to strengthen alignment and improve outcomes exist. These areas include the following.

- A** FENZ's utilisation of experienced tall timber firefighting and heavy machinery operations could be strengthened. One way to address this is by involving forestry-trained personnel early in the initial response phase of wildfires, ensuring that specialist skills and equipment are effectively integrated into suppression efforts.
- B** The emerging risk from fires starting outside of forests, with significant potential for loss eg., Pigeon Valley fire 2019.
- C** Some forest owners have observed instances where differences in tactics, resourcing, or local knowledge may have contributed to slower containment than anticipated. Independent operational reviews of recent events could help identify opportunities to strengthen coordination, enhance situational awareness, and improve deployment and more effective and efficient use of specialist assets.
- D** FENZ is relying heavily on deploying community-based volunteer firefighters to contain wildfires in the forest and rural landscape, and has reduced or
- made minimal or inconsistent use of available partners' expertise and capability
- E** National statistics of the area burned across different fuel types in the forest and rural landscape are regarded as incomplete, inconsistent and inadequate. The gaps in reporting have made it difficult for sector stakeholders to accurately assess fire behaviour trends or identify where emerging risks are greatest. This limitation is further underscored by the Bioeconomy Science Institute's inability (due to insufficient FENZ data collection and data quality) to publish a detailed breakdown of area burned by fuel type since the 2021/22 reporting year – an absence that highlights ongoing challenges in data collection, standardisation, and reporting at the national level. Together, these issues have constrained the sector's ability to undertake robust analysis, compare year-to-year changes, and support evidence-based fire management planning.
- F** FOA members remain keen to work in partnership with FENZ to make the best use of aircraft in wildfire management, including fire suppression. The forest industry employs trained Forest Managers who routinely oversee aerial operations in day-to-day forest management. FOA members are willing to partner with FENZ to strengthen
- aerial firefighting and improve aircraft productivity on the fireground. There may be opportunities for clearer pathways and protocols that better enable forestry aviation managers and other specialists to contribute during wildfire events. Strengthening these mechanisms could enhance aircraft efficiency and support safe, effective operations.
- G** FOA members remain committed to working collaboratively with FENZ to strengthen wildfire management in New Zealand's forests and rural landscape. Key partnership opportunities include:
 - Integrating forestry-trained and experienced resources and machinery into initial wildfire response.
 - Establishing joint protocols for managing fires that originate outside plantations.
 - Reviewing and improving suppression tactics and cost efficiency.
 - Expanding the role of forestry aviation expertise to support and improve aircraft deployment.
 - Improving data collection systems to enable better monitoring, analysis, research and reporting.
 - Advancing regulatory tools to better manage and reduce fire risk in forests and other high-risk areas during periods of elevated fire danger.

Strategic conclusions and policy implications

The 2025 Study provides the most comprehensive picture to date of wildfire impacts, fire-protection expenditure, and operational capability across New Zealand's plantation forestry sector.



Twenty-one large forest owners contributed verified data covering

1.081 million hectares

– 62% of the national estate – with an additional 267,000 hectares added through an agreed-upon gap-filling methodology.

Based on the survey results, this enabled robust analysis across

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The FFA contributed by helping oversee the study and providing the only national data on wildfire risk, insurance, and capability among small-scale forest owners, ensuring their perspectives were included in the sector-wide analysis.

Insurance coverage remains a key component of financial risk

management, though uptake varies significantly by ownership scale. Approximately 24% of the large scale estate is insured, with annual premiums averaging \$8 million across 2023–2025. Survey results from FFA members indicate that around 46% of small forests are insured.

A central concern emerging from the study is the erosion of forest-specific fire-management expertise within FENZ's first-response model. Skills historically provided by major forest owners – deep knowledge of forest fuels, terrain, access networks, equipment, and operational hazards – appear to have decreased significantly since 2017. This capability loss has reduced the system's ability to anticipate fire behaviour and respond



↑ Image by Paul Hart, Ernslaw One, Land Clearing Burn

effectively to fires in plantation environments, potentially contributing to larger burned areas when fires escape initial attack.

While climate change is often cited as the primary driver of increased wildfire risk, fire-weather data indicators reinforce that near-term risk reduction depends far more on operational capability, land-use practices, and the availability of trained personnel. Rebuilding practical skills, strengthening initial-attack capacity, and restoring forest-appropriate response models will deliver more immediate benefits than climate-focused narratives alone.

Despite these systemic changes, forest owners remain strongly committed to protecting their planted forests. Investment in prevention, preparedness, and estate-specific suppression capability continues, ensuring that forest assets remain protected even as broader system capability declines.

Given the ongoing impacts of these changes, direct fire-protection costs for forest owners have declined since 2022, decreasing from \$8.26/ha to \$5.81/ha. This reduction reflects a shift in operational demand rather than any improvement in underlying preparedness or risk. Over the past seven years, FENZ has used forestry-sector resources less frequently during initial-attack operations, resulting in fewer callouts and reduced deployment

of industry crews and equipment. Concurrently, the incidence of wildfires affecting large forest estates has been relatively low over the past three years, limiting the need for large-scale suppression and further suppressing direct costs for affected forest owners.

While these factors have contributed to lower direct expenditure, the reduction should not be interpreted as a sign that fire-management capability is less important. Instead, it highlights the sensitivity of annual costs to operational tempo and reinforces the value of maintaining a trained, well-equipped in-house response capacity that can scale rapidly when conditions deteriorate.

Overall, the 2025 Study provides a robust, evidence-based stocktake that supports ongoing trend monitoring and enables constructive engagement with government on fire-service performance and funding settings. It highlights the forestry sector's substantial and sustained investment in fire protection, the critical importance of maintaining a response capability tailored to plantation-forest environments, and the value of a strong initial-attack model. The findings reinforce that effective wildfire management in New Zealand's planted forests relies on strong partnerships, clear accountability, and a renewed focus on operational enhancement across the entire fire-management system.

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